Former Philadelphia Refinery
Public Comment Remedial Investigation Report
March 31, 2021

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APPENDICES

COMMON ACRONYMS IN ACT 2 REPORTS

AOI	Area of Interest
CO&A	Consent Order and Agreement
COC	Constituent (or Compound) of Concern
EPA	United States Department of Environmental Protection
LNAPL	Light Non-Aqueous Phase Liquid
NIR	Notice of Intent to Remediate
MSC	Medium Specific Concentration
MTBE	Methyl Tertiary-Butyl Ether
PADEP	Pennsylvania Department of Environmental Protection
PES	Philadelphia Energy Solutions
PRM	Potomac-Raritan-Magothy
PWD	Philadelphia Water Department
RIR	Remedial Investigation Report
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Public Comment Remedial Investigation Report (RIR) addresses public comments that have been submitted for the former Philadelphia Refinery (Site) in relation to past reports completed under Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2) Program, as well as the joint Pennsylvania Department of Environmental Protection (PADEP) and U.S. Environmental Protection Agency (EPA) One Cleanup Program. Since Dec. 30, 2013, Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen), has managed the investigation and remediation of the legacy environmental conditions at the Site. Evergreen is an affiliate of Sunoco, Inc., now known as ETC Sunoco Holdings LLC.

Evergreen submitted a Notice of Intent to Remediate (NIR) to the PADEP in 2006, formally entering the Site into the Act 2 Program. At the request of the City of Philadelphia (City), Evergreen developed a Public Involvement Plan (PIP) in 2006 and updated it in 2019. The PADEP requested that Evergreen prepare this Public Comment RIR to complete the public involvement process for the past Act 2 Reports that were previously submitted to the PADEP. Each report had a 30-day comment period at the time of their submittal and the City requested an additional 120-day comment period to allow the public time to review the past reports and provide their comments and questions.

A Public Information Session was scheduled for Nov. 7, 2019 to start the comment period and provide a summary of the data contained within the reports but was unfortunately blocked by a community group from being completed as planned. Evergreen, however, has willingly included all comments received during and since the November 2019 attempted meeting in this Public Comment RIR. Evergreen successfully held a Public Information Session on Aug. 27, 2021, which officially opened the "120-day" comment period. Evergreen held another Public Information Session on Jan. 14, 2021, which marked the end of the "120-day" comment period. Even though 120 days from the Aug. 27, 2020 public information session was Dec. 26, 2020, Evergreen included comments received through the Public Information Session on Jan. 14, 2021 in this report. While the purpose of the public comment period was to engage the public in reviewing and providing comment on reports previously reviewed by the regulatory agencies, many comments collected to date do not relate specifically to the past reports, but rather to other topics that may be addressed in future Act 2 submittals. However, all comments received through Jan. 14, 2021, are addressed in this Public Comment RIR, regardless of topic and method of submittal (e.g. written, live during public meetings, telephone, or other methods).

Evergreen consulted other stakeholders for some of the answers provided in this document, as they either fully or partially pertained to other entities' activities or were better-suited to be answered by a regulatory agency. These other stakeholders include the PADEP, EPA, the City, and Hilco Redevelopment Partners (HRP or Hilco). An EPA contractor, Skeo Solutions, Inc. (Skeo), held a public meeting on Aug. 6, 2020, where they presented the results of their review of the past Act 2 reports. This Public Comment RIR also includes comments that were made during Skeo's public meeting if they were not already addressed by comments made directly to Evergreen.

For ease of review, questions with similar subject matter and responses are grouped together below. In addition, as the purpose of the public comment period was for review of past Act 2 reports, comments associated with those reports are included in a separate section from comments and questions related to other topics. Appendix A includes copies of the public notices that were sent out for this report. Appendices B and C include copies of the comments received from the public. Some comments were duplicated by multiple commentors; in these instances, the question is only included once in the text of

this report, but all original comments are included as submitted in Appendices B and C. The comments and responses included in the text of this report are also included on Evergreen's website for the Site (https://phillyrefinerycleanup.info).

2.0 COMMENTS AND RESPONSES RELATED TO PAST ACT 2 REPORTS

Section 2.0 summarizes the comments from the public related to the past Act 2 reports and provides Evergreen's and/or others' responses.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Air monitoring has been done on site to see if vapors were present in refinery buildings or the surrounding air. When will this investigation of air quality be extended to surrounding areas, slash neighborhoods?

Question:
Most of the testing in all media was limited to the industrial site or very close to it. Since contamination from air pollution occurred continuously outside the site, since most contamination migrates and may change over time, depending on many factors, more extensive offsite testing for all compounds should be done.

Question:
Evergreen conducted air monitoring for indoor air in buildings on the site, will you also monitor the basement of homes near the VOC contamination for ambient pollution?

Answer:
As part of the Act 2 program, Evergreen evaluates potential air quality effects from subsurface conditions (as opposed to any air quality issues from above-ground operations). The evaluation of any vapors to indoor and outdoor air from a dissolved plume beneath the subsurface is part of the evaluation required by Act 2 and will be included in future Act 2 reports, submitted upon completion of all Remedial Investigation Reports. Evergreen has conducted initial assessments using existing data and conservative assumptions, which did not find any potential impacts to off-site residences from the conditions in shallow groundwater; therefore, we have no plans to test off-site buildings. However, future fate and transport evaluation will model the projected extent of groundwater contaminants, which will be used to confirm the assessment of offsite air quality effects from subsurface conditions and will be summarized future reports.

Question:
When were the outdoor air samples taken?

Answer:
The outdoor (ambient) air samples that Evergreen has collected across the Site have been collected over many years. Some samples were collected during individual Area of Interest (AOI) investigations, and some were collected as part of a site-wide vapor investigation, generally conducted between 2009 and 2018. Individual sample dates are included in the air data tables within the RIRs.

Question:
It seems like many of the RIRs are still pending despite Hilco's plans to start construction in 2021. 1) What AOIs are planned to be clear to build in 2021 and 2) what are the states of their RIR and Remedial Action Reports such that building can occur so soon. 3) If [Hilco is] starting in the North, AOI 8 has an identified benzene plume that exceeds the site boundary to the north. There is a sample point in the lower aquifer on the boundary that is outside of the active and inactive remediation boundaries. What are the remediation activities that need to be done prior to construction to address these needs?

Answer:
Hilco Redevelopment Partners' construction schedule is not dependent on completion of Evergreen's remediation activities. Operation of Evergreen's remediation systems in the North Yard (AOI 8) and in other areas of the Site will continue during and after Hilco Redevelopment Partners' decommissioning, demolition, and redevelopment activities. Hilco Redevelopment Partners and Evergreen have and will continue to coordinate actively to make sure Evergreen's work can continue during Hilco Redevelopment Partners redevelopment.

With respect to soil delineation, Remedial Investigation (RI) activities are complete in all AOIs. With respect to groundwater, Evergreen is collecting additional off-site information for AOI 4 and AOI 9, and RI activities are complete for the other AOIs. After all RI activities are complete, Evergreen will submit Cleanup Plans that will incorporate Hilco Redevelopment Partners planned development.

The question was also provided to Hilco Redevelopment Partners, who provided the following response: Hilco Redevelopment Partners recognizes the potential for impacted soil and groundwater to act as vapor-intrusion sources for new buildings constructed at the Site. Hilco Redevelopment Partners will conduct sampling and analysis to evaluate the potential for vapor intrusion into planned buildings in accordance with PADEP guidance. If warranted based on sampling results, Hilco Redevelopment Partners will install vapor barriers or other vapor-mitigation controls (such as subslab venting systems) beneath new buildings.

Question:
When will Evergreen conduct the fate and transport analysis for the lower aquifer? There is no aquitard between upper and lower aquifer across most of the site. Won't the heavily contaminated shallow aquifer gradually leach contaminants into the lower aquifer? (a critical drinking water source for New Jersey)

Answer:
The fate and transport analysis for the lower aquifer will be performed once the RIRs for AOIs 4 and 9 have been approved. Areas beneath the Site where connections exist between the lower aquifer and water table aquifer are less extensive than the areas where we have that important clay layer present. The cross section shown during the August 27, 2020 Public Information Session was just one example from the site model that straddles the Schuylkill River where the aquitard is interpreted to be missing. Other cross sections show the continuity of that clay layer. Even where the aquitard is missing, it does not necessarily mean that water and contaminants will move down into the deeper aquifer. That potential has to do with pressure gradients that the model can simulate. The fate and transport model will simulate future scenarios based upon current conditions.

It is noted that the fate and transport analysis will include mapping of the middle clay unit aquitard. Water quality in the lower aquifer is monitored through routine sampling of groundwater from approximately 80 wells, and to date, we have not observed significant contamination in the lower aquifer beneath the Site. Considering the aging and degrading petroleum sources in the water table from historic Sunoco sources, we do not expect groundwater hydrocarbon plumes to expand under current groundwater conditions.

Question:
Are drinking water intake portals downstream from the site. All the way to the Delaware Bay?

Answer:
As a part of the investigations, Evergreen conducted a well search including field reconnaissance within a one-mile radius of the Site using Pennsylvania's Groundwater Information System (PaGWIS) and PADEP's eMapPA GIS mapping tool. Search results did not identify potable water supply wells in the area. We also conducted a search of surface water intakes from the Schuylkill River within one mile of the Site, and the Philadelphia Water Department did not identify any surface water intake portals within one mile in its 2010 "Schuylkill River Hydrology and Consumptive Use Report." For reference, the search radius for potable groundwater or surface water is typically ¼ to ½ mile from a Site, but Evergreen completed a one-mile search as part of the RI activities for this Site.

Question:
When will the revised RIRs for AOIs 4, 9 and 11 be submitted?

Answer:
The RIR Addendums for AOIs 4 and 9 will be submitted once the public comment period for the approved RIRs is completed and a summary document is submitted and approved by the PADEP. Evergreen incorporated the investigation of the deep groundwater unit (AOI 11) into the other RIRs since 2013 based on discussions with the PADEP, so we will not submit a separate AOI 11 RIR since it has been more appropriately incorporated into previously submitted RIRs. The 2020 First Amendment to the Consent Order and Agreement stipulates that both the AOI 4 and AOI 9 RIR Addendums must be submitted by September 2021, and the Fate and Transport RIR (which will include the AOI 11 lower aquifer) must be submitted by December 2021.

Question:
Gulf operated a refinery where the Schuylkill Tank Farm is currently located before building the refinery at Girard Point. What contamination is left at the former refinery site? What are the implications for people living or working in Eastwick?

Answer:
The site characterization and history for the Schuylkill River Tank Farm (SRTF), which is also known as AOI 9, can be found in the RIR for AOI 9. Some contaminants are present in soil and groundwater related to the~~se~~ former operations. Light non-aqueous phase liquid (LNAPL), or oil, is also present in limited areas and has been observed in monitoring wells. Evergreen completed additional off-site delineation of the dissolved contaminants since the submittal of the last RIR (2017) and is planning to submit these

results to PADEP in a forthcoming addendum to the AOI 9 RIR (2021). The results of the site characterization demonstrate that the contamination from AOI 9 does not extend to any residential areas. The final remedial approach will be presented in a Cleanup Plan dedicated to the SRTF.

Question:
Can these report summaries identify the metrics and the benchmarks that you think Evergreen is attaining and succeeding and those that have not been reached - the question remains – what the critical path benchmarks for Lead, Benzene, Air Quality etc.

Answer:
The goal of each RIR is to identify and define the source of contamination and particular constituents of concern, define the nature and extent of the contaminants (including fate and transport), characterize the affected media, and determine the appropriate Act 2 standards to be used. PADEP and EPA determine whether these goals and benchmarks have been met through their review of the RIRs upon submittal. For example, the RIRs for AOIs 4 and 9 were not approved due to the need for additional delineation of the extent of groundwater impact beyond a property boundary, as identified in the report summaries.

The RIRs compare the data to the Act 2 statewide health standards (one metric of comparison). Future Risk Assessment Reports and Cleanup Plans will define whether other metrics or benchmarks will be used, such as site-specific standards or cleanup goals that must be met to achieve Act 2 closure. The current critical paths for lead, benzene (or any other compound) and air quality (soil or groundwater also) is to complete the remedial investigations to be able to proceed to these future assessments.

Future report summaries will clearly define the goals of the reports and whether those goals have been met.

Question:
How long does it take to collect soil and groundwater data for an AOI?

Answer:
That depends on a number of factors. Data has been collected at the Site for years for various reasons, whether it was in response to a particular release or general characterization of an area. Most AOI investigations begin with compiling all known past data and historical information such as the particular use of an area, then preparing a work plan for collection of new information. After the work plan activities are completed, often additional data needs to be collected to delineate an area of impact (i.e. to further define the contamination horizontally and vertically). The duration of field data collection depends mostly on the number of borings/wells to be installed and the amount of sampling to be conducted. Tasks such as clearing locations for utilities prior to drilling and developing wells after installation and prior to sampling also takes time. Large-scale sampling efforts such as involved here can typically take months to years.

Question:
Is soil tested to a depth greater than 2 feet deep?

Answer:
Yes, soil is tested at many depths. We showed the soil data results in two different slides: 0-2 feet below the surface greater than 2 feet below the surface because the standard concentrations to which we compare our data are different for surface soil (0-2 feet) and subsurface soil (2-15 feet, or greater).

Question:
Immediate multiple station environmental sensing for air, water and soil is essential to establish a baseline of current and future conditions of the now Hilco owner of the refinery.

Answer:
All historic data collected to date has established a baseline of environmental conditions, as per the requirements of Act 2, and have been documented in RIRs. Ongoing groundwater sampling activities and soil samples collected since the RIRs were submitted, and the thousands of soil samples that are to be collected by Hilco Redevelopment Partners as part of its environmental sampling to support redevelopment continue to document conditions at the former refinery. We will monitor future conditions related to the Act 2 Cleanup based on the requirements of the Cleanup Plans and Post-Remedial Care Plan.

Question:
In its remedial investigation, Evergreen should adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater to the river, and into adjacent residential neighborhoods.

Answer: Remedial investigations are evaluations of current conditions, and current condition measurements inherently include climate effects as they have occurred and are occurring. The future effects of climate change will be evaluated in future modeling efforts. The fate and transport modeling efforts are also part of the remedial investigation process.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Groundwater needs more attention and testing as well as soil. For one thing, an update is needed to reflect the conditions of both shallow and deep groundwater because of the length of time since the reported sampling, and after years of partial remediation. Contamination in groundwater aquifers does not stay in one place for years! I'm also concerned that the shallow and deep aquifers were presented as being separated by an aquitard, implying that the deeper drinking water aquifer was somehow protected from the high pollution in the more shallow areas. However, the shallow and deep aquifers are not continuously separated, leaving contamination to migrate between them. This is even more concerning since some shallow areas of the aquifer are very close to highly contaminated soil and thus very vulnerable to becoming more contaminated over time. Also, while pumping contamination out of the water has removed a lot of pollution, pumping also alters how quickly and in what direction

groundwater (and contamination) moves, and may have increased the movement of contamination between these unconfined aquifers or how far from the refinery the contamination extends. Because of this, it would be prudent to conduct new tests as well as sampling a larger portion of both aquifers.

Question:
The current work cannot be evaluated until all analysis about the aquifers is completed. Without that information, the public does not have all of the information to evaluate decisions on soil and groundwater sampling.

Question:
Evergreen has not sufficiently delineated the nature and extent of contamination in the deep aquifer and the unconfined aquifer (water table).

Answer:
Evergreen conducts continual groundwater sampling at the Site, not just as part of the RIRs. Sampling is necessary before, during and after remediation is complete; therefore, sampling will continue at this facility for quite some time. The current work under evaluation (what's included in the RIRs) includes defining the nature and extent of contamination in the subsurface as well as significant information on the geology and hydrogeology, which do not require additional aquifer analysis to review. Remaining aquifer analysis, which is the fate and transport model, takes the RIR data and predicts migration. The eventual Final Report for the site will also include additional analysis to demonstrate that remediation goals have been attained, which will include further groundwater analysis of aquifer conditions.

We frequently evaluate the direction and rates of groundwater flow at the Site and routinely collect groundwater samples from various hydrogeologic units beneath the Site. Our remedial investigation activities also evaluated the areas where the confining layers in the subsurface were not continuous through the completion of soil borings, installation of monitoring wells, collection of groundwater samples, groundwater elevations and completion of aquifer tests to determine hydraulic properties of the groundwater units. We will use this data for the upcoming evaluation of contaminant movement in the fate and transport evaluation through the use of a three-dimensional numerical model, which will be presented in the Fate and Transport RIR.

Characterization of the Site's geology, hydrogeology, and extent of contamination -- including study of the pathways that could exist -- has been ongoing and is included in the RIRs. A fate and transport analysis will be prepared once all RIRs have been approved, and the analysis will include model simulations of contaminant transport. This report is expected to be submitted by the end of 2021.

Question:

What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)? If so, when? If not, why not?

Answer:
RIRs must include delineation of contamination in soil and groundwater be approved. Soil impacts have been delineated across the Site and up to the fence lines as noted in each of the RIRs, meaning soil impacts are not shown to extend off-site. The RIRs for AOIs 4 and 9 were not approved due to the need for additional off-site delineation of groundwater impacts. Thus, we have installed off-site wells beyond the property boundaries of both AOIs 4 and 9. Results will be presented in forthcoming RIR Addendums.

Note that the presentation graphics from the August 27, 2020 Public Information Session included the off-site data collected up to the time of the presentation, including new off-site wells. We have collected additional data since the presentation for the AOI 4 off-site wells, which will be included in the AOI 4 RIR Addendum. The RIR Addendums for both AOI 4 and AOI 9 must be submitted by September 2021 to meet interim goals outlined in the First Amendment to Consent Order and Agreement.

Question

MTBE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.

Answer:
That is correct. There are multiple compounds that have been detected in groundwater at the Site above statewide health standards, as reported in RIRs. MTBE and other compounds that are present above the statewide health standards in groundwater will be evaluated in relation to remedial action in future Act 2 submittals, including Risk Assessment and Cleanup Plans. Some of the interim groundwater remedial systems currently address groundwater with impacts above the statewide health standards, including MTBE, along Site boundaries. These systems, along with other remedial measures, will be evaluated in future Act 2 submittals.

The following questions are similar, so a combined answer is provided to address these related questions.

Question

The refinery was historically coal-fired. Where and how has the site been tested for Arsenic

Question

Should other heavy metals be expected to be found given the history of heavy industrial use?

Question

Why is lead the only metals COC? Aren't there other contaminants such as copper, cadmium, arsenic that come from refining processes?

Question:
Evergreen fails to properly delineate the contamination of arsenic, manganese, and other inorganics (metals) in the unconfined aquifer and the deep aquifer.

Answer:
We tested the Site for a complete list of metals as part of the 1992 EPA Resource Conservation and Recovery Act (RCRA) Facility Investigation, and none of these metals – with the exception of lead –were identified as contaminants of concern. The 1992 report is posted on the Evergreen website for reference.

We have sampled both soil and groundwater samples from various areas of the Site with history of crude storage and processing for a more comprehensive analyte list, which included other metals as part of the remedial investigation activities. These data have all been included in the RIRs.

Evergreen is pursuing an Act 2 release of liability for only the compounds that are identified on the site list as contaminants of concern.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Could you talk more about the topmost 'fill' layer in the Environmental Setting slides … how deep is this fill, what is it composed of? When was it added there?

Question:
What is the composition of the layer labeled 'Fill'? Does Evergreen know from where the fill was obtained? Is river dredging/channel widening one possible source for this fill?

Answer:
Much of the former refinery and surrounding area is underlain by historic fill material, which was primarily placed for the purpose of reclaiming lowlands along the banks of the tidal Delaware and Schuylkill Rivers during industrialization. The fill materials are heterogeneous in nature and have been characterized as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer, where historic land surfaces were highest, to more than 20 feet deep, within the locations of former lowlands such as stream valleys, marshes, and open pits.

Fill may or may not have been encountered in each boring. If fill was encountered and was characterized by the person logging the hole, the boring log would contain the description. Evergreen is not aware of and cannot speculate on all potential sources of historic fill at the site. The general descriptor "fill" is not necessarily indicative of imported materials but of disturbed native soils with man-made debris.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Since Evergreen used an inappropriate standard as a basis for its remedial investigation reports, how does it justify that it has correctly defined the extent of lead contamination?

Question:
Lead looks to be close to the edge of the site which is close to residential areas. Are you willing to commit to cleaning up the lead to residential standards in areas of the property that are closer to residential areas?

Question:
Evergreen fails to sufficiently delineate exceedances of the soil-to-groundwater numeric value and the direct contact numeric value for all constituents of concern.

Answer:

RIRs must include delineation of soil contamination, including all analyzed compounds, and must be approved by the PADEP. We compared all compounds of concern to their respective soil-to-groundwater, medium-specific concentration, as illustrated in RIR data tables, and delineated to the direct-contact, medium-specific concentrations in both surface and subsurface soil based on existing exposure pathways, as illustrated in RIR figures. This delineation is conducted up to the fence line or other boundaries of the property, as required by Act 2.

The exception to this is lead in surface soil only, which was delineated to the site-specific standard based on a direct-contact pathway and updated model calculations. As noted in response to other questions concerning lead, the calculation of the site-specific standard was appropriate in accordance with Act 2 regulations and recommendations from the USEPA and the PADEP.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Evergreen may not fragment the Remedial Investigation Reports by diverting its deficiencies into a future Fate and Transport Remedial Investigation Report.

Question:
Once again, you are dealing with a corporate entity not dedicated to much beyond its profits and quite willing to put the health of its workers and the public at risk. The way this corporation has divided its reports, delayed releasing updates, promises to report later regarding crucial elements of the project that are needed to make a final decision is NOT the kind of behavior we want to see in our region. I find this appalling and needs to be separately addressed.

Answer:
All RIRs do contain fate and transport analysis. Earlier AOI reports used the Domenico model to analyze the individual AOI areas. The decision to complete a site-wide fate and transport model to be included in a separate RIR allows Evergreen to evaluate groundwater flow and contaminant transport on a site-wide basis, since the groundwater conditions are not bound by AOI boundaries. This cannot be completed until each of the AOIs has been adequately characterized (indicated by agency approval of all RIRs). In addition, the proposed Fate and Transport RIR will use a robust numerical 3D groundwater model, which can more accurately predict groundwater contamination movement. Also note that the most recent RIRs for each of the AOIs do include fate and transport in the form of qualitative analysis, as allowed under Act 2.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:

Can you comment on why AOI 11 deep groundwater report has not yet been approved?

Question:
AOI 11 has deep aquifer contamination that was not accepted by the DEP. Please discuss the extent of pollution, its evaluation and anticipated cleanup timeline.

Answer:
Evergreen submitted both an AOI 11 RIR and a Final Report, and both were disapproved solely for the fate and transport analysis that was included in the reports. The remedial investigation portion of those reports were acceptable. Note that before we started a site-wide model concept, each of the AOI reports had separate individual models completed and we have since updated that approach. Because the only disapproval aspects for the AOI 11 reports were based on the fate and transport, in subsequent discussions with PADEP we decided that the next phase of reporting for AOI 11 would be in the site-wide Fate and Transport RIR. Also note that AOI 11 has been monitored continually and data has been reported for AOI 11 in other AOI RIRs.

Per the 2020 First Amendment to Consent Order and Agreement, the Fate and Transport RIR is due by Dec. 31, 2021, and a Final Report for Sitewide Groundwater is due by Dec. 31, 2024.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:

Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

Question:

Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Question:
I am writing to state that the RIRs presented are so flawed that even those that were previously approved by DEP (without adequate public review) need to be rejected, improved significantly at least as described below and in other's detailed comments, and then resubmitted for public review and comment before they are used to develop long-term remediation plans. It is not necessary to stop ongoing remediation, but future remediation should not be limited by using incomplete and potentially inaccurate data.

Question:
The data in these reports was mostly collected between 2011 and 2017, and are too old to be trusted to reflect the current conditions and contaminants in all areas. The amount of time passed, the additional

pollution from several years of refinery operation and fires, and the heavy rainfall that the area has received in the past decade all probably resulted in changes or movement of some or all contaminants, including moving more off-site and into the lower aquifer. New sampling needs to be conducted in all areas, on land and in water, to both verify actual conditions and contaminants and to test for contamination that was not tested for at all (like PFAS compounds), and to test some areas, like both shallow and deep portions of the aquifer, more thoroughly. As new sampling is done, if it becomes apparent that the old "edges" of contamination have moved, the sampling areas need to be enlarged until new "edges" are well-established.

Question:
Evergreen needs to revise its remedial investigation reports to conform both with evolving scientific knowledge AND with the evolving state of our world due (at least in part) to changes brought on by climate change.

Question:
Evergreen completed its remedial investigation reports over three years ago. Given the fire incidents and other changes during that time, relying on older data seems questionable. Evergreen should provide evidence that data from these reports are still representative.

Question:
All of the RIRs, as well as the Ecological Risk Assessment and the Site Wide Lead Human Health Risk Assessment, were completed between June 2011 and December 2017. As all of these reports are now three to ten years old, we request that Evergreen demonstrate that the data in the RIRs remains consistent with the site's current conditions.

Question:

Climate change presents one of the most significant threats to the health, safety, and sustainability of our communities. Flooding is one of Philadelphia's central climate vulnerabilities, and the location of the former refinery site puts it at significant risk. At present, Evergreen has not included any climate change impact analysis in its RIRs or released any other information on how climate change will impact the site and how that could change the necessary remediation efforts. EPA Region III has released policy guidance stating that sea level rise should be considered as part of the remedial investigation stage.10 We request that you follow this guidance and update all relevant Act 2 materials to include the impacts of climate change on the site.

Question:
Evergreen's Conceptual Site Model is fundamentally flawed, necessitating substantially revised reports for public comment before submission to the Department.

Question:
Evergreen should revise the reports to reflect up-to-date material (including data and analyses from Groundwater Monitoring Status Reports).

Question:
The Remedial Investigation Reports are deficient because they fail to address the impacts of climate change – including sea level rise and storm surges.

Answer:

It is important to remember that Evergreen is responsible for investigating and remediating contamination that was present up until the time of the sale of the facility to Philadelphia Energy Solutions (PES) in 2012. Any releases or emissions from refinery operations or other site activities after 2012 are the responsibility of the new property owners.

The RIRs that PADEP requested to be "reopened" for public comment were submitted over various years between 2011 and 2017. They included all historic data, including data collected up until the time of the report. At the time of their review, PADEP determined in their approvals that data included in the reports was reliable. The potential effects of climate change will be determined in the future contaminant Fate and Transport RIR.

Groundwater analytical data and field measurements are collected routinely from the wells at the facility, not just as part of remedial investigations. The RIRs presented all historic and current data up to the time of the reports; however, additional data has been collected since those dates. The groundwater quality figures presented in the August 27, 2020 Public Information Session included data up through and including 2019. The current "edges" of plumes are defined not only by past data, but by data collected recently, and also will be evaluated using future laboratory data and predicted through fate and transport modeling.

Soil data also spans many years, as multiple characterization activities have been conducted in each of the AOIs. Many of the areas of focused soil sampling included efforts to characterize and delineate past releases/issues/historic activities, not ongoing ones. Therefore, data collected closer to the time of release versus later in time would be more conservative as petroleum compounds naturally degrade over time, while data collected to delineate a past release would more accurately reflect current conditions. Evergreen contends that the soil data included in the RIRs accurately characterizes the environmental impacts that Evergreen is responsible to investigate under the Act 2 Program. Hilco Redevelopment Partners and Evergreen will also collect a significant amount of additional soil data as part of the development process. We will develop the Cleanup Plan(s) using all appropriate data.

The Groundwater Remediation Status Reports, which are submitted to the PADEP, are meant to provide brief updates on data collected and remediation activities throughout the Act 2 process, including during the time between RIR submittals and after the RIR process is complete. Any and all data collected up until the time of an RIR was included in the RIR reports, and any new data collected subsequent to RIRs are included in RIR addendums or other Act 2 reports including the Fate and Transport RIR and the Cleanup Plan. Since new data are included in future Act 2 reports, already approved RIRs are not updated as new data is collected.. The Conceptual Site Model (CSM), which is discussed in each of the RIRs, was also approved by PADEP. However, Evergreen noted in its presentation that a CSM is continually updated as new data/information is known about a site. We will utilize the results of all RIR activities – along with any subsequent data as both soil and groundwater data continue to be collected– in future CSMs in the Fate and Transport RIR and Cleanup Plan to support future determination of necessary remediation.

Question:
Regarding the soil-to-groundwater value, did you compare the soil concentrations to the soil-to-groundwater number and the site-specific number? If so, it didn't seem like the soil-to-groundwater number was given enough consideration or serious analysis.

Answer:
In the RIRs, the soil concentrations were compared to the statewide health standard soil-to-groundwater number, the statewide health standard direct contact number, and the site-specific number (for lead only). We have hundreds of wells on site that provide groundwater concentrations, and we evaluate groundwater concentrations of all compounds of concern, not just those that have exceeded soil-to-groundwater Medium-Specific Concentrations (MSCs). With respect to soil, the direct-contact number was utilized for comparison based on the existing pathway of exposure.

Question:

Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.

Answer:
As shown in the RIRs, benzene is present in groundwater but is less extensive in soil. While concentrations of benzene in soil and groundwater exceed the statewide health standards in sampling locations, the concentrations in soil and groundwater have not been shown to emit high levels of benzene into the atmosphere. Many samples have already been collected to evaluate benzene in air, and part of the future fate and transport assessment and cleanup plan activities includes further vapor-intrusion assessment, which looks at potential for migration of vapors from soil and groundwater.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
This comment regards the benzene groundwater contamination on the Verizon SDWC property and subsequent properties. There does not seem to be sufficient sampling points located on the properties to the north of N-3 or west of V-MW-9 to accurately estimate the true extent of the plume. Similarly there appears to be insufficient data points to the north east of V-MW-16 on the north part of the Verizon SDWC property to properly determine a contaminant boundary . Was subsequent sampling and monitoring performed alongside I-76 or on the other side of the highway near the Philadelphia Housing Authority building to further delineate offsite impacts? Water level gradients seem to indicate slight a NE flow off of the Verizon SDWC that this report did not consider or investigate.

Question:
In addition the pump-and-treat system along Maiden Ln does not look like it changes the gradient of the plume that extends to the Verizon SDWC property and beyond. What is being done to properly delineate and mitigate this off-site benzene issue?

Answer:

The Verizon SDWC property is a separate remediation site. A Site Characterization Report indicating closure via a combination of the statewide health standard and site-specific standard was submitted by the property owners and approved in 2012. A subsequent site-specific standard Remedial Action Plan was approved in 2012. A Remedial Action Completion Report was submitted in 2015, in which they requested closure via a combination of statewide health, site-specific, and background standards due to impacts at the southern property boundary, which is across Maiden Lane from the former refinery.

Groundwater gradient in the area between the Verizon property and the area of the remediation system along Maiden Lane is shallow, but we generally observe a groundwater flow pattern that indicates convergence in the vicinity of the AOI 8 boundary with Maiden Lane, near the Mifflin Street Sewer.

The benzene dataset presented in Figure 9-2 of the AOI 8 RIR utilized maximum concentrations from 2014-2016 groundwater sampling, as this was the most comprehensive dataset at the time. It should be noted that benzene concentrations measured in groundwater varied through that time period (as low as 6.2 micrograms per liter (ug/L) in a V-MW-9 groundwater sample on March 16, 2016; benzene was not detected in well N-3 groundwater samples on June 2, 2014, March 17, 2016, and May 27, 2016; benzene was not detected in well V-MW-16 groundwater samples on April 17, 2014, June 25, 2014, September 5, 2014, and March 16, 2016 (See AOI 8 RIR Table 4-2). An overall decreasing benzene trend in this area was demonstrated in the RIR in Figure 9-5b.

Subsequent gauging and sampling support the RIR interpretations of groundwater flow patterns in this area and indicates recent N-3 benzene concentrations ranging from non-detect to 6.75 ug/L in groundwater. We will continue to monitor the area wells and incorporate data into future modeling efforts.

A horizontal recovery well was installed in that area for the purpose of LNAPL recovery as well as to mitigate any potential migration of dissolved contaminants away from AOI 8. The treatment system in that location was started up in January 2021. Therefore, you would not have seen any changes in the groundwater gradient as a result of pumping in reports submitted prior to that time.

3.0 ADDITIONAL COMMENTS AND RESPONSES

Section 3.0 summarizes the comments from the public that were not specifically related to past Act 2 reports and includes Evergreen's responses to these comments. For ease of review, questions with similar subject matter are provided under an appropriate topic heading; while many questions could be assigned to multiple topics, each question is only included once in this document.

Air Quality

Question:
Are chemicals you are presently using putting additional toxins in the air?

Answer:
Evergreen does not use chemicals in its current remediation systems.

Question:
I read that Benzene levels were 30 times higher than permitted, putting them on par with levels you would see in 3rd world countries like India. Also watchdog websites went black in the weeks leading up to the explosion. There was no data available to the public in the weeks leading up to the explosion.

Answer:
Evergreen is responsible for managing the environmental investigation and cleanup of soil and groundwater from impacts that occurred before PES purchased the site in 2012. PES has operated the site since then and would have the information pertaining to any recent air emission data. In addition, the City of Philadelphia Department of Public Health's Air Management Services may be able to provide additional air quality data from that time period: (215) 685-7584 or dphams_service_requests@phila.gov.

Question:

Hi, I live in Siena place. I noticed that Benzene concentration is a light green and close to the dark green shaded areas in the same spot as my current house (very close to pha housing and refinery) *(Evergreen note: this question refers to slide #38 "Groundwater Investigation Results – Benzene" in the Aug. 27, 2020, presentation which is available for view or download on www.phillyrefinerycleanup.info).* I think it was in the lower aquifer and water table aquifer. Because it is right below my house it seems from the map, can this present a danger to me or the house? Like can my water and be affected? And gas vapors be present? Or is it totally safe to live in this area even though it is below ground?

Answer:
Information from the remedial investigation activities does not indicate that there is any risk to indoor or outside air in off-site properties from benzene in groundwater originating from the Site. Generally, Act 2 requires an evaluation of vapors to indoor and outdoor air from a dissolved plume beneath the subsurface;. that evaluation will be included in future Act 2 reports, to be submitted upon completion of all RIRs. Please note that the slide being referenced shows refinery data as well as data collected from

other nearby Act 2 sites. Subsurface impacts originating from other Act 2 sites are evaluated by the appropriate responsible parties who are remediating those Sites.

Question:
Now I'm smelling and feeling the toxic pollution from the refinery again.

Answer:
There is no indication of off-site air impacts from the historic subsurface environmental impacts to soil and groundwater that Evergreen is investigating and remediating. Additional information concerning air quality from either the EPA or the City of Philadelphia may be helpful to identify the source of any smells.

Question:
Right now there is a very strange smell outside. I am inclined to believe it may be emissions from your site. If so, what could it be?

Answer:
The operation of the site has been under the direction of PES since the sale of the site in 2012 from Sunoco to PES. In addition, PES operations at the former refinery were shut down in 2019, so we are unsure of what recent smell you are referring to. The City of Philadelphia maintains air monitoring in the vicinity of the site, which is summarized in its 2020-2021 Air Monitoring Network Plan: https://www.phila.gov/media/20200504115105/2020-2021_AMNP_DRAFT_FINAL__20200424.pdf

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Question:
I currently reside in Siena Place near the borderline of the refinery. I just want to know is it safe to live there in terms of air quality and in regards to the plume status. Recently, I have smelled gas outside approximately on a few occasions near the end of July and don't know if that is from the refinery or cleanup process as the refinery is not currently operating.

Answer:
Refining operations were shut down in 2019. Evergreen is unaware of other site activities at the facility since that time, so we are unsure of the source of any odors. PES operated the site and would have information pertaining to air-emission data. In addition, the City of Philadelphia Department of Public Health's Air Management Services may also be able to provide additional air quality data from that time period: (215) 685-7584 or dphams_service_requests@phila.gov. The City of Philadelphia maintains air monitoring in the vicinity of the site, which is summarized in its 2020-2021 Air Monitoring Network Plan: https://www.phila.gov/media/20200504115105/2020-2021_AMNP_DRAFT_FINAL__20200424.pdf.

Evergreen is responsible for investigation and cleanup of subsurface conditions present at the property before the sale to PES in 2012. Part of Evergreen's investigation involves defining the extent of contamination in groundwater (the plume) and determine if the impacts present a risk to people on site and those located near the Site. Evergreen operates remediation systems at the facility to control groundwater contamination and to control vapors in sewers near and through the facility. Based on the

completed investigations, the environmental impacts to soil and groundwater have not shown to cause impact to indoor or outdoor air in residential areas off site.

Question

Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Answer:
Evergreen must investigate air quality arising from subsurface contamination only, not from refinery operations above ground. As documented in the RIRs, air samples were collected from inside site buildings, and from outdoor air locations, both as background and above areas of known LNAPL plumes. Based on the data collected in the RIRs there are no known residential areas where the contaminated groundwater has migrated from the facility to beneath those areas, therefore no off-site air sampling is planned. The future fate and transport RIR will present the results of fate and transport modeling of groundwater plumes which will show the projected extent of groundwater contaminants over time.

Climate Change

Question:
A) On the Q+A page, responding to the question "The hydrological situation is changing …" Evergreen's response includes the words "climate changes predicted to occur within the anticipated timeframe to completion will be considered." B) On the Q+A page, responding to the question "Climate change-generated sea-level rise (Schuylkill, Delaware) is a given" Evergreen's response includes the words "… i.e., how many years are predicted for Evergreen to meet Cleanup goals under Act 2 compared to the magnitude of climate change predictions within that general time period." Both of these responses imply that only the amount of sea-level rise that occurs during the clean-up operation will be considered. However, sea level rise will continue to affect the site for decades, or perhaps centuries. 1. Can Evergreen confirm (in plain English) that it is only considering sea-level rise for the duration of the remediation project? 2. If so, why is Evergreen not considering long-term sea level rise and its impact on aquifers into account, when considering the remediation plans for the site?

Answer:
It is Evergreen's intent to consider climate changes predicted to occur within the timeframe of cleanup of the Site. In general, this timeframe would be considered "long term," as petroleum contaminants in groundwater may take decades to remediate and/or degrade to concentrations below regulated standards.

Follow-up question to the question above: *Can you expand on your use of quotes for "long term" in this reply. Do you consider this a reference to Act 2, Sec. 304 – site-specific standards?*

Because long is a relevant descriptor of time that is subject to interpretation, Evergreen's use of quotes in this response was meant to add context to the comparison of the anticipated remediation timeframe and a changing climate as both being long-term considerations. Evergreen has selected a combination of Act 2 standards for cleanup of the Site, and this response wasn't in reference to any particular standard.

Follow-up question to the question above: *In the zoom meeting of December 2020, it was pointed out that climate change will continue after the remediation. The Evergreen position was clarified to state that Evergreen will follow climate change data and predictions up until 2100, which is the current limit for reliable modeling that is accepted in the wider scientific community. Can you confirm that this is Evergreen's policy? [Evergreen note: Evergreen held virtual meetings in August 27, 2020 and January 2021].*

Evergreen does not have a policy on this matter. It is Evergreen's intent to consider peer-reviewed and published climate change predictions based on modeling studies for, or inclusive of, the Philadelphia region. To date, the year 2100 generally appears to be the most widely cited future limit for reliable climate predictions in the area. Evergreen's assessment of potential climate change impacts on the groundwater model used for fate and transport will work within this timeframe.

Question:
On the Q+A page, responding to the question "Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling …", Evergreen's response includes the sentence "Evergreen plans to evaluate climate change data … will include a review of

available literature on climate change predictions for the Philadelphia region." 1. It would be useful to see which sources Evergreen is consulting. Will Evergreen share a bibliography of the sources that you have consulted with the public?

Answer:
Yes, Evergreen's Fate and Transport RIR will include a references section with all cited publications and resources used in the groundwater modeling. Evergreen is also planning future meetings to discuss the model and input values.

Question:
On the Q+A page, responding to the question "Why is there no mention of climate change in discussion of the Water-table aquifer? …", the response includes the sentence "Evergreen recognizes that climate changes are predicted that could alter local hydrologic conditions near the facility, such as higher water levels in the water-table aquifer or higher tides in the Schuylkill River." This misrepresents the nature of climate change and sea level rise. It's not a question of higher tides. Everything will be higher - low tides, mean water levels, and high tides. Everything is going to go up. This will affect both the Schuylkill (as far as it is tidal, to the art museum), and the Delaware. 1. What sources and estimates for climate change and sea level rise is Evergreen working with? 2. What is the maximum value for sea level rise that Evergreen is considering? 3. Sea-levels will continue to rise at least into the next century. What time-scale, in terms of years from now, does Evergreen consider adequate to 'future proof' the site from rising sea levels?

Answer:
Most of Evergreen's groundwater modeling efforts to date have focused on the development of a baseline model that is calibrated to simulate current, average conditions. Evergreen is presently reviewing available documentation pertaining to climate changes predicted for the Philadelphia region. Data review is in its early stages, as the Fate and Transport RIR is proposed for submittal at the end of 2021. However, the model and input parameters considered will be discussed during future outreach efforts.

Question:
I think we're asking the same questions about climate change/sea level rise etc., because we cannot parse/understand the answers that have been posted on the web site.

Answer:
As noted, we will consider climate change in future contaminant modeling efforts. Most questions posed to date cannot be answered specifically because we are not at that phase in the Act 2 process yet. We can say that Evergreen will consider questions, comments and input relating to climate change received during the comment period for past Act 2 reports in future modeling efforts, and there will be opportunity to discuss this during follow-up meetings and/or group discussions, which should provide clarity on how climate change may be incorporated into groundwater modeling and remediation at the facility.

Question:
Climate change-generated sea-level rise (Schuylkill, Delaware) is a given. There are already models out there. What range of values in feet are Evergreen assuming for 2050, and 2100?

Answer:
Evergreen has yet to complete the contaminant fate and transport assessment for the facility and currently has a working groundwater flow model that is calibrated to recent, average sea level in the Schuylkill River, estimated from a local tide gauge. The magnitude of sea-level rise has not yet been selected for evaluation in the modeling and is pending a literature review of available resources and initial modeling results to understand the time constraints on contaminant fate under Act 2 (i.e., how many years are predicted for Evergreen to meet cleanup goals under Act 2 compared to the magnitude of climate change predictions within that general time period).

Question:
Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling states, "the boundary condition data variability must be quantifiable and based on accepted models or observations." What in plain language does this response mean? You have not directly answered the question. What efforts are being made to quantify the boundary condition data? Are accepted models available or not? If not, why not?

Answer:
Evergreen plans to evaluate climate change data in support of groundwater modeling for contaminant fate and transport. The effort will include a review of available literature on climate change predictions for the Philadelphia region. Accepted climate models would be those that are published, peer-reviewed, and/or otherwise viewed as reliable and relevant to future conditions at the facility. Quantifiable refers to the need for climate change data to be numeric in nature so that the values can be incorporated into Evergreen's modeling.

Question:
Why is there no mention of climate change in discussion of the Water-table aquifer? These levels could change by multiple feet in the next few decades.

Answer:
One of Evergreen's primary objectives through the remedial investigations under Act 2 was to characterize the facility's geologic framework and the water-bearing units it supports. Potential flow pathways for contaminant transport could be evaluated in this manner using recent groundwater observations from hundreds of wells at the facility. Evergreen's groundwater model is calibrated and validated to this recent groundwater data to provide fate-and-transport simulations that are based on current conditions. A sensitivity analysis was performed on the groundwater model to evaluate the impact of changes to inputs on performance and increase confidence in its ability to make predictions.

Evergreen recognizes that climate changes are predicted that could alter local hydrologic conditions near the facility, such as higher water levels in the water-table aquifer or higher tides in the Schuylkill River. An assessment of climate change from available, published resources and the potential implications to Evergreen's groundwater model will be included in the upcoming Fate and Transport RIR.

Question:
Does your careful evaluation of pollutant concentrations, water levels, plumes etc. take account of future rises in sea level due to global warming, the fact that some portion of the site (perhaps most of it) will be underwater by the end of the century), also the value of restoring some of the site to the wetland it used to be for relation between land and water?

Answer:
The remedial investigations performed to date sought to characterize the facility's current and past conditions, delineate petroleum contamination, and form a basis for making predictions of future conditions. Evergreen recognizes that changes to climate are predicted to occur and may impact the facility in the future, and that these changes should be evaluated within the timeframe of the Act 2 remediation.

The question was also provided to Hilco Redevelopment Partners, who provided the following response: Hilco has plans for significant earth work to raise ground-surface elevations in areas potentially susceptible to flooding. Approximately 4 million cubic yards of soil are expected to be moved in order to raise the ground surface elevations on the portion of the Site east of the Schuylkill River above base flood elevations (BFE). Some of the ground surface elevations at the Site are currently below BFE while other areas are above BFE. Hilco plans to move soils from locations with higher ground surface elevations to areas with lower ground surface elevations so that the final grades for all areas of the site east of the Schuylkill River achieve the design standard of being above the BFE as established by the Federal Emergency Management Agency. Specifically, all parking lots will be above the BFE and all building floor slabs will be more than 4 feet above the BFE. All building floor slabs will also be above the 500-year floodplain. None of the soils that are moved as part of the regrading process will be placed in areas below the groundwater table. Hilco is raising elevations above and beyond what is required by statute and regulations to take resiliency and climate change into account.

Question:
Could you clarify the period in which you are considering climate change projections? Is it the period of remediation or the post-remediation use of the site? If it's post-remediation, what assumption are you using for future climate change?

Answer:
At a minimum, we anticipate looking at several decades to be considered for climate change projections. This process is ongoing, however, and will continue to be evaluated to see if longer time frames are necessary as the Fate & Transport RIR is completed this year.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Here's another example of where responses could be clearer. In response to questions about tide gates, the answer on the site is (partly):

"The tide gates at the Site were not specifically designed to address sea level rise; however, the Site will continue to be regulated under the stormwater management requirements of the City of Philadelphia and the PADEP which includes provisions for sea level rise."

But it would be good to citations of these claims - what documents are these requirements contained in, and where can they be found? As it is the answer is kind of an answer but not very useful.

Question:
What sea level rise, if any, was the tide gate built to accommodate?

Answer:
Tide gates are a common flood-prevention structure for areas in a tidal zone. Tide gates close during incoming tides to prevent inundation from downstream water propagating inland, and they open during outgoing tides to drain upland areas. The tide gates at the Site were not specifically designed to address sea level rise; however, the Site will continue to be regulated under the stormwater management requirements of the City of Philadelphia and the PADEP, which includes provisions for sea level rise.

The tide gate was installed by Sunoco long ago and it was installed specifically to address oil in the sewer at the time. There are remediation systems in place to address the potential for oil to migrate into those sewers; therefore, in the future the tide gate may not be necessary. As noted, climate change is something that will be included in the fate and transport modeling which will be presented in the Fate and Transport RIR. Any climate change resources used in future modeling efforts will be referenced in the Fate and Transport RIR and the Cleanup Plan.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
The hydrological situation is changing. Are you considering remediation strategies with respect to sea-level rise, which could affect groundwater on the site?

Question:
Are you considering your remediation strategies with respect to sea level rise, which could affect groundwater and will you be incorporating changes resulting from climate change, sea level rise and frequency of storms into groundwater modeling.

Question:
What plans do you have to keep this site safe as precipitations and sea level rise increase due to climate change?

Question:
As a Philadelphia resident and concerned citizen, I've been disturbed and frustrated to learn about the former PES refinery site and the legacy of toxins and pollutants it has left on the environmental justice community that surrounds the refinery. The opportunity to clean up and redevelop the refinery is a once in a lifetime chance to repair the biggest blight of our region. And as greenhouse gas emissions continue to rise and we know sea level rise, storm surge and precipitation events will continue to worsen. Evergreen must ensure its remedial investigation adequately addresses these future climate change

conditions. For the +150 years this community has suffered from the presence of this refinery, we owe it to this community to ensure their health will be protected once this site is finally cleaned up.

Answer:
Evergreen will detail its approach to remediation of the facility in future Cleanup Plans and will consider climate changes predicted to occur within the anticipated timeframe to completion. Evergreen will also incorporate climate change into future modeling.

The following questions are similar, so a combined answer is provided to address these related questions.

Will Evergreen be incorporating climate resilience into its groundwater modeling?

Question:

Specifically, I call on you to include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Question:

Contaminated groundwater in this low-lying geographic region will be affected by sea-level rise and frequent superstorms ushered in by the climate crisis.

Answer:
A literature review of available, published resources on climate change for the Philadelphia region and discussion of the potential implications to Evergreen's groundwater model will be included in the upcoming Fate and Transport RIR.

Evergreen's groundwater flow model for the former Philadelphia Refinery has been calibrated and validated to recent environmental conditions and measured observations. As a part of the remedial investigation's contaminant fate and transport assessment, Evergreen will review available information related to climate change in the Philadelphia area and, if warranted, the groundwater model could be adjusted to adapt to predicted climate conditions and could provide a range of potential outcomes for consideration (e.g., a higher average Schuylkill River stage due to sea-level rise or an increased recharge rate due to an increase in annual precipitation). For a defensible model and reliable predictions, the boundary condition data variability must be quantifiable and based on accepted models or observations.

Fate and Transport

Question:
What is the status of your groundwater and aquifer modeling for all pollutants?

Answer:
The groundwater flow model has been completed but cannot be finalized and submitted until all RIRs are approved, as data collected for RIRs are used as the basis for the groundwater flow model. Groundwater contaminant fate and transport model efforts will be conducted subsequent to approval of the RIRs since the fate and transport modeling is dependent upon the information in the RIRs and the groundwater flow model.

Question:
How much more information do you need to complete the fate and transport model?

Answer:
We believe we have sufficient information to complete the model. However, we need to have agreeance from PADEP prior to submittal. In other words, all of the RIRs must be approved first, which signals that PADEP feels we have sufficiently defined the contamination so that a model can be accurate and complete. Once the RIR Addendums for AOIs 4 and 9 are submitted and approved, the fate and transport model will be finalized and submitted to PADEP for approval.

Groundwater

Question:
There is a benzene pool that extends toward residential neighborhoods of South Philadelphia. In June 2019, PES reported fence line measurements of benzene above regulatory limits. What's the situation? What corrective actions have been taken?

Answer:
Dissolved benzene in groundwater (otherwise known as a benzene groundwater plume) is present at the former Philadelphia Refinery. The RIRs summarize the benzene in groundwater that Evergreen has characterized as part of the Act 2 investigations. For example, the AOI 1 RIR presents details concerning benzene in groundwater along the eastern boundary of the former Philadelphia Refinery. These reports also summarize the interim remedial activities to address environmental impacts, including groundwater and vapor remediation systems that exist along the property boundary on 26th Street. Part of the Act 2 processes include evaluating potential impact to off-site properties, including residences. These evaluations show that the dissolved benzene impacted groundwater beneath AOI 1 is not likely to migrate under nearby residential areas, and that there are no air impacts from the benzene groundwater plume to off-site properties. Evergreen prepared an overall summary slide of benzene in groundwater beneath the whole facility due to on-site and off-site sources for presentation during the November 2019 public meeting. The presentation is posted to Evergreen's website (https://phillyrefinerycleanup.info/). . PES, as owner and operator of the facility, was required to report fence line measurements of benzene based on air emissions from PES' operations. This air monitoring is unrelated to the subsurface benzene groundwater plume and Evergreen does not have the information to be able to address the portion of your question related to the 2019 PES-reported fence line monitoring.

Question:
Has AOI 11 cleanup been started? What is the plan for the cleanup for AOI 11?

Answer:
Additional investigation has been completed for AOI 11 since the time of the last RIR submitted solely for AOI 11 in 2013. In fact, the latest RIRs for each of the AOIs include information about AOI 11, or the lower groundwater, within that AOI. We chose to incorporate AOI 11 into the other AOI RIRs in order to give a full description of groundwater within each AOI in these reports. After the RIRs are all submitted and approved, Risk Assessment and Cleanup Plans will be submitted for different areas of the site. The proposed cleanup for AOI 11 will be included in the Cleanup Plans. Note that active ongoing remediation efforts in shallow groundwater to remove petroleum products and contaminated groundwater have likely had a positive effect on AOI 11 groundwater quality through source removal. In addition, natural processes work to break down petroleum in the subsurface.

Question:
When will the public hearings for AOI 11 under Act 2 take place?

Answer:
There is currently no separate meeting planned to discuss AOI 11. Evergreen held a Public Information Session on Aug. 27, 2020, during which the environmental data collected from all AOIs was reviewed with the public. Additional meetings are planned to be held for future Act 2 submittals and/or other key milestones in the Act 2 process, some of which will include information about AOI 11. The public is encouraged to ask questions and provide comments to any report submitted during the Act 2 process. Notices will be sent to the public via newspapers, as well as an email to interested parties for all future report submittals and meetings.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
There has been some concern that because of the aquifer under the water, pollutants from the refinery may impact drinking water in downstream New Jersey. Do you think this was ever a concern? If yes, will it continue to be one even as the refinery shuts down?

Question:
I am a New Jersey resident who is extremely concerned about the potential for groundwater contamination at the PES refinery site and how it could affect my young child. The area has been highly contaminated for a century, and residents of both Pennsylvania and New Jersey are now well aware of the dangers posed by groundwater contamination, following high-profile cases in Tom's River, NJ, and the now-confirmed systemic drinking water contamination occurring as a result of fracking the Marcellus Shale. Please follow the advice of experts at the Clean Air Council and perform an immediate and thorough and plan to identify and remediate contamination.

Answer:
Evergreen's role is to evaluate and remediate groundwater conditions created based on use of the facility up through 2012. Based on extensive data collected over the last 20+ years and groundwater modeling performed to date, it is highly unlikely that groundwater impacts at the former refinery Site affect drinking water quality in New Jersey. As part of the Act 2 process, Sunoco and Evergreen have performed several preliminary risk assessments, including accounting for the projection of dissolved contaminant migration in groundwater. All assessments to date have shown that conditions with respect to groundwater beneath the facility are protective of human health both on-site and off-site. Evergreen is working on a complete groundwater fate and transport analysis, which projects where and how far contaminants may travel and at what concentrations, as well as other reports that will provide additional and more detailed analysis.

Question:
What are the biggest environmental concerns with the water moving forward as this space is transitioned to a mixed-use industrial site?

Answer:
In general, water concerns remain the same between use of the Site as a refinery and the proposed use by Hilco. As part of the Act 2 process, groundwater quality must be investigated, as well as migration of,

and risks associated with, the contaminants identified. The groundwater beneath the site is not allowed to be used for any potable (human consumption) or industrial use; therefore, the direct exposure to groundwater through these pathways is not identified as a concern. Potential vapor intrusion, or vapors migrating from the groundwater into indoor structures, is being evaluated as part of the investigation process. The proposed redevelopment may increase site elevation, due to the need for added grade for construction, which may help address potential concerns about floodwaters interacting with impacted soils. The remaining pathway to be evaluated is the interaction of groundwater with surface water in the Schuylkill River. The results of the evaluation of this pathway will be presented in a site-wide Fate and Transport RIR. The findings in this report, along with the completion of the Human Health and Ecological Risk Assessment, will determine if additional cleanup measures for groundwater are needed, which will be presented in the Act 2 Cleanup Plan.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
What effect has pollution been in the last 7 years since the last reports on AOI 11 were issued on 6/21/2013?

Question:
We understand that contamination has reached the deep aquifer (area of interest 11), which means we need to clean the water too. We've learned from the Clean Air Council that "while Evergreen has made available semiannual groundwater reports through the first half of 2020, that information is not part of the reports open for public comment".

Answer:
New groundwater data for AOI 11 has been collected since 2013 and it is presented in the RIRs for each of the other AOIs. Overall, most groundwater conditions in the lower groundwater (AOI 11) have been demonstrated to be stable to improving for petroleum-related compounds since the 2013 RIR was submitted. Data collected annually from sampling events conducted after the remedial investigations are included in semi-annual update reports, which are also available on the website. While the updated reports themselves are not Act 2 submittals, the data included within them will be carried forward into future Act 2 reports, such as the Fate and Transport RIR and Cleanup Plan, which are subject to public comment.

Question:
Has NJDEP been involved with any issues on the NJ side of the Delaware River? Have public and municipal water companies in NJ been notified about pollution in the PRM Aquifer water supply? Have they been notified about AOI 11 efforts by PA DEP and EPA?

Answer:
The NJDEP is routinely involved with groundwater investigations of the Potomac-Raritan-Magothy aquifer (PRM) due to source areas located in New Jersey that are not related to impacts in AOI 11. There has been no demonstrated connection between groundwater impacts in AOI 11 due to past refinery operations and the PRM groundwater quality in New Jersey. As such, the NJDEP has not been involved

with cleanup of the former Philadelphia Refinery. AOI 11 groundwater conditions beneath and adjacent to the refinery has not warranted notification of the public or municipal water companies in New Jersey, nor is Evergreen aware that PADEP or EPA have notified these water purveyors that there is a perceived risk to New Jersey groundwater quality stemming from operation of the former Philadelphia Refinery.

Question:
As a former groundwater quality specialist, even small breaks in confining layers can result in significant transfer of contaminants. And, the direction and rates of water movement can change over time, often from groundwater drilling.

Answer:
The direction and rates of groundwater flow are evaluated frequently at the Site, and groundwater samples are collected routinely from various hydrogeologic units beneath the facility. The remedial investigation activities also evaluated the areas where the confining layers in the subsurface were not continuous through the completion of soil borings, installation of monitoring wells, collection of groundwater samples, groundwater elevations, and completion of aquifer tests to determine hydraulic properties of the groundwater units. This data will be used for the upcoming evaluation of contaminant movement in the fate and transport evaluation through the use of a three-dimensional numerical model. This will be presented in the Fate and Transport RIR.

Question:
In today's presentation, the presenter described that water flows within the upper groundwater can only mix with water in the lower groundwater if there is a "hole" in the 'shelf' layer between. Even from a layman's perspective, the airplane-view images provided for comparing the two zones and the ''shelf-like' separation, that pathway appeared quite large–and that it could be a pathway of contaminates. Is this being studied? What is the status of such a report and when would its findings be presented and addressed?

Answer:
Characterization of the Site's geology, hydrogeology, and extent of contamination, including study of the pathways that could exist, has been ongoing and is included in the RIRs. A fate and transport analysis will be prepared once all the RIRs have been approved, and the analysis will include model simulations of contaminant transport. This report is expected to be submitted by the end of 2021.

Question:
Have there been any studies on the effect of the pollution of the PRM in the water supply in NJ, as public and private water companies draw water from it and Phila stopped using it in the 1990's because it was too polluted?

Answer:
Evergreen is not aware of any available studies that evaluate the fate and transport of petroleum hydrocarbon chemicals in groundwater from the Site into New Jersey groundwater. Evergreen plans to complete fate and transport modeling with a numerical groundwater model, which will evaluate the potential migration of petroleum-related chemicals from both the water-table aquifer (AOIs 1-10) and

lower aquifer (AOI 11). Based on data collected to date, there is no indication that petroleum-related chemicals in groundwater from site operations have or will migrate to New Jersey.

There have been several studies of the PRM groundwater unit focusing on groundwater flow and naturally occurring metals, including:

- Historical Ground-Water-Flow Patterns and Trends in Iron Concentrations in the PotomacRaritan-Magothy Aquifer System in parts of Philadelphia, Pennsylvania, and Camden and Gloucester Counties, New Jersey, U.S. Geological Survey, Water-Resources Investigations Report 03-4255, - Schreffler, Curtis, L., 2001.
- Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia Pennsylvania, U.S. Geological Survey, Water-Resources Investigations Report 01-4218, Sloto, R. A., 2003.

Question:
The benzene graphic is different from one previously presented, which showed different levels of concentration for benzene on and off the site. *(Evergreen note: comment refers to slide 38 "Groundwater Investigation Results: Benzene" from the Aug. 27, 2020, Public Information Session).* The arrow that is pointing to "offsite benzene source areas" is pointing to a residential area and the PGW facility (just west of I76). Who is responsible for cleaning up the off-site contamination under the residential area?

Answer:
The benzene graphic was modified to simplify the presentation and depict where benzene is predicted to be present above the statewide health standard in the water table. The purple arrows were drawn to denote other off-site properties active in Pennsylvania's Act 2 program that have benzene sources in groundwater. These include the Philadelphia Gas Works (PGW) Passyunk Facility, Belmont Terminal, and the former Defense Supply Center Philadelphia. The residential area between I-76 and the PGW facility includes monitoring wells installed by PGW to characterize groundwater conditions. Cleanup under Act 2 would be the responsibility of the party that released the contaminants.

Question:
Will this affect our drinking water?

Answer:
No; the refinery contamination sources discussed during the public information session are not expected to impact local drinking water supplies obtained by the City from the Delaware and Schuylkill Rivers.

Hilco / Redevelopment

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Have you reached out to Hilco about their clean-up efforts? Will you be monitoring them for accountability over severe toxic chemical spills in the water and soil?

Question:
I believe that Hilco must provide up-to-date, factually correct, and timely information about the status of the site's pollution and the harm pollutants at the site (past, present, and future) and inflicting upon neighboring communities. Currently the burden of asthma and cancer around the site suggest that there are significant health risks that need to be remediated and addressed by Hilco. This solution must include more time for public comment and collaborative and meaningful engagement with residents of neighboring communities impacted by legacy contamination and who will be affected by development.

Answer:
Evergreen will continue to communicate and work with Hilco Redevelopment Partners during its redevelopment so that our investigation and remediation can continue during their redevelopment activities. Evergreen's Cleanup Plan, which will address contamination in soil and groundwater existing up to the date of the sale of the facility to PES in 2012, is being completed under PADEP's Act 2 program and tank program, as well as the EPA's Resource Conservation and Recovery Act program.

The question was also provided to Hilco Redevelopment Partners, who provided the following response: Hilco Redevelopment Partners is responsible for remediation of areas of the site where contamination occurred after September 2012. As Hilco Redevelopment Partners enters these areas of the site into the Act 2 regulatory process, it will conduct Act 2 public involvement activities related to those specific remediation areas. Hilco Redevelopment Partners has also been conducting separate public outreach to inform the community about its redevelopment plans.

Question:
If Hilco is going to help Evergreen throughout the cleanup, then why aren't they on this call and subsequent PIP meetings? *(Evergreen note: question referring to the August 27, 2020 Public Information Session)*

Answer:
Evergreen is responsible for former Sunoco releases that occurred prior to September 2012. Hilco Redevelopment Partners and Evergreen are working together during the site development to ensure that Evergreen's remediation activities continue without disruption, and to coordinate where the development activities need to be considered in developing the remedial plan (for example, placement of vapor barriers in future buildings to address potential vapor migration/exposure).

The question was also provided to Hilco Redevelopment Partners, who provided the following response: Hilco Redevelopment Partners is responsible for remediation at focused areas of the site where contamination occurred after September 2012. As Hilco Redevelopment Partners enters these areas into the Act 2 regulatory process, it will conduct Act 2 public involvement activities related to those

specific remediation areas. Hilco Redevelopments Partners has also been conducting separate public outreach to inform the community about its redevelopment plans. Hilco Redevelopment Partners continually engages with the community through public meetings quarterly, through social media channels, and through the office of corporate affairs. If you have any questions that are not answered please contact: jsessoms@hilcoglobal.com.

Question:
Is there any involvement of Hilco, the new owner?

Answer:
Hilco Redevelopment Partners is not involved in Evergreen's Act 2 program at the site. Hilco Redevelopment Partners will have its own remediation program to manage focused areas where contamination occurred after September 2012; however, the two programs are separate. Evergreen and Hilco Redevelopment Partners will work together to limit disruptions of Evergreen's remediation program during the development activities.

Question:
Philly Inquirer (8/3/2020) says Hilco is calling for an "exposure barrier," instead of removal. How extensive is contamination beyond the site? Concerned this does not address the health and environmental rights of the local community, nor account for sea-level rise and climate change flooding.

Answer:
The off-site impacts are described in the RIRs and two AOIs, AOI 4 and AOI 9, have completed additional investigation activities to delineate off-site impacts. As part of developing future Cleanup Plans for the site, several remedial options will be evaluated, including exposure barriers which may be necessary on-site. Exposure barriers are a general term and may include remedial options such as capping (to eliminate any direct-contact exposure to soil) and vapor barriers (to eliminate any exposure to vapors in a building). Although Evergreen has not developed any Cleanup Plans yet, it is anticipated that exposure barriers will be one of the remedial options that will be considered in accordance with the PADEP's capping guidance. The effects of sea-level rise and/or flooding will be evaluated as part of the Cleanup Plans.

Question:
Do you have any idea what is going to be done with the site, and is there any way to encourage using it as a site for renewable energy for the city?

Answer:
Evergreen is responsible only for the historic contamination that exists below the surface in soil and groundwater at the Site. We are in the process of finishing the investigation activities at the site to identify the extent of the chemicals in soil and groundwater, so we can develop a remediation (cleanup) plan for the site. At various steps in the process, Evergreen will prepare reports and hold public meetings for the Act 2 reports. This information will be posted to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Evergreen will make additional notifications before any additional final cleanup activities specified in the cleanup plans begin.

Hilco Redevelopment Partners plans to redevelop the site into a multi-modal logistics hub and does not plan to operate the site as a refinery. As part of their outreach activities, Hilco Redevelopment Partners will provide more information for specific future site uses as the redevelopment process continues. Evergreen will continue to communicate and work jointly with Hilco Redevelopment Partners so that our investigation and cleanup activities can continue during their redevelopment. Hilco Redevelopment Partners has made outreach to the community with updates on progress at the site. This will continue throughout the life cycle of the development.

Question:
I'm especially interested in the Schuylkill River Bike Path improvements, and would like to get on your email list with redevelopment progress and updates.

Answer:
Site improvements such as this are being conducted by the property owner, Hilco Redevelopment Partners, as part of their redevelopment activities. However, we have added you to Evergreen's email list for future notices regarding legacy remediation.

Question:
Evergreen's priority during the cleanup should be beautifying the riverbank in a way that will adapt with rising water levels.

Answer:
Any site improvements are being conducted by the property owner, Hilco Redevelopment Partners, as part of its redevelopment activities.

Question:
Hilco was responsible for an appalling failure during remediation that put local residents, an immigrant-heavy, environmental justice community, at risk. As part of the remediation process, they had to demolish the former smoke stack from the Plant. Although they had all of the permits necessary, they still completed it in such a way that sent a cloud of potentially toxic chemicals into the air. Chicago Mayor, Lori Lightfoot, commented that "The city was given repeated assurances that Hilco had a solid plan to contain the dust. Clearly that didn't happen," Lightfoot said. "This is absolutely and utterly unacceptable. It's unsafe, it's unsanitary. I would not tolerate this in my neighborhood and we're not going to tolerate it here either." Ultimately, because of the danger that Hilco created to the community, Hilco agreed to pay $370,000 to settle a lawsuit filed by the State.

Answer:
Evergreen provided this question to Hilco Redevelopment Partners, who provided the following response: We have partnered with a best in class demolition contractor who has a great deal of experience demolishing refineries and a strong presence in Philadelphia. They will be implementing an extensive dust mitigation plan and will be working with all appropriate agencies and stakeholders throughout the duration of the project. Every project that we undertake provides lessons learned that we apply to other projects. The demolition in Chicago was conducted according to plan but resulted in dust unintentionally migrating off site. No one was injured, HRP took immediate action to address

concerns of community members, and independent testing of the dust by the Chicago Department of Public Health and the United States Environmental Protection Agency revealed it poses "no apparent health risk to the surrounding community." HRP is proud of its successful history of redevelopment and renewal.

Question:
Did you say that Evergreen will cleanup as Hilco redevelops/builds?

Answer:
Partially. Evergreen has been remediating the site for years and remediation is ongoing. Therefore, Evergreen will have some remedial measures in place before Hilco Redevelopment Partners redevelops an area of the Site, and some remedial measures are part of the development (for example, capping and vapor mitigation measures in a building, if warranted). The timing of the Cleanup Plans will be based on the redevelopment schedule so Evergreen can incorporate the final site use based on the development into the remedial design.

Question:
Trucks with no identifying logos or signage are going into and out of the property and more smoke is coming off of the property lately. Does Evergreen know what is going on with these situations? Is this Evergreen-related or Hilco-related?

Answer:
Evergreen provided this question to Hilco Redevelopment Partners, who provided the following response: Some trucks should be on site assisting Hilco Redevelopment Partners in transforming the site. We have a security check point that everyone must register and produce identification.

Question:
What direct communication have you had with Hilco? They seem unaware of the data you shared that shows how dangerous the site remains and yet Hilco is marketing and promoting the redevelopment of PES site as safe for businesses.

Answer:
Evergreen is in direct communication with Hilco Redevelopment Partners regarding our activities and how that may impact their planned site activities. Evergreen has shared, and plans to continue to share, all data with Hilco Redevelopment Partners.

Question from EPA's contractor SKEO August 6, 2020 Public Meeting:
Can anything be built there after the cleanup?

Answer:

What is built at the property is not determined by Evergreen; however, the future use of the Site must remain non-residential.

LNAPL

Question:
Are the LNAPL bodies in Slide 32 a result of shallow, deep or both wells being gauged? *(Evergreen note: question references Slide 32 in the August 27, 2020, presentation)*

Answer:
Evergreen gauged all site wells, but only those reporting LNAPL were used to create Slide 32. The LNAPL bodies shown during the presentation were drawn using observations from wells screened across the water table (i.e. shallow wells). No deep or lower aquifer wells were used.

General

Question:
I was wondering what your plans are now that Hilco has purchased the land PES and Sunoco both left in shambles.

Answer:
Evergreen is in the process of finishing the investigation activities at the former Philadelphia Refinery to identify the extent of the chemicals in soil and groundwater, in order to develop a remediation (cleanup) plan for the site. At various steps in the process, Evergreen will prepare reports and hold public meetings on Act 2 reports, and we will post information to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Evergreen will make additional notifications before beginning any additional final cleanup activities consistent with future cleanup plans approved by PADEP.

Question:
I would also like to know your plan for holding Sunoco responsible for the decades of destructive pollution they caused in our city. This pollution has had direct impacts on community health in the surrounding neighborhood and has fueled the devastating climate crisis now impacting us all.

Answer:
Sunoco is responsible for cleaning up soil and water contamination generated prior to the sale of the facility in September 2012. Evergreen is managing this cleanup.

Question:
Can you please report how many people are on this meeting as we the public cannot see how many people are here? *(Evergreen note: question refers to the August 27, 2020 Public Information Session)*

Answer:
According to GHD, who administered the meeting on behalf of Evergreen, the raw data indicated an attendance of 493 people. However, after eliminating duplicate logins, attendance by presenters/regulators, and those who connected via both phone and computer, etc., the final count was approximately 213 people. This would not account for multiple people attending via a single computer.

Question:
Will this presentation be uploaded with closed captioning and translated/available in other languages? *(Evergreen note: the question refers to the Aug. 27, 2020, Public Information Session).*

Answer:
In addition to English, Evergreen has posted the presentation and other key documents to the website in three additional languages, Chinese, Vietnamese, and Spanish, which are the three next-most commonly spoken languages in the Philadelphia region. We also modified the website to include a translation button on each page.

Question:
Isn't there ongoing litigation about that plume by 26th street and whether Sunoco/Hilco/Evergreen is responsible for its source and remediation?

Answer:
Evergreen is not aware of any ongoing litigation involving 26th Street. Evergreen currently manages remediation at the property boundary along 26th Street.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
And for waste that is removed, please spell out which communities that waste will be dumped on, at which facilities, the type of facility, the demographics around that facility, and whether this violates Title VI of the Civil Rights Act

Question:
If you remove contaminated soil, where will you place it so that it is not harming others?

Answer:
Transportation, storage, and disposal (TSD) facilities are regulated by the EPA under RCRA through which guidance on hazardous and non-hazardous waste has been developed. Wastes that may be removed from the former refinery facility could go to various different regulated TSD facilities, which will be determined at the time based on the chemical composition and physical properties (determined by testing prior to removal from the facility). Waste profiles, bills of lading or manifests, and/or disposal certificates are provided as documentation of wastes removed from the site and final destination.

Question:
Who is GHD? And what is their relationship to Evergreen and Sunoco and ET?

Answer:
GHD is one of several environmental consulting firms contracted by Evergreen to work on Sunoco's legacy remediation at the Philadelphia refinery.

Question:
Is there a transparent plan to look for and report on any radioactivity (radon, radon daughters, etc.…), whether it is naturally occurring from underground or otherwise?

Answer:
Radon is a naturally-occurring substance and is not known to be affiliated with refinery operations. Radon or other radioactive substances have not been identified as compounds of concern at the Site based on past operations or investigations; therefore, they have not been included in the remedial investigations.

Question:
What was your process for hiring the local consultants. Was there any review of consultants by residents/public?

Answer:
Evergreen considered several factors in selecting consultants at this site including but not limited to a thorough evaluation of the consultants' past experience at similar sites; for example, have they worked at refineries before and/or have they worked on petroleum sites before.

Question:
How can you tell whose benzene is whose?

Answer:
In general, where there are potentially off-site and/or on-site sources that may explain the presence of benzene, factors such as the respective products used at a site, release history and/or environmental conditions – such as geology and hydrogeology, which govern how those products behave in the subsurface -- may assist in identifying a source. Where different releases on-site may explain the presence of benzene, factors such as when the release occurred, among other factors, may assist.

Question:
With the closing of PES an opportunity to restore wetland habitat to the river shouldn't be overlooked. Wetlands purify water and remove contaminants. They also provide habitat for wildlife. And wildlife habitat with accessibility attracts people and helps expose kids to ecology. With that being said - Parcel AOI-10, the West Yard, is just downstream from Bartram's Gardens and is cutoff from the PES facilities on the eastern banks of the river. While river access for barges or boats may be attractive for the future development, creating habitat along the banks of the river, will not only clean and beautify the area, but could also protect the redevelopment from flooding or water damage.

Answer:
It is Evergreen's understanding that there is no planned development for AOI 10 (West Yard).

Question:
Evergreen and Hilco may have a reasonable and actionable agreement about how the cleanup is divided

between you, but the public has no idea whether there is one. It's illogical for Evergreen to be working on a remediation project, and do an incomplete job on an area because some of the contaminants arrived after PES bought it. Or vice-versa.

Answer:

In 2006, Sunoco voluntarily entered the site into Act 2 and Evergreen, since 2013, has been managing the legacy (pre-sale in 2012) site investigation and remediation. PES/Hilco Redevelopment Partners are separately managing post-sale in 2012 releases. Both Evergreen and Hilco Redevelopment Partners separately report to the PADEP on their respective efforts. Sunoco, PES and PADEP entered into a Consent Order & Agreement (CO&A) in 2012 and an amendment in 2020 setting forth their respective obligations. PADEP consent orders are public information and the CO&A is posted to Evergreen's website.

Question from EPA's contractor SKEO's Aug. 6, 2020, Public Meeting
What questions has Skeo asked to Evergreen? Were the answers received satisfactory? What unanswered questions does Skeo have for Evergreen?

Answer:
Skeo has not asked Evergreen any specific questions about the RIRs. Evergreen has reviewed the Q&A that was part of Skeo's report and has included any questions that were included in Skeo's report that were not subsequently asked to Evergreen, as described in Section 1.0.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
The dates for final completion was originally set for December 31, 2020 but was extended for 10 years to December 31, 2030. Why?

Question:
In reference to the deadline, why ten years instead of 3 to 4 years for example?

Answer:
The extension to the cleanup deadline was agreed by Sunoco and the PADEP in the CO&A amendment in 2020 because of bankruptcy of PES and impending acquisition of the property by Hilco Redevelopment Partners, which included a substantial and material change in the use of the site. Evergreen must coordinate its Act 2 timeline with Hilco Redevelopment Partners' redevelopment timeline, which is expected to be approximately 10 years. The planned future use of the site (including, for example, the locations and construction details of buildings) must be known before generating Cleanup Plans.

Question:
Evergreen should make available on its website all historical reports referenced in Appendix A of the 2004 Current Conditions Report.

Answer:

The 2004 Current Conditions Report is not an Act 2 document, nor are the documents referenced in that report. However, many available documents referenced in Appendix A of the Current Conditions Report are posted on the website for reference.

Question:
Unfortunately, there are a few things that I am concerned with as well, including recycling the debris and where are they going to take it?

Answer:
Evergreen provided this question to Hilco Redevelopment Partners, who provided the following response: Approximately 30,000 tons of Asbestos Containing Material (ACM) will be safely abated and disposed of in close coordination with the City of Philadelphia and other regulatory agencies such as PaDEP, USEPA, OSHA etc. and per all applicable standards and regulations.

Question:
We are also requesting that OSHA inspects the site and provides the community with a detail report ensuring that all OSHA precautions are adhered to.

Answer:
Since Sunoco no longer owns or operates the Site, any OSHA inspections should be coordinated with the new site owner, Hilco Redevelopment Partners.

Question:
What sampling has been done of the water and sediment in the Schuylkill River?

Answer:
There has been no direct sampling conducted by Evergreen in the Schuylkill River. An ecological risk assessment has been completed, which evaluated site conditions in relation to the surface water and sediment in the Schuylkill River. This will be submitted after the RIRs are approved in accordance with the Act 2 requirements. Going forward, the groundwater model, which includes a surface water model that is completed in conjunction with the fate and transport model, will predict potential future impacts to the river. Predictive modeling is generally used in lieu of sampling because the Schuylkill River goes through industrial areas and it becomes difficult to discern what contaminants are present and from what party. Therefore, these water and sediment concentrations are predicted through direct modeling from concentrations found on site.

Question:

Who pays evergreen to do this work?

Answer:

Evergreen is an indirect subsidiary of Energy Transfer. Evergreen is fully capitalized to fund the remediation of the site.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:

Evergreen has a specific charge, which you are pursuing in a professional and rigorous way. But you are still governed by that definition. How can we work together to make that real in this case in Philadelphia? Every violation of EJ involves different agencies acting narrowly and ignoring the big picture as not their job. Please work with us to change that here

Question:

EPA does not define environmental justice – especially when it's long been an agency accused of environmental racism itself. The movement defined it in the 17 Principles of Environmental Justice here: https://protect-us.mimecast.com/s/bruECkRKRRf1E6AC8LqL7 - principle #7 is particularly relevant.

Question:

Here is the EPA definition of Environmental Justice. To the best of my knowledge it has not been revoked. Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work

Answer:
Throughout the remedial investigation phase of our Act 2 requirements, we have continued to involve the public in various ways. We remain committed to finding ways to meaningfully engage the public in future meetings, both in our own public meetings and through participation in Hilco Redevelopment Partners' community meetings. We have not and will not intentionally discriminate against any group of people in our public involvement.

Evergreen's work at this site is overseen by both the EPA and PADEP. We look forward to working alongside these agencies, as well as Hilco Redevelopment Partners and the interested public, as we move forward in the Act 2 remediation process and as Hilco Redevelopment Partners works toward redeveloping the site. This will include additional Evergreen public meetings, participation in Hilco Redevelopment Partners' community meetings, and continually updating our website, www.phillyrefinerycleanup.info. This is where we house all relevant reports, documents, background, and presentations, as well as ways for the public to submit comments and questions, and a full record of all past questions and answers.

The following response was provided by the EPA on Jan. 8, 2021:

Our regional Environmental Justice program, and the national Office of Environmental Justice (OEJ) coordinates the Agency's efforts to integrate environmental justice into all policies, programs, and activities. Our mission is to facilitate the Agency efforts to protect environment and public health in minority, low-income, tribal, and other vulnerable communities by integrating environmental justice in all programs, policies, and activities.

Below is an outline of key information on understanding our position on practicing environmental justice in our communities:

***Environmental justice (EJ)** is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.*

***Fair treatment** means no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies.*

***Meaningful involvement** means: • People have an opportunity to participate in decisions about activities that may affect their environment and/or health; • The public's contribution can influence the regulatory agency's decision; • Community concerns will be considered in the decision-making process; and • Decision makers will seek out and facilitate the involvement of those potentially affected.*

EPA and Environmental Justice

EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work.

EPA's environmental justice mandate extends to all of the Agency's work, including: • Setting standards • Permitting facilities • Awarding grants • Issuing licenses • Regulations • Reviewing proposed actions by the federal agencies

For more information or additional questions, please contact Reggie Harris, Branch Chief, Communities and Tribes Branch Office of Communities, Tribes and Environmental Assessment at harris.reggie@epa.gov or 215 814-2998.

Also, please refer to this link for more information read the Factsheet about the EPA's Office of Environmental Justice: https://protect-us.mimecast.com/s/sXusC82A22U79jQtn9IDy

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The following questions are similar, so a combined answer is provided to address these related questions.

Question:

The Site is a Source to a Drinking Water Aquifer.

Question:

Is the water table or the lower aquifer the source of drinking water for anyone?

Answer:
The water table and lower aquifers are not utilized as sources of potable water in proximity to the Site. As a part of the investigations, Evergreen conducted a well search within a one-mile radius of the Site using Pennsylvania's Groundwater Information System (PaGWIS) and PADEP's eMapPA GIS mapping tool. Results of the search, which included field reconnaissance, indicated a low probability for potable water supply wells in the area.

Question:

Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.

Answer:
The RIRs and figures presented during the August 27, 2020, Public Information Session show the known extent of dissolved benzene on- and off-site. Evergreen will be including additional off-site groundwater information in the AOI 9 and AOI 4 RIR Addendums. As addressed in previous comments, no off-site air impacts have been identified from off-site groundwater related to historic environmental impacts that Evergreen is evaluating under Act 2. Evergreen has acknowledged the benzene due to on-site sources and identified that there are other neighboring, contaminated sites that are also contributing to the observed off-site site groundwater impacts.

Question:

Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.

Answer:
Remediation systems are reviewed in the RIRs. The RIRs also all include a qualitative fate and transport discussion, which addresses how conditions have changed over time. It is not expected that Hilco Redevelopment Partners will need to replace any of Evergreen's remediation systems because Hilco Redevelopment Partners and Evergreen are working together to limit disruption to Evergreen's ongoing remediation during Hilco Redevelopment Partners' development activities. Evergreen will be able to finalize and share proposed remedial approaches once we are able to finish the remedial investigations and formulate Cleanup Plans. At that time, Evergreen will propose what (if any) replacements, new systems, and/or elimination of existing systems are appropriate.

The question was also provided to Hilco Redevelopment Partners, who provided the following response: Hilco Redevelopment Partners is responsible for remediation at focused areas of the site where contamination occurred after September 2012. Hilco Redevelopment Partners is evaluating ways to improve remediation activities that are ongoing in some of these areas. As Hilco Redevelopment Partners enters these areas into the Act 2 regulatory process, it will conduct Act 2 public involvement activities related to those specific remediation areas. Hilco Redevelopment Partners has also been conducting separate public outreach to inform the community about its redevelopment plans.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:

PFAS - Fire fighting and training exercises have released PFAS ("forever carcinogens") at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Question:
The PA Dept of Environmental Protection has added Per- and polyfluoroalkyl substances (PFAS) to the recent regulations for contaminants—likely present in refineries, since they are used in firefighting foams. Indeed, other states such as Alaska, Michigan, Colorado, and Wisconsin found PFAS contamination in refineries, and are requiring or undergoing remediation of those sites. The site should be tested for these contaminants and required to address the contamination.

Question:
It is important that public agencies at the state and city level ask more of Evergreen. Basic reporting, as required by state law, is not sufficient for this site. PFAS, for example, are likely highly concentrated here due to firefighting on site. I support the specific reporting measures recommended by the Clean Air Council in Mr. Minott's op ed in The Inquirer this morning (January 13). This would be a big step forward.

Question:
Regarding the F&T model, are PFAS compounds going to be included in the model? A model in 2001 showed that groundwater does flow from beneath the refinery to parts of New Jersey, so we wanted to know if PFAS compounds, especially PFOA, PFOS and PFNA, are going to be sampled and included in the modeling?

Question:
Evergreen fails to include Per- and Polyfluoroalkyl Substances (PFAS) as a constituent of concern, despite a history of catastrophic fires at the refinery.

Question:

1) The Site is a Significant Potential Source of PFAS to the Environment

2) Applicable Guidelines Require PFAS Investigation

3) The PES Site should be required to sample for PFAS using appropriate EPA Method 537 methodologies in shallow and deep groundwater and surface water and soil consistent with EPA and PADEP requirements. The Site has experienced multiple releases of AFFF, a product known to contain PFAS, and the lower aquifer beneath the Site, the Potomac-Raritan-Magothy ("PRM") aquifer system, is a major source of drinking water in New Jersey. **The report prepared by EPA's contractor, Skeo Solutions, Inc., acknowledges that contamination in the lower aquifer could migrate offsite and affect the water supply for parts of New Jersey. EPA's policy, Interim Recommendations to Address Groundwater Contaminated with PFOA and PFOS, sets a preliminary remediation goal of 70 ppt for PFOA and PFOS in groundwater that is a current or potential source of drinking water. The Pennsylvania

Act 2 program uses the EPA PFOA and PFOS Lifetime Drinking Water Health Advisory Level of 70 ppt as the groundwater MSC. New Jersey, where drinking water supplies may be impacted, has established an MCL of 14 ppt for PFOA, 13 ppt for PFOS, and 13 ppt for PFNA.

Answer:
PFAS was not sampled during the remedial investigations as it was not included as a Contaminant of Concern. However, as noted during public meetings, PADEP and Evergreen have had discussions regarding future sampling of these compounds. Evergreen subsequently received a formal request from PADEP to sample remediation system effluents for PFAS compounds. Upon receipt of data, results will be discussed with PADEP.

A portion of one of the questions above notes: The report prepared by EPA's contractor, Skeo Solutions, Inc., acknowledges that contamination in the lower aquifer could migrate off-site and affect the water supply for parts of New Jersey. Skeo's report noted "The refinery's pollution may affect an area of underground water (i.e. an aquifer) used by the state of New Jersey for drinking water". That statement is accurate in that an aquifer exists beneath both the former refinery and parts of New Jersey, and Evergreen has acknowledged impact in the lower aquifer beneath the former refinery. However, it is highly unlikely that contamination sourced at the refinery could migrate into New Jersey. We have also noted that until a chemical fate and transport model can be completed, this cannot be confirmed.

Ownership / History / Infrastructure

Question:
In today's presentation (August 27, 2020 Public Information Session), a summary of the content within RI reports was provided. If source, extent and pathway of contaminants is discovered to have conveyed contaminants beyond the beyond the property boundary which legal entity is currently responsible for impact study costs and remediation costs?"

Answer:
Act 2 requires that the RIR defines the extent of contamination, including beyond the property boundaries. Two of the RIRs were not approved for that reason, which is why they required additional off-site work to further define the full extent of contamination in those areas. Any entity causing a release is responsible for the investigation and remediation of that release.

Question:
Could you explain Evergreen's exact relationship with the refinery?

Answer:
Evergreen is an affiliate of Sunoco (R&M), LLC (formally known as Sunoco, Inc. (R&M), a former operator of the refinery), and both companies are indirect subsidiaries of Energy Transfer L.P. In November 2013, Evergreen was formed to manage Sunoco's legacy environmental cleanup at the Philadelphia Refinery. By legacy, we mean that Sunoco retained responsibility for remediating the subsurface conditions at the refinery that existed on Sept. 8, 2012, when the property was transferred to Philadelphia Energy Solutions.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Please explain the formal, legal, and/or organization ties that Evergreen has to Sunoco and/or Energy Transfer.

Question:
What is [Evergreen's] relationship with Sunoco present-day?

Answer:
Evergreen is an affiliate of Sunoco (R&M), LLC (formally known as Sunoco, Inc. (R&M), a former operator of the refinery), and both companies are indirect subsidiaries of Energy Transfer L.P. In November 2013, Evergreen was formed to manage Sunoco's legacy environmental cleanup at the Philadelphia Refinery.

Question:
I thought the refinery was to be permanently shut down following the explosion in June of 2019? Will the refinery be permanently shut down?

Answer:
Evergreen is responsible only for the historic (pre-2012) contamination that exists below the surface in

soil and groundwater at the Site. Because of that, our work includes investigating and cleanup of the extent of contamination in the subsurface that existed before the sale of the facility from Sunoco to PES in 2012.

Evergreen understands that Hilco Redevelopment Partners, the current owner, plans to redevelop the site and does not plan to operate the site as a refinery. Hilco Redevelopment Partners' work to decommission and demolish the refinery began in the summer of 2020.

Question:
What other companies are involved in the cleanup, besides Evergreen?

Answer:
Evergreen is responsible to cleanup legacy contamination generated prior to September 2012. Hilco Redevelopment Partners is responsible for cleanup of contamination that relates to the time period since September 2012.

Question:

How is it determined what ground pollution is from 2012 and before…and what is from 2012 to the present?

Answer:
When the facility was sold to PES in 2012, Sunoco had a good understanding of the nature and extent of contamination at the facility. After the sale of the property, if changes in the contaminant profile on-site occurred, or known spills happened, the resulting cleanup became PES' responsibility. In some instances, new contamination co-exists with old contamination, and the responsibility is shared.

Similar to our understanding of LNAPL, multiple lines of data are used to help support our understanding of what's historic and what's more recent. Looking at stable isotope chemistry of different elements like carbon and hydrogen and looking at trends (how contaminant concentrations change through time) are examples of some of the tools that are planned to applied for the Site.

Question:
The logistical infrastructure moves petrochemicals across the site. Where are the pipelines, pumps, storage tanks, and intakes/offtakes located (on a map)? What dangers do each pose?

Answer:
The features related to petroleum operations that were included in Evergreen's Act 2 or Chapter 245(Tank Act) investigations are included in the figures in the RIRs, and the associated environmental impacts are summarized in these reports. Also note that operations have been shut down and we expect that most infrastructure will likely be removed as part of the redevelopment.

Question:
The site contains two refineries (at Point Breeze and Girard Point). What is the story for each refinery?

Answer:
While the question is a bit open-ended and capable of multiple interpretations, we interpret this question to be generally inquiring about the ownership history of the two refineries. As specified on the website, Point Breeze (which includes AOIs 1, 2, 3 4, and 8) was formerly owned by Atlantic Richfield Company (ARCO) and purchased by Atlantic Refining & Marketing Company in 1985 and Sunoco subsequently purchased Atlantic in 1988. Girard Point (which includes AOIs 5, 6 and 7) was formerly owned by Chevron and was purchased by Sunoco in 1994. In 2012, the complex was transferred from Atlantic (as to Point Breeze) and Sunoco (as to Girard Point) to PES.

Question:
The site contains multiple tank farms (Schuylkill, etc.). What is the story for each tank farm?

Answer:
While the question is a bit open-ended, we interpret this question to be generally inquiring about Sunoco's regulatory compliance with respect to tanks at the property. The environmental impacts at the tank farms have been evaluated two different ways as part of Evergreen's activities. If there was a release or tank closure from a tank operated by Sunoco, an investigation was completed and reported following the Pennsylvania Tank Act regulations. The general areas of the tank farms were also evaluated following the Act 2 process. Many tank investigations are also included in the RIR documents. Tank closures and releases occurring after 2012 were addressed by the current owner/operator.

Public Participation

Question:
Please listen to the people who have no interests other than the health of their loved ones. Please understand that people are not exaggerating that generations have been suffering from the toxicity of the previous oil refinery's existence, and do not belittle their concerns. Everything is fixable, the question is who will you choose to represent, the people and their health or corporate levers of power? I hope it's not the latter. Clean this area up THOROUGHLY.

Answer:
Evergreen's role here is very specific as it relates to environmental remediation of subsurface contamination at the former refinery site through 2012, when Sunoco sold the refinery, as required by Act 2. We are following all appropriate regulations to carry out this remediation work, including attempting to engage the public throughout the process. However, Evergreen has recently engaged a Community Engagement Consultant to assist us in developing an outreach and engagement plan with the community to further develop our outreach efforts including communication with community members on their concerns and interests.

Question:
Public Participation that begins after the all the information is gathered, everything decided and recommendations are ready to be presented to the public is not adequate public participation. Public participation must begin at the beginning, not the end or near the end.

Answer:
Sunoco submitted a public notice at the time of the Notice of Intent to Remediate (NIR) that started the Act 2 process, and similarly when the NIR was updated two times afterwards. In addition, Sunoco/Evergreen completed public notice when each of the 21 Act 2 reports were submitted to the PADEP. Evergreen also held a public meeting in 2006, during the early stages of the Act 2 activities at the Site, and remains committed to continuing public participation as part of the public involvement plan. This has included and will continue to include additional public meetings.

Question:
Thank you for doing your best to use plain language and take the measures you have to try to include the public, as is required by Act 2. Will you hold more regular small group sessions, as a necessary precursor to the public being able to submit educated comments? Information only presented in a one-way format does not enable true public engagement.

Answer:
Evergreen has offered to community groups, such as Philly Thrive, to meet in smaller group settings to answer questions concerning the Site. Evergreen will work with the community to develop the best format to engage in smaller group settings as part of the Act 2 process.

Question:
Why was there no meeting 11/7/20. Why was Evergreen "blocked" from the meeting? Was there a meeting at all?

Answer:
Evergreen is unaware of the exact reason the meeting was blocked by certain members of the public. The purpose of that meeting was to initiate public involvement by introducing who Evergreen is, provide a summary of the work that has been completed at the site to date, and discuss Evergreen's future activities. Evergreen ultimately held a virtual meeting on August 27, 2020, for the same purpose.

Question:
Does Evergreen consider the 11/7 "event" a formal meeting, and if so, does this start the timeline for them? If it does not, when will the next meeting be held?

Answer:
Evergreen was disappointed that entrances were blocked at the planned meeting on November 7, 2019, preventing members of the community and agency officials from engaging in a discussion about the environmental condition of the refinery property. Evergreen views the public engagement process for the site as ongoing, as comments and questions from the public have been collected since the attempted meeting which involve future activities. Note that since this question was initially asked, Evergreen has hosted Public Information Sessions on August 27, 2020, and January 14, 2020. Another session is planned for March 31, 2021.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?

Question:
Why was Evergreen so delinquent in doing the outreach associated with the legal/contracted obligations to this site? Until the massive explosion, the community at large had not heard from them in years and their outreach/engagement was pitiful.

Answer:
The June 2019 fire at the PES facility does not relate to Evergreen's Act 2 submittals or public involvement plan.

Since Atlantic/Sunoco purchased the refinery, there have been 21 Act 2 reports submitted and, at the time of each submission (as well as at the time of each of three NIRs submitted for the property), a letter was sent to the City of Philadelphia and notices appeared in a local newspaper informing the public of each submittal and their opportunity to comment on the submittals. In August 2018, PADEP requested that Evergreen revisit the previous public involvement plan with the City of Philadelphia. After a meeting with PADEP, EPA and City officials in November 2018, Evergreen began developing the www.phillyrefinerycleanup.info website in preparation for a public meeting. The fire at PES' facility

occurred after this effort was underway, in June of 2019. At that time, Evergreen suggested opening the website prior to announcing a date for a legacy remediation public meeting to allow the agencies to share the website to aid in answering questions that were being posed about Sunoco's legacy remediation program.

Question:
Many of the finalized online reports reflect reviews done between 2011 to 2016 with no updates. How can I learn what happened next? Is there a person to contact with specific, referenced questions, which would be onerous for a Zoom conference?

Answer:
RIRs do not get updated once approved. Once RIRs are completed and approved, other reports are submitted with additional information, activities, and updates in the Act 2 process. Evergreen has multiple reports planned for 2021 and will provide a draft schedule on the website of upcoming reports. We have also provided copies of the semi-annual update reports on the website, which are not Act 2 submittals, but provide a routine update on remediation activities at the facility. The public can ask questions in writing via email, mail correspondence to our PO Box, or ask them live during meetings. In addition, Evergreen is currently planning smaller group meetings in the future which may make communication easier.

Question:
Tonight's Information Session *(Evergreen note: refers to the August 27, 2020 Public Information Session)* offers a strong basic primer on geology, groundwater and characterization of the contamination readings, and the presenters are very good at explaining things. Many engaged community members have already studied this material together, and with a variety of other subject matter experts, and are ready to move on to learning more about the key decisions being made now (or soon) about contamination management and clean up. Similarly, at the recent meeting held by SKEO and EPA, representatives were resistant to answering public questions beyond the scope of the TASC report. Limiting what information will be given to the public to arbitrarily defined packages does not support meaningful engagement or transparency as defined by the law. I agree with other suggestions that Evergreen and others focus future discussion on critical paths for decision making about management of risks to adjacent communities and the ecological future of the site. As this meeting approaches its end, will you commit to a part 2 of this meeting, soon, to discuss decision making?

Answer:

PADEP requested Evergreen to re-open the comment period for previously submitted Act 2 reports and provide a venue where the information contained in those reports would be presented to the public. This was also echoed by the request from the City to begin and end the comment period with meetings about those previously submitted Act 2 reports.

Therefore, the January 14, 2021 meeting included an open Q&A session to mark the end of the comment period for past characterization reports (where geology/hydrogeology, and characterization are the key elements). Past comments from members of the community also requested that Evergreen provide more explanation about the content of the RIRs.

Evergreen agrees that future meetings should be utilized to discuss future activities at the site. Forthcoming reports are planned for future Act 2 phases – contaminant fate and transport, human health and ecological risk assessments, and site cleanup - which will each have its own comment period and small group meetings to discuss these and other community-requested topics.

With that said, the proposed reporting cannot proceed without first having completed the additional public review process for the remedial investigations.

Question:
Thanks for being open to a community advisory group. This would be a big step forward. It would be very good to schedule a meeting of the advisory group + other stakeholder representatives in the near future to begin to discuss and compare all of the available remediation and capping methods in terms of cost and benefit, and to outline when and how choices will be made.

Answer:
Evergreen is open to discussing these topics with the public and is currently evaluating the most effective method of communication and engagement with all community members. Evergreen cannot proceed through the Act 2 process (including Cleanup Plans) until the public comment process for the approved RIRs and forthcoming addendums is completed; therefore, remedial approaches can be discussed only in general terms since completion of the remaining Act 2 phases is needed to have a more detailed discussion on these topics.

Question:
A presentation where more than 3/4 of the time is spent in a one-way flow of information and where residents' concerns are relegated to a still-diminishing-and-to-be-seen Q & A period at the end of the meeting does not bode well for a process that is inclusive of the public, as the City has requested and as the law requires. (Evergreen note: this comment refers to the Aug. 27, 2020 event).

Answer:
The first public information session held on August 27, 2020, was designed to provide an overview of the technical information in the RIRs. It included discussion of questions and comments already received from the public, both on the reports and the Act 2 process in general. Evergreen is aware that the presentation went long and apologizes for any inconvenience, but intended to work in as many issues that were received from the community while also meeting all PADEP and City requirements for review of the information contained within the reports submitted to date.

Based on feedback received from the public such as this comment, and because the January 14, 2021 meeting was held to close the comment period that was kicked off by August 2020 meeting, the information session held in January included mostly time for Q&A with a short introduction in the beginning. Future public meetings and other outreach efforts will include additional opportunities for open dialog with the communities during the meetings.

Question:
The information on your website seems to be outdated but I recently received a letter in the mail asking

us to submit comments. I worry about our community over the river in South Philly who have dealt with countless decades of health problems due to this harmful refinery. Please keep me updated on this matter.

Answer:
We appreciate that you have taken the time to look at the Evergreen website. The intent of the website is to be a central location that contains all of the most recent reports for the site, a summary of frequently asked questions, and news about upcoming events. We are currently updating the website with information on an upcoming public information session. The postcard was part of Evergreen's overall outreach plan to the community and we welcome any comments you have on the Site and the proposed cleanup process.

Question:
Evergreen has not sufficiently answered questions from the public on its Q&A Webpage.

Answer:
Evergreen is continually reviewing the Q&A to determine what updates are needed to be included in the Public Comment RIR. The Q&A webpage will be updated as any answers are updated as part of this process. Also note that some questions/comments cannot be addressed fully, as the subject matter may be part of future site activities and/or future Act 2 processes.

The following questions are similar, so a combined answer is provided to address these related questions.

As a community resident I think this media forum is not consumer friendly in allowing community members to have an opportunity to participate fully in this report out process. *(Evergreen Note: comment refers to the use of Microsoft Teams Live event during the August 27, 2020 Public Information Session)*

Many communities and cities are finding that COVID 19 doesn't have to stifle public debate. The South Philadelphia and Grays Ferry communities are comfortable with virtual tools that allow us to see and hear each other, as well as Evergreen. It is important that you adopt tools (which you likely use in your daily meetings with colleagues) that promote a true virtual public meeting. Would Evergreen be willing to discuss with community organizations the selection of technology that is more appropriate for virtual public meetings?

Answer:
The Microsoft Teams Live format was selected to ensure that as many people as possible could see the presentation and participate. Other meeting platforms, like Zoom, have caps on attendance, and we knew that there was potentially a significant interest in the first meeting. We chose a platform that had a higher capacity to allow as many people as possible to attend and view the information.

We also chose this specific Q&A format to allow for as many questions as possible to be asked. Taking verbal questions following our presentation would have limited the total number of questions taken.

While many of us use virtual platforms for small group meetings, this type of large group event (the August 27, 2020 event had well over 100 attendees) is not typical for us. As we have all likely experienced, even in small groups there can be issues with background noise and interruptions. We are open to suggestions on ways to improve future meetings in a way that maximizes the opportunity for participation. We also hope that we don't need to do virtual meetings much longer!

With all of that said, we shifted the format of the January 14, 2021, meeting slightly. We utilized the Zoom Webinar platform, to allow for administrators to open microphones individually for those that chose to state questions verbally. We also used the chat function to collect written questions. The intent for this was to allow open dialog while still answering as many questions as possible.

The following questions are similar, so a combined answer is provided to address these related questions.

This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean-up, throughout the development of the reports and the clean-up itself.

If residents are going to invest time & energy in providing our comments, we need to know that there will be responsiveness to the comments- and they won't just sit on a website (thank u for the website btw!). Specifically: can "approved" reports that didn't have public input until now be reopened and revised based on public comments that find any inadequacies in the reports? Otherwise what is the point of us commenting?

Answer:
Evergreen is in the process of receiving questions from the public concerning the approved RIRs. We will revise these reports if we find new information concerning the conclusions. The comments received during this phase will also inform the future Act 2 phases, which have yet to occur at the site. These include the Fate and Transport, Risk Assessment, and Cleanup Plan phases.

Note that the question "This process needs to change…" was also forwarded to PADEP for response. PADEP's response was:

"You are correct that public participation should occur throughout the Act 2 process and not after reports have already been approved. Unfortunately, there was a lapse in the administration of the public involvement requirements for this project, and this is the reason the previously approved reports were "reopened" for 120 days to provide for public comment now. Based on the comments submitted, additional environmental work may be required, and the reports may need to be revised. At a minimum, Act 2 requires public access to documents, a public meeting, opportunities for public comment, and responses to those comments from the remediator. Two-way communications (submittal of questions, concerns, and suggestions by the public and responses to those comments by the remediator) is central to public involvement. Act 2 does not mandate, nor does it enable PADEP to require, additional public involvement actions. However, because of the size, duration, and complexity of the Philadelphia Refinery

cleanup project, Evergreen has agreed to implement several other community involvement measures. They are also planning small group meetings which would allow for two-way consultation between Evergreen and the community. The public involvement activities must continue for the entirely of the Act 2 process.

PADEP has also provided input on their guidance with respect to the public's role in Act 2 reports as provided here: *"Act 2 and our regulations and guidance describe several measures "to involve the public in the development and review" of reports, some of which are required. The intent of these measures is to collect comments, suggestions, concerns, and questions on the Act 2 work. The remediator's responses to this input may result in revisions to the report, and in this manner the public influences the development of the report. The public is not just on the receiving end, but it's correct that the primary public role is to comment on the work being done. Those comments can impact both the remediator's actions and also PADEP's technical review and decision to approve the report."*

The following questions are similar, so a combined answer is provided to address these related questions.

Question:

I support the demands of Philly Thrive and all fence line community members. Beyond presenting your goals to the community, it is the right of the community to demand and expect free, prior, and informed consent over the entire process given the health impacts of the air, water, soil, and aesthetics of their community.

This process is one-sided and not meaningfully engaging the public. To follow through on your stated commitment to hear residents about how to make meetings better, listen to our feedback that we've repeatedly shared tonight to create public meetings in a small group format that allow the public to meaningfully share OUR insights with Evergreen and create a community-based advisory group to solicit questions and comments, and continually evaluate the effectiveness of the PIP.

This is a once in a hundred-year opportunity to do right by the people who live by the site. People are eager to be involved and engaged. Will Evergreen consider a process that is less hierarchical? There are limitations due to COVID but past efforts at engagement indicate that communication is one-way rather than a dialogue. Will you make room for smaller, topic-targeted conversation in real-time rather than this type of Q+A?

Question:

The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean-up, throughout the development of the reports and the clean-up itself.

Question:

The people affected by what Evergreen and Hilco are doing need to be involved. Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-

based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

Question:

As a Grays Ferry resident, I'm very concerned about the clean-up and the lack of community involvement in the process as well as minimal communication with the community as to the health hazards and potential risks. There needs to be meaningful inclusion of community members throughout the Act 2 process, which means open access to information, feedback, and frequent consultation. This can be accomplished by creating a community-based advisory group to solicit questions and comments and evaluate the effectiveness of the PIP on an ongoing basis. None of the work that's been done so far has involved active outreach to ALL community members.

Question:

For years have been told what was happening only to find out it was not true we need to create a community base Advisory to review everything that's going on are you willing to do that.

Answer:
Evergreen understands the community's interest in the site and is committed to providing meaningful public involvement. Evergreen has reached out in many ways, beyond Act 2 requirements, to work with the public and identify the best and most productive ways to engage. Evergreen has already taken several actions to involve the public in meaningful ways as bulleted below. In addition to the items listed below, Evergreen plans to expand outreach/communication efforts throughout future Act 2 phases and reports, and is currently engaging with the community in small groups to garner additional input on the best methods for future communication and engagement activities. Future meetings are already planned with the goal of discussing topics that are of particular interest to the public based on receipt of comments/questions to date. This may include the public involvement process, climate change, lower aquifer conditions, contaminant transport, site cleanup, etc. All of these activities are part of the development of an advisory process that is planned to be discussed in more detail during the March 31, 2021 public meeting.

Below are some examples of recent public engagement activities conducted by Evergreen:

- **Comprehensive Website**

Evergreen created a website for the Philly Refinery remediation program, which offers full public access to the completed Act 2 reports, the PADEP comments to these reports, and supporting information and background. The reports have been posted on this site since it was opened in July 2019 and we have continued to supplement with additional background and presentations. The website also includes an area for the public to directly submit comments and questions; a full record of past questions and comments, along with Evergreen's responses; the dates and logistics of upcoming events, including public meetings, report submittals, etc.; and email and U.S. mail addresses opened solely to accept public questions and comments. This website will be updated continually and will provide an information hub for the public to access information about Evergreen's activities at the facility.

- **Hard Copy Mailer**

Evergreen sent a hard copy mailer to all known addresses of residents and businesses within approximately one mile of the site in June 2020 to notify the public about Evergreen's investigation and

remediation activities, the availability of documents for public review, and the opportunity to ask questions and engage in dialogue with Evergreen.

• Meetings with Community Groups

Evergreen has met with Philly Thrive on a number of occasions since the initial meeting attempt in November 2019. Philly Thrive members have provided insight into the community and Evergreen will continue to reach out to Philly Thrive and other local groups in an effort to reach other interested stakeholders.

• Participation in Existing Community Advisory Panel

Evergreen will be available to discuss any legacy remediation activities with the existing Community Advisory Panel (CAP), which was initially created for the site by Sunoco to provide updates on environmental matters to the public. PES continued this CAP, and Evergreen provided PES with updates on remediation progress for use during the CAP meetings. Hilco Redevelopment Partners has also continued this CAP, which serves as an open forum for discussion with community stakeholders.

• Plain Language Summaries

Due to the technical nature of the Act 2 process, the reports include a lot of technical terms, concepts, and acronyms. Evergreen has created plain-language summaries for the Act 2 reports, as well as a plain-language summary to assist in the public's review of these documents. Evergreen will continue to include plain-language summaries along with all future Act 2 submittals.

• Translation of Documents

Evergreen has provided translations of the plain-language summaries as well as the presentation given during the August 27, 2020 Public Information Session into Chinese, Spanish and Vietnamese, since these represent the next three most common languages spoken by community members surrounding the former Philadelphia Refinery (in addition to English).

• Local Library Access

Act 2 reports are also available at two local library branches, noted on the website, along with all other Act 2 documents. All future reports will be added to the library as well.

• Public Information Sessions

Evergreen hosted a virtual Public Information Session on August 27, 2020 to provide the public with an overview of the investigation and remediation program to date at the facility. This meeting provided a summary of all Act 2 reports submitted since the site entered the Act 2 program in 2006. This meeting marked the beginning of an additional 120-day review period for each report, as each report had a public notice and comment period at the time of their submittal and before their review by the PADEP. The end of the review period was marked with a second meeting on January 28, 2021 where commonly asked questions were reviewed, and an open question and answer period was conducted.

• Email Blasts

Evergreen has worked with the City of Philadelphia, regulators, and community leaders to create an email distribution list for individuals, civic groups and local businesses who may be interested in the Act 2 process at the site. Any person submitting a question or comment is added to this list for future

communication. Email notifications have been, and will continue to be, sent to this distribution list in advance of public meetings and report submittals. People receiving these notifications are encouraged to share them with others who may also be interested in the process.

Question:

We are listening to your description of evergreen communications, but after exploring the materials at length, and attending meetings, many engaged citizens don't agree that you are offering access to materials that facilitate public conversations, delivering 1000 page documents for comment is not democratic. Your reports can easily be designed to make key data and decisions accessible to the public. And the question is are you willing to create living documents that are updated about the state of knowledge about contamination and incorporate public comment? This will make for authentic public conversation about the future of this incredibly important place in our city. The recent NYT article about PES and Philly Thrive shows that the world is watching how we do this. Evergreen can be an important leader.

Answer:
The reports Evergreen is required to submit to regulators are inherently long and technical due to their specific requirements as related to the site's history, size, and complexity. Reports must include the incorporation of not just current data, but all historic data, with back-up documentation for all referenced activities and interpretation in the reports. While the reports have always been accessible to the public, Evergreen created the website to make them even more accessible, in addition to developing plain-language summaries and translating them into multiple languages indicative of Philadelphia's demographics, which is not required by Act 2.

While the content and general format of the Act 2 reports themselves remain constant, Evergreen is interested in hearing ideas about other ways to provide digestible information to the public, in addition to the plain-language summaries and visual presentations made available from past public information sessions. Evergreen also plans to create a page on the website for a calendar and project updates to provide more timely updates on Evergreen's site activities, since the time between Act 2 reports is often long.

Question:

Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.

Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.

Answer:
The RIRs have been available at PADEP for the public to review since the time of their submittal. The reports have been posted to Evergreen's website created for the refinery project since July 2019. The 120-day comment period consists of the time between the first Public Information Session on August 27, 2020, and the second Public Information Session In January 2021. This Public Comment RIR includes the

comments and questions received since the attempted meeting in November 2019, including the "120-day" comment period from August to January 2021.

Once this RIR is accepted by the PADEP, Evergreen will then submit the RIR Addendums to address reports that had not been approved by PADEP. These reports outline the nature and extent of contamination; they do not propose a final cleanup plan. The majority of the questions raised by the public concern topics that will be addressed in future reports and activities that cannot take place until remedial investigation is complete.

The required 120-day period, which will have actually been open for 14 months, since notice went out for the planned November 2019 meeting, is only for the RIRs; the public will again have the opportunity to engage Evergreen concerning all future Act 2 phases, including Risk Assessment and Cleanup Plans. These two phases will encompass many of the questions and concerns that the public has provided to date.

Philly Thrive had previously requested removal of the 120-day comment period in August 2020, to which Evergreen provided the following responses:

• The 120-day timeframe was agreed to by the City, PADEP and EPA.

• The CO&A entered between Sunoco and PADEP includes deadlines for remediation progress, requiring that the Remedial Investigation reports be completed in order to move to the next phones of the Act 2 process. Evergreen cannot move forward with the Act 2 cleanup process without finalizing these reports.

• The previously submitted reports have been available for public review/comment for over a year and many public comments have already been received and addressed. The 120-day period being proposed is an extension of this overall review period.

PADEP offered the following response to Philly Thrive's request as well:

"The duration of the public Comment period isn't defined by Act 2 and DEP does not decide its length. The public involvement plan was created by Evergreen with input from the city. We have had several conversations with these parties and EPA concerning the public comment period, and we also participated in meetings with Thrive on this topic (in December 2019 and May 2020). We understand that city representatives are satisfied with the 120-day period. PADEP considers 120-days to be appropriate considering that Act 2 documents have been available online since July 2019 and Evergreen has been accepting public comments snice November 2019."

Regulations

Question:
Have you submitted draft cleanup plans to DEP? Can we receive a copy of the Cleanup Plan?

Answer:
A draft Cleanup Plan has not been submitted to the PADEP. Remedial investigations must be completed prior to submitting Cleanup Plans and other Act 2 reports that follow remedial investigations in the Act 2 process. Upon completion of RIRs for each of the AOIs, the subsequent Act 2 reports can then be submitted. The Cleanup Plan(s) will be prepared and submitted following the Sitewide Fate & Transport RIR, Sitewide Ecological Risk Assessment Report and any Human Health Risk Assessments completed for the Site. However, remediation (cleanup) activities which were conducted prior to entering the Act 2 program and interim remediation activities currently being conducted are summarized in the RIRs posted to the website.

Question:
I understand that the cleanup is happening under a voluntary act 2 opt in? What were the benefits to opting into this program?

Answer:
The information provided below was largely obtained from the PADEP Overview of the Land Recycling Program Fact Sheet, which can be accessed through this link: DEP Fact Sheet.

The Land Recycling Program (which actually includes Acts 2, 3, 4, 6 and 68, but is commonly referred to as "Act 2") encourages the recycling and redevelopment of old industrial sites, such as the PES Refinery. It sets standards, by law, that are protective of human health and the environment and that consider future use. It provides potential developers with clear cleanup standards based on risk, not a moving target in a negotiated agreement, and provides an end to liability when that cleanup standard is met. This makes old industrial sites more attractive to potential developers. As a result, many sites have been and will be redeveloped with Act 2, helping many of the Commonwealth's urban and rural municipalities to provide jobs and economic growth while remediating environmental impacts, ensuring protection of human health and the environment.

Some additional advantages of using Act 2 for the cleanup of the site include:

Uniform cleanup standards – Act 2 establishes environmental remediation standards to provide a uniform framework for cleanups. The standards established under Act 2 are used for most voluntary and mandatory cleanups conducted in Pennsylvania.

Standardized review procedures – Act 2 describes the submission and review procedures used at sites, thus providing a uniform process for all sites statewide. Uniformity makes it easier to prepare submissions and follow through the steps necessary to remediate a site, which also provides more transparency to the public in the process. It also establishes timeframes in which regulators must complete review of submissions.

State releases from liability – Act 2 provides owners or developers with releases from state liability for a site that has been remediated, according to the standards and procedures in the Act. Act 3 extends

liability protection to financiers, such as economic development agencies, lenders, and fiduciaries (fiduciaries are those who act as a trustee, executor, or administrator for the benefit of another person). These provisions are intended to reduce the liability concerns that may inhibit involvement with/cleanup of contaminated sites.

Memorandum of Agreement with EPA – In April 2004, PADEP and EPA entered into a Memorandum of Agreement (MOA) that clarifies how sites remediated under Pennsylvania's brownfields program also may satisfy requirements for three key federal laws: the RCRA, the Comprehensive Environmental Response Compensation Liability Act (CERCLA), and the Toxic Substances Control Act (TSCA). The framework outlined in the MOA provides procedures for coordinating cleanups under Act 2 with federal cleanup requirements under RCRA, CERCLA, and TSCA, where applicable. Specifically, the MOA allows for Act 2 to address the cleanup of the PES Refinery not only in relation to historic releases and tank closure (under the Pennsylvania Tank Program), but it also provides for the closure of EPA's concerns (under the RCRA program), which will result in a more comprehensive site cleanup. In 2011, the facility was entered into the One Cleanup Program.

Question:
Is your remediation process (Act Two and beyond) guided in accordance with the Environmental Rights Amendment (ERA), (Article I, Section 27 of the Pennsylvania Constitution), which states:

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people."

Answer:
Section 101 of the Land Recycling and Environmental Remediation Standards Act, which established Act 2, specifically includes language about how Act 2 helps to achieve the objectives of Article I, Section 27 of the Pennsylvania Constitution. The future cleanup activities of the Site will be completed in accordance with the Act 2 program requirements, also supporting these goals.

Question:
In today's presentation, related to lead, the presenter described that 'it is a complex process' for 'choosing the standard' associated with lead contamination levels and its subsequent categorization. Why does the entity responsible for contamination clean-up (and their supporting team) have the option to choose their standard for clean-up? Who is the authority having jurisdiction who reviews the selected standard? Are other standards more stringent? If so, why were those standards not used for these contaminants in this case?

Answer:
There are three choices for cleanup standards that can be applied to any Act 2 site: statewide health, background, or site-specific. The choice between the three standards is up to the remediator, but each one has strict guidelines and processes that must be followed to demonstrate to the PADEP (who has jurisdiction and responsibility to review the selected standard) that the standard is appropriate and has

been met. PADEP has also provided some information that is helpful in answering this question - please see the PADEP response below to the question "How do DEP and Evergreen determine what is safe?"

Question:
How do DEP and Evergreen determine what is safe?

Answer:
This question was sent to PADEP who provided the following response:

PADEP establishes Act 2 statewide health standard cleanup values for soil and groundwater, known as MSCs, using a variety of risk- and health-based methods. For instance, many groundwater MSCs are adopted from EPA's drinking water standards. Other MSCs are calculated by PADEP to protect human health at acceptable risk levels (e.g., a cancer risk of no more than 1 in 100,000).

For site-specific standard cleanups, remediators may develop a risk assessment that uses data specific to the site, and therefore it may differ from attainment of the statewide health standard MSCs. Risk assessments must demonstrate acceptable cumulative risks, meaning that health effects of all contaminants from both soil and groundwater and through all exposure pathways must be examined. Risk assessments must also consider all potential human receptors (e.g., workers and contractors, as well as nearby residents if contamination has migrated to homes, parks, etc.).

An alternative approach with the site-specific standard is known as "pathway elimination," meaning that the remediator implements measures to prevent people from being exposed to contamination. These measures commonly include constructing a cap at the surface so people won't touch or ingest contaminated soil and dust, prohibiting groundwater use, and sometimes installing systems to mitigate vapor intrusion in buildings. The determination that pathway elimination remedies are "safe" relies in part on the remediator following best practices and standard guidance. PADEP reviews plans and specifications for the work (submitted in an Act 2 cleanup plan), PADEP reviews documentation for the remedy completion (submitted in an Act 2 final report), and PADEP inspects the installation work and subsequent maintenance of the remedy. In addition, PADEP oversees the execution of an environmental covenant recorded on the property deed to ensure future maintenance of the remedies. In some cases, testing is also performed to verify that the remedy is effective.

Lastly, while the focus of Act 2 cleanups is on the protection of human health, they must also address potential ecological exposures. Contamination that affects certain sensitive ecological receptors, such as threatened and endangered species, must be addressed in the cleanup. This can also be accomplished through a risk assessment or remedial measures.

Question:
Are you aware which Philadelphia City officials are charged with reviewing the documents?

Answer:
Evergreen is not aware of who at the City may review the Act 2 reports. Our Act 2 reports must be reviewed by both PADEP and EPA for approval, not the City. Nonetheless, the City is engaged in the public involvement process.

Question:
But the state of PA actually uses a blood lead level double what the federal CDC updated in 2012.https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm

Answer:
Response provided by PADEP and posted on Dec. 28, 2020:

DEP's published statewide health standard non-residential direct contact numeric value for lead in soil, 1000 mg/kg (milligrams lead per kilogram soil), was based on a target blood lead level in adults of 20 <U+F06D>g/dL (micrograms lead per deciliter of blood). Evergreen derived a site-specific direct contact numeric value in their 2015 risk assessment based on a target blood lead level of 10 <U+F06D>g/dL. This is U.S. EPA's default value in the Adult Lead Methodology, which was the method used by Evergreen in their risk assessment calculation.

Remediation

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
When will the community be notified in south and southwest Philly about the clean-up?

Question:
I am wondering if you are able to send out updates about what plans are being carried out when. For instance, if you are cleaning a particular thing, I'd like to know ahead of time when that cleaning will take place and what the risks to the surrounding environment/people are.

Answer:

Evergreen is in the process of finishing the investigation activities at the former Philadelphia Refinery to identify the extent of the chemicals in soil and groundwater, in order to ultimately develop remediation (cleanup) plans for the site. During this process, Evergreen will develop reports and hold public meetings, both of which will have public notices. Throughout the process, we will post information to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Evergreen will make additional notifications before beginning any final cleanup activities.

Question:
Hilco has indicated in the Soil Management Report it filed with the City that the site-specific standard for lead required for the HRP intended uses for the site is 1,000 PPM. Will Evergreen remediate to this 1,000 PPM standard rather than the 2,240 PPM previously approved by PADEP?

Answer:
Evergreen's future Cleanup Plans will still compare all new soil data to both the statewide health and site-specific values to determine appropriate remedy selection. In addition, Evergreen will reevaluate the current site-specific standard based on PADEP's proposed new soil standards and associated input values.

Question:
Have you submitted draft cleanup plans to DEP? Can we receive a copy of the Cleanup Plan?

Answer:
A draft Cleanup Plan has not been submitted to the PADEP. Remedial investigations must be completed prior to submitting Cleanup Plans and other Act 2 reports that follow remedial investigations in the Act 2 process. Upon completion of RIRs for each of the AOIs, the subsequent Act 2 reports can then be submitted. The Cleanup Plan(s) will be prepared and submitted following the Sitewide Fate & Transport RIR, Sitewide Ecological Risk Assessment Report and Sitewide Human Health Risk Assessment Report (or some combination of these reports). However, remediation (cleanup) activities which were conducted prior to entering the Act 2 program and interim remediation activities currently being conducted are summarized in the RIRs posted to the website.

Question:
Have you considered remediating with bacteria? Or mycelium? We understand they're both more affordable options.

Answer:
Evergreen has considered and will continue to consider various remedial options at each area of the site. Remedial options must consider a number of factors, including but not limited to logistics, utilities, subsurface flow conditions, chemistry, nature and extent of the contamination, nutrient availability, etc. Bioremediation technologies, not specifically mycoremediation, have been/are being utilized in AOIs 4 and 1 and will continue to be considered for the Site.

Question:
What is the quality of the water discharged from the Pollock St well system into the Schuylkill?

Answer:
Groundwater collected from the Pollack Street well system is not discharged directly to the Schuylkill River. Groundwater discharged from any remediation system is either processed through the facility's wastewater treatment plant, which operates under a National Pollutant Discharge Elimination System (NPDES) permit held by PES, or discharged to the Philadelphia Water Department (PWD) sewer system via a Groundwater Discharge Permit held by Evergreen. Evergreen samples groundwater discharge to the PWD sewer per the permit requirements and the discharge from the facility's wastewater treatment plant is sampled by PES in accordance with their NPDES permit.

Question:
What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?

Answer:
Groundwater and LNAPL are being recovered via remediation system recovery wells along the property boundary in an area along 26th Street. Groundwater and LNAPL are also recovered via horizontal recovery wells along the Pollack Street sewer through the facility. Sewer conditions are to be evaluated as part of the future modeling efforts.

Question:
Two water filtration plants (at Girard Point and Point Breeze) treat groundwater before returning water to the Schuylkill River. How effective are these systems? What happens during heavy rains and floods?

Answer:
The water treatment plants are run and operated by PES under a NPDES permit issued by the PADEP. Operation of the water treatment plant will be conducted by the new property owner. PES or the PADEP would be better able to respond to the question of how effective these systems are and what happens during heavy rains and floods.

Question:
Should the groundwater remediation systems that were discontinued be restarted? If not, why not? If so, when will that happen?

Answer:
Various remediation systems have historically been discontinued when the remedial goals are complete or where the technology is no longer the most appropriate. Each remediation system is discussed in its associated RIR. Any proposed additional systems, remedial goals and associated monitoring will be included in future Act 2 reports such as the Cleanup Plan.

Question:
Can you please go over your plan to clean up lead and other toxic contaminants at the site? And your plan to provide a sufficient analysis of and a plan for effectively and safely cleaning up contaminants in the deep aquifer below the site. I urge you to use the strictest possible health-based standard to clean up toxics in both of these and all other cases.

Answer:
All plans for cleaning up contamination in both soil and groundwater will be included in the Act 2 Cleanup Plan(s).

Question:
Can we get some documentation saying that your company has started cleaning any part of this site?

Answer:
Documentation of Evergreen's ongoing and historic remediation activities are included in each of the RIRs.

Question:
Does the remediation process create an odor or smell? What kind? Will it be all the time, or at certain times?

Answer:
Emissions from Evergreen's systems are all treated in some form. Groundwater and LNAPL pumping systems are closed-loop systems from which vapors are extracted from the system components themselves (no vapors are extracted from the subsurface) and are treated with either granular activated carbon or catalytic oxidation. The sewer vapor extraction systems both use biofilter beds to treat air that is removed from the sewers. All systems are permitted by Philadelphia Air Management Services (AMS), who define emission levels that each system must meet. There are no odors observed from these systems' emissions.

Other remediation processes, such as excavation, may create short-term odor simply by disturbing the subsurface and extracting the materials. Engineering controls (e.g. odor/dust suppressants and/or fans) are typically used to minimize the transport of odors off-site during excavation activities.

Question:
When will we get information comparing all the available remediation methods in terms of cost, effectiveness, and community impacts (such as air emissions from the remediation process itself)?

Answer:
Evaluation of current and potential remedial options is ongoing. Evergreen will submit Cleanup Plans upon completion of all remedial investigation activities, which will consist of identification and evaluation of remedial alternatives; selection of proposed remedies; and plans for the development, construction, and initial operation of the proposed remedy and/or documentation of interim remedial actions already in place. Note that remediation to site-specific standards may include treatment, removal, engineering, or institutional controls.

Per Section 304(j) of Act 2, the Cleanup Plans will document the evaluation of criteria such as the effectiveness of the remedy to manage risk, the extent to which the risks are being reduced, the ability to implement the remedy, reduction of regulated substances, post-remediation care plans, and cost-benefit considerations.

Question:
Can you please make the water permits mentioned public?

Answer:
Evergreen currently holds PWD discharge permits. These will be posted to the website.

Question:
What is the timeline for the [remaining] cleanup? Is it measured in months, or years?

Answer:
Evergreen's active remediation has been ongoing for decades and may extend for many years. Part of the future Act 2 Cleanup Plan will include defining parameters that are measured and tracked to determine the appropriate time to cease active remediation in each area.

Question:
What specific steps are being taken to clean the water from potential contaminants?

Answer:
Since the original Consent Order & Agreement between Sunoco and PADEP in 1993, Sunoco and Evergreen have implemented several interim remedial actions at the refinery. Various remediation systems were installed in the facility in 1995 to prevent the migration of impacted groundwater off-site. Additional remediation systems have been installed since that time to either address source removal (removing petroleum product and contaminated groundwater at the source of the release on-site) and/or control the migration of impacted groundwater beyond the property boundary. Between 1993 and the present, twenty-five remediation systems have been operated at the refinery by Sunoco/Evergreen.

Remediation activities have included, but are not limited to groundwater and/or product recovery via both vertical and horizontal wells, where product and/or groundwater impacted with hydrocarbons are removed from the subsurface; oxygen injection into groundwater ,to aid in removal and/or breakdown of petroleum products in the subsurface; sewer ventilation systems, or the removal of petroleum vapors from air in subsurface utilities; and soil vapor extraction, or removing petroleum vapors from the subsurface.

Many of the remediation systems have been decommissioned over the years when they have achieved their intended purpose and/or other remedial alternatives have been selected. Evergreen currently operates nine remediation systems at the site. In addition to remediation systems, areas of soil have been remediated at the facility via excavation and/or capping.

As discussed above, after the Fate and Transport RIR, Human Health Risk Assessment and Ecological Risk Assessments are completed, these interim remedies – along with potential additional remedies – will be evaluated and included in the Act 2 Cleanup Plan.

Question:
How long will this take and when will the cleanup start?

Answer:
The cleanup, when talking about subsurface remediation, has been ongoing for quite some time. The need for any additional remediation systems to address pre-2012 impacts will be detailed in the Cleanup Plan(s). However, some subsurface cleanup activities (soil removal) will occur as Hilco Redevelopment Partners' development occurs. If impacted soils are encountered during site work that cannot remain on-site, they will be excavated and removed for off-site disposal. The timing of that would be coordinated with Hilco Redevelopment Partner' schedule for development of different areas of the site.

Question:
In today's presentation, the presenter described the topic of "source removal" as a remediation approach, summarizing it as "get rid of it." It is understood that this is a plain-word explanation for a more involved process. What percentage of this project is proposed to be source removal, and where is the material to be removed going? What is the line of custody for such removal, at what stage are the applicable permits? Are the byproducts of such processes contaminants themselves, and does the proposal comply with regulations and standards for such byproducts?

Answer:
These are all questions that are generally addressed in an Act 2 Cleanup Plan. The Cleanup Plan(s) will be submitted subsequent to RIRs.

Question:
Conventional land remediation consists of capping the contaminated soil with tarp and/or concrete; or hauling the soil someplace else. Capping ignores the problem for a few decades at most, until chemicals leach out. In this case, into the Delaware River. Hauling the soil elsewhere just pushes the problem of leaching onto another bioregion. Neither of these methods is true remediation since we're either

burning, burying, or relocating the contamination. Eco-remediation is the most cost effective method of remediating soil and water, per figure 98 in "Mycelium Running, Paul Stamets.

Answer:
Evaluation of current and potential remedial options is ongoing. Cleanup Plans will be submitted upon completion of all remedial investigation activities, which will consist of identification and evaluation of remedial alternatives, selection of proposed remedies, and plans for the development, construction, and initial operation of the proposed remedy and/or documentation of interim remedial actions already in place. The Cleanup Plans will document the evaluation of criteria such as the effectiveness of the remedy to manage risk, the extent to which the risks are being reduced, the ability to implement the remedy, reduction of regulated substances, and post-remediation care plans, among other potential factors.

Question:
Remove all of the lead, we deserve a space that is safe to work and play in.

Answer: Act 2 includes procedures to allow for the reuse and redevelopment of a site while maintaining safety of the community, environment, and workers on site. This is inherently the purpose of Act 2. Evergreen will evaluate how best to do this through remediation, pathway elimination, modeling, risk assessment, and engineering and institutional controls to make sure that the workers and people of the community are safe, and to protect the environment.

Question:
To what extent will you be using bioremediation technology?

Answer:
Evergreen is currently using a form of biotechnology at the site for interim remedial activities. We have two biofilters on site, which take the vapors pulled out of the sewers and treat them. Bioremediation technology is not currently used to treat any groundwater. Most systems on site currently are in place to prevent migration of contaminants to receptors such as sewers or property boundaries. Evergreen will evaluate treatment options in future Cleanup Plans.

Question from EPA's contractor SKEO's August 6, 2020, Public Meeting:
What was the impact of the recent hurricane on the ongoing remediation processes? *[Evergreen note: the SKEO Meeting took place in October 2020]* Were any of the water treatment processes overwhelmed and were there any discharges into the River?

Answer:
Evergreen has not observed any impact by heavy storm on our remediation processes at the site. Evergreen is unaware of conditions with facility wastewater treatment plants or discharges, as those are facility operations.

Question from EPA's contractor SKEO's Aug. 6, 2020, Public Meeting:
We are still waiting on a city response to our request for a public hearing on Evergreen's existing remediation infrastructure, including vents that emit fumes coming from underground pollutants.

Answer:

It is our understanding that Philadelphia AMS will hold a public hearing on the draft Natural Minor Operations Permit; however, Evergreen is not aware of the timing. Questions regarding the permit application and timing of future public hearings should be directed to Philadelphia AMS.

Question:

These are very informative graphics (referring to the August 27, 2020, Public Information Session). What about removal of contaminants that are in the soil? Lead cannot be pumped out. All the soil must be removed.

Answer:

Contamination in soil can be addressed in many ways. While some areas of soil impact have been excavated previously, soil remediation can also include institutional and engineering controls, which eliminate a risk by blocking a pathway of exposure. Remedial plans for all media will be detailed in the Cleanup Plan(s).

Question:

In addition to the toxins already mentioned, what is the plan to deal with the benzene that is in the soil?

Answer:

In general, benzene and other volatile compounds are not identified for further evaluation in soils (meaning they were not detected above the statewide health standards in many locations). However, all remedial options, which can include engineering and intuitional controls, will be detailed in future Cleanup Plans.

Question:

Is there a permit for the discharge of water from the wastewater treatment system to the Phila Water Dept? Who is the permittee? Have the permit requirements been met?

Answer:
Evergreen has a permit for discharge from a remediation system directly to the PWD and is not the permittee for the on-site wastewater treatment plant.

Question:
It may have been more effective if this presentation was made available a week ago and we could have spent these two hours asking pertinent questions, such as: 1. what are the critical paths for considering the risks of lead and benzene to the adjacent communities; 2. how are increased climate-change risks being assessed; 3. how is ground and surface water run off being considered in the plans; 4. how is Hilco assessing the additional risks of (what looks like will be) hard scape pavement of 85-90% of the site?

Answer:

1) The route of exposure (or risk pathway) identified for adjacent communities would be potential indoor or outdoor air impacts from dissolved groundwater plumes that migrate offsite. However, initial assessment did not find any potential impacts to off-site residences from the conditions in shallow groundwater. This will be further evaluated after the contaminant fate and transport model is completed. Any issues that require mitigation efforts will be addressed in future Cleanup Plans.
2) Climate change will be considered during the Fate and Transport modeling. This will be presented in the Fate and Transport RIR, as well as in the selection of the remedial approach of the Site, which will be presented in the Cleanup Plan.
3) Ground and surface water runoff will be evaluated as part of the remedial approach, presented in the Cleanup Plans.
4) Questions regarding Hilco Redevelopment Partners' plans should be directed to them.

Question:
If there are risks to people I would like to be provided with information which will allow me to identify if something in your process has gone poorly and if I need to take further precaution to keep myself and my family safe.

Answer:
Evergreen interprets this question as potentially being in reference to the ongoing demolition and construction processes, which would be the responsibility of the new property owner. However, with respect to Evergreen's responsibility to investigate and remediate soil and groundwater contamination, the route of exposure to nearby communities would be potential indoor or outdoor air impacts from dissolved groundwater contamination that moves offsite in some areas. However, our initial assessment did not find any potential impacts to off-site residences from the conditions in shallow groundwater. This will be further evaluated in the future and any issues that require mitigation efforts will be addressed in future Cleanup Plans. Evergreen is also currently developing better processes for communicating important information about our remediation program to community members.

Question:
What are some of the possible risk pathways that you've encountered at the refinery. And how are you dealing with them?

Answer:
Risk pathways include routes of exposure for contaminants to reach receptors. One potential pathway would be vapor migration into sewers or buildings. Vapor intrusion into buildings can be addressed

through various engineering controls, such as positive pressure in a building or vapor barriers/mitigation systems. Potential sewer vapors are currently being controlled in multiple locations using remediation systems that extract air from the sewers. Another potential risk pathway is direct contact with impacted soils, which can be controlled by eliminating the pathway via capping or use of personal protective equipment/safety standards. All potential exposure scenarios and proposed mitigation measures will be detailed in future Cleanup Plans.

Question:
The speaker (during the August 27, 2020 Public Information Session) said that the remedial investigation reports have to be approved before Evergreen does risk assessments. Since this hasn't happened yet, why did Evergreen already complete the risk assessment for lead in soil?

Answer:
In order to determine risk to human or ecological receptors associated with contamination in soil or groundwater, the extent of the contamination must be known/defined for accurate calculation of risk. The calculation of the lead site-specific standard for shallow soil used risk-based calculations utilizing the updated adult lead model and exposure assumptions recommended by the EPA and the PADEP. This approach was appropriate since the extent of lead in soil had been defined. The two RIRs that were not approved were due to the need for additional wells to better define off-site migration of groundwater plumes, not lead in soil.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
I'm worried about Hydrofluoric acid or HF because if it gets into the neighborhood and someone throws a cigarette and it hits it, the whole neighborhood will blow up causing massive casualties.

Question:
Another concern I have is about Butane because this is the second large chemical in there this is lighter fluid and if it's the right pressure and temperature then this will blow up also, this was the gas that blow up in the first place and if this was in a neighborhood it would be like a nuclear bomb exploded.

Question:
Another concern I have is about nickel carbonyl because nickel carbonyl is very toxic and can cause chronic bronchitis, reduced lung function, and lung and nasal cancer if breathed in.

Answer:
These comments refer to chemicals used in petroleum refining processes and concerns with potential gas phase/ambient air conditions. Evergreen cannot address concerns regarding use of these chemicals, as Evergreen is responsible solely for contamination in the subsurface and from releases prior to 2012.

Question:
Of particular concern are impacts to living species in the Schuylkill and Delaware Rivers: - Persisting

water quality problems stemming from site pollution (including sedimentation) that enters surface water through stormwater runoff and other pathways. These problems include low Dissolved Oxygen that impinges on fish and other aquatic life, hydrocarbons such as benzene and polychlorinated biphenyls (PCBs), along with other legacy pollutants that harm species and their habitats - Endangered species (i.e., Atlantic Sturgeon and Shortnose Sturgeon, both of which are federally endangered); both of these sturgeon species are greatly imperiled and use this part of the tidal Schuylkill and the tidal Delaware - Fish and fishlife and other vulnerable species such as mussels and migratory fish, known to live and utilize the river.

Answer:
If contamination affects certain sensitive ecological receptors, such as threatened and endangered species, it must be addressed in the cleanup. This can be accomplished through a risk assessment or remedial measures. An ecological risk assessment evaluating the ecological receptors that would be in the Schuylkill River and on site has been completed already and will be submitted through the Act 2 process upon completion of the remedial investigation phase of the project. As part of this process, chemicals at the site were evaluated in relation to the species of concern, such as the Atlantic Sturgeon and Shortnose Sturgeon. Based on this assessment, chemicals at the site were not identified as likely to impact species of concern.

Question:
Will the site-specific standard be at least as stringent as the statewide [health] standards?

Answer:
There will be a combination of statewide health and site-specific standards at this site. The lead site-specific standard calculated for the Site utilized the Adult Lead Model (ALM) and the standard PADEP default assumptions. Use of the ALM resulted in a lead site-specific standard that was higher than the statewide health standard, but nonetheless still protective of human health. As the PADEP revises its standard assumptions for lead, Evergreen will modify the lead site-specific standard accordingly. Although not proposed at this time, if site-specific standards are developed for other chemicals, the process will use site-specific conditions as inputs to the calculations, so they will be protective of the population that encounters the soils at the site. If the pathway elimination option under the Act 2 site-specific standard is used at the Site, a new standard will not be calculated, but the Cleanup Plan and Final Report will document how the entire pathway is eliminated.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
Delaware Riverkeeper Network is opposed to the site being cleaned up only to industrial use standards. This decision limits the use of the site and the cleanup required. The site is a rare opportunity for public open space and uses that are compatible with residence, mixed community use, and recreational use such as river access for paddling and water sports. The connection of people to the Schuylkill is of great value, as is demonstrated by the historically and economically important river access for rowing and boating upstream. These river friendly activities can be fostered by providing access from this property to the natural riverside on the Schuylkill and the downstream Delaware River. Most importantly,

requiring clean up to residential standards and setting cleanup standards based on human health standards and site-specific scientifically-based standards that are protective of human health and the environment will provide maximum benefit and use of the site and not condemn it to always be a source of pollution because those responsible successfully avoided the costs of cleaning up the pollution they caused.

Question:
We the environmental justice community are concerned about all of the other standards that have not been submitted yet. They were submitted with anticipated use of the site as a refinery, so are those standards going to be revised in terms of what the actual use of the property is going to be?

Question:
Will you commit to cleaning up all areas near residential off-site areas to residential health based standards? For the part of the property that will be a public park, do residential standards apply to these areas?

Answer:
Per the 2020 First Amendment to the Consent Order & Agreement dated June 26, 2020 (and the deeds transferring the parcels), PES/Hilco Redevelopment Partners is committed to continuing to use the former refinery property for non-residential use. As such, Sunoco agreed to remediate the site to non-residential use standards under Act 2, and Evergreen's future Cleanup Plans will be developed based on the non-residential use of the property.

The following questions are similar, so a combined answer is provided to address these related questions.

Question:
When will the areas be sampled that have not been sampled before because the refineries had been operating and when will that data be made public?

Question:
As the facilities are deconstructed, you will be doing the sampling that wasn't done before and that you'll be sending that data to the DEP. When you send that new data to DEP, will you make it publicly available?

Answer:
There are some areas under the old process units that weren't accessible or where it wasn't safe for us to drill or dig because of ongoing operations. Once those units have been dismantled and the areas are accessible, Evergreen will go out and do additional sampling. Evergreen has not been provided with the planned schedule of demolition of the unit areas. However, the sampling will be performed immediately upon clearing of those areas and the data will have to be submitted to the PADEP as part of the Act 2 process after sampling has been conducted.

Question:
The 2015 Human Health Risk Assessment Report [HHRA] assesses the exposure for non-residential populations. Fenceline measurements of chemicals such as benzene are above regulatory limits. What

health risk assessments have been done for nearby residential populations and are these publicly available?

Answer:
The 2015 HHRA report was completed specifically to assess lead exposure in soils to site workers. Fenceline measurements of benzene occurred as an operational task required by the EPA because it was an operating refinery at the time, and therefore, monitoring was done by PES. Evergreen is responsible for potential impacts from contamination at or below the ground surface, so that is our focus. We evaluate potential risk to off-site populations from dissolved plumes moving off-site. There was no indication from initial assessments that there is any risk to indoor/outdoor air from historic environmental data collected during the RI activities.

Question:
Evergreen should not characterize this remediation project as a voluntary cleanup.

Answer:
Act 2 is a voluntary cleanup program. Sunoco is obligated to cleanup the legacy contamination under the Act 2 cleanup program through enforceable legal agreements signed with PADEP, and Evergreen completes the cleanup on Sunoco's behalf. Therefore, Evergreen's participation is not voluntary nor does Evergreen characterize the remediation project as voluntary.

Question:

Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.

Answer:
As part of the Act 2 process, a risk assessment can be completed for a Site to develop risk based cleanup standards. The cumulative impacts from detected compounds would be included in the risk assessment activities. Evergreen cannot complete a risk assessment until the RIRs are submitted and approved, and the RIR process cannot be completed until the public comment process on the RIRs is completed.

Question:

Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on-site? What is the rationale for not sampling the others?

Answer:
The current analyte list utilized for the Act 2 program at the facility was developed after analyzing historic reports and data from previous sampling efforts, and in consideration of historic use of the site and the PADEP analyte 'short lists' for various petroleum products. Evergreen's current analyte list includes compounds indicative of the various petroleum products processed at the facility. In addition, both soil and groundwater samples from areas of the facility which historically stored and processed crude were sampled for a more comprehensive analyte list as part of the remedial investigation activities. These data have all been included in the RIRs.

Question:

Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Answer:

As presented in the RIRs, the lower aquifer (AOI 11) has been investigated during all the other AOI investigations completed since 2013, and the results were reported in the individual RIRs. The concentrations found in the deep aquifer do not indicate a potential risk to communities in New Jersey, so no cleanup is anticipated as being necessary. The projected fate and transport of contaminants in the deep aquifer will be included in the Fate and Transport RIR, which is anticipated for submittal by the end of 2021. Upon completion of the modeling, it will be confirmed whether any remedial action is necessary in the lower aquifer.

Soil

Question:
These graphics *(Evergreen note: assumption is reference to graphics from the August 27, 2020 Public Information Session relating to remediation)* all show problems relating to gasses and water…not contaminated soil. Will soil be removed and replaced with clean soil?

Answer:
The remediation systems operated at the site, historically and currently, were installed to address groundwater and/or vapors since they represented potential risk pathways, which is why they were shown during the August 27, 2020, Public Information Session. The purpose of the information session was to review historic reports, which include mostly RIRs. Remedial plans for all media, including soil, will be detailed in the future Cleanup Plan(s), as remediation options are not a topic of RIRs. While some areas of soil impact have been excavated previously, soil remediation can also include institutional and engineering controls that eliminate a risk by blocking a pathway of exposure.

Question:
Various docks have handled ships since 1866. Multiple fires have occurred on ships over the years. What is the condition of the land along the waterfront?

Answer:
The environmental impacts that have been characterized during Evergreen's Act 2 investigations along the waterfront are presented in the RIRs, specifically in AOIs 2, 3, 5, 6, 7, 8, 9 and 10.

Question:
The site contains several rail facilities (North Yard, West Yard, etc.). What are the conditions at rail terminals and along rail tracks?

Answer:
The rail facilities are located in AOIs 5 and 8. Installation of these rail facilities occurred after the property transfer to PES. Therefore, conditions near these lines resulting from their operation would not be part of Evergreen's investigations. However, the environmental conditions characterized as part of the Act 2 investigations, which included the areas below and around the current rail areas, are included in the RIRs for AOIs 5 and 8. Contaminants associated with past petroleum operations in those areas are summarized in those reports. Evergreen is unable to provide information about the operational conditions related to recent (since 2012) operations of the rails. PES would be better able to respond to those inquiries.

Question:

Lead is a heavy metal, but it will not remain stationary. Contaminated soil will be kicked up as dust by cars on the road, construction projects, and even by children at play.

Answer:

Potential dust from Site soils will be addressed through the remedies selected for the Site, which will be proposed in the Cleanup Plan. Measures to prevent dust generation during redevelopment should be included in Hilco Redevelopment Partners' site development permits.

Question:

1) We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk.

2) Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifer.

3) The work done so far does not consider the impacts of climate change, rising sea level and worsening storms. Note: for the purpose of response, this comment was split into three topics by Evergreen.

Answer:

1) The site-specific standard for lead was approved by both PADEP and EPA and utilized the updated ALM and exposure assumptions recommended by the EPA and the PADEP. As part of the remedial investigations, the lead data was compared to the Act 2 statewide health standards MSC, which is 450 ppm, based on the soil-to-groundwater pathway. This comparison is shown on the tables in the RIRs and in the August 27, 2020 presentation. The approach that was used to calculate the site-specific standard for direct contact was to use the ALM recommended by the EPA. The PADEP used the same model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead.

2) PADEP did not approve two of the RIRs – AOIs 4 and 9 – based on the need for additional off-site characterization, not a level of contamination over other AOIs. The characterization portion of the AOI 11 report was sufficient for approval; however, the fate and transport portion of the AOI11 report was not, which is why it was not approved. Data has been collected from the lower aquifer wells as part of the other AOI remedial investigations since 2013 and reported in the RIR submitted since 2013.

3) Characterization and delineation of contaminants of concern does not generally require consideration of climate change, sea level rise or worsening storms. Climate change will be considered in future fate and transport efforts and Cleanup Plans where that type of variable warrants consideration.

Lead – Site-Specific Standard

Question:
Why does the former refinery get special treatment compared to other non-residential sites? In terms of the lead site-specific standards in soils 0 to 2 feet

Answer:
The ability to calculate a site-specific standard (for any media) is a provision in the Act 2 regulations. It is not the only one allowed, but it is common practice and one of the three options for standards that can be applied to a site: statewide health, background, or site-specific. Other sites can also calculate a site-specific standard if they choose to do so for their Act 2 projects.

This question was also provided to PADEP, to which the following response was provided:

Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2 of 1995) allows the remediator to select the type of cleanup standard they wish to use for the site. One option is the site-specific standard, and risk assessments are a means available to any remediator to attain that standard. Evergreen chose to use a risk assessment to determine a site-specific standard for direct contact exposures of people with lead in surface soil (upper 2 feet). With this approach they were able to use a more current scientific methodology from U.S. EPA to calculate a risk-based value. Remediators who do not perform a site-specific analysis will generally use the published statewide health standard default cleanup values, but the site-specific standard option may be used by any remediator and it is not unique to this site.

Question:
So, you are acknowledging that the DEP is attempting to increase the non-residential surface soil lead standard to 2,500 from 1000 to accommodate the refinery site?

Answer:
The PADEP calculated a new proposed direct-contact standard based on the updated ALM and updated exposure assumptions recommended by the EPA, not to accommodate any specific site.

Question:
Why did you choose such a high site-specific standard, and do you plan to keep it that high?

Answer:
The approach used to calculate the site-specific standard for direct contact was to use the ALM, recommended by the EPA. The PADEP used the same model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead. If the PADEP changes its assumptions related to lead, such as permissible blood lead levels, Evergreen will update the site-specific standard accordingly.

Question:
The lead standard should be revised to be protective of public health. The standard that was approved (2240 parts per million (ppm) in surface soil) is much weaker than the default standard of 1000 ppm. The assumptions Evergreen used in calculating the standard are inaccurate and outdated.

Answer:
The site-specific standard was calculated using the updated ALM and exposure assumptions recommended by the EPA and the PADEP. The previous calculations used by the PADEP were outdated; therefore, the PADEP recently used the same updated ALM to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead. The new calculated proposed direct contact statewide health standard for lead is in line with the site-specific standard that was calculated in 2015 for the site. If the PADEP changes its assumptions related to lead, such as permissible blood lead levels, Evergreen will update the site-specific standard accordingly.

Question:
Why isn't the site-specific standard for lead being reevaluated based on the anticipated site use (commercial warehouse)?

Answer:
The site-specific standard for lead was calculated based on non-residential (not industrial) site use, which is consistent with the planned future use. If the PADEP changes its assumptions related to lead, such as permissible blood lead levels, Evergreen will update the site-specific standard accordingly, but will continue to assume a non-residential Site use, consistent with future use.

Question:
Why is Evergreen's site-specific Lead standard (2240 ppm) so much higher than the state standard (1000 ppm)?

Answer:
The PADEP's Non-Residential MSC was derived using the Society for Environmental Geochemistry and Health (SEGH) model (Wixson, 1991). Since that time, the PADEP has endorsed the use of alternative uptake biokinetic models for the evaluation of lead toxicity including the Bower model (Bowers et al., 1994) for non-residential site uses. The EPA adapted the Bowers et al. model to develop the ALM, a widely accepted approach to risk characterization for non-residential exposure scenarios and recommended by the EPA (EPA, 2001). Evergreen used the EPA's default assumptions for assessing non-residential risks from lead exposure in the ALM model to develop the site-specific standard for lead.

Question:

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site – an important factor in determining the

site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.

Answer:
As part of the remedial investigations, Evergreen compared the lead data to the Act 2 soil-to-groundwater statewide health standard, which is 450 parts per million (ppm) and the direct contact statewide health standard, which is 1000 ppm, as well as the site-specific standard. This comparison is shown on the figures/tables in the RIRs and in the August 27, 2020 presentation. The RIRs only report the data, not remedial decisions relating to the use of lead site-specific standard. The approved site-specific standard for lead is based on updated information and models from the EPA and PADEP that reflect the current state of science for lead. If the PADEP changes its assumptions related to lead, such as permissible blood lead levels, Evergreen will update the site-specific standard accordingly.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This report summarizes and responds to all of the comments received for past Act 2 reports during the public comment period. The requested 120-day comment period by the City was in reality 140 days, from August 27, 2020, to January 14, 2021. In addition, the reports re-opened for comment were posted to Evergreen's website which went live in July 2019 and this document includes responses to all questions and comments received since the initial attempted meeting in November 2019. Once the comments and responses relating to the past reports are reviewed and approved by the PADEP, Evergreen will summit the Addendum for AOI 4 RIR, the Addendum for AOI 9 RIR, and the Fate and Transport RIR. It is expected that all of these reports will be submitted in 2021. Evergreen will then be able to complete and report on future phases of the Act 2 process. Many of the questions and comments addressed in this report are applicable to and will be considered in these future phases.

Evergreen will continue to engage with the community and expects to hold quarterly Public Meetings throughout 2021, in addition to conducting other outreach activities to better communicate with the surrounding communities regarding the legacy environmental activities. Evergreen will also continue to welcome comments concerning the ongoing Act 2 activities and will provide responses on the Evergreen website, as well as during public meetings.

APPENDIX A

NOTIFICATIONS TO PUBLIC

Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

March 30, 2021

Leigh-Anne Rainford, Director
Environmental Health Services
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, PA 19104

RE: Submission of Public Comment Remedial Investigation Report
Former Philadelphia Refinery
PADEP Primary Facility ID # 780190 (Site-wide)
3144 Passyunk Ave, Philadelphia, PA, Philadelphia County, PA

Dear Ms. Rainford:

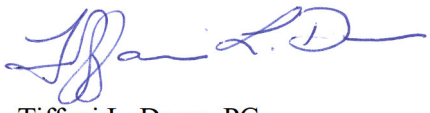
This letter is to provide notice that Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) is submitting a Public Comment Remedial Investigation Report (RIR) to the Department of Environmental Protection Southeast Regional Office for the former Philadelphia Refinery located at 3144 Passyunk Avenue in Philadelphia, Pennsylvania (Site). The Public Comment RIR addresses public comments that have been submitted for the Site in relation to past reports completed under Pennsylvania's Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2 (Act 2), as well as the joint Pennsylvania Department of Environmental Protection (PADEP) and U.S. Environmental Protection Agency (EPA) One Cleanup Program. Evergreen is an affiliate of Sunoco (R&M), LLC, a former operator of the refinery, and both companies are indirect subsidiaries of Energy Transfer L.P. In November 2013, Evergreen was formed to manage Sunoco's legacy environmental cleanup at the Philadelphia Refinery.

Evergreen submitted a Notice of Intent to Remediate (NIR) to the PADEP in 2006, formally entering the Site into the Act 2 Program. At the request of the City of Philadelphia (City), Evergreen developed a Public Involvement Plan (PIP) in 2006 and updated it in 2019. The PADEP requested that Evergreen prepare the Public Comment RIR to complete the public involvement process for the Act 2 Reports that were previously submitted to the PADEP. The City requested a 120-day comment period to allow the public time to review the past reports and provide their comments. Evergreen held a virtual Public Information Session on Aug. 27, 2021 which began the comment period. Jan. 14, 2021, marked the end of the "120-day" comment period, when another virtual Public Information Session was conducted. While the purpose of the public comment period was to engage the public in reviewing previously submitted Act 2 including mostly RIRs, many comments collected to date do not relate specifically to the past reports, but rather to other topics that may be addressed in future Act 2 submittals. All comments received between November 2019 and Jan. 14, 2021, are addressed in the Public Comment RIR, regardless of topic and method of submittal (e.g. written, live during public meetings, telephone, or other methods). The comments and responses included in the text of the Public Comment RIR are also included

on Evergreen's website for the Site (https://phillyrefinerycleanup.info). An electronic copy of the Public Comment RIR will also be posted to the website and provided to two local library branches. A hard copy will be made available to you upon request. PADEP and EPA will review the report and provide comment within 90 days.

We have appreciated the opportunity to work closely with the City in the development of the Public Comment RIR as part of the implementation of our Public Involvement Plan and we look forward to continuing to collaborate with the City and the community at the former Philadelphia Refinery.

Regards,
Evergreen Resources Management Operations



Tiffani L. Doerr, PG

Cc:

Scott Cullinan, PE, Evergreen
C. David Brown, PG, PADEP (via email and online submittal)
Lisa Strobridge, PG, PADEP (via email)
Kevin Bilash, EPA (via email)
Patrick ONeill, City of Philadelphia (via email)
Dennis Yeun, City of Philadelphia (via email)

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PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SANBORN HEAD

20 Foundry Street, Concord, NH 03301

Leigh-Anne Rainford, Director
Environmental Health Services
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, PA 19104

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Environmental Health Services
Philadelphia Department of Public Health
321 University Avenue
Philadelphia, PA 19104

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Newspaper notice printed in Philadelphia Daily News and South Philly Review on 3-31-21

Evergreen - Former Philadelphia Refinery

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Evergreen has submitted a Public Comment Remedial Investigation Report to the Pennsylvania Department of Environmental Protection for the former Philadelphia Refinery located at 3144 Passyunk Avenue, Philadelphia, PA Philadelphia County. The Public Comment Remedial Investigation Report provides all comments received by Evergreen between November 2019 and January 2021 on previously submitted Act 2 Reports for the Site.. There is no Act 2 public comment period associated with this report. However, as always, general communications can be sent to Evergreen via the website www.phillyrefinerycleanup.info or via email at phillyrefinerycleanup@ghd.com.

The Philadelphia Inquirer

801 MARKET STREET, SUITE 300, PHILADELPHIA, PA 19107

Affidavit of Publication

On Behalf of:
SANBORN HEAD
20 Foundry Street
Concord, NH 03301

STATE OF PENNSYLVANIA COUNTY OF PHILADELPHIA:

Before the undersigned authority personally appeared the undersigned who, on oath represented a and say: that I am an employee of The Philadelphia Inquirer, LLC, and am authorized to make this affidavit of publication, and being duly sworn, I depose and say:

1. The Philadelphia Inquirer, LLC is the publisher of the Philadelphia Daily News, with its headquarters at 801 Market Street, Suite 300, Philadelphia, Pennsylvania 19107.
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3. The printed notice or publication attached hereto set forth on attached hereto was published in all regular print editions of the Philadelphia Daily News on

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3/31/2021

4. Under oath, I state that the following is true and correct, and that neither I nor The Philadelphia Inquirer, LLC have any is interest in the subject matter of the aforesaid notice or advertisement.

Helene Sweeney

Kathrine V. Harley
Notary Public

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Evergreen - Former Philadelphia Refinery

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Evergreen has submitted a Public Comment Remedial Investigation Report to the Pennsylvania Department of Environmental Protection for the former Philadelphia Refinery located at 3144 Passyunk Avenue, Philadelphia, PA Philadelphia County. The Public Comment Remedial Investigation Report provides all comments received by Evergreen between November 2019 and January 2021 on previously submitted Act 2 Reports for the Site. There is no Act 2 public comment period associated with this report. However, as always, general communications can be sent to Evergreen via the website **www.phillyrefinerycleanup.info** or via email at phillyrefinerycleanup@ghd.com.

Public notice submitted via email to distribution list on 3-31-21

Public Notice – Act 2 Report Submittal
Former Philadelphia Refinery

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Evergreen submitted a *Public Comment Remedial Investigation Report (RIR)* to the Pennsylvania Department of Environmental Protection on March 31, 2021 for the former Philadelphia Refinery located at 3144 Passyunk Avenue, Philadelphia, PA Philadelphia County. The *Public Comment RIR* provides all comments and questions received by Evergreen between November 2019 and January 2021 on previously submitted Act 2 Reports for the Site. There is no public comment period associated with the *Public Comment RIR* as it includes only comments on past Act 2 reports, no new data. However, general communications can be sent to Evergreen via the website www.phillyrefinerycleanup.info, PO Box 7275 Wilmington, Delaware, or via email at phillyrefinerycleanup@ghd.com. The report will also be posted to the aforementioned website. PADEP and EPA will provide review of the Act 2 report related comments in this document within 90 days. Many of the comments and questions included in the report will be addressed in future activities and reports.

APPENDIX B

COPIES OF INDIVIDUAL COMMENTS

DOERR, TIFFANI L

From: DAVID STEINBERG <steinberg.david07@comcast.net>
Sent: Friday, June 19, 2020 1:23 PM
To: Philly Refinery Cleanup
Subject: AOI 11 PES Refinery

Please answer the following questions in connection with **AOI 11** relating to the **PRM (Potomic-Raritan-Magothy) Aquifer System.**

1. Has **AOI 11** cleanup been started?
    1. What is the plan for the cleanup for **AOI 11**?
    2. When will the public hearings for **AOI 11** under Act 2 take place?
    3. What effect has pollution been in the last 7 years since the last reports on **AOI 11** were issued on 6/21/2013?
2. Have there been any studies on the effect of the pollution of the **PRM** in the water supply in NJ, as public and private water companies draw water from it and Phila stopped using it in the 1990's because it was too polluted?
    1. Has NJ DEP been involved with any issues on the NJ side of the Delaware River?
    2. Have public and municipal water companies in NJ been notified about pollution in the PRM Aquifer water supply?
    3. Have they been notified about **AOI 11** efforts by PA DEP and EPA?

Peace, Shalom, Salaam
David L. Steinberg , **IWA*** 856.383.5325 **LinkedIn.com/DavidLSteinberg**

- *** Honored to be the *2018 Nobel Peace Prize Nominee* by the (IWA) International Writers and Artists Association**
    - **Tri-CSA (Tri-County Sustainability Alliance) Chair, Towns Helping Towns Committee**
    - **Recipient of the *"2019 Changemaker Award"* granted by the NJ League of Conservation Voters**

DOERR, TIFFANI L

From: Caroline Houlihan <gridwin@gmail.com>
Sent: Sunday, June 21, 2020 9:02 PM
To: Philly Refinery Cleanup
Subject: Request

Hi. I am wondering if you are able to send out updates about what plans are being carried out when. For instance, if you are cleaning a particular thing, I'd like to know ahead of time when that cleaning will take place and what the risks to the surrounding environment/people are. If there are risks to people I would like to be provided with information which will allow me to identify if something in your process has gone poorly and if I need to take further precaution to keep myself and my family safe.

For example, right now there is a very strange smell outside. I am inclined to believe it may be emissions from your site. If so, what could it be?

Thank you for your time and attention.

Sincerely,
Caroline Houlihan

DOERR, TIFFANI L

From: christopher.eck@gmail.com
Sent: Tuesday, June 23, 2020 9:52 AM
To: Philly Refinery Cleanup
Subject: PES refinery

I thought the refinery was to be permanently shut down following the explosion in June of 2019? I read that Benzine levels were 30 times higher than permitted, putting them on par with levels you would see in 3rd world countries like India. Also watchdog websites went black in the weeks leading up to the explosion. There was no data available to the public in the weeks leading up to the explosion. Now I'm smelling and feeling the toxic pollution from the refinery again. Will the refinery be permanently shut down? Why was there no meeting 11/7/20. Why was Evergreen "blocked" from the meeting? Was there a meeting at all?
Sent from my iPhone

DOERR, TIFFANI L

From: Gladys Harlow <gladysharlow@gmail.com>
Sent: Thursday, June 25, 2020 3:16 AM
To: Philly Refinery Cleanup
Subject: Clean-Up Efforts with Hilco

Hello,

My name is Gladys and I live in West philadelphia very close to Bartram Gardens. I was wondering what your plans are now that Hilco has purchased the land PES and Sunoco both left in shambles. Have you reached out to Hilco about their clean-up efforts? Will you be monitoring them for accountability over severe toxic chemical spills in the water and soil? The information on your website seems to be outdated but i recently received a letter in the mail asking us to submit comments.

I worry about our community over the river in South Philly who have dealt with countless decades of health problems due to this harmful refinery. Please keep me updated on this matter. Thank you.

Cheers,
Gladys Harlow
786-899-9934

DOERR, TIFFANI L

From: Alex Toner <apt5010@gmail.com>
Sent: Saturday, June 27, 2020 2:59 PM
To: Philly Refinery Cleanup
Subject: Philly Refinery Environmental Cleanup

Hello,

I received your mailer today and would like to be included on future communications, especially for any public meetings. Do you have any idea what is going to be done with the site, and is there any way to encourage using it as a site for renewable energy for the city?

Thank you!
Alex

-
Alex Toner

_____

DOERR, TIFFANI L

From: Stephen Giardino <kane727@aol.com>
Sent: Tuesday, July 28, 2020 8:38 AM
To: Philly Refinery Cleanup
Subject: Environmental concern

Hi , I currently reside in Siena Place near the borderline of the refinery . I just want to know is it safe to live there in terms of Air quality or was/is benzene a risk and in regards to the plume status affecting water or air or the properties themselves in Siena place . Recently , I have smelled Gas outside approximately on A few occasions near the end of July and don't know if that is from the refinery or cleanup process as the refinery is not currently operating . Thanks

DOERR, TIFFANI L

From: James Mullison <jamesmul@vt.edu>
Sent: Tuesday, August 18, 2020 9:30 PM
To: DOERR, TIFFANI L
Cc: C Hemingway; Carol Foy; Sylvia Bennett; Mark Clincy; Peter Winslow; lkh1066@earthlink.net; Philip; Patrick ONeill; Dennis Yuen; Kennedy, Cathleen; Gotthold, Paul; ccostello@sanbornhead.com; Bilash, Kevin; Brown, C David; Dula, Justin; debbierobinson641@gmail.com; Shawmar Pitts
Subject: Re: Document transfer and call for meeting

Hi Tiffani,

Thank you for your message. At this time, the clean up circle is continuing to digest the TASC report provided by Skeo and the EPA, as well as engage with technical advisors to get a better sense for what has transpired up until now. You will most certainly hear from me as soon as it is possible for us to meet. We will also be present for your public meeting on the 27th.

Thank you,
James

On Wed, Aug 5, 2020 at 1:04 PM DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com> wrote:

> Good afternoon,
>
> We wanted to pass along some documents that Evergreen had prepared to help further communications with the community around the former refinery. Attached are versions of the Overview Plain Language Summary as well as the Public Notice Mailer that were generated in various languages noted by both the City and EPA as being the three most spoken languages in Philadelphia communities in addition to English. Note that the mailer versions were combined into one document.
>
> We also wanted to reach out again to see if you were able to come up with a date to continue the conversations from our call on 5/29/20 and to discuss questions/concerns addressed in subsequent emails. As a reminder, Evergreen's Public Information Session is scheduled for 8/27/20. Please reach out at your convenience for suggested dates.
>
> Thank you,
>
> **Tiffani L. Doerr, PG**
>
> **Evergreen Resources Management Operations**
>
> 2 Righter Parkway, Suite 120
>
> Wilmington, DE 19083

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Wednesday, August 26, 2020 8:36 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Jillian Harris

Email

jhdan2@gmail.com

Address

1025 Cross Street
Philadelphia, Pennsylvania 19147
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Those of us who live near the refinery believe in our basic human right to have clean air, soil, and water as well as natural spaces not covered in concrete. While we are relieved that the refinery is closed, we are concerned that our needs are not being addressed by the cleanup and redevelopment process that currently exists. We demand the following:

An equal partnership with the public that is achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced.

Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.

The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

Source	Type	Identity	Timestamp	Content
Moderator	Announcement	Stacy Mueller (Stacy.Mueller@ghd.com)	8/27/2020 22:21	Thank you for joining us. We will begin our Philadelphia Refinery Legacy Remediation Act 2 Program information Session at 6:30 pm.
Attendee	Question	Gabriel (Unverified)	8/27/2020 22:40	Digital information for presentation slides is showing through "teams' app appears fairly blurry. Can that be improved?
Attendee	Question	Gabriel (Unverified)	8/27/2020 22:40	Digital information for presentation slides is showing through "teams' app appears fairly blurry. Can that be improved?
Moderator	Response	Katrina McCullough (Katrina.McCullough@ghd.com)	8/27/2020 22:48	You can also download the slides here: https://phillyrefinerycleanup.info/wp-content/uploads/2020/08/FINAL_Aug27_Public_Meeting_Presentation_08262020.pdf(Gabriel (Unverified) asked "Digital information for presentation slides is showing through "teams' app appears fairly blurry. Can that be improved?")
Attendee	Question	Mick (Unverified)	8/27/2020 22:40	I'm looking for where the presentation pdf is available. Thank you!
Attendee	Question	Mick (Unverified)	8/27/2020 22:41	I'm looking for where the presentation pdf is available. Thank you!
Moderator	Response	Katrina McCullough (Katrina.McCullough@ghd.com)	8/27/2020 22:46	https://phillyrefinerycleanup.info/wp-content/uploads/2020/08/FINAL_Aug27_Public_Meeting_Presentation_08262020.pdf(Mick (Unverified) asked "I'm looking for where the presentation pdf is available. Thank you! ")
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:44	DEMANDS: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:44	DEMANDS: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:46	I'd like to add my voice to Philly Thrive's demands. The public trust has been violated over and over again by this refinery, and the only way to fix it is by involving the public Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
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Attendee	Question	Anonymous (Unverified)	8/27/2020 22:48	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:48	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Tarik A (Unverified)	8/27/2020 22:48	Adding my support for Philly Thrive and for the people of South Philly! Specifically we demand: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Lena Glickman (Unverified)	8/27/2020 22:48	I want to also add my support the Philly Thrive demands: Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Gabriel (Unverified)	8/27/2020 22:48	Is Hilco/PES represented in this discussion today?
Attendee	Question	Tarik A (Unverified)	8/27/2020 22:49	Adding my support for Philly Thrive and for the people of South Philly! Specifically we demand: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

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Attendee	Question	Lena Glickman (Unverified)	8/27/2020 22:49	
Attendee	Question	Gabriel (Unverified)	8/27/2020 22:49	Is Hilco/PES represented in this discussion today?
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:49	What was your process for hiring the local consultants - was there any vetting of consultants by residents/the public? I am a Philly resident and add my voice to the demands set forth by Philly Thrive: Equal partnership with the public needs to be achieved by: creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Ella S (Unverified)	8/27/2020 22:49	The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Anonymous (Unverified)	8/27/2020 22:49	What was your process for hiring the local consultants - was there any vetting of consultants by residents/the public? I am a Philly resident and add my voice to the demands set forth by Philly Thrive: Equal partnership with the public needs to be achieved by: creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Ella S (Unverified)	8/27/2020 22:49	The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Ellen Neises (Unverified)	8/27/2020 22:50	Is Evergreen open to partnership with the public to prepare for the future of this site? Tonight's event is a one-way presentation, rather than a public meeting. Partnership could be better be achieved by holding small-group meetings to allow for meaningful public engagement throughout the Act 2 process, and by creating a community-based advisory group to solicit questions and comments from the residents and businesses in the area. Will you consider a more open process where a variety of voices and experts can be seen and heard?
Attendee	Question	Ellen Neises (Unverified)	8/27/2020 22:51	Is Evergreen open to partnership with the public to prepare for the future of this site? Tonight's event is a one-way presentation, rather than a public meeting. Partnership could be better be achieved by holding small-group meetings to allow for meaningful public engagement throughout the Act 2 process, and by creating a community-based advisory group to solicit questions and comments from the residents and businesses in the area. Will you consider a more open process where a variety of voices and experts can be seen and heard?
Attendee	Question	carol foy (Unverified)	8/27/2020 22:53	how long will this take when will the cleanup start
Attendee	Question	carol foy (Unverified)	8/27/2020 22:53	how long will this take when will the cleanup start

Attendee	Question	James (Unverified)	8/27/2020 22:54	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.
Attendee	Question	James (Unverified)	8/27/2020 22:54	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 22:55	Why is the site specific standard for lead contamination at the site more than double the default state nonresidential lead standard?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 22:55	Why is the site specific standard for lead contamination at the site more than double the default state nonresidential lead standard?
Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/27/2020 22:55	Your collaboration with Hilco is obvious. Your _collaboration_ with neighbors is obviously absent_. A PIP does not mean merely that you tell the community what you are doing. It means that you cooperate with neighbors on every decision that you make that affects therm. That has not yet happened. It must.
Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/27/2020 22:55	Your collaboration with Hilco is obvious. Your _collaboration_ with neighbors is obviously absent_. A PIP does not mean merely that you tell the community what you are doing. It means that you cooperate with neighbors on every decision that you make that affects therm. That has not yet happened. It must.
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 22:55	HI- what is the address of the website? when I google it several different ones come up- thank you
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 22:55	HI- what is the address of the website? when I google it several different ones come up- thank you
Moderator	Response	Katrina McCullough (Katrina.McCullough@ghd.com)	8/27/2020 22:56	https://phillyrefinerycleanup.info/(Pouné Saberi (Unverified) asked "HI- what is the address of the website? when I google it several different ones come up- thank you")
Attendee	Question	Flora (Unverified)	8/27/2020 22:56	Can you please go over your plan to clean up lead and other toxic contaminants at the site? And your plan to provide a sufficient analysis of and a plan for effectively and safely cleaning up contaminants in the deep aquifer below the site. I urge you to use the strictest possible health-based standard to clean up toxics in both of these and all other cases.
Attendee	Question	Flora (Unverified)	8/27/2020 22:56	Can you please go over your plan to clean up lead and other toxic contaminants at the site? And your plan to provide a sufficient analysis of and a plan for effectively and safely cleaning up contaminants in the deep aquifer below the site. I urge you to use the strictest possible health-based standard to clean up toxics in both of these and all other cases.
Attendee	Question	Flora (Unverified)	8/27/2020 22:59	I would also like to know your plan for holding Sunoco responsible for the decades of destructive pollution they caused in our city. This pollution has had direct impacts on community health in the surrounding neighborhood and has fueled the devastating climate crisis now impacting us all.
Attendee	Question	Flora (Unverified)	8/27/2020 22:59	I would also like to know your plan for holding Sunoco responsible for the decades of destructive pollution they caused in our city. This pollution has had direct impacts on community health in the surrounding neighborhood and has fueled the devastating climate crisis now impacting us all.
Attendee	Question	Flora (Unverified)	8/27/2020 22:59	Finally, I want to echo and express support for the demands put forth by Philly Thrive. And I am eager to hear what your response to their demands are.
Attendee	Question	Flora (Unverified)	8/27/2020 22:59	Finally, I want to echo and express support for the demands put forth by Philly Thrive. And I am eager to hear what your response to their demands are.
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:00	What investigation has been done and will be planned to identify contmination to soil or groundwater beyond the property boudary? If so, when? If not, why not?
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:00	What investigation has been done and will be planned to identify contmination to soil or groundwater beyond the property boudary? If so, when? If not, why not?
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:01	If Hilco is going to help Evergreen throughout the cleanup, then why aren't they on this call and subsequent PIP meetings?
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:01	If Hilco is going to help Evergreen throughout the cleanup, then why aren't they on this call and subsequent PIP meetings?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:01	What sea level rise, if any, was the tide gate built to accommodate?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:01	What sea level rise, if any, was the tide gate built to accommodate?

Attendee	Question	Rachel Merriman-Goldring (Philly Thrive) (Unverified)	8/27/2020 23:01	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Rachel Merriman-Goldring (Philly Thrive) (Unverified)	8/27/2020 23:02	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Peter Handler (Unverified)	8/27/2020 23:02	In additdion to the toxins already mentioned, what is the plan to deal with the benzene that is in the soil? On belhalf of Citizens' Climate Lobbyi and Philly Thrive.
Attendee	Question	Peter Handler (Unverified)	8/27/2020 23:02	In additdion to the toxins already mentioned, what is the plan to deal with the benzene that is in the soil? On belhalf of Citizens' Climate Lobbyi and Philly Thrive.
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:03	What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:03	What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?
Attendee	Question	Carrie Barcomb (Unverified)	8/27/2020 23:03	Adding my support for Philly Thrive and for the people of South Philly. Specifically we demand: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Carrie Barcomb (Unverified)	8/27/2020 23:03	Adding my support for Philly Thrive and for the people of South Philly. Specifically we demand: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Philly Thrive (Unverified)	8/27/2020 23:03	This process needs to change to involve the public in the development of all reports, as required by Act 2 law - not just commenting after reports are produced.
Attendee	Question	Philly Thrive (Unverified)	8/27/2020 23:03	This process needs to change to involve the public in the development of all reports, as required by Act 2 law - not just commenting after reports are produced.
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:03	Who pays Evergreen to do this work?
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:03	Who pays Evergreen to do this work?

Attendee	Question	Karen M'Closkey (Unverified)	8/27/2020 23:03	This is a once in a hundred year opportunity to do right by the people who live by the site. People are eager to be involved and engaged. Will Evergreen consider a process that is less hierarchical? There are limitations due to COVID but past efforts at engagement indicate that communication is one-way rather than a dialogue. WIll you make room for smaller, topic-targeted conversation in real-time rather than this type of Q+A?
Attendee	Question	Karen M'Closkey (Unverified)	8/27/2020 23:04	This is a once in a hundred year opportunity to do right by the people who live by the site. People are eager to be involved and engaged. Will Evergreen consider a process that is less hierarchical? There are limitations due to COVID but past efforts at engagement indicate that communication is one-way rather than a dialogue. WIll you make room for smaller, topic-targeted conversation in real-time rather than this type of Q+A?
Attendee	Question	Peter Winslow (Unverified)	8/27/2020 23:05	I reiterate the demands of Philly Thrive for meaningful public involvement in all aspects of the Act 2 processes for environmental remediation of the site through a more robust PIP.
Attendee	Question	Peter Winslow (Unverified)	8/27/2020 23:05	I reiterate the demands of Philly Thrive for meaningful public involvement in all aspects of the Act 2 processes for environmental remediation of the site through a more robust PIP.
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:05	Why isn't the site specific standard for lead being reevaluated based on the anticipated site use (commercial warehouse)?
Attendee	Question	Kenneth Daly (Unverified)	8/27/2020 23:06	I also want to add my voice in support of the Philly Thrive demands. The people affected by what Evergreen and Hilco are doing need to be involved. Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
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Attendee	Question	Ellen Neises (Unverified)	8/27/2020 23:08	We are listening to your description of Evergreen communications, but after exploring the materials at length, and attending meetings, many engaged citizens don't agree that you are offering access to synthetic materials that facilitate public conversation. Delivering 1000-page documents for comment is not democratic. Your reports can easily be designed to make key data and decisions accessible to the public. Are you willing to create living documents that update the state of knowledge about contamination, and incorporate public comment so learning is synthesized and accessible? This will make for authentic public conversation about the future of this incredibly important place in our city. The recent NYT article about PES and Philly Thrive shows that the world is watching how we do this. Evergreen can be an important leader.
Attendee	Question	Ellen Neises (Unverified)	8/27/2020 23:08	We are listening to your description of Evergreen communications, but after exploring the materials at length, and attending meetings, many engaged citizens don't agree that you are offering access to synthetic materials that facilitate public conversation. Delivering 1000-page documents for comment is not democratic. Your reports can easily be designed to make key data and decisions accessible to the public. Are you willing to create living documents that update the state of knowledge about contamination, and incorporate public comment so learning is synthesized and accessible? This will make for authentic public conversation about the future of this incredibly important place in our city. The recent NYT article about PES and Philly Thrive shows that the world is watching how we do this. Evergreen can be an important leader.
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:09	I support the demands of Philly Thrive and all fenceline community members. Beyond presenting your goals to the community, it is the right of the community to demand and expect free, prior, and informed consent over the entire process given the health impacts of the air, water, soil, and asthetics of their community.
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:09	I support the demands of Philly Thrive and all fenceline community members. Beyond presenting your goals to the community, it is the right of the community to demand and expect free, prior, and informed consent over the entire process given the health impacts of the air, water, soil, and asthetics of their community.

Attendee	Question	Gabriel (Unverified)	8/27/2020 23:09	Act 2 Standard, as presented in today's presentaion, is being applied for statewide, and site specific. The presentation and presenter also reinforced the fact that the most stringent requriment must apply. If PA state's lead standard in soil is 1000 ppm, why is Evergreen proposing a site-specific standard of 2,240 ppm, which is clearly twice the quantity?
Attendee	Question	Franca Trubiano (Unverified)	8/27/2020 23:09	I also want to add my voice in support of the Philly Thrive demands. The people affected by what Evergreen and Hilco are doing need to be involved. Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
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Attendee	Question	Mike (Unverified)	8/27/2020 23:11	How long does it take to collect soil and groundwater data for an AOI?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:11	Is there a permit for the discharge of water from the wastewater treatment system to the PWD? Who is the permittee? Have the permit requirements been met?
Attendee	Question	Mike (Unverified)	8/27/2020 23:11	How long does it take to collect soil and groundwater data for an AOI?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:11	Is there a permit for the discharge of water from the wastewater treatment system to the PWD? Who is the permittee? Have the permit requirements been met?
Attendee	Question	Mick (Unverified)	8/27/2020 23:12	Can you comment on why AOI-11 deep water report has not yet been approved?
Attendee	Question	Mick (Unverified)	8/27/2020 23:12	Can you comment on why AOI-11 deep water report has not yet been approved?
Attendee	Question	Peter Winslow (Unverified)	8/27/2020 23:12	Further to the question asked above by Phil, HRP has indicated in the Soil Management Report it filed with the City that the site specific standard for lead required for the HRP intended uses for the site is 1,000 PPM. Will Evergreen remediate to this 1,000 PPM standard rather than the 2,240 PPM previously approved by PADEP?
Attendee	Question	Peter Winslow (Unverified)	8/27/2020 23:12	Further to the question asked above by Phil, HRP has indicated in the Soil Management Report it filed with the City that the site specific standard for lead required for the HRP intended uses for the site is 1,000 PPM. Will Evergreen remediate to this 1,000 PPM standard rather than the 2,240 PPM previously approved by PADEP?
Attendee	Question	carol foy (Unverified)	8/27/2020 23:12	why did they test it all AOL
Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:12	If residents are going to invest time & energy in providing our comments, we need to know that there will be responsiveness to the comments- and they won't just sit on a website (thank u for the website btw!). Specifically: can "approved" reports that didn't have public input until now be reopened and revised based on public comments that find any inadequacies in the reports? Otherwise what is the point of us commenting?
Attendee	Question	carol foy (Unverified)	8/27/2020 23:12	why did they test it all AOL
Moderator	Response	Katrina McCullough (Katrina.McCullough@ghd.com)	8/27/2020 23:22	Can you clarify your question?(carol foy (Unverified) asked "why did they test it all AOL")
Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:13	If residents are going to invest time & energy in providing our comments, we need to know that there will be responsiveness to the comments- and they won't just sit on a website (thank u for the website btw!). Specifically: can "approved" reports that didn't have public input until now be reopened and revised based on public comments that find any inadequacies in the reports? Otherwise what is the point of us commenting?

Attendee	Question	Gabriel (Unverified)	8/27/2020 23:13	In today's presentation on the status of reports completed to date, several remedial investigation reports, including for areas of interest 4, 9, and 11, are still unfinished. When will the revised versions be submitted to DEP?
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:13	In today's presentation on the status of reports completed to date, several remedial investigation reports, including for areas of interest 4, 9, and 11, are still unfinished. When will the revised versions be submitted to DEP?
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:13	Is your remediation process (Act Two and beyond) guided in accordance with the Environmental Rights Amendment (ERA), (Article I, Section 27 of the Pennsylvania Constitution), which states: "The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people"?
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:13	Is your remediation process (Act Two and beyond) guided in accordance with the Environmental Rights Amendment (ERA), (Article I, Section 27 of the Pennsylvania Constitution), which states: "The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people"?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:14	Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:14	What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:14	Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:14	What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)?
Attendee	Question	carol foy (Unverified)	8/27/2020 23:15	WHEN CLEANUP WILL THE COMMIUTY be noticefile in south and southwest philly
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Attendee	Question	Ellen Neises (Unverified)	8/27/2020 23:16	Many communities and cities are finding that COVID 19 doesn't have to stifle public debate. The South Philadelphia and Grays Ferry communities are comfortable with virtual tools that allow us to see and hear each other, as well as Evergreen. It is important that you adopt tools (which you likely use in your daily meetings with colleagues) that promote a true virtual public meeting. Would Evergreen be willing to discuss with community organizations the selection of technology that is more appropriate for virtual public meetings?
Attendee	Question	Karen M'Closkey (Unverified)	8/27/2020 23:16	The hydrological situation is changing. Are you considering remediation strategies with respect to sea-level rise, which could affect groundwater on the site?
Attendee	Question	Ellen Neises (Unverified)	8/27/2020 23:16	Many communities and cities are finding that COVID 19 doesn't have to stifle public debate. The South Philadelphia and Grays Ferry communities are comfortable with virtual tools that allow us to see and hear each other, as well as Evergreen. It is important that you adopt tools (which you likely use in your daily meetings with colleagues) that promote a true virtual public meeting. Would Evergreen be willing to discuss with community organizations the selection of technology that is more appropriate for virtual public meetings?
Attendee	Question	Karen M'Closkey (Unverified)	8/27/2020 23:16	The hydrological situation is changing. Are you considering remediation strategies with respect to sea-level rise, which could affect groundwater on the site?
Attendee	Question	Franca Trubiano (Unverified)	8/27/2020 23:17	It may have been more effective if this presentation was made available a week ago and we could have spent these two hours asking pertinent questions, such as: 1. what are the critical paths for considering the risks of lead and benzene to the adjacent communities; 2. how are increased climate-change risks being assessed; 3. how is ground and surface water run off being considered in the plans; 4. how is Hilco assessing the additional risks of (what looks like will be) hard scape pavement of 85-90% of the site?
Attendee	Question	Franca Trubiano (Unverified)	8/27/2020 23:18	It may have been more effective if this presentation was made available a week ago and we could have spent these two hours asking pertinent questions, such as: 1. what are the critical paths for considering the risks of lead and benzene to the adjacent communities; 2. how are increased climate-change risks being assessed; 3. how is ground and surface water run off being considered in the plans; 4. how is Hilco assessing the additional risks of (what looks like will be) hard scape pavement of 85-90% of the site?
Attendee	Question	Charles Reeves...resident action committee ll (Unverified)	8/27/2020 23:19	For years have been told what was happening only to find out it was not true we need to create an community base Advisory Board.to review everything that's going on are you willing to do that.
Attendee	Question	Charles Reeves...resident action committee ll (Unverified)	8/27/2020 23:19	For years have been told what was happening only to find out it was not true we need to create an community base Advisory Board.to review everything that's going on are you willing to do that.
Attendee	Question	Mike (Unverified)	8/27/2020 23:20	What are some of the possible risk pathways that you've encountered at the refinery? How are you dealing with them?

Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:20	Thank you for doing your best to use plain language and take the measures you have to try to include the public, as is required by Act 2. Will you hold more regular small group sessions, as a necessary precursor to the public being able to submit educated comments? Information only presented in a one-way format does not enable true public engagement. Please support Philly Thrive's demands: Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Elisa McCool (Unverified)	8/27/2020 23:20	The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Mike (Unverified)	8/27/2020 23:20	What are some of the possible risk pathways that you've encountered at the refinery? How are you dealing with them?
Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:20	Thank you for doing your best to use plain language and take the measures you have to try to include the public, as is required by Act 2. Will you hold more regular small group sessions, as a necessary precursor to the public being able to submit educated comments? Information only presented in a one-way format does not enable true public engagement. Please support Philly Thrive's demands: Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Elisa McCool (Unverified)	8/27/2020 23:20	The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Peter Handler (Unverified)	8/27/2020 23:21	How is it determiend what ground pollution is from 2012 and before...and what is from 2012 to the present?
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Attendee	Question	Gabriel (Unverified)	8/27/2020 23:22	In today's presentation, a summary of the content within RI reports was provided. If souce, extent, and pathway of contaminates is discovered to have conveyed contaminates beyond the property boundry, which legal entity is currently responsibly for impact study costs and remediation costs? For the current public good and for future generations, it is not constructive for the answer to this question to be "nobody" or "such entities no longer exist."
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:22	The speaker said that the remedial investigation reports have to be approved before Evergreen does risk assessments. Since this hasn't happened yet, why did Evergreen already complete the risk assessment for lead in soil?
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:22	In today's presentation, a summary of the content within RI reports was provided. If souce, extent, and pathway of contaminates is discovered to have conveyed contaminates beyond the property boundry, which legal entity is currently responsibly for impact study costs and remediation costs? For the current public good and for future generations, it is not constructive for the answer to this question to be "nobody" or "such entities no longer exist."
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:22	The speaker said that the remedial investigation reports have to be approved before Evergreen does risk assessments. Since this hasn't happened yet, why did Evergreen already complete the risk assessment for lead in soil?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:23	You said air monitoring has been done on site to see if vapors were present in refinery buildings or the surrounding air. When will this investigation of air quality be extended to surrounding areas / neighborhoods?
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:23	Is there a transparent plan to look for and report on any radioactivity (radon, radon daughters, etc...), whether it is naturally occuring from underground or otherwise?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:23	You said air monitoring has been done on site to see if vapors were present in refinery buildings or the surrounding air. When will this investigation of air quality be extended to surrounding areas / neighborhoods?
Attendee	Question	Tammy Murphy (Unverified)	8/27/2020 23:23	Is there a transparent plan to look for and report on any radioactivity (radon, radon daughters, etc...), whether it is naturally occuring from underground or otherwise?

Attendee	Question	Peter Patton (Unverified)	8/27/2020 23:23	Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling states, "the boundary condition data variability must be quantifiable and based on accepted models or observations." What in plain language does this response mean? You have not directly answered the question. What efforts are being made to quantify the boundary condition data? Are accepted models available or not? If not, why not?
Attendee	Question	Peter Patton (Unverified)	8/27/2020 23:23	Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling states, "the boundary condition data variability must be quantifiable and based on accepted models or observations." What in plain language does this response mean? You have not directly answered the question. What efforts are being made to quantify the boundary condition data? Are accepted models available or not? If not, why not?
Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:28	What would lead you to not agree to Philly Thrive's request for creation of a community advisory board to be in ongoing consultation with you, given you don't know the surrounding neighborhoods?
Attendee	Question	Alexa Ross (Unverified)	8/27/2020 23:28	What would lead you to not agree to Philly Thrive's request for creation of a community advisory board to be in ongoing consultation with you, given you don't know the surrounding neighborhoods?
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 23:28	Is the water table or the lower aquifer the source of drinking water for anyone?
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 23:28	Is the water table or the lower aquifer the source of drinking water for anyone?
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:29	When will Evergreen conduct the fate and transport analysis for the lower aquifer? There is no aquitard between upper and lower aquifer across most of the site. Won't the heavily contaminated shallow aquifer gradually leach contaminants into the lower aquifer? (a critical drinking water source for New Jersey)
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:30	When will Evergreen conduct the fate and transport analysis for the lower aquifer? There is no aquitard between upper and lower aquifer across most of the site. Won't the heavily contaminated shallow aquifer gradually leach contaminants into the lower aquifer? (a critical drinking water source for New Jersey)
Attendee	Question	Carrie Barcomb (Unverified)	8/27/2020 23:30	Philly Inquirer (8/3/2020) says Hilco is calling for an "exposure barrier," instead of removal. How extensive is contamination beyond the site. Concerned this does not address the health and environmental rights of the local community, nor account for sea-level rise and climate change flooding.
Attendee	Question	Carrie Barcomb (Unverified)	8/27/2020 23:30	Philly Inquirer (8/3/2020) says Hilco is calling for an "exposure barrier," instead of removal. How extensive is contamination beyond the site. Concerned this does not address the health and environmental rights of the local community, nor account for sea-level rise and climate change flooding.
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:31	Why is there no mention of climate change in discussion of the Water-table aquifer? These levels could change by multiple feet in the next few decades?
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:31	Why is there no mention of climate change in discussion of the Water-table aquifer? These levels could change by multiple feet in the next few decades?
Attendee	Question	Mick (Unverified)	8/27/2020 23:32	Could you talk more about the topmost 'fill' layer in the Environmental Setting slides ... how deep is this fill, what is it composed of? When was it added there? Thank you!
Attendee	Question	Mike (Unverified)	8/27/2020 23:32	Are the aquifers used as a drinking water source for the city?
Attendee	Question	Mick (Unverified)	8/27/2020 23:32	Could you talk more about the topmost 'fill' layer in the Environmental Setting slides ... how deep is this fill, what is it composed of? When was it added there? Thank you!
Attendee	Question	Mike (Unverified)	8/27/2020 23:32	Are the aquifers used as a drinking water source for the city?
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:35	When will Evergreen submit its revised remedial investigation reports for Areas of Interest 4, 9 and 11?
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Attendee	Question	Anonymous (Unverified)	8/27/2020 23:36	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.
Attendee	Question	Meredith (Unverified)	8/27/2020 23:36	Are your LNAPL bodies in Slide 32 a result of shallow, deep or both wells being gauged?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:36	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.
Attendee	Question	Meredith (Unverified)	8/27/2020 23:36	Are your LNAPL bodies in Slide 32 a result of shallow, deep or both wells being gauged?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:36	This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced.

				Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:36	
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Attendee	Question	Anonymous (Unverified)	8/27/2020 23:36	
				We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk. Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifier. The work done so far does not consider the impacts of climate change,
Attendee	Question	Kimberly Allen (Unverified)	8/27/2020 23:37	rising sea level and worsening storms.
				We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk. Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifier. The work done so far does not consider the impacts of climate change,
Attendee	Question	Kimberly Allen (Unverified)	8/27/2020 23:37	rising sea level and worsening storms.
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:38	Why is lead the only metals COC? Aren't there other contaminants such as copper, cadmium, arsenic that come from refining processes?
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:38	Why is lead the only metals COC? Aren't there other contaminants such as copper, cadmium, arsenic that come from refining processes?
				Here's another example of where responses could be clearer. In response to questions about tide gates, the answer on the site is (partly): "The tide gates at the Site were not specifically designed to address sea level rise; however, the Site will continue to be regulated under the stormwater management requirements of the City of Philadelphia and the PADEP which includes provisions for sea level rise." But it would be good to citations of these claims - what documents are these requirements contained in, and where can they be found? As it is the answer is kind of an
Attendee	Question	Mick (Unverified)	8/27/2020 23:38	answer but not very useful.
				In today's presentation, the presenter described that water flows within the upper groundwater can only mix with water in the lower groundwater if there is a "hole" in the 'shelf' layer between. Even from a layman's perspective, the airplane-view images provided for comparing the two zones and the ''shelf-like' separation, that pathway appeared quite large--and that it could be a pathway of contaminates. Is this being studied? What is the status of such a report and when would it's findings be presented
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:38	and addressed?
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 23:38	Should other heavy metals be expected to be found given the history of heavy industrial use?
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Attendee	Question	Mick (Unverified)	8/27/2020 23:39	answer but not very useful.
				In today's presentation, the presenter described that water flows within the upper groundwater can only mix with water in the lower groundwater if there is a "hole" in the 'shelf' layer between. Even from a layman's perspective, the airplane-view images provided for comparing the two zones and the ''shelf-like' separation, that pathway appeared quite large--and that it could be a pathway of contaminates. Is this being studied? What is the status of such a report and when would it's findings be presented
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:39	and addressed?
Attendee	Question	Pouné Saberi (Unverified)	8/27/2020 23:39	Should other heavy metals be expected to be found given the history of heavy industrial use?

Attendee	Question	Jocelyn (Unverified)	8/27/2020 23:40	As a Grays Ferry resident, I'm very concerned about the clean up and the lack of community involvement in the process as well as minimal communication with the community as to the health hazards and potential risks. There needs to be meaningful inclusion of community members throughout the Act 2 process, which means open access to information, feedback, and frequent consultation. This can be accomplished by creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. None of the work that's been done so far has involved active outreach to ALL community members.
Attendee	Question	Jocelyn (Unverified)	8/27/2020 23:40	As a Grays Ferry resident, I'm very concerned about the clean up and the lack of community involvement in the process as well as minimal communication with the community as to the health hazards and potential risks. There needs to be meaningful inclusion of community members throughout the Act 2 process, which means open access to information, feedback, and frequent consultation. This can be accomplished by creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. None of the work that's been done so far has involved active outreach to ALL community members.
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:41	Agree with Phil's comment. The refinery was historically coal-fired. Where and how has the site been tested for Arsenic?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:41	Agree with Phil's comment. The refinery was historically coal-fired. Where and how has the site been tested for Arsenic?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:41	ARE chemicals you are presently using putting additional toxin in the air
Attendee	Question	Carol H (Unverified)	8/27/2020 23:41	As a community resident I think this media forum is not consumer friendly in allowing community members to have an opportunity to participate fully in this report out process
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:41	ARE chemicals you are presently using putting additional toxin in the air
Attendee	Question	Carol H (Unverified)	8/27/2020 23:42	As a community resident I think this media forum is not consumer friendly in allowing community members to have an opportunity to participate fully in this report out process
Attendee	Question	Peter Patton (Unverified)	8/27/2020 23:43	Is soil tested to a depth greater than 2 feet deep?
Attendee	Question	Peter Patton (Unverified)	8/27/2020 23:43	Is soil tested to a depth greater than 2 feet deep?
Attendee	Question	Claudia Crane (Unverified)	8/27/2020 23:44	Any drinking water intake portals downstream from the site,. all the way to the Delaware Bay?
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Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:45	Will Evergreen be incorporating changes resulting from climate change (sea level rise and increased frequency of storms and volume of rain) into its groundwater modeling?
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Attendee	Question	Coryn (Unverified)	8/27/2020 23:45	Why did you choose such a high site-specific standard and do you plan to keep it that high?
Attendee	Question	Coryn (Unverified)	8/27/2020 23:45	Why did you choose such a high site-specific standard and do you plan to keep it that high?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:46	Why does the former refinery get special treatment compared to other nonresidential sites? In terms of the lead site specific standards in soils 0 to 2 feet
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:46	Why does the former refinery get special treatment compared to other nonresidential sites? In terms of the lead site specific standards in soils 0 to 2 feet
Attendee	Question	Emily Hyatt (Unverified)	8/27/2020 23:47	I stand in support of Philly Thrive and the end of environmental racism in Philadelphia! Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

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Attendee	Question	Emily Hyatt (Unverified)	8/27/2020 23:47	I stand with Philly Thrive and our demands!! Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Luna (Unverified)	8/27/2020 23:49	I stand with Philly Thrive and our demands!! Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:49	Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
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Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:50	The lead standard should be revised to be protective of public health. The standard that was approved (2240 parts per million (ppm) in surface soil) is much weaker than the default standard of 1000 ppm. The assumptions Evergreen used in calculating the standard are inaccurate and outdated.
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:51	The lead standard should be revised to be protective of public health. The standard that was approved (2240 parts per million (ppm) in surface soil) is much weaker than the default standard of 1000 ppm. The assumptions Evergreen used in calculating the standard are inaccurate and outdated.
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:52	Since Evergreen used an inappropriate standard as a basis for its remedial investigation reports, how does it justify that it has correctly defined the extent of lead contamination?
Attendee	Question	Matt Walker (Clean Air Council) (Unverified)	8/27/2020 23:52	Since Evergreen used an inappropriate standard as a basis for its remedial investigation reports, how does it justify that it has correctly defined the extent of lead contamination?
Attendee	Question	Gabriel (Unverified)	8/27/2020 23:53	In today's presentation, related to lead, the presenter described that 'it is a complex process' for 'choosing the standard' associated with lead contamination levels and its subsequent categorization. Why does the entity responsible for contamination clean-up (and their supporting team) have the option to choose their standard for clean-up? Who is the authority having jurisdiction who reviews the selected standard? Are other standards more stringent? If so, why were those standards not used for these contaminants in this case?

Attendee	Question	Gabriel (Unverified)	8/27/2020 23:53	In today's presentation, related to lead, the presenter described that 'it is a complex process' for 'choosing the standard' associated with lead contamination levels and its subsequent categorization. Why does the entity responsible for contamination clean-up (and their supporting team) have the option to choose their standard for clean-up? Who is the authority having jurisdiction who reviews the selected standard? Are other standards more stringent? If so, why were those standards not used for these contaminants in this case?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:53	Please consider all the community requests for a dedicated community advisory group. Also please include climate change/severe weather impacts in all planning.
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Attendee	Question	Phil Gunderson (Unverified)	8/27/2020 23:53	How can you tell whose benzene is whose?
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Attendee	Question	Anonymous (Unverified)	8/27/2020 23:55	Isn't there ongoing litigation about that plume by 26th street and whether Sunoco/Hilco/Evergreen is responsible for its source and remediation?
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Attendee	Question	Anonymous (Unverified)	8/27/2020 23:55	The benzene graphic is different from one previously presented, which showed different levels of concentration for benzene on and off the site. The arrow that is pointing to "offsite benzene source areas" is pointing to a residential area and the PGW facility (just west of I76). Who is responsible for cleaning up the off site contamination under the residential area?
Attendee	Question	Anonymous (Unverified)	8/27/2020 23:55	The benzene graphic is different from one previously presented, which showed different levels of concentration for benzene on and off the site. The arrow that is pointing to "offsite benzene source areas" is pointing to a residential area and the PGW facility (just west of I76). Who is responsible for cleaning up the off site contamination under the residential area?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:55	Why wasn't Q and A started at 730 as in the agenda?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/27/2020 23:56	Why wasn't Q and A started at 730 as in the agenda?
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:01	When were the outdoor air samples taken?
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:01	When were the outdoor air samples taken?
Attendee	Question	Carol H (Unverified)	8/28/2020 0:03	When are you all going to stop talking and respond to the questions that have been posted.
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Attendee	Question	Anonymous (Unverified)	8/28/2020 0:04	Sound just went out-
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:04	Sound just went out-
Moderator	Response	Katrina McCullough (Katrina.McCullough@ghd.com)	8/28/2020 0:06	Others are not reporting that, try exiting the event and re-entering(Sound just went out-)
Attendee	Question	Gabriel (Unverified)	8/28/2020 0:05	In today
Attendee	Question	Gabriel (Unverified)	8/28/2020 0:05	In today
Attendee	Question	Philly Thrive (Unverified)	8/28/2020 0:06	A presentation where more than 3/4 of the time is spent in a one-way flow of information and where residents' concerns are relegated to a still-diminishing-and-to-be-seen Q & A period at the end of the meeting does not bode well for a process that is inclusive of the public, as the City has requested and as the law requires.
Attendee	Question	Philly Thrive (Unverified)	8/28/2020 0:06	A presentation where more than 3/4 of the time is spent in a one-way flow of information and where residents' concerns are relegated to a still-diminishing-and-to-be-seen Q & A period at the end of the meeting does not bode well for a process that is inclusive of the public, as the City has requested and as the law requires.
Attendee	Question	Phil Gunderson (Unverified)	8/28/2020 0:07	These are very informative graphics. What about removal of contaminants that are in the soil? Lead cannot be pumped out. All of the soil must be removed.

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Attendee	Question	Debbie Robinson (Unverified)	8/28/2020 0:09	Can we get some documentation saying that your company has started cleaning any part of this site
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Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 0:10	When will we get information comparing ALL of the available remediation methods in terms of cost, effectiveness, and community impacts (such as air emissions from the remediation process itself)?
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 0:10	When will we get information comparing ALL of the available remediation methods in terms of cost, effectiveness, and community impacts (such as air emissions from the remediation process itself)?
Attendee	Question	Peter Handler (Unverified)	8/28/2020 0:10	These graphics all show problems relating to gasses and water...not contaminated soil. Followu to Phil Gunderson....will soil be removed and replaced with clean soil?
Attendee	Question	Ellen Neises (Unverified)	8/28/2020 0:10	Tonight's Information Session offers a strong basic primer on geology, groundwater and characterization of the contamination readings, and the presenters are very good at explaining things. Many engaged community members have already studied this material together, and with a variety of other subject matter experts, and are ready to move on to learning more about the key decisions being made now (or soon) about contamination management and clean up. Similarly, at the recent meeting held by SKEO and EPA, representatives were resistant to answering public questions beyond the scope of the TASC report. Limiting what information will be given to the public to arbitrarily defined packages does not support “meaningful engagement” or transparency as defined by the law. I agree with other suggestions that Evergreen and others focus future discussion on critical paths for decisionmaking about management of risks to adjacent communities and the ecological future of the site. As this meeting approaches its end, will you commit to a part 2 of this meeting, in the near future, to discuss decisionmaking?
Attendee	Question	Peter Handler (Unverified)	8/28/2020 0:10	These graphics all show problems relating to gasses and water...not contaminated soil. Followu to Phil Gunderson....will soil be removed and replaced with clean soil?
Attendee	Question	Ellen Neises (Unverified)	8/28/2020 0:11	Tonight's Information Session offers a strong basic primer on geology, groundwater and characterization of the contamination readings, and the presenters are very good at explaining things. Many engaged community members have already studied this material together, and with a variety of other subject matter experts, and are ready to move on to learning more about the key decisions being made now (or soon) about contamination management and clean up. Similarly, at the recent meeting held by SKEO and EPA, representatives were resistant to answering public questions beyond the scope of the TASC report. Limiting what information will be given to the public to arbitrarily defined packages does not support “meaningful engagement” or transparency as defined by the law. I agree with other suggestions that Evergreen and others focus future discussion on critical paths for decisionmaking about management of risks to adjacent communities and the ecological future of the site. As this meeting approaches its end, will you commit to a part 2 of this meeting, in the near future, to discuss decisionmaking?
Attendee	Question	Gabriel (Unverified)	8/28/2020 0:11	In today's presentation, the presenter described the topic of "source removal" as a remediation approach, summarizing it as "get rid of it." It is understood that this is a plain-word explanation for a more involved process. What percentage of this project is proposed to be source removal, and where is the material to be removed going? What is the line of custody for such removal, at what stage are the applicable permits? Are the byproducts of such processes contaminates themselves, and does the proposal comply with regulations and standards for such byproducts?
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 0:11	And for waste that is removed, please spell out which communities that waste will be dumped on, at which facilities, the type of facility, the demographics around that facility, and whether this violates Title VI of the Civil Rights Act.
Attendee	Question	Gabriel (Unverified)	8/28/2020 0:11	In today's presentation, the presenter described the topic of "source removal" as a remediation approach, summarizing it as "get rid of it." It is understood that this is a plain-word explanation for a more involved process. What percentage of this project is proposed to be source removal, and where is the material to be removed going? What is the line of custody for such removal, at what stage are the applicable permits? Are the byproducts of such processes contaminates themselves, and does the proposal comply with regulations and standards for such byproducts?
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 0:12	And for waste that is removed, please spell out which communities that waste will be dumped on, at which facilities, the type of facility, the demographics around that facility, and whether this violates Title VI of the Civil Rights Act.
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 0:12	And please stop talking about human beings whose health is being impacted as "receptors." That's just really insulting.
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Attendee	Question	Anonymous (Unverified)	8/28/2020 0:13	How much more information do you need to complete the fate and transport model?
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:13	Will this presentation be uploaded with closed captioning and translated/available in other languages?
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Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:14	This evening has not represented an inclusive process and does not demonstrate good will towards active engagment and communication. Please consider another approach in the future.
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Attendee	Question	Lynn Robinson (Unverified)	8/28/2020 0:20	I do not see how a government agency can be a stakeholder.
Attendee	Question	Lynn Robinson (Unverified)	8/28/2020 0:20	I do not see how a government agency can be a stakeholder.
Attendee	Question	Jisoo Kim (Unverified)	8/28/2020 0:23	1. Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. 2. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced. 3. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found. 4. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.
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Attendee	Question	Anonymous (Unverified)	8/28/2020 0:24	A government agency is absolutely a stakeholder because they represent the citizens of the Commonwealth as a whole, and as a government agency they alone have the power to enforce regulation.
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Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 0:27	Does your careful evaluation of pollutant concentrations, water levels, plumes etc. take account of future rises in sea level due to global warming, the fact that some portion of the site (perhaps most of it) will be underwater by the end of the century), also the value of restoring some of the site to the wetland it used to be for relation between land and water.
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Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:28	But the state of PA actually uses a blood lead level double what the federal CDC updated in 2012.https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:28	But the state of PA actually uses a blood lead level double what the federal CDC updated in 2012.https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm
Attendee	Question	Mick (Unverified)	8/28/2020 0:30	I think we're asking the same questions about climate change/sea level rise etc, because we cannot parse/understand the answers that have been posted on the web site.
Attendee	Question	Mick (Unverified)	8/28/2020 0:31	I think we're asking the same questions about climate change/sea level rise etc, because we cannot parse/understand the answers that have been posted on the web site.

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Attendee	Question	Anonymous (Unverified)	8/28/2020 0:33	Sniping about major questions having been posed at previous meetings or being available online kind of erases all the talk of improving your community outreach approach in the beginning of this presentation.
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Attendee	Question	Jon R (Unverified)	8/28/2020 0:34	It seems like many of the RIRs are still pending despite Hilco's plans to start construction in 2021. 1) What AOIs are planned to be clear to build in 2021 and 2) what are the states of their RIR and Remedial Action Reports such that building can occur so soon. 3)If they are starting in the North, AOI 8 has an identified benzene plume that exceeds the site boundary to the north. There is a sample point in the lower aquifer on the boundary that is outside of the active and inactive remediation boundaries. What are the remediation activities that need to be done prior to construction to adress these needs?
Attendee	Question	Jon R (Unverified)	8/28/2020 0:34	It seems like many of the RIRs are still pending despite Hilco's plans to start construction in 2021. 1) What AOIs are planned to be clear to build in 2021 and 2) what are the states of their RIR and Remedial Action Reports such that building can occur so soon. 3)If they are starting in the North, AOI 8 has an identified benzene plume that exceeds the site boundary to the north. There is a sample point in the lower aquifer on the boundary that is outside of the active and inactive remediation boundaries. What are the remediation activities that need to be done prior to construction to adress these needs?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:34	So you are acknowledging that the DEP is attempting to increase the nonresidential surface soil lead standard to 2,500 from 1000 to accommodate the refinery site?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:34	So you are acknowledging that the DEP is attempting to increase the nonresidential surface soil lead standard to 2,500 from 1000 to accommodate the refinery site?
Attendee	Question	Ellen Neises (Unverified)	8/28/2020 0:36	Thanks for being open to a community advisory group. This would be a big step forward. It would be very good to schedule a meeting of the advisory group + other stakeholder representatives in the near future to begin to discuss and compare all of the available remediation and capping methods in terms of cost and benefit, and to outline when and how choices will be made.
Attendee	Question	Ellen Neises (Unverified)	8/28/2020 0:36	Thanks for being open to a community advisory group. This would be a big step forward. It would be very good to schedule a meeting of the advisory group + other stakeholder representatives in the near future to begin to discuss and compare all of the available remediation and capping methods in terms of cost and benefit, and to outline when and how choices will be made.
Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:37	Can these report summaries identify the metrics and the benchmarks that you think Evergreen is attaining and succeeding and those that have not been reached - the question remains -- what the critical path benchmarks for Lead, Benzene, Air Quality etc
Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:37	Can these report summaries identify the metrics and the benchmarks that you think Evergreen is attaining and succeeding and those that have not been reached - the question remains -- what the critical path benchmarks for Lead, Benzene, Air Quality etc
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:41	Can you please make the water permits mentioned public?
Attendee	Question	Russell Zerbo (Clean Air Council) (Unverified)	8/28/2020 0:41	Can you please make the water permits mentioned public?
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:47	How many people are here tonight?
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:47	How many people are here tonight?
Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:47	can you please report how many people are on this meeting as we the public cannot see how many people are here
Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:47	can you please report how many people are on this meeting as we the public cannot see how many people are here
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:50	This site will not affect drinking water. Phila water comes from up stream intakes of river water and is constantly monitored. There are no down river intakes for anyone. City does not use groundwater for drinking.
Attendee	Question	Anonymous (Unverified)	8/28/2020 0:50	This site will not affect drinking water. Phila water comes from up stream intakes of river water and is constantly monitored. There are no down river intakes for anyone. City does not use groundwater for drinking.
Attendee	Question	Rachel Merriman-Goldring (Thrive) (Unverified)	8/28/2020 0:54	This process is one-sided and not meaningfully engaging the public. To follow through on your stated commitment to hear residents' about how to make meetings better, listen to our feedback that we've repeatedly shared tonight — create public meetings in a small group format that allow the public to meaningfully share OUR insights with Evergreen and create a community-based advisory group to solicit questions and comments, and continually evaluate the effectiveness of the PIP.
Attendee	Question	Rachel Merriman-Goldring (Thrive) (Unverified)	8/28/2020 0:54	This process is one-sided and not meaningfully engaging the public. To follow through on your stated commitment to hear residents' about how to make meetings better, listen to our feedback that we've repeatedly shared tonight — create public meetings in a small group format that allow the public to meaningfully share OUR insights with Evergreen and create a community-based advisory group to solicit questions and comments, and continually evaluate the effectiveness of the PIP.

Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 0:56	Here is the EPA definition of Environmental Justice. To the best of my knowledge it has not been revoked.
Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 0:56	Here is the EPA definition of Environmental Justice. To the best of my knowledge it has not been revoked. •Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. •EPA has this goal for all communities and persons across this nation. It will be achieved when everyone enjoys: –the same degree of protection from environmental and health hazards, and –equal access to the decision-making process to have a healthy environment in which to live, learn, and work
Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 0:56	•Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. •EPA has this goal for all communities and persons across this nation. It will be achieved when everyone enjoys: –the same degree of protection from environmental and health hazards, and –equal access to the decision-making process to have a healthy environment in which to live, learn, and work
Attendee	Question	Franca Trubiano (Unverified)	8/28/2020 0:59	thank you for allowing the question and answer period to be extended
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Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 1:00	Evergreen has a specific charge, which you are pursuing in a professional and rigorous way. But you are still governed by that definition. How can we work together to make that real in this case in Philadelphia? Every violation of EJ involves different agencies acting narrowly, and ignoring the big picture as not their job. Please work with us to change that here
Attendee	Question	David Clowney (phila citizen & Philly Thrive member) (Unverified)	8/28/2020 1:00	Evergreen has a specific charge, which you are pursuing in a professional and rigorous way. But you are still governed by that definition. How can we work together to make that real in this case in Philadelphia? Every violation of EJ involves different agencies acting narrowly, and ignoring the big picture as not their job. Please work with us to change that here
Attendee	Question	Mick (Unverified)	8/28/2020 1:01	Climate change-generated sea-level rise (Schuylkill, Delaware) is a given. There are already models out there. What range of values in feet are Evergreen assuming for 2050, and 2100.
Attendee	Question	Mick (Unverified)	8/28/2020 1:01	Climate change-generated sea-level rise (Schuylkill, Delaware) is a given. There are already models out there. What range of values in feet are Evergreen assuming for 2050, and 2100.
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 1:04	EPA does not define environmental justice -- especially when it's long been an agency accused of environmental racism itself. The movement defined it in the 17 Principles of Environmental Justice here: http://ejnet.org/ej/principles.pdf - principle #7 is particularly relevant.
Attendee	Question	Mike Ewall (Energy Justice Network) (Unverified)	8/28/2020 1:04	EPA does not define environmental justice -- especially when it's long been an agency accused of environmental racism itself. The movement defined it in the 17 Principles of Environmental Justice here: http://ejnet.org/ej/principles.pdf - principle #7 is particularly relevant.
Attendee	Question	Lisa HastingsAnonymous (Unverified)	8/28/2020 1:05	As a former groundwater quality specialist, even small breaks in confining layers can result in significant transfer of contaminants.And, the direction and rates of water movement can change over time, often from groundwater drilling.
Attendee	Question	Lisa HastingsAnonymous (Unverified)	8/28/2020 1:06	As a former groundwater quality specialist, even small breaks in confining layers can result in significant transfer of contaminants.And, the direction and rates of water movement can change over time, often from groundwater drilling.

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 8:54 AM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name
Erica Yudelman
Email
erica.yudelman@gmail.com
Address
United States Map It
Report
Philadelphia Refinery_AOI 1 RIR_8-5-16
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Name

Flora Cardoni

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floracardoni@gmail.com

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4937 Hazel ave
Philadelphia, Pennsylvania 19143
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Report

Philadelphia Refinery_AOI 1 RIR_8-5-16

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We need a complete cleanup of the Philly Refinery Site that protects the health of the surrounding community using the strictest possible standards, includes broad community input, and holds Sunoco accountable for the devastation they've caused.

In this process, special consideration must be paid to cleaning up lead and other toxic contaminants, using the most rigorous health-based standards available. Evergreen must also provide a sufficient analysis of and a plan for effectively and safely cleaning up contaminants in the deep aquifer.

Sunoco should also be held responsible for the decades of destructive pollution they caused. This pollution has had direct, horrible impacts on community health in the surrounding neighborhood and has fueled the devastating climate crisis.

Finally, we need community involvement and input at every step of the cleanup and remediation process. This has been sorely lacking thus far, so I want to echo and express my support for the demands of Philly Thrive outlined below:

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DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 10:58 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Gabriella Ravida

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gabravida@gmail.com

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3601 Market Street
Apartment 1203
Philadelphia, Pennsylvania 19104
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Report

Philadelphia Refinery_AOI 1 RIR_8-5-16

Comment

Hello,

I would like to voice my support of immense public involvement in the process of determining what is best for the environmental safety and security of Philadelphia's most vulnerable citizens. My demands are as follows:

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Thank you for your time.

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From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 8:27 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Jisoo Kim

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Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

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Sent: Thursday, August 27, 2020 3:06 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Katie Schank

Email

schank.katie@gmail.com

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3446 Bowman St.
Philadelphia, Pennsylvania 19129
United States
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From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 8:41 AM
To: DOERR, TIFFANI L
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Name

Kayla Speedy

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kaylaaspeedy@gmail.com

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1238 S Alder Street
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Name

Lena Glickman

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lenaglickman8@gmail.com

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2217 St Albans Street
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Philadelphia, Pennsylvania 19146
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Philadelphia Refinery_AOI 1 RIR_8-5-16

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From: Martha Morgan <marthaamorgan@gmail.com>
Sent: Thursday, August 27, 2020 11:36 AM
To: Philly Refinery Cleanup
Subject: comments for the refinery cleanup

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M Morgan
Phila, PA

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Sent: Thursday, August 27, 2020 8:54 AM
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Subject: New submission from Comment Submission Form

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Erica Yudelman
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jiso@sas.upenn.edu

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M Morgan
Phila, PA

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 11:29 AM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

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Community Outreach Plan Revised (draft) - August 11 2020

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DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 8:31 AM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Roseann Day

Email

day.roseann@gmail.com

Address

4426 Pine St
Apt 1R
Philadelphia, Pennsylvania 19104
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

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Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.

The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 10:58 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Gabriella Ravida

Email

gabravida@gmail.com

Address

3601 Market Street
Apartment 1203
Philadelphia, Pennsylvania 19104
United States
Map It

Report

Philadelphia Refinery_AOI 1 RIR_8-5-16

Comment

Hello,

I would like to voice my support of immense public involvement in the process of determining what is best for the environmental safety and security of Philadelphia's most vulnerable citizens. My demands are as follows:

1. Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

2. This process needs to change to involve the public in the development of all reports, as required by Act 2 law- not just commenting after reports are produced.

3. Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.

4. The Public Involvement Program should allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

Thank you for your time.

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Thursday, August 27, 2020 11:29 AM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Morgan Mahdavi

Email

morgannm106@gmail.com

Address

1311 S 52nd St
Apt 5
Philadelphia, Pennsylvania 19142
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

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To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

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Email

day.roseann@gmail.com

Address

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Apt 1R
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Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

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DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Friday, August 28, 2020 7:41 AM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name
S L
Email
kane727@aol.com
Address
United States Map It
Report
Community Outreach Plan Revised (draft) - August 11 2020
Comment
Hi , I live in Siena place . I noticed that Benzene concentration is a light green and close to the dark green shaded areas in the same spot as my current house (very close to pha housing and refinery) . I think it was in the lower aquifer and water table aquifer. Because it is right below my house it seems from the map, can this present a danger to me or the house ? Like can my water and be affected ? And gas vapors be present ? Or is it totally safe to live in this area even though it is below ground ? Thanks

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Saturday, August 29, 2020 12:16 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Sarah Wittwer

Email

bravermansarah@gmail.com

Address

19 W Dartmouth Rd
Bala Cynwyd, Pennsylvania 19004-2520
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

My name is Sarah Wittwer and I support Philly Thrive.

Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

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DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Saturday, August 29, 2020 12:49 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Sonja Dahl

Email

sonja035@gmail.com

Address

19104
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

I am a resident of Philadelphia and a proud supporter of Philly Thrive. I attended last fall's "community meeting" and can see that the process as it stands does not allow for residents of neighborhoods near the former refinery site to meaningfully take part in deciding the future of the land, including site clean-up to the standard that many neighbors want.

Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis. This process needs to change to involve the public in the ***development*** of all reports, as required by Act 2 law- not just commenting after reports are produced.

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DOERR, TIFFANI L

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Sent: Saturday, August 29, 2020 12:16 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

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bravermansarah@gmail.com

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To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Sonja Dahl

Email

sonja035@gmail.com

Address

19104
United States
Map It

Report

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DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Tuesday, September 1, 2020 5:48 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Miles McManus

Email

milesmcmanus@gmail.com

Address

235 East 22nd St
Apt 16J
New York, New York 10010
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Equal partnership with the public is needed to ensure that the refinery clean up does not continue to poison residents who have been poisoned for generations--and what kind of new life is possible for the land.

This can only be effectively achieved by:

(1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process, and

(2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

This process needs to involve the public in the **development of all reports**, as required by Act 2 law- not just commenting after reports are produced.

Reports completed since 2006 with virtually no public involvement should be reopened and revised based on public comments that find any inadequacies in the reports. We should be able to call for revision of previously approved reports if new information is found.

A sincere and effective Public Involvement Program must allow for proactive, two-way consultation between Evergreen and the community about the clean up, throughout the development of the reports and the clean up itself.

Thank you.

DOERR, TIFFANI L

From: noreply@phillyrefinerycleanup.info
Sent: Tuesday, September 1, 2020 5:48 PM
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form

Name

Miles McManus

Email

milesmcmanus@gmail.com

Address

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Apt 16J
New York, New York 10010
United States
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Thank you.

DOERR, TIFFANI L

From: Brian Solomon <info@sg.actionnetwork.org>
Sent: Thursday, October 22, 2020 2:40 PM
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water

table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.
- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Brian Solomon
brian.solomon15@gmail.com
5110 Hazel Avenue, Apt 3f
Philadelphia, Pennsylvania 19143

Philadelphia Refinery Legacy Remediation
Act 2 Program Public Meeting

Act 2 Reports are available from:

- Project website: www.phillyrefinerycleanup.info
- PADEP: https://www.dep.pa.gov/Citizens/PublicRecords/Pages/Informal-File-Review.aspx
- Thomas F. Donatucci, Sr. Library: 1935 Shunk St.
- Eastwick Library: 2851 Island Ave.

Comments can be submitted via:

- Email: phillyrefinerycleanup@ghd.com
- Online Comment Submission Form: www.phillyrefinerycleanup.info

Comment period will last for 120 days ending when the second meeting is held on or around March 9, 2020

Comments

Public participation that begins after all the information is gathered, everything decided & recommendations are ready to be presented TO the public is not adequate public participation. Public participation must begin at the beginning, not at the end or near the end

Name: Lisa Hastings

Address: 2001 Hamilton St. #108 Phila 19130 **Telephone:** 215-575-0823

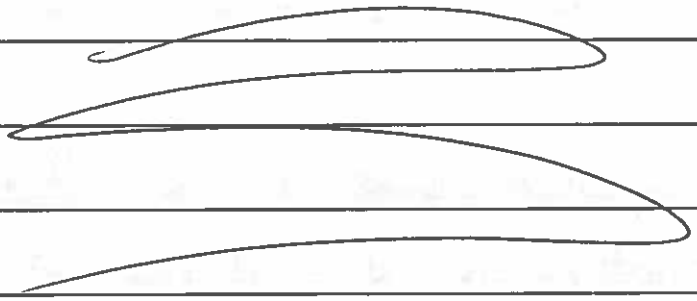
E-mail Address: LKH1066@earthlink.net

Thank you for your participation

Comments

I formerly handled public participation for State of Arizona on contentious environmental programs, regulations, lawsuits, etc.

P.P. can empower government action!



Philadelphia Refinery Legacy Remediation
Act 2 Program Public Meeting

we are not fooled by your name!

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Comments

I am disgusted and appalled. Why is no one here from the city/ city council? We went to the polls yesterday and stood up for you! This whole process stinks. Top priorities are: starting the cleanup of this filthy site before it does more harm to the air + the water table. This is an emergency! Not a time for stalling! Other top priority is caring for your sacked employees — training them for new, GREEN careers! Get with the future!

Name: C. Klepser

Address: 931 Clinton St. **Telephone:**

E-mail Address: Pjcritter@yahoo.com

Thank you for your participation

Comments

Philadelphia Refinery Legacy Remediation
Act 2 Program Public Meeting

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Comments

The people are demanding a statement saying the refinery will remain shut forever — and that the land + property will be remediated to an extent which is appropriate for human life — well beyond that of continued refining. The seas are rising and 7 needs to be clear.

Name: ALEXANDRE IMBOT

Address: 4114 Pine St. Phila. PA 19104 **Telephone:** +1 2026415557

E-mail Address: IMBOT@SAS.UPENN.EDU

Thank you for your participation

Comments

DOERR, TIFFANI L

From: PhillyRefineryCleanup@ghd.com
Sent: Friday, November 8, 2019 2:53 PM
To: DOERR, TIFFANI L
Subject: FW: Thursday's hoped-for meeting

From: patricia.libbey@verizon.net <patricia.libbey@verizon.net>
Sent: Friday, November 8, 2019 5:17 AM
To: Philly Refinery Cleanup <PhillyRefineryCleanup@ghd.com>
Subject: Thursday's hoped-for meeting

Wanted to apologize for the HUGE protest at your proposed meeting last night - I did not participate in the protest and DID want to hear what you-all were coming to say - even was not allowed inside the school when I arrived 2 hrs. early, so had to wait out in the cold til doors finally partially opened and someone gave me a chair inside for last few minutes til doors fully opened. Will try to access your website to read what you were going to say. Did tell a couple people in the protest that a lawyer IS the best way to get their feelings known, but they just kept saying they could not afford. - DO NOT feel this kind of protest does ANY good for them!!!!

DOERR, TIFFANI L

From: dan s <dan.schupsky@gmail.com>
Sent: Friday, November 8, 2019 4:35 PM
To: PhillyRefineryCleanup@ghd.com
Subject: Qs to answer RE: PES, Sunoco & Act 2

Please submit these questions in lieu of the public meeting on 11/7, with answers to be published as soon as possible.

1. When will the revised RIRs for AOIs 4, 9 and 11 be submitted?
2. Have you submitted draft cleanup plans to DEP?
3. What is the status of your groundwater and aquifer modeling for all pollutants?
4. What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)?
5. What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?
6. What is the quality of the water discharged from the Pollock St well system into the Schuylkill?
7. Is there a permit for the discharge of water from the wastewater treatment system to the PWD? Who is the permittee? Have the permit requirements been met?
8. What sea level rise, if any, was the tide gate built to accommodate?
9. Will Evergreen be incorporating climate resilience into its groundwater modeling? 10. Should the groundwater remediation systems that were discontinued be restarted? If not, why not? If so, when will that happen?
11. Why is Evergreen's site-specific Lead standard (2240 ppm) so much higher than the state standard (1000 ppm)?
12. Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?
13. Please explain the formal, legal, and/or organization ties that Evergreen has to Sunoco and/or Energy Transfer.
14. Does Evergreen consider the 11/7 "event" a formal meeting, and if so, does this start the timeline for them? If it does not, when will the next meeting be held?

DOERR, TIFFANI L

From: Bhandal,Harvin <hdb35@drexel.edu>
Sent: Wednesday, November 13, 2019 11:41 AM
To: PhillyRefineryCleanup@ghd.com
Subject: Request for Refinery Cleanup Info - Drexel Student Project

Hello,

My name is Harvin Bhandal and I am a senior at Drexel University. I am apart of a senior design project group tasked with developing a remediation strategy for the PES site refinery. Our area of focus is AOI-8.

I attended the public meeting on November 7th and was also disappointed that it ended up being cancelled due to protesters.

I was wondering if we could receive a copy of the clean up plan, and if you have any updated information about the contaminant levels/subsurface conditions (including boring logs, soil bearing capacity recommendations, etc). We are currently using the AOI-8 RIR Report from 2017 to conduct our analysis.

We look forward to hearing back from you!

Thanks,

Harvin

--
Harvin Bhandal
B.S./M.S. Civil Engineering
Drexel University Class of 2020
hdb35@drexel.edu

DOERR, TIFFANI L

From: Meenal Raval <meenal.raval@gmail.com>
Sent: Monday, November 18, 2019 6:01 PM
To: PhillyRefineryCleanup@ghd.com
Subject: remediation questions

Please keep me on your mailing list, and submit these questions in lieu of the public meeting on 11/7, with answers to be published as soon as possible.

1. When will the revised RIRs for AOIs 4, 9 and 11 be submitted?
2. Have you submitted draft cleanup plans to DEP?
3. What is the status of your groundwater and aquifer modeling for all pollutants?
4. What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)?
5. What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?
6. What is the quality of the water discharged from the Pollock St well system into the Schuylkill?
7. Is there a permit for the discharge of water from the wastewater treatment system to the Phila Water Dept? Who is the permittee? Have the permit requirements been met?
8. What sea level rise, if any, was the tide gate built to accommodate?
9. Will Evergreen be incorporating climate resilience into its groundwater modeling?
10. Should the groundwater remediation systems that were discontinued be restarted? If not, why not? If so, when will that happen?
11. Why is Evergreen's site-specific Lead standard (2240 ppm) so much higher than the state standard (1000 ppm)?
12. Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?
13. Please explain the formal, legal, and/or organization ties that Evergreen has to Sunoco and/or Energy Transfer.
14. Does Evergreen consider the 11/7 "event" a formal meeting, and if so, does this start the timeline for them? If it does not, when will the next meeting be held?
15. Who is GHD? And what is their relationship to Evergreen and Sunoco and ET?
16. Have you considered remediating with bacteria? Or mycelium? WE understand they're both more affordable options.

Regards,
Meenal Raval
--

-----Original Message-----
From: Georgia Ray <rayge@sas.upenn.edu>
Sent: Thursday, March 26, 2020 5:32 PM
To: DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com>
Subject: PES refinery inquiry

Hi Ms. Doerr,

My name is Georgia Ray and I'm a junior at the University of Pennsylvania. I'm currently taking a community-based environmental health course and I was given your name by Kevin Bilash who came to speak to our class on issues regarding the PES refinery.

My particular project has to do with the environmental effects of the refinery on water and after speaking to Kevin, I was particularly interested in gathering more information on what the cleanup project was going to look like. Obviously, as a part of Evergreen, I thought that you would be a very useful person to speak to.

I am free all day tomorrow after 10am EST and Monday after noon EST. If you have any availability for a phone call during those times, that would be very helpful. If you aren't free at either of those two times, we can also discuss availability later next week. Additionally, feel free to let me know if you have any questions or would like any more information about the project!

I'm looking forward to hearing from you!

Best,

Georgia

Lisa Alic

From: Alex Bomstein <bomstein@gmail.com>
Sent: Friday, December 4, 2020 1:38 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Alex Bomstein
1438 S 9th St
Philadelphia, PA 19147

Lisa Alic

From: Allan Freedman <apfreedman@gmail.com>
Sent: Friday, December 4, 2020 3:56 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Allan Freedman
7821 PARK AVE
ELKINS PARK, PA 19027

Lisa Alic

From: Anisa George <anisageorge@gmail.com>
Sent: Friday, December 4, 2020 4:10 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Anisa George
1232 Reed St
Philadelphia, PA 19147

Lisa Alic

From: Arden Kass <Arden@ardenkass.com>
Sent: Friday, December 4, 2020 4:19 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

WE LIVE RIGHT NEAR THE AIRPORT & REFINERY SITES. MY BLOCK IS FULL OF YOUNG CHILDREN. PLEASE MAKE THE MOST ETHICAL CHOICE AND PROTECT ALL OF OUR HEALTH.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Arden Kass
758 S. 18th Street
Philadelphia, PA 19146

Lisa Alic

From: Donna Cosgrove <dzymzy@gmail.com>
Sent: Friday, December 4, 2020 1:42 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Donna Cosgrove
2411C Delancey Pl
Philadelphia, PA 19103

Lisa Alic

From: Gerrie Schmidt <gerriehope@gmail.com>
Sent: Friday, December 4, 2020 3:30 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gerrie Schmidt
733 Bradford Aly
Philadelphia, PA 19147

Lisa Alic

From: Gianna Rosati <grosati1@gmail.com>
Sent: Friday, December 4, 2020 1:28 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gianna Rosati
1600 Arch St
Philadelphia, PA 19103

Lisa Alic

From: James Castellan <james.castellan@gmail.com>
Sent: Friday, December 4, 2020 3:50 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
James Castellan
42 Rabbit Run Rd
Rose Valley, PA 19086

Lisa Alic

From: Jason Volpe <jason.a.volpe@gmail.com>
Sent: Friday, December 4, 2020 1:39 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Volpe
826 N Capitol St
Philadelphia, PA 19130

Lisa Alic

From: Jody Ferry <jodyferry@gmail.com>
Sent: Friday, December 4, 2020 1:29 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jody Ferry
441 Hawarden Rd
Springfield, PA 19064

Lisa Alic

From: John Colgan-Davis <j.colgan-davis@att.net>
Sent: Friday, December 4, 2020 1:20 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
John Colgan-Davis
101 W Mount Airy Ave
Philadelphia, PA 19119

Lisa Alic

From: Karen Guarino Spanton <kguarinospanton@gmail.com>
Sent: Friday, December 4, 2020 1:22 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Karen Guarino Spanton
199 DuPont St
Philadelphia, PA 19127

Lisa Alic

From: Linnea Bond <linneajbond@gmail.com>
Sent: Friday, December 4, 2020 3:32 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linnea Bond
1338 N 26th St
Philadelphia, PA 19121

Lisa Alic

From: Loree Schuster <lsschuster@att.net>
Sent: Friday, December 4, 2020 2:31 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Loree Schuster
53 W Tulpehocken St
Philadelphia, PA 19144

Lisa Alic

From: Marisa Wilson <marisatwilson@gmail.com>
Sent: Friday, December 4, 2020 1:48 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marisa Wilson
4916 Hazel Ave Apt 1
Philadelphia, PA 19143

Lisa Alic

From: Max Temnogorod <mdarkcity@gmail.com>
Sent: Friday, December 4, 2020 1:26 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Max Temnogorod
558 S 48th St Apt 2
Philadelphia, PA 19143

From:	michael zuckerman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Friday, December 4, 2020 5:18:42 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
michael zuckerman
3207 Winter St
Philadelphia, PA 19104

Lisa Alic

From: Nora Nash <nnash@osfphila.org>
Sent: Friday, December 4, 2020 1:29 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nora Nash
609 S. Convent Rd
Aston, PA 19014

Lisa Alic

From: Priscilla Mattison <sallymattison@gmail.com>
Sent: Friday, December 4, 2020 1:19 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

I am a concerned Pennsylvanian who cares about the environment and public health.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. We are all aware of the current and increasing effects of climate change. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago, and it's not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please make the necessary changes.

Sincerely,
Priscilla Mattison
1052 Broadmoor Rd
Bryn Mawr, PA 19010

Lisa Alic

From: Rebecca Finkel <rfinkel712@gmail.com>
Sent: Friday, December 4, 2020 1:56 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rebecca Finkel
916 PARK AVE
Collingswood, NJ 08108

Lisa Alic

From: Robert DuPlessis <rduples1@swarthmore.edu>
Sent: Friday, December 4, 2020 5:04 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Robert DuPlessis
413 S 24th St
Philadelphia, PA 19146

Lisa Alic

From: Rose Paddison <rbpaddison@gmail.com>
Sent: Friday, December 4, 2020 4:04 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rose Paddison
2003 W Girard Ave
Philadelphia, PA 19130

Lisa Alic

From: Russell Zerbo <rzerbo@cleanair.org>
Sent: Friday, December 4, 2020 1:10 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Russell Zerbo
1330 S Melville
Philadelphia, PA 19143

Lisa Alic

From: Sandahl Tolbert <sandahl.parrish@gmail.com>
Sent: Friday, December 4, 2020 2:55 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sandahl Tolbert
2504 Deepwood Dr
Wilmington, DE 19810

Lisa Alic

From: Sandra Foehl <sandra.foehl@temple.edu>
Sent: Friday, December 4, 2020 2:24 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sandra Foehl
3443 W Penn St
Philadelphia, PA 19129

Lisa Alic

From: Serena Levingston <serenalevingston@gmail.com>
Sent: Friday, December 4, 2020 2:08 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Serena Levingston
6909 Henley St
Philadelphia, PA 19119

Lisa Alic

From: Sheldon Isaac <sheldonhisaac@gmail.com>
Sent: Friday, December 4, 2020 4:05 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sheldon Isaac
658 W. Park Lane
Philadelphia, PA 19144

Lisa Alic

From: Susan Babbitt <philad49@att.net>
Sent: Friday, December 4, 2020 1:39 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Susan Babbitt
319 South Tenth Street, 133
Philadelphia, PA 19107

Lisa Alic

From: Tim Miller <timmiller203@gmail.com>
Sent: Friday, December 4, 2020 2:42 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tim Miller
2401 Pennsylvania Ave
Philadelphia, PA 19130

Lisa Alic

From: Marie DiMattia <dimatm90@gmail.com>
Sent: Friday, December 4, 2020 10:58 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marie DiMattia
542B S 48th St
Philadelphia, PA 19143

Lisa Alic

From: Joseph McCullough <jerseyman01@gmail.com>
Sent: Friday, December 4, 2020 6:35 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Joseph McCullough
1854 Plymouth Drive
Woodlyn, PA 19094

From: Katey Kitchenman
To: Philly Refinery Cleanup
Subject: Please read: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 4, 2020 7:26:28 PM

Evergreen Resources,

Hi! Please read with compassion.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop

Lisa Alic

From: Sheila Erlbaum <sjerlbaum@gmail.com>
Sent: Friday, December 4, 2020 5:58 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sheila Erlbaum
7150 Bryan St.
Philadelphia, PA 19119

appropriate remediation plans.
- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Katey Kitchenman
kateykitchenman@gmail.com
4129 Greeby Street
Philadelphia, Pennsylvania 19135

Lisa Alic

From: Jill Turco <jillylovespugs@gmail.com>
Sent: Friday, December 4, 2020 11:59 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jill Turco
2428 Manton St
Philadelphia, PA 19146

Lisa Alic

From: Walter Tsou <walter@psrpa.org>
Sent: Friday, December 4, 2020 4:08 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Walter Tsou
325 E. Durham St.
Philadelphia, PA 19119

Lisa Alic

From: Edward Thornton <ert@sas.upenn.edu>
Sent: Friday, December 4, 2020 11:42 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Edward Thornton
7 Swarthmore Pl
Swarthmore, PA 19081

Lisa Alic

From: Elizabeth Anderson <libby@painterhill.com>
Sent: Friday, December 4, 2020 11:28 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Anderson
3300 Darby Rd Apt 7118
Haverford, PA 19041

Lisa Alic

From: Jean Plough <jeanough@gmail.com>
Sent: Friday, December 4, 2020 11:07 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jean Plough
817 Westview st
Philadelphia, PA 19119

Lisa Alic

From: Carl Gershenson <cgershenson@gmail.com>
Sent: Saturday, December 5, 2020 12:08 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Sincerely,
Carl Gershenson
2118 Ellsworth St
Philadelphia, PA 19146

Lisa Alic

From: frann shore <frannshore@gmail.com>
Sent: Saturday, December 5, 2020 5:41 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
frann shore
1263 Dixon Ln
Jenkintown, PA 19046

Lisa Alic

From: Shawn Megill Legendre <sslegend2000@gmail.com>
Sent: Saturday, December 5, 2020 11:48 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Shawn Megill Legendre
1 Linden Place
Philadelphia, PA 19144

Lisa Alic

From: Tiffany Gaal <tiffanygaal@gmail.com>
Sent: Saturday, December 5, 2020 5:04 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tiffany Gaal
7911 Heather Rd.
Elkins Park, PA 19027

Lisa Alic

From: Helen Syen <shhhhhsilenceisgolden@gmail.com>
Sent: Saturday, December 5, 2020 2:26 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Helen Syen
2542 Faunce St
Philadelphia, PA 19152

Lisa Alic

From: David Spangenberg <pooch@professorpooch.com>
Sent: Saturday, December 5, 2020 5:35 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
David Spangenberg
170 East. St.
Philadelphia, PA 19127

Lisa Alic

From: Annette Ballard <nballard@dca.net>
Sent: Sunday, December 6, 2020 11:13 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Annette Ballard
265 Northwestern Ave
Philadelphia, PA 19128

Lisa Alic

From: Katherine Packer <kzane5007@gmail.com>
Sent: Sunday, December 6, 2020 10:39 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Packer
2601 Pennsylvania Avenue
Philadelphia, PA 19130

Lisa Alic

From: Marielle Lerner <marielle.lerner@gmail.com>
Sent: Sunday, December 6, 2020 9:49 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marielle Lerner
328 Dawson St
Philadelphia, PA 19128

Lisa Alic

From: MICHELLE Doron <doron.michelle@gmail.com>
Sent: Sunday, December 6, 2020 9:04 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
MICHELLE Doron
2418 Linden Dr
Havertown, PA 19083

Lisa Alic

From: Emily Davis <emilylambertdavis@gmail.com>
Sent: Monday, December 7, 2020 9:58 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Emily Davis
1901 John F Kennedy Blvd
Philadelphia, PA 19103

Lisa Alic

From: Sydney Meyer <sydmeyer11@gmail.com>
Sent: Tuesday, December 8, 2020 8:50 PM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sydney Meyer
3230 Aramingo Ave
Philadelphia, PA 19133

Lisa Alic

From: Spencer Koelle <42sbkoelle@gmail.com>
Sent: Wednesday, December 9, 2020 4:21 AM
To: Philly Refinery Cleanup
Subject: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear phillyrefinerycleanup.info,

This is a bad idea. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. PLEASE withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes. Sometimes the tapwater in this state catches on fire.

Sincerely,
Spencer Koelle
2112 Mifflin St
Philadelphia, PA 19145

From: Debbie Robinson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 2:42:35 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Esther Hoffman
hoffman.esther@gmail.com
414 Oakwynne Dr
Wynnewood, Pennsylvania 19096

From: George Tillman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 6:09:14 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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George Tillman
docsbassist@yahoo.com
3331 N Park Ave
Philadelphia, Pennsylvania 19140

From: Goda Trakumaite
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 10:51:20 PM

Evergreen Resources,

I appreciate the work and research Philly Thrive has put into coming up with the following recommendations and sign off on each one of them! The clean up at the refinery site must be thorough and complete, and take into consideration the health and well-being of the humans who live in its shadow - not just arbitrary standards! It's especially disturbing to see learn about the "site-specific" standards for things like lead. I understand that the site is very contaminated and that remediation processes aren't simple or cheap. However, the extra costs should not be paid by our health!! The resources to do this remediation right exist, they just need to be put in the correct places. Build health for the community instead of wealth for yourselves.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Goda Trakumaite
godatrakumaite@gmail.com
1515 S Garnet St.
Philadelphia, Pennsylvania 19146

From:	Jessica Bellwoar
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, December 10, 2020 1:56:51 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Bellwoar
1441 S Beulah Street
Philadelphia, PA 19147

From: Megan Gehrke
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 9:26:04 AM

Evergreen Resources,

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Megan Gehrke
megangehrke@gmail.com
4815 Chester Ave 2F
Philadelphia , Pennsylvania 19143

From: Roman Krivitsky
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 8:12:46 PM

Evergreen Resources,

Please listen to the people who have no interests other than the health of their loved ones. Please understand that people are not exaggerating that generations have been suffering from the toxicity of the previous oil refinery's existence, and do not belittle their concerns. Everything is fixable, the question is who will you choose to represent, the people and their health or corporate levers of power? I hope it's not the latter. Clean this area up THOROUGHLY.

Roman Krivitsky
romansky89@gmail.com
1131 S. Wilton St
Philadelphia, Pennsylvania 19143

From: George Tillman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 6:09:14 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Debbie Robinson
debbierobinson641@gmail.com
3110 wharton 1c 19146
Philadelphia, Pennsylvania 19146

From: Debbie Robinson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 2:42:35 PM

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Debbie Robinson
debbierobinson641@gmail.com
3110 wharton 1c 19146
Philadelphia, Pennsylvania 19146

From:	Linda Wilson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, December 10, 2020 9:54:18 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Linda Wilson
2762 Jericho Street
White River Junction, VT 05001

From: Goda Trakumaite
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 10, 2020 10:51:20 PM

Evergreen Resources,

I appreciate the work and research Philly Thrive has put into coming up with the following recommendations and sign off on each one of them! The clean up at the refinery site must be thorough and complete, and take into consideration the health and well-being of the humans who live in its shadow - not just arbitrary standards! It's especially disturbing to see learn about the "site-specific" standards for things like lead. I understand that the site is very contaminated and that remediation processes aren't simple or cheap. However, the extra costs should not be paid by our health!! The resources to do this remediation right exist, they just need to be put in the correct places. Build health for the community instead of wealth for yourselves.

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Goda Trakumaite
godatrakumaite@gmail.com
1515 S Garnet St.
Philadelphia, Pennsylvania 19146

From: Esther Hoffman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 12:18:38 PM

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George Tillman
docsbassist@yahoo.com
3331 N Park Ave
Philadelphia, Pennsylvania 19140

From: Amy Jersild
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 7:45:59 AM

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Amy Jersild
amy.jersild@gmail.com
1720 Delancey St
Philadelphia , Pennsylvania 19103

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Date: Friday, December 11, 2020 7:45:59 AM

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Amy Jersild
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Date: Friday, December 11, 2020 12:18:38 PM

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Esther Hoffman
hoffman.esther@gmail.com
414 Oakwynne Dr
Wynnewood, Pennsylvania 19096

From: John Smith
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 1:51:57 AM

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John Smith
goodfish_badfish@protonmail.com
4925 Larchwood Ave
Philadelphia, Pennsylvania 19143

From: Jay Kerr
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 11:53:32 AM

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Figure it out. Clean it up, and keep it tidy, Because it's a mess.

Jay Kerr
deadsmileyman@gmail.com
1413 Melton Ave
Richmond, Virginia 23223

From: Kevin DeMoura
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 11:47:35 AM

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Kevin DeMoura
kdemoura121@gmail.com
16 W Browning Rd
Collingswood, New Jersey 08108

From: Matthew Robinson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 12:03:41 PM

Evergreen Resources,

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Matthew Robinson
mrobinson3427@gmail.com
1022 N 5th street, Apt 3
Philadelphia, Pennsylvania 19123

From: MARTA GUTTENBERG
To: Philly Refinery Cleanup
Subject: Re: Philly Refinery -Virtual Public Information Session
Date: Friday, December 11, 2020 2:52:43 PM

will a Zoom link be sent?

On 12/11/2020 1:05 PM Evergreen <phillyrefinerycleanup@ghd.com> wrote:

Virtual Public Information Session
Former Philadelphia Refinery

Evergreen to hold a virtual Public Information Session to discuss the Legacy Environmental Cleanup of the former Philadelphia Refinery

The purpose of this session is to provide a live question and answer period regarding the Act 2 remediation program at the facility. This meeting will mark the end of a 120-day review period during which previously submitted reports to the PADEP were reopened for an additional public comment period. There will be future meetings and opportunities for public involvement subsequent to this event.

Many of the questions and comments submitted to date have already been uploaded to Evergreen's website. Additional comments/questions and responses are being uploaded periodically. All Q&A received through the January information session will be uploaded to the site and also provided to PADEP in a Public Comment Remedial Investigation Report.

What: Virtual Public Information Session
When: 6:30 to 8:00 p.m., Jan. 14, 2021
Where: Zoom Webinar

The event link will be posted to www.phillyrefinerycleanup.info at least 24 hours prior to the event time under the Public Involvement tab and will be sent via email to those on the email distribution list.

If you do not have access to the internet or a computer/mobile phone, a phone number will also be provided prior to the event for dial-in participation. Those calling in will also be able to ask live questions.

If this will be your first time attending a **Zoom Webinar Event** , please try the link at least 24-hours in advance to ensure there are no technical problems. You do not need the Zoom app to participate – simply click on the link; however, to watch from a mobile device, you may need to download the Zoom app.

There will be no presentation during the planned session in order to allow the entire session to be devoted to a live Q&A session. The public is encouraged to review the website Q&A for information prior to the session.

The public is encouraged to provide input before or during the Public Information Session through any of the methods listed below:

- **Website at www.phillyrefinerycleanup.info**
- **Email Evergreen at phillyrefinerycleanup@ghd.com**
- **U.S. mail at (P.O. Box 7275, Wilmington, DE 19803)**

All input is valued equally, regardless of the method of input.

For information about environmental cleanup at the former Philadelphia Refinery, please visit www.phillyrefinerycleanup.info. To be added to future email distribution of public notices, you may do so on the Public Involvement tab of the website.

From:	MARTA GUTTENBERG
To:	Philly Refinery Cleanup
Subject:	Questions ahead of the public hearing
Date:	Friday, December 11, 2020 3:26:33 PM

Dear Evergreen,

1. Is there any involvement of Hilco, the new owner?

Thanks for putting the relevant documents online with the Library!

2. Are you aware which Philadelphia City officials are charged with reviewing the documents?

3, Many of the finalized online reports reflect reviews done between 2011 to 2016 with no updates. How can I learn what happened next. Is there a person to contact with specific, referenced questions, which would be onerous for a Zoom conference.

Marta Guttenberg
267 318 2272

From: Ankur Saxena
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 11, 2020 2:26:35 PM

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Ankur Saxena
saxenaankur001@gmail.com
4247 Locust St
Philadelphia, Pennsylvania 19104

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Saturday, December 12, 2020 8:29:24 PM

Name

Michael Khoo

Email

mick_khoo@protonmail.com

Address

320 S 49th St Philadelphia PA 19143
PHILADELPHIA, Pennsylvania 19143
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

On page 8 of the TASC report, “Remedial Investigation Reports Review, June 2020,” there is a figure “Hydrogeologic layers at the Site (Source: Evergreen).”

1. What is the composition of the layer labeled ‘Fill’?
2. Does Evergreen know from where the fill was obtained? Is river dredging/channel widening one possible source for this fill?
3. Is it possible to get a high resolution file of this figure? It’s very hard to read in the report. Thank you.

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Michael Khoo

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mick_khoo@protonmail.com

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Community Outreach Plan Revised (draft) - August 11 2020

Comment

A) On the Q+A page, responding to the question “The hydrological situation is changing …” Evergreen’s response includes the words "climate changes predicted to occur within the anticipated timeframe to completion will be considered.”

B) On the Q+A page, responding to the question “Climate change-generated sea-level rise (Schuylkill, Delaware) is a given” Evergreen’s response includes the words "… i.e., how many years are predicted for Evergreen to meet Cleanup goals under Act 2 compared to the magnitude of climate change predictions within that general time period.”

Both of these responses imply that only the amount of sea-level rise that occurs during the clean-up operation will be considered. However, sea level rise will continue to affect the site for decades, or perhaps centuries.

1. Can Evergreen confirm (in plain English) that it is only considering sea-level rise for the duration of the remediation project?
2. If so, why is Evergreen not considering long-term sea level rise and its impact on aquifers into account, when considering the remediation plans for the site?

Thank you.

From: noreply@phillyrefinerycleanup.info
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1. It would be useful to see which sources Evergreen is consulting. Will Evergreen share a bibliography of the sources that you have consulted with the public?

(For what it’s worth I’d be happy to share sources with you, maybe in another comment so it is part of the public record.)

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This misrepresents the nature of climate change and sea level rise. It's not a question of higher tides. Everything will be higher - low tides, mean water levels, and high tides. Everything is going to go up. This will affect both the Schuykill (as far as it is tidal, to the art museum), and the Delaware.

1. What sources and estimates for climate change and sea level rise is Evergreen working with?
2. What is the maximum value for sea level rise that Evergreen is considering?
3. Sea-levels will continue to rise at least into the next century. What time-scale, in terms of years from now, does Evergreen consider adequate to ‘future proof’ the site from rising sea levels?

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Thank you.

From: C C
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, December 14, 2020 2:45:14 AM

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C C
carolynhana@gmail.com
500 college ave
Swarthmore, Pennsylvania 19081

Keep or delete email?

From: DOERR, TIFFANI L
To: Brown, C David
Cc: Colleen Costello; Philly Refinery Cleanup; Strobridge, Lisa
Subject: RE: public comments, Philadelphia Refinery
Date: Monday, December 14, 2020 5:46:05 PM

Hi Dave,

Thanks for passing those along. We'll keep the document for record and update it as received from you. Those are the same messages that we've also received from Clean Air Council. We've also logged each one for the record. We see three comments that require response in their emails:

1. Reduction of the lead standard
2. Revising RIRs to include climate change
3. Validity of data in the reports based on age

The first two have already been asked and answered in various forms on the website, but we plan to upload CAC's exact comments to the Q&A page and Public Comment RIR so that it's clear that we're responding to their concerns directly. The third question is not one we've received previously but will also provide a response. Does DEP plan to provide response to these comments since they were sent to DEP directly? I know you've also provided response to the lead comment in general, but not the other two and I think they would benefit from DEP response.

Please let me know how you plan to proceed and if you want to discuss. I did want to ask how you envision Evergreen incorporating the answers that you provided previously to comments that I had forwarded. I was thinking that we'd post the question/comment like we have all of the others and add a note to the response like "Note: DEP provided the following response to the comment above." Let me know if that makes sense and if you want it to be validated further with reference to an email date or your name, etc.

Thanks,

Tiffani L. Doerr, PG
Evergreen Resources Management Operations
2 Righter Parkway, Suite 120
Wilmington, DE 19083
Office: 302-477-1305
Cell: 484-889-7347

From: Brown, C David <cdbrown@pa.gov>
Sent: Monday, December 14, 2020 11:27 AM
To: DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com>
Cc: Colleen Costello <ccostello@sanbornhead.com>; phillyrefinerycleanup@ghd.com; Strobridge, Lisa <lstrobridg@pa.gov>
Subject: public comments, Philadelphia Refinery

Tiffani,

Last week we received 81 public comments on the Act 2 reports, attached. These are based on a Clean Air Council form letter and focus on the lead standard and climate change. They may have also sent the comments to Evergreen, but in case some didn't I'm providing them to you. If we receive more I'll append them to this document and get you an update.

C. David Brown P.G. | Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5792 | Fax: 484.250.5961
www.dep.pa.gov

From: Lola Milder
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, December 14, 2020 6:11:09 PM

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Lola Milder
lolamilder@gmail.com
1507 S 13th St
Philadelphia, Pennsylvania 19147

From: Sophia Weinstein
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, December 14, 2020 10:52:38 AM

Evergreen Resources,

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Sophia Weinstein
sophacoco@gmail.com
5040 Larchwood
Philadelphia, Pennsylvania 19143

From: LIsa Hastings
To: Philly Refinery Cleanup
Subject: Comment deadline on RIRs
Date: Tuesday, December 15, 2020 7:35:04 AM
Importance: High

What is the current deadline for comments on the refinery RIRs? Has it been extended past 120 days?

Please call, text, or email a reply.

Thank you.

Lisa Hastings
610-299-9898 (cell)

From: Meredith Hegg
To: Philly Refinery Cleanup
Subject: Comments on PES clean-up
Date: Tuesday, December 15, 2020 6:40:58 PM

Evergreen Resources,

Please do it right. PES owes it to the local community to do a proper and thorough clean-up.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
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Meredith Hegg
mhegg1@yahoo.com
123 E Berkley Ave
Clifton Heights, Pennsylvania 19018-2602

From: Grace Shannon
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 16, 2020 8:31:33 PM

Evergreen Resources,

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Grace Shannon
graceshannon95@gmail.com
1826 McClellan St
Philadelphia , Pennsylvania 19145

From: Libby Harding
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 16, 2020 3:49:51 PM

Evergreen Resources,

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Libby Harding
elizabeth.law.harding@gmail.com
12 Wellington road
Wilmington , Delaware 19803

From: Shane Carey
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 16, 2020 3:26:36 PM

Evergreen Resources,

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Shane Carey
sc178511@gmail.com
245 S. 45th Street
Philadelphia, Pennsylvania 19104

From: Emily Gunkel
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 17, 2020 11:34:52 PM

Evergreen Resources,

Please, right the wrongs of the past by doing a proper job of cleaning up the PES Refinery; do NOT do the bare minimum because, while this makes things easier on your end, the Philadelphia community has already suffered far too much to have you perform a slap-dash job as currently planned.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Best,
EG

Emily Gunkel
lg.art1@yahoo.com
1734 Monument St
Philadelphia, Pennsylvania 19121

From: mariam@movementalliance.org
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 17, 2020 9:24:30 PM

Evergreen Resources,

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mariam@movementalliance.org
1531 S 18th Street
Philadelphia, Pennsylvania 19146

From: Iris Marie Bloom
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 17, 2020 7:04:43 PM

Evergreen Resources,

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Iris Marie Bloom
protectingourwaters@gmail.com
116 Schoonmaker Lane
Stone Ridge, New York 12484

From: lownes.nat@gmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 17, 2020 8:50:39 PM

Evergreen Resources,

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lownes.nat@gmail.com
3424 Division St
Philadelphia, Pennsylvania 19129

From: Chamara Cotton
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 18, 2020 12:48:56 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Chamara Cotton
boogierose222@gmail.com
3039 Wharton St,
Philadelphia, Pennsylvania 19146

From: Brian O"Keefe
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 23, 2020 12:12:49 PM

Evergreen Resources,

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Brian O'Keefe
brianoke@gmail.com
429 N 13TH ST, APT 3F
PHILADELPHIA, Pennsylvania 19123

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Wednesday, December 23, 2020 6:41:00 PM

Name

David Steinberg

Email

steinberg.david07@comcast.net

Address

825 E Clements Bridge Road
Apartment 313
Runnemede, New Jersey 08078
United States
Map It

Report

Philadelphia Refinery_AOI 11 Final Report_06-21-2013

Comment

When I went on to your website, I got this message from my security provider.
Please have someone in your IT department review this. We, the public, need to be able to access this resource. Thank you.
David
++
"Website blocked due to a suspicious top level domain (TLD)
Website blocked: phillyrefinerycleanup.info

Malwarebytes Browser Guard blocked this page because it uses a suspicious top level domain (TLD). These are frequently used by scam or phishing sites, but can be used by legitimate websites as well. If you trust this website, please click CONTINUE TO SITE. Otherwise, choose GO BACK.
We strongly recommend you do not continue.
Tooltip icon
Do not block this site again for scam"

From: Kevin Quimbo
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 23, 2020 5:54:33 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
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Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Kevin Quimbo
quimbo@sas.upenn.edu
47 Stonewall Ct
Woodcliff Lake, New Jersey 07677

From: Sandra Choukroun
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 23, 2020 9:54:37 AM

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Sandra Choukroun
sandrajdc@verizon.net
709 Braeburn Lane
Penn Valley , Pennsylvania 19072

From: Vincent Prudente
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 23, 2020 9:20:02 PM

Evergreen Resources,

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Vincent Prudente
pruv9@verizon.net
1826 Fitzwater Street
Philadelphia, Pennsylvania 19146

From: Ken Daly
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, December 25, 2020 1:11:36 PM

Evergreen Resources,

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Ken Daly
kenneth_daly_149@comcast.net
2200 Ben Frank Pwy Apt S1411
Philadelphia, Pennsylvania 19130

From:	Darryl Roberts
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, December 29, 2020 7:10:58 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Darryl Roberts
1910 Mountain Street
Philadelphia, PA 19145

From: Ivan Juarez
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, December 30, 2020 12:50:28 PM

Evergreen Resources,

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Ivan Juarez
juarezivan2014@gmail.com
932 Clinton St Apt 208
Philadelphia, Pennsylvania 19107

From:	Harley Frances
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, December 31, 2020 6:21:37 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Harley Frances
7900 Lindbergh Blvd
Philadelphia, PA 19153

From: Letha Muth-Kimball
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, December 31, 2020 2:47:27 PM

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Letha Muth-Kimball
l.muthkimball@gmail.com
2138 S Woodstock St.
Philadelphia, Pennsylvania 19145

From: Benjamin Camp
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 3, 2021 9:43:37 PM

Evergreen Resources,

Do it right the first time! There's an opportunity to set an example here, and redevelop this area in a way that the surrounding community can be excited about! Take the time, spend the money, clean it up properly the first time. Think long term about this land!
-Ben, South Philly Resident

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Benjamin Camp
benjaminmcamp@gmail.com
1913 S 8th St
Philadelphia, Pennsylvania 19148

From:	charles reeves jr
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Sunday, January 3, 2021 2:31:36 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
charles reeves jr
1539 S Patton St
Philadelphia, PA 19146

From:	charles reeves jr
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Sunday, January 3, 2021 2:32:41 AM

Dear phillyrefinerycleanup.info,

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charles reeves jr
1539 S Patton St
Philadelphia, PA 19146

From:	Katy Ruckdeschel
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:07:19 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katy Ruckdeschel
309 Valley Rd
Merion Station, PA 19066

From: Terri Soifer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 10:03:06 AM

Evergreen Resources,

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- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Terri Soifer
t.l.soifer@gmail.com
3013 W Stiles St
Philadelphia, Pennsylvania 19121

From:	Marcus Ferreira
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:39:43 AM

Dear phillyrefinerycleanup.info,

Any remediation plan should include the planting of trees and installation of robust riparian buffer zones (100' or greater), cleared of invasive plants and with an eye towards native species (selected with the goal of maximizing phytoremediation, air purification and riparian habitat restoration) should be included as part of the solution.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Marcus Ferreira
1620 South Street
Philadelphia, PA 19146

From:	Maryanne Zakreski
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 2:37:41 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Maryanne Zakreski
120 Hilldale Rd
CHELTENHAM, PA 19012

From:	matthew feldman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 9:43:06 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
matthew feldman
4837 Pulaski Ave
Philadelphia, PA 19144

From:	Michael Bourg
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:06:56 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michael Bourg
2639 E Venango St
Philadelphia, PA 19134

From:	Michelle Dugan
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 6:09:46 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michelle Dugan
222 Maypole Rd
Upper Darby, PA 19082

From:	Phyllis Blumberg
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:06:28 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Phyllis Blumberg
332 Kent Rd.
Bala Cynwyd, PA 19004

From:	Russ Allen
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:20:14 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Russ Allen
1510 Grove Av.
Jenkintown, PA 19046

From: Rylie Parton
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 1:06:05 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
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Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Rylie Parton
rspartin12@gmail.com
1107 Carpenter St
Philadelphia , Pennsylvania 19147

From:	Susan Schewel
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 12:13:50 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Susan Schewel
419 Gate Lane
Philadelphia, PA 19119

From: Timothy Leonard
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 7:39:43 PM

Evergreen Resources,

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Timothy Leonard
timleonardcello@gmail.com
209 Rector St
Philadelphia, Pennsylvania 19128

From:	Vivian Murray
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 12:22:38 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Vivian Murray
2600 Pine Street
Philadelphia, PA 19103

From:	Lori Flanagan-Cato
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 1:12:59 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Lori Flanagan-Cato
525 Prescott Rd
Merion Station, PA 19066

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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Jensen Sprowl
jensensprowl@gmail.com
5056 Mansfield Ave, #622
Royal Oak, Michigan 48073

From: duncangromko@gmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 8:08:35 PM

Evergreen Resources,

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duncangromko@gmail.com
2218 South St Unit B
Philadelphia, Pennsylvania 19146

From:	Jack Byerly
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 1:10:14 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jack Byerly
1234 S. 7th Street
Philadelphia, PA 19147

From:	Howard Sherman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:43:47 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Howard Sherman
267 N. Highland Avenue
Lansdowne, PA 19050

From:	Alexandria Barbadoro
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 6:08:14 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alexandria Barbadoro
2954 S Smedley St
Philadelphia, PA 19145

From:	Diana Hulboy
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 2:26:49 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Diana Hulboy
308 Ripka St
Philadelphia, PA 19128

From:	Carolin Schellhorn
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:05:46 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carolin Schellhorn
119 E Montgomery Ave
Ardmore, PA 19003

From:	Andrew Kalan
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 5:29:13 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Andrew Kalan
802 Northwinds Dr
Bryn Mawr, PA 19010

From:	Carl Gershenson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:54:33 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carl Gershenson
2118 Ellsworth St
Philadelphia, PA 19146

From:	Billy Nichols
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 9:55:18 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Billy Nichols
1935 Mount Vernon St
Philadelphia, PA 19130

From:	Alexis Brzuchalski
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 9:57:40 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alexis Brzuchalski
1108 South 8th Street
Philadelphia, PA 19147

From:	Alexandria Barbadoro
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 6:08:14 PM

Dear phillyrefinerycleanup.info,

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Alexandria Barbadoro
2954 S Smedley St
Philadelphia, PA 19145

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1108 South 8th Street
Philadelphia, PA 19147

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Date:	Monday, January 4, 2021 5:29:13 PM

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802 Northwinds Dr
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Sincerely,
Diana Hulboy
308 Ripka St
Philadelphia, PA 19128

From:	Jack Byerly
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 1:10:14 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Jack Byerly
1234 S. 7th Street
Philadelphia, PA 19147

From:	Lori Flanagan-Cato
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 1:12:59 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lori Flanagan-Cato
525 Prescott Rd
Merion Station, PA 19066

From:	Maryanne Zakreski
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 2:37:41 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Maryanne Zakreski
120 Hilldale Rd
CHELTENHAM, PA 19012

From:	Michelle Dugan
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 6:09:46 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Michelle Dugan
222 Maypole Rd
Upper Darby, PA 19082

From:	Russ Allen
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 10:20:14 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Russ Allen
1510 Grove Av.
Jenkintown, PA 19046

From: Terri Soifer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 10:03:06 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Terri Soifer
t.l.soifer@gmail.com
3013 W Stiles St
Philadelphia, Pennsylvania 19121

From:	Vivian Murray
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 4, 2021 12:22:38 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Vivian Murray
2600 Pine Street
Philadelphia, PA 19103

From: Betelhem Muno
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 4, 2021 11:30:07 PM

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Betelhem Muno
bmuno@haverford.edu
370 Lancaster Ave
Haverford, Pennsylvania 19041

From:	Gabriel Hohag
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 5, 2021 12:27:51 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gabriel Hohag
808 Dickinson St
Philadelphia, PA 19147

From:	Robert DeCarolis
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 5, 2021 4:23:06 PM

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Robert DeCarolis
2407 S Woodstock Street
Philadelphia, PA 19145

From:	Kevin Foskett
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 5, 2021 8:54:08 AM

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Sincerely,
Kevin Foskett
112 Glenn Road
Ardmore, PA 19003

From: Louisa Franco
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 5, 2021 10:03:19 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
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- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

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- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
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Louisa Franco
louisafranco31@gmail.com
1107 Carpenter Street
Philadelphia, Pennsylvania 19147

From:	Gail Mershon
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 5, 2021 9:22:35 PM

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Sincerely,
Gail Mershon
614 W Sedgwick St
Philadelphia, PA 19119

From:	Charles Homler
To:	Philly Refinery Cleanup
Subject:	Parcel AOI-10 - West Yard
Date:	Tuesday, January 5, 2021 5:09:51 PM
Attachments:	bartrams list.csv FDR Park.csv

To Whom It May Concern,

My name is Chuck Homler and I am a local wildlife photographer. Every spring I head to Bartram's Gardens for birdwatching and photography. I also visit a number of other locations in the area, some that are also on the banks of the Schuylkill River. The Schuylkill, being tidally influenced from where the Fairmount Waterworks to the Delaware River, is much cleaner above the falls. Oil slicks are visible along the banks of Bartram's Garden and even from the Schuylkill Banks trails installed between South Street and the Art Museum.

In the water, asides from waterfowl and gulls, I've seen muskrats and a beaver was spotted there a few times last year, close to 676.

With the closing of PES an opportunity to restore wetland habitat to the river shouldn't be overlooked. Wetlands purify water and remove contaminants. They also provide habitat for wildlife. And wildlife habitat with accessibility attracts people and helps expose kids to ecology.

https://sciencing.com/do-wetlands-purify-water-7585568.html
https://www.nps.gov/keaq/learn/education/water-filtering-of-wetlands.htm
https://pubmed.ncbi.nlm.nih.gov/19589001/

With that being said - Parcel AOI-10, the West Yard, is just downstream from Bartram's Gardens and is cutoff from the PES facilities on the eastern banks of the river. While river access for barges or boats may be attractive for the future development, creating habitat along the banks of the river, will not only clean and beautify the area, but could also protect the redevelopment from flooding or water damage.

Attached are two lists of birds that I have observed at Bartram's Gardens and nearby in FDR Park.

If it would help, I can also share images and experiences with the wildlife on the Schuylkill.

My Best,
Chuck Homler

www.focusonwildlife.me
facebook.com/focusonwildlife

From:	CASSIDY BOULAN
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 5, 2021 8:36:29 PM

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Sincerely,
CASSIDY BOULAN
334 S 12th St
Philadelphia, PA 19107

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Date:	Tuesday, January 5, 2021 8:54:08 AM

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From: Pierie Korostoff
To: Philly Refinery Cleanup
Subject: My comments on the Public Involvement Process, Outreach Plan, and Lead Report
Date: Wednesday, January 6, 2021 12:18:42 AM

Evergreen Resources,

Hello and happy new year. I'm writing as a concerned citizen and community member, to register my grievances in regards to the cleanup of the former PES Refinery site in South Philadelphia and the public outreach plan that accompanies this cleanup.

I have taken the time to write to you today because I have friends who have grown up and lived near this contaminated site, and I have seen their health suffer as a direct result. I would not wish for any person to suffer the same experiences that my friends have gone through due to their exposure to the contaminants at the PES site. They have had family die far too young, after painful battles with cancer, asthma, and eye problems. I urge you to remember that this cleanup will have powerful reverberations in the lives of real people-- and I hope you can find enough empathy within yourself and your organization to conduct the cleanup as if it were your own loved ones living near this site.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues. Thank you for taking the time to read these comments and address them fully.

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Pierie Korostoff
pkorostoff@gmail.com
4710 Warrington Ave
Philadelphia, Pennsylvania 19143

From:	Eric Larson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 6, 2021 7:16:08 AM

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Eric Larson
5510 Henry Ave
Philadelphia, PA 19128

From: Pierie Korostoff
To: Philly Refinery Cleanup
Subject: My comments on the Public Involvement Process, Outreach Plan, and Lead Report
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Date:	Wednesday, January 6, 2021 9:13:42 PM

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Philadelphia, PA 19148

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

walder javier
waldermodel95@gmail.com
2228 dickinson s6t
philadelphia, Pennsylvania 19146

From: Jeffrey Tan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 6, 2021 7:43:30 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Jeffrey Tan
freakysoulz@yahoo.com
912 Greenwich St
Philadelphia, Pennsylvania 19147

From:	Julie Shapiro
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 3:46:12 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Julie Shapiro
519 S 46th St
Philadelphia, PA 19143

From:	Christina Rosan
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:58:34 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Christina Rosan
4405 Pine St
Philadelphia, PA 19104

From:	Linda Clark
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 12:05:29 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linda Clark
221 Pelham Rd
Philadelphia, PA 19119

From:	Louise Giugliano
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 11:49:06 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Louise Giugliano
225 N Essex Ave
Narberth, PA 19072

From:	Matt Stern
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 1:39:17 PM

Dear phillyrefinerycleanup.info,

I own my home and live less than two miles away from the former refinery site. Please clean up the site as if you and your family lived nearby. Evergreen's proposal and approach does not met that standard.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Matt Stern
1839 South Mole St
Philadelphia, PA 19145

From:	Michael Niles
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 11:36:50 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michael Niles
3906 Netherfield Road
Philadelphia, PA 19129

From:	Pamela Selle
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 12:05:03 PM

Dear phillyrefinerycleanup.info,

The cleaning standards MUST be the highest possible (or better) -- the communities impacted by this pollution have been for so long, and the only just action is to truly approach the cleanup with the utmost vigor and enthusiasm. Don't let this slide, please!!

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Pamela Selle
1616 S Clarion St
Philadelphia, PA 19148

From:	Rob Hewitt
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 6:06:48 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rob Hewitt
447 Wellesley Rd
Philadelphia, PA 19119

From:	Ryan McCormick
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 10:56:57 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ryan McCormick
819 S Warnock Street
Philadelphia, PA 19147

From:	Tim Emmett-Rardin
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:59:09 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tim Emmett-Rardin
176 Glentay Ave
Lansdowne, PA 19050

From:	Katherine Gulick
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:53:17 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Gulick
1601 Spring Garden St Apt G107
Philadelphia, PA 19130

From:	Katherine Jueds
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:55:17 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Jueds
139 E Mount Pleasant Ave
Philadelphia, PA 19119

From:	Jessica Krow
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 6:17:37 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Krow
3118 W Penn St
Philadelphia, PA 19129

From:	Jessica Ram
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:54:01 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Ram
138 Sutcliffe Ln
Conshohocken, PA 19428

From:	Heather Knizhnik
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 11:24:06 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Heather Knizhnik
4715 Cedar Ave
Philadelphia, PA 19143

From:	Genie Ravital
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 6:11:21 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Genie Ravital
647 W Ellet St
Philadelphia, PA 19119

From:	G. D.
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 10:41:27 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
G. D.
5502 Houghton St,
Philadelphia, PA 19128

From:	Fran Fulton
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 6:31:34 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Fran Fulton
1919 Chestnut Street
Philadelphia, PA 19103

From:	Emma Sabin
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 4:51:45 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Emma Sabin
8417 Shawnee Street
Philadelphia, PA 19118

From:	Erich Everbach
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 10:18:03 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Erich Everbach
212 Dogwood Ln
Wallingford, PA 19086

From:	Elizabeth Lutes
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 10:06:51 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Lutes
1928 S ISEMINGER ST
PHILADELPHIA, PA 19148

From:	Diane Fuchs
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 1:36:34 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children.

I am particularly concerned about my grandchildren who live in south Philadelphia and have serious allergies.

Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Thank you.

Sincerely,
Diane Fuchs
1929 Fitzwater St
Philadelphia, PA 19146

From:	Chara Armon
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:53:36 AM

Dear phillyrefinerycleanup.info,

I live within a few miles of the refinery site. How it is cleaned up matters to me, my family, my neighbors, and all the surrounding towns and residents. Our health is at stake. Our health matters.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Chara Armon
309 Dogwood Ln
Wallingford, PA 19086

From:	Denise Costello
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 9:50:17 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Denise Costello
1325 Wolf St
Philadelphia, PA 19148

From:	Eugenia Ahern
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 10:02:02 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Eugenia Ahern
7044 Horrocks Street
Philadelphia, PA 19149

From:	Carol Blum
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 7:38:11 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carol Blum
2446 Aspen St
Philadelphia, PA 19130

From:	Carl Gershenson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 7, 2021 3:55:56 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carl Gershenson
2029 Saint Albans St
Philadelphia, PA 19146

From: Darryl Holland
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 8, 2021 8:11:29 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Darryl Holland
darryl_ho_2000@yahoo.com
851 0 luther Place
Philadelphia, Pennsylvania 19153

From: Kearney, Laila (Reuters)
To: Philly Refinery Cleanup
Subject: Reuters query about Philadelphia refinery cleanup
Date: Friday, January 8, 2021 2:26:12 PM

Hello – I'm working on a story about the Philadelphia refinery cleanup, and I have several questions for Evergreen Resources Group on the topic. Who should I direct my questions to?

Thanks for your help,

Laila Kearney
U.S. energy reporter
Reuters
Mobile: (917) 809-0054
Laila.kearney@thomsonreuters.com
Twitter: @lailakearney

From:	Ogden Mitchell
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Friday, January 8, 2021 6:00:57 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ogden Mitchell
4123 Spring Garden Street
Philadelphia, PA 19104

From: Ramona Rousseau-Reid
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 8, 2021 6:49:36 PM

Evergreen Resources,

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Comments on Unaddressed Issues:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Ramona Rousseau-Reid
rousseau_reid@yahoo.com
8402 Brunswick Place
Philadelphia, Pennsylvania 19153

From:	shawn sweeney
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Friday, January 8, 2021 4:43:15 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
shawn sweeney
1512 E Palmer Street
Philadelphia, PA 19125

From: Terrance Johnson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 8, 2021 2:51:53 PM

Evergreen Resources,

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Terrance Johnson
TERRY8426@GMAIL.COM
8426 GIBBS PL
PHILADELPHIA, Pennsylvania 19153

From: Leonard Stewart
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 8, 2021 3:31:29 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Leonard Stewart
audreyist@comcast.net
8528 Lyons Pl
Phila , Pennsylvania 19153

From: JOHN CAMERON JR
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 8, 2021 3:22:12 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

JOHN CAMERON JR
johncameron8401@comcast.net
8401 GIBBS PL
PHILADELPHIA, Pennsylvania 19153

From:	Frank Romano
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Friday, January 8, 2021 11:20:23 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Frank Romano
2330 MOUNTAIN ST
PHILADELPHIA, PA 19145

From:	merian soto
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Saturday, January 9, 2021 6:22:05 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
merian soto
360 Pelham Rd
Philadelphia, PA 19119

From:	Theresa Heinsler
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Saturday, January 9, 2021 9:27:34 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Theresa Heinsler
2527 Island Ave
Philadelphia, PA 19153

From: Tosha Brown
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 5:10:43 AM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Tosha Brown
tosha.brown12@gmail.com
2737 S. 78th St.
PHILADELPHIA, Pennsylvania 19153

From: Bethany Wiggin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 9:42:02 PM

Evergreen Resources,

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Bethany Wiggin
bwiggin@gmail.com
302 Pelham Road
Philadelphia, Pennsylvania 19119

From: Sonya Sanders
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 9:06:20 PM

Evergreen Resources,

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Sonya Sanders
sexysonya32@gmail.com
1433 south 32nd street
Philadelphia, Pennsylvania 19146

From: Tosha Brown
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 5:10:20 AM

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Tosha Brown
tosha.brown12@gmail.com
2737 S. 78th St.
PHILADELPHIA, Pennsylvania 19153

From: walder javier
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 4:14:24 PM

Evergreen Resources,

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Rachael C
hairbyrachaelanne@gmail.com
0 sergeant st
Philadelphia, Pennsylvania 19123

From: Jeremy Griffin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 2:19:16 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Clean that crap up! It's killing us! Contact me for more questions.
-Jeremy R Griffin
Twitter @germtwix

Jeremy Griffin
dygriff95@yahoo.com
320 Clifton Ave
Collingdale, Pennsylvania 19023

From: Cynthia Bertrand Holub
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 6:57:19 PM

Evergreen Resources,

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Cynthia Bertrand Holub
ckbh@verizon.net
3229 W Penn St
Philadelphia, PA, Pennsylvania 19129

From:	Chris Ahlers
To:	Philly Refinery Cleanup
Cc:	DOERR, TIFFANI L
Subject:	Evergreen reports/public comments due on Thursday, January 14, 2021
Date:	Sunday, January 10, 2021 3:47:14 PM

Evergreen,

The Council will be submitting comments to phillyrefinerycleanup@ghd.com on Thursday night before 11:59 pm. There will be some attachments. Is there any limitation on your email system's capacity for accepting attachments, necessitating that we break them down to a certain size?

Thanks,

Chris

--
Christopher D. Ahlers
Staff Attorney
Clean Air Council
135 S.19th Street, Suite 300
Philadelphia, PA 19103
Telephone: 215-567-4004, ext. 125
*Licensed to Practice Law in Pennsylvania (Limited In-House Corporate Counsel)
*Licensed to Practice Law in New York

From: Claire Epstein
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 6:22:00 PM

Evergreen Resources,

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Claire Epstein
claireae@sas.upenn.edu
3411 Chestnut St. APT 611
Philadelphia, Pennsylvania 19104

From: John Watts
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 11:07:58 AM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

John Watts
john48watts@gmail.com
1543 s Myrtlewood st
Philadelphia , Pennsylvania 19145

From: Juan Durst
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:47:45 AM

Evergreen Resources,

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Juan Durst
cpdurst@aol.com
1547 S. 30th
Philadelphia , Pennsylvania 19146

From: Julia Horan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 6:45:26 PM

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Julia Horan
Julia.horan@ymail.com
224 s Washington st
Baltimore, Maryland 21231

From: Kathleen Horan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:18:27 AM

Evergreen Resources,

As a former long term resident of Philadelphia, where I also studied environmental studies and became intimately familiar with the environmental injustices committed in the city, this issue is of great value to me and I hope to you as well. There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Kathleen Horan
khoran333@gmail.com
203 Chrystie St
New York, New York 10002

From: Kathryn LaBrake
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:29:00 AM

Evergreen Resources,

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Kathryn LaBrake
klabrake@wetlandsandecology.com
407 East Girard Avenue
Philadelphia, Pennsylvania 19125

From: Keisha Price
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:25:41 PM

Evergreen Resources,

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Keisha Price
theladylulu.kp@gmail.com
322 N broad street
Philadelphia, Pennsylvania 19102

From: Lauren Frazee
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:28:42 AM

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Thank you for your time.

Dr. Lauren Frazee

Lauren Frazee
ljfrazee@verizon.net
2431 Frankford Ave
Philadelphia, Pennsylvania 19125

From: Lucy James-Olson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:17:05 PM

Evergreen Resources,

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Lucy James-Olson
lucyjamesolson@gmail.com
1123 brandywine blvd
wilmington, Delaware 19809

From:	Macklyn Hutchison
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Monday, January 11, 2021 6:17:49 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address PA-DEP's concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Ms. Macklyn Hutchison
250 Forest Ridge Rd Unit 71
Ste 1100
Monterey, CA 93940
(512) 750-4414

From: Margaret Gushue
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 9:13:14 PM

Evergreen Resources,

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Margaret Gushue
margaret.gushue@gmail.com
1539 Morris st
Philadelphia , Pennsylvania 19145

From: Marianne Maloy
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 9:42:33 PM

Evergreen Resources,

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Marianne Maloy
marianne.maloy@gmail.com
1523 S 16th St
Philadelphia , Pennsylvania 19146

From: Matt Gibbons
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:12:41 AM

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Matt Gibbons
gibneighter@gmail.com
520 Brookview ln
Havertown, Pennsylvania 19083

From: Matthew Witmer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 3:24:12 PM

Evergreen Resources,

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
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- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
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Matthew Witmer
matt.e.witmer@gmail.com
1818 Manton St
Philadelphia, Pennsylvania 19146

From: Maura Stephens
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:51:52 PM

Evergreen Resources,

My family has experienced the pain and suffering of environmentally caused illnesses. We have felt the helplessness and fury at the lack of regulatory oversight and enforcement of laws that were intended to protect people and our environment from the health harms perpetrated by polluting corporations. And we have felt the searing agony of watching loved ones sicken and suffer and die from corporate-caused cancers.

In this case I am writing on three sections of the Philly Refinery "cleanup" AOI 1-11, Lead Report, Outreach Plan: Process Comments, Issue Comments, and Unaddressed issues.

Community Outreach Plan:
- Evergreen has refused to provide a remotely adequate Public Involvement Process.
- The community needs much more time and many more public meetings--in the time of Covid, even more so.
- Act 2 requirements are not adequate. Evergreen must do more.
- No air quality data have been collected at contaminated sites or in surrounding neighborhoods. This is unacceptable.

Comments on Contaminants of Concern:
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Maura Stephens
maurastephensupeace@gmail.com
825 N 29TH ST APT 5EE
PHILADELPHIA, Pennsylvania 19130

From: Michael McKenna
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:21:32 PM

Evergreen Resources,

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Michael McKenna
tue87625@temple.edu
444 N 4th St Apt 319
Philadelphia, Pennsylvania 19123

From: Mike Mehalick
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:30:23 PM

Evergreen Resources,

As a current Philadelphia resident I can attest from a practical standpoint of exposure and observation to the obvious lack of diligence in considering the safety standards put forth in this process:

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Mike Mehalick
zepplin8tr@gmail.com
2233 Wallace Street
Philadelphia, Pennsylvania 19130

From: Morgan Mahdavi
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 6:45:37 PM

Evergreen Resources,

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Morgan Mahdavi
morganmahdavi@gmail.com
1311 S 52nd St
Philadelphia, Pennsylvania 19143

From: Morgyn Demby
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:16:11 PM

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Morgyn Demby
morgz@udel.edu
41 Cheswold Blvd
Newark , Delaware 19713

From: Nelson Howard
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:45:39 AM

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Nelson Howard
nelsonhoward7@gmail.com
1532 s 26th st
Philadelphia , Pennsylvania 19146

From: Nina Fonseca
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 6:51:58 PM

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Nina Fonseca
fonseca.ninaf@gmail.com
100 Park Blvd. Apt. 88C
Cherry Hill, New Jersey 08034

From: Noelle Vought
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:32:44 AM

Evergreen Resources,

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Noelle Vought
noellevought@gmail.com
2008 Spring Garden St, Apt 6
Philadelphia, Pennsylvania 19130

From: Paige Halligan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:16:04 PM

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Paige Halligan
Phalligan123@gmail.com
30 East Jefferson St
Media, Pennsylvania 19063

From: Quinn Karpiak
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 12:50:53 PM

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Comments on Unaddressed Issues:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Quinn Karpiak
karpiakquinn@gmail.com
1318 s Colorado St
Philadelphia, Pennsylvania 19146

From: Rachael C
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:46:10 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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Comments on Unaddressed Issues:
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From: Rachel Guerra
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:43:09 PM

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Rachel Guerra
rachelannguerra@gmail.com
923 s 49th
Philadelphia, Pennsylvania 19143

From: Ryan Shellenberger
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:59:14 AM

Evergreen Resources,

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Ryan Shellenberger
rshell23@gmail.com
2047 Pierce St
Philadelphia, Pennsylvania 19145

From: Samantha Marx
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:53:43 AM

Evergreen Resources,

Greetings,

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Samantha Marx
sammymarxxx@gmail.com
1713 Spring Garden St
Philadelphia, Pennsylvania 19130

From: Samantha Mayer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 8:46:15 PM

Evergreen Resources,

The site of the former South Philadelphia oil refinery needs to be cleaned up in an environmentally sound and ethically responsible way to reduce harm to current and future generations, and to ensure least damage to the environment and human/animal life.
Please see my concerns included below with the currently publicized information concerning the clean up:
Sincerely,
Samantha Mayer

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Samantha Mayer
sam.alyson@gmail.com
5026 kingsessing ave
Philadelphia, Pennsylvania 19143

From: Taylor Williams
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:04:31 PM

Evergreen Resources,

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. This follows a tradition of environmentally damaging actors who tout community engagement, while doing the bare minimum to clean up after their messes.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations. This grossly undervalued the damage they have levied against the surrounding community. To truly amend the magnitude of that damage, Evergreen must survey through whatever available means the environmental impact to the surrounding community.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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Taylor Williams
tsjwilliams15@gmail.com
841 W Park St
Stockton, California 95203

From: Will Fraser
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:32:56 AM

Evergreen Resources,

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Will Fraser
wfraser@cleanair.org
135 S 19th St, Suite #300
Philadelphia, Pennsylvania 19103-4912

From:	Will Fraser
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 11, 2021 9:55:34 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Will Fraser
135 S 19th St
Philadelphia, PA 19103

From: Zach Sayles
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:58:07 PM

Evergreen Resources,

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Zach Sayles
zacharymalcolmsayles@gmail.com
21 n 3rd st
Philadelphia, Pennsylvania 19106

From: Zachary Decker
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:56:18 PM

Evergreen Resources,

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Zachary Decker
deckerzachary@gmail.com
1818 N Mutter St
Philadelphia, Pennsylvania 19122

From: Zemyara Berrios
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:28:17 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Zemyara Berrios
zemy1b@gmail.com
3001 rt 130 s APT 68L
Delran, New Jersey 08075

From: Jamie Creamer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:44:51 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Jamie Creamer
jamiecreamer56@gmail.com
7014 large st
Philadelphia , Pennsylvania 19149

From: Jack Stewart-Castner
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:25:59 AM

Evergreen Resources,

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Jack Stewart-Castner
jack.castner@gmail.com
5167 1/2 Village Green
Los Angeles, California 90016

From: Erinn Kovar
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:38:03 PM

Evergreen Resources,

To Whom It May Concern,

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Erinn Kovar
erinn1kovar@gmail.com
2304 Sepviva St
philadelphia , Pennsylvania 19125

From: Elliot Beck
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 12:00:22 AM

Evergreen Resources,

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Elliot Beck
elliotperc@gmail.com
718 S 49th St.
Philadelphia, Pennsylvania 19143

From: Ellie Gunther-Mohr
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:21:50 PM

Evergreen Resources,

I want everything below and I want each of us to imagine our responsibility to the earth and our communities. If we can't understand that healing is only as effective as how far it spreads we will be overcome with greed and waste. Let this community breath
There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Ellie Gunther-Mohr
elizacurtisgunthermohr@gmail.com
1313 s 52nd street
Philadelphia , Pennsylvania 19143

From: Cybele Kummer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:55:10 PM

Evergreen Resources,

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Cybele Kummer
cybelebkummer@gmail.com
21 North Third Street
Philadelphia, Pennsylvania 19106

From: earl wilson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 5:56:13 PM

Evergreen Resources,

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earl wilson
ehwilsonsr2@aol.com
7720 Olympus Place
Philadelphia, Pennsylvania 19153

From: earl wilson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 6:04:57 PM

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earl wilson
ehwilsonsr2@aol.com
7720 Olympus Place
Philadelphia, Pennsylvania 19153

From: Derron LaBrake
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 9:57:50 AM

Evergreen Resources,

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM. This unacceptable to the community and our concerns must be heard and addressed.
- Benzene - High levels of benzene are present extensively at the site, and benzene, which is recognized as a carcinogen, is currently being emitted into the atmosphere. The assessment of its potential effects on the community must be assessed during worst-case scenario, i.e., when the region is experiencing a summer temperature inversion and the air remains stagnant for days at a time, not during average atmospheric conditions.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- It is highly likely that the fire-fighting agents containing PFAS were used on the site and their presence needs to be assessed.
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

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Derron LaBrake
dlabrake@wetlandsandecology.com
124 E Park Rd
Havertown, Pennsylvania 19083

From: demorrahawkins@aol.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 11:56:36 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

demorrahawkins@aol.com
8608 Dickson Place
Philadelphia, Pennsylvania 19153

From: Christopher Keenan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 4:52:23 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
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Christopher Keenan
kk89@gmail.com
404 East Girard Ave
Philadelphia, Pennsylvania 19125

From: Caitlin Donnelly
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 7:06:20 PM

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Caitlin Donnelly
cedonne@umich.edu
612 Wesley St
Ann Arbor , Michigan 48103

From:	Aseel Rasheed
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Monday, January 11, 2021 5:25:48 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Aseel Rasheed
Bartram's Garden, 5400 Lindbergh Blvd
Philadelphia, PA 19143

From: Heather Gettis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 10:51:52 AM

Evergreen Resources,

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Heather Gettis
Heathergettis90@gmail.com
1715 Spring garden St
Philadelphia, Pennsylvania 19130

From: Ashley Scrivener
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 3:52:15 PM

Evergreen Resources,

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Ashley Scrivener
scrivstudios@gmail.com
4735 hazel ave
Philadelphia , Pennsylvania 19144

From: Jensen Sprowl
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Monday, January 11, 2021 8:22:48 PM

Evergreen Resources,

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From: Ashley Horrocks
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:42:47 PM

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Ashley Horrocks
maxgreenisluv@aim.com
841 plymouth road
Plymouth meeting, Pennsylvania 19462

From: Brandon Loyd
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:14:21 PM

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Brandon Loyd
brandonloyd9@gmail.com
463 W Abbottsford Ave
Philadelphia, Pennsylvania 19144

From: Carl Bannerman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:55:15 PM

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Carl Bannerman
bannermancarl@gmail.com
4019 Baring Street
Philadelphia, Pennsylvania 19104

From: Charissa Iluore
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:46:21 PM

Evergreen Resources,

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Charissa Iluore
ciluore@gmail.com
4525 Walnut St
Philadelphia, Pennsylvania 19139

From: Charissa Iluore
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:49:59 PM

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Charissa Iluore
ciluore@gmail.com
4525 Walnut St
Philadelphia, Pennsylvania 19139

From:	Cheryl Pyrch
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 12, 2021 9:11:19 PM

Dear phillyrefinerycleanup.info,

I am writing on behalf of the Philadelphia Chapter of Pennsylvania Interfaith Power & Light, people of faith concerned about climate change as a moral issue. We were involved in the movement to close the refinery and are very glad that it will no longer be a fossil-fuel production site.

However, the clean up must be thorough if we are to live out our call to be good stewards of the environment and just to the nearby community which bore the brunt of the refinery's pollution. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site is not sufficient. We strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, any plan that does not take into account the effects of climate change is not reality based. It shirks our responsibility to future generations. We ask that Evergreen rewrite the proposal to take into account rising sea levels, more intense storms, and other climate-related factors.

We understand that over 100 years of refining oil has caused great damage to the site. But now is not a time to cut corners. It is time to take care, to think about the future, and to do what is needed so that the site will be life-supporting for all of Philadelphia for years to come. Thank you.

Sincerely,
Cheryl Pyrch
229 W. Upsal St. #105
Philadelphia, PA 19119

Lisa Alic

From: Cheryl Pyrch <cpyrch@summitpres.net>
Sent: Tuesday, January 12, 2021 9:16 PM
To: Philly Refinery Cleanup
Subject: Comment
Attachments: Comment on Refinery PAIPL.docx

Hi,

Just sent a comment through the website but it's attached as well. Cheryl Pyrch, chair Philadelphia Chapter of PA IPL, 646-319-8720

From: Evan Iliakis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:52:49 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Evan Iliakis
eai02014@mymail.pomona.edu
128 S Bonsall St
Philadelphia, Pennsylvania 19103

From: Grace Ng
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 7:13:16 PM

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Grace Ng
graceyng14@gmail.com
2330 Fitzwater St, Unit B
Philadelphia, Pennsylvania 19146

From: Harvey Chanin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:17:33 PM

Evergreen Resources,

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Harvey Chanin
harvey.chanin124@gmail.com
124 Tomlinson Rd
Philadelphia , Pennsylvania 19116

From: Idan Erez-Slott
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:39:01 PM

Evergreen Resources,

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Idan Erez-Slott
idan6460@gmail.com
1 Dancing Rabbit Ln
Rutledge, Missouri 63563

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 9:41:33 PM

Name

Indi Williams

Email

9819094@philasd.org

Address

110 N 61st
Philadelphia, Pennsylvania 19139
United States
Map It

Report

Philadelphia Refinery_Lead HHRA _02-24-15

Comment

To Whom It May Concern,

My name is Indi Williams and I am a high school student in Philadelphia. I am in the 10th grade and I live in a nice neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.
Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site.
I would like to begin by sharing my hope, I hope you guys fix the problems with the refinery. I hope this occurs because the refinery is giving off pollutants that are harmful to civilians around the area.
Unfortunately, there a few things that I am concerned with as well, including pollutants and waste dumping. I'm worried about lead because it can cause drastic health effects, such as increased blood pressure, weakness in the ankles, and brain damage.
Another concern I have is about benzene because it causes confusion, tremors, rapid heart rate, and convulsions.
Thank you for taking the time to read my comments. Recently, I learned a lot about the D.E.P, so I will leave you with this quote " Hilco seems to opting for the cheapest remediation methods not the best one ".
Best Regards,
Indi Williams

From: Isabelle Rule-Becker
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:21:02 PM

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Isabelle Rule-Becker
i.rulebecker@gmail.com
101 North Merion Ave
Bryn Mawr, Pennsylvania 19010

From: Joe Brewer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 7:58:56 PM

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Joe Brewer
brewerjoe@me.com
2710 trent pines ct
Sherrills ford, North Carolina 28673

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 7:51:07 PM

Name

Jon Radice

Email

JRADICE@GEOSYNTEC.COM

Address

1518 Walnut Street Suite 1110
Philadelphia, Pennsylvania 19102
United States
Map It

Report

Philadelphia Refinery_AOI 8 RIR_12-21-17

Comment

This comment regards the benzene groundwater contamination on the Verizon SDWC property and subsequent properties. There does not seem to be sufficient sampling points located on the properties to the north of N-3 or west of V-MW-9 to accurately estimate the true extent of the plume. Similarly there appears to be insufficient data points to the north east of V-MW-16 on the north part of the Verizon SDWC property to properly determine a contaminant boundary . Was subsequent sampling and monitoring performed alongside I-76 or on the other side of the highway near the Philadelphia Housing Authority building to further delineate offsite impacts? Water level gradients seem to indicate slight a NE flow off of the Verizon SDWC that this report did not consider or investigate

In addition the pump-and-treat system along Maiden Ln does not look like it changes the gradient of the plume that extends to the Verizon SDWC property and beyond. What is being done to properly delineate and mitigate this off-site benzene issue?

From: Jose Garcia
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 1:42:14 PM

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Jose Garcia
jose.a.garcia@aol.com
2501 Washington ave
Philadelphia , Massachusetts 02135

From: Kaelor Gordon
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:23:58 PM

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Kaelor Gordon
kg7894@gmail.com
3900 CITY AVE
PHILADELPHIA, Pennsylvania 19131

From: Kiran Raja
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:00:58 PM

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Kiran Raja
kiran1raja@gmail.com
3817 Spruce Street
Philadelphia, Pennsylvania 19104

From:	Ialur Lane
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 12, 2021 7:44:36 PM

Dear phillyrefinerycleanup.info,

Evergeen must use the highest standards for cleaning up this site.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
lalur Lane
303 St Peters Way
Philadelphia, PA 19106

From: Lauren Callans
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 7:23:47 PM

Evergreen Resources,

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

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Lauren Callans
lauren.callans@gmail.com
2329 St. Albans St
Philadelphia , Pennsylvania 19146

From: Likhitha Kolla
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:38:28 PM

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Likhitha Kolla
likhithakolla@gmail.com
226W Rittenhouse Sq
Philadelphia, Pennsylvania 19103

From: Mary Dever
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:12:26 PM

Evergreen Resources,

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Mary Dever
devermk@gmail.com
463 W Abbottsford Ave
Philadelphia, Pennsylvania 19144

From: Max Freedman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:41:31 PM

Evergreen Resources,

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Max Freedman
maxsfreedman@gmail.com
1531 S 18th St
Philadelphia, Pennsylvania 19146

From: Meera Krishnamoorthy
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 10:31:24 PM

Evergreen Resources,

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As a concerned citizen and member of the healthcare community I recognize that there are drastic effects on the health of those in this community from this incident and I hope that measures can be taken to further public safety.

Meera Krishnamoorthy
meerak0597@gmail.com
13201 Dutrow Dr
Clarksburg, Maryland 20871

From: Olivia Palmer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 7:10:44 PM

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Olivia Palmer
opalmer14@gmail.com
1012 s 19th
Philadelphia, Pennsylvania 19146

From: Olivia Sandvold
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 7:56:24 PM

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Olivia Sandvold
oliver302@gmail.com
2624 South St
Philadelphia, Pennsylvania 19146

From: Randall Burson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:45:58 PM

Evergreen Resources,

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Randall Burson
rcburson2@gmail.com
3260 South St.
Philadelphia, New Mexico 87031

From: Shannon Connors
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:52:09 PM

Evergreen Resources,

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Shannon Connors
sconnors174@gmail.com
239 Milton Drive
Malvern, Pennsylvania 19355

From: Simi Tani-Olugbemi
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:17:28 PM

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Simi Tani-Olugbemi
tuk33372@temple.edu
920 N 17th Unit 2
Philadelphia, Pennsylvania 19130

From: Tab Skervin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:34:23 PM

Evergreen Resources,

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Tab Skervin
Tabitha@eqat.org
5412 Webster St
Pholadelphia, Pennsylvania 19143

From: zrandom5@yahoo.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:30:29 PM

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zrandom5@yahoo.com
3723 Brandywine St Apt 2
Philadelphia, Pennsylvania 19104

From: Avi Rubin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:47:20 AM

Evergreen Resources,

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Avi Rubin
avirrubin@gmail.com
4795 Edison Ave
Boulder, Colorado 80301

From:	Barry Weiss
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 12:38:19 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Barry Weiss
10842 Lockart Ct Apt B # B
B
Philadelphia, PA 19116
(215) 969-9555

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 1:21:14 PM

Name

brandon head

Email

7630537@philasd.org

Address

United States
Map It

Report

Philadelphia Refinery_Lead HHRA _02-24-15

Comment

To Whom It May Concern,

My name is Brandon Head and I am a high school student in Philadelphia. I am in the 10th grade and live in East Falls neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.

Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site..

I would like to begin by sharing my hope. I hope that the refinery will have a great clean up team. I hope this occurs because the neighborhoods would like for this to be clean the right way.

Unfortunately, there are a few things that I am concerned with as well, including recycling the debris and where are they going to take it? I'm worried about Hydrofluoric acid or HF because if it gets into the neighborhood and someone throws a cigarette and it hits it, the whole neighborhood will blow up causing massive casualties.

Another concern I have is about Butane because this is the second large chemical in there this is lighter fluid and if it's the right pressure and temperature then this will blow up also, this was the gas that blow up in the first place and if this was in a neighborhood it would be like a nuclear bomb exploded.

Thank you for taking the time to read my comments. Recently, I learned a lot about Robert Brady , so I will leave you with this quote, "Three quarters of the East Coast's refinery capability is located in the Philadelphia region."

Best Regards,
Brandon Head

From: Cameron Farthing
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 1:40:07 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

We the people demand a safe environment to live in. Unless this site is cleaned up to PA health levels this safe environment for the people cannot be achieved.

Cameron Farthing
camfarthing@gmail.com
801 N. 3rd St, ATP 1
Philadelphia, Pennsylvania 19123

From: Abby Kallin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:04:34 PM

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Abby Kallin
chrissy2018legend@gmail.com
1448 S TAYLOR ST
Philadelphia, Pennsylvania 19146

From: Carolyn Chow
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:53:08 PM

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Carolyn Chow
carolyn.chow@pennmedicine.upenn.edu
2201 Chestnut
Philadelphia, Pennsylvania 19103

From:	Chris Spencer
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 12:11:53 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
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- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Chris Spencer
314 Kauffman St
Philadelphia, PA 19147
(610) 896-1342

From: Dan Gordon
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:36:06 PM

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Dan Gordon
dgordon234@gmail.com
P.O. Box 512
Minturn , Colorado 81645

From: Dan White
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:47:24 PM

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Dan White
danxwhite@gmail.com
1530 s 5th st
Philadelphia, Pennsylvania 19147

From: Danika Tomchinsky-Holland
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 2:09:34 PM

Evergreen Resources,

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Danika Tomchinsky-Holland
danika.tomchinsky@gmail.com
3518 Kirkwood Place
Boulder, Colorado 80304

From:	Doff Meyer
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 11:58:24 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Ms. Doff Meyer
1354 S Bouvier
Philadelphia, PA 19146
(215) 290-2906

From: E A
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:19:02 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

E A
bbarias23@gmail.com
Q
Q, Pennsylvania 19130

From:	E Gardner
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:41:46 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. E Gardner
1513 W Girard Ave
Philadelphia, PA 19130
(757) 537-4409

From:	Eleanor Dill
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 12, 2021 1:11:51 PM

Dear phillyrefinerycleanup.info,

As a former Environmental Public Health employee, I am shocked that Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes. This community has been over-exposed far to long.

Sincerely,
Eleanor Dill
27 E Browning Rd Apt B
Collingswood, NJ 08108

From: Elizabeth Beard
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:03:23 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Elizabeth Beard
ebeard19@gmail.com
5132 Catharine St
Philadelphia, Pennsylvania 19143

From: Elizabeth Studer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:31:46 AM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Elizabeth Studer
elistuder@gmail.com
1505 n myrtlewood st
Philadelphia, Pennsylvania 19121

From: Frances Millar
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:41:19 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Frances Millar
frances.fcm.millar3@gmail.com
2407 Longest Ave
Louisville , Kentucky 40204

From: Grace Walton
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:09:30 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
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- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Grace Walton
gracekwalt@gmail.com
1113 winton st
Philadelphia , Pennsylvania 19148

From: Griffin Ayres
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:31:06 PM

Evergreen Resources,

I'd like to submit comments dealing with three matters related to the refinery clean-up: process comments, issue comments, and unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide "meaningful public involvement" in the Act 2 processes. The Public Involvement Process is inadequate.
- Evergreen has not given the community enough time to understand and consider all of the information. 120 days is insufficient.
- Evergreen has not actually addressed community concerns in ways that are relevant to the community
- Air quality was tested inside existing buildings, but NOT in surrounding neighborhoods or onsite at contaminated locations

Comments on Contaminants of Concern:
- Lead - high levels of lead appear in multiple locations. PADEP is letting Evergreen use a "site-specific lead standard" of 2240 PPM, but the statewide health limit is under half that, 1000 PPM
- Benzene - benzene is both present in high levels at the site and being emitted into the atmosphere
- MBTE - Methyl Tert-butyl Ether (MTBE) is present at concentrations over 100x higher than the state-wide health standard
- 30 contaminants of concern were identified individually, but they are not present individually, they are present together. What is their cumulative effect? If that wasn't determined, why not?
- The refinery used more than those 30 chemical compounds. Why were only those 30 sampled? If it is believed that other compounds are safe, what happens if we ignore their presence now and then future research shows they were dangerous?
- Deep Aquifer - Evergreen says that the "water table" and "deep aquifer" are separated by clay and mud, but that barrier isn't continuous or impregnable, so Evergreen needs to say what it will do to investigate and fix any contamination that crosses into the aquifer which supplies drinking water in New Jersey

Comments on Unaddressed Issues
- Current conditions - Some of the data is from over a decade ago
- Off-site contamination - Benzene pools exist beyond the property line, but Evergreen has not mapped or acknowledged any responsibility for contaminants that originated inside the site but extend outside it
- Water treatment - there isn't enough information about the current contamination conditions

or why Hilco's plans to replace the systems are appropriate or what they are
- PFAS - Fire fighting and training exercises have released PFAS ("forever carcinogens") at the site. Evergreen needs to sample for PFAS and include them in plans for remediation.

Griffin Ayres
griffinayres0@gmail.com
417 South 44th Street
Philadelphia, Pennsylvania 19104

From: Haley Blazer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:47:57 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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Haley Blazer
haleyblazer@gmail.com
5118 Whitby Ave
Philadelphia, Pennsylvania 19143

From:	Homer Robinson
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 2:07:16 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

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Specifically, I call on you to:
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- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Homer Robinson
624 W Upsal St
Philadelphia, PA 19119
(267) 331-5979

From: hudaziz@gmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:37:47 AM

Evergreen Resources,

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hudaziz@gmail.com
2224 mifflin st
Philadelphia, Pennsylvania 19145

From: Ian Bosak
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:31:30 AM

Evergreen Resources,

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Ian Bosak
ianbosak@gmail.com
2122 s lambert st
Philadelphia, Pennsylvania 19145

From: Ian Louda
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:07:03 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Ian Louda
iclouda@gmail.com
901 N 30th St.
Philadelphia, Pennsylvania 19130

From: Indira Jimenez
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 9:57:36 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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Indira Jimenez
indirajimenez21@gmail.com
1720 Moore St
Philadelphia, Pennsylvania 19145

From:	JANICE LOUDEN
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 1:49:10 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Miss. JANICE LOUDEN
5841 SAUL ST
PHILADELPHIA, PA 19149
(267) 538-5606

From: Jeanette Miller
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 3:10:34 PM

Evergreen Resources,

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Jeanette Miller
mjeanette204@gmail.com
1521 so 32nd street
Philly , Pennsylvania 19146

From:	Jeanne C Myers
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:52:43 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to Dramatically Strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

I look forward to hearing your response.

Sincerely,
Dr. Jeanne C Myers
210 Locust St
Apt 23D
Philadelphia, PA 19106
(215) 592-4096

From: Jenny Gaeng
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:14:27 PM

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Jenny Gaeng
jengaeng@gmail.com
3515 N. Columbine St.
Denver, Colorado 80205

From: Jessica Snyder
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:17:05 PM

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Jessica Snyder
fessicasmith@yahoo.com
27 Luquer St
Brooklyn, New York 11231

From: Jill Hladczuk
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:53:20 PM

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Jill Hladczuk
jhladczuk@gmail.com
1844 Memphis St
Philadelphia, Pennsylvania 19125

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 1:15:33 PM

Name

Jocelyn Eaton

Email

7994242@philasd.org

Address

United States
Map It

Report

Philadelphia Refinery_AOI 11 SCR_RIR_09-12-11

Comment

To Whom It May Concern,

My name is Jocelyn E. and I am a high school student in Philadelphia. I am in the 10th grade and live in a North West Philly neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.

Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site..

I would like to begin by sharing my hope. I hope that less Refineries are put in Philadelphia . I hope this occurs because people tend to put more refineries and factories etc in cities with less fortunate people and also discriminate because of the color of our skin (black and brown people).
Unfortunately, there are a few things that I am concerned with as well, including pollution and chemicals. I'm worried about hydrochloric acid because if hydrochloric acid gas in the air is 0.035%, Humans can have pain in their throat and chest which can cause trouble breathing within 10 minutes.
Another concern I have is about nickel carbonyl because nickel carbonyl is very toxic and can cause chronic bronchitis, reduced lung function, and lung and nasal cancer if breathed in.
Thank you for taking the time to read my comments. Recently, I learned a lot about Tyrone Hayes, so I will leave you with this quote, "The secret to a happy, successful life of paranoia is to keep careful track of your persecutors ."

Thank You,
Jocelyn Eaton

From: Joe Wozniak
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:08:35 AM

Evergreen Resources,

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Joe Wozniak
woz.joe@gmail.com
2923 W Girard Ave
Philadelphia , Pennsylvania 19130

From: Johannah CordonHill
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:14:01 PM

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Johannah CordonHill
jcordonhill@gmail.com
758 S 51st st
Philadelphia, Pennsylvania 19143

From: Joshua Lerner
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 3:13:44 PM

Evergreen Resources,

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Joshua Lerner
shaftboson@gmail.com
3815 Kirkwood pl
Boulder, Colorado 80303

From: Justin Palmisano
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:19:51 PM

Evergreen Resources,

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Justin Palmisano
justinridesafuji@gmail.com
923 S 49th st Apt 2R
Philadelphia, Pennsylvania 19143

From: Katherine Luchette
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 6:11:59 PM

Evergreen Resources,

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Katherine Luchette
katie.luchette@gmail.com
2223 Grays Ferry Avenue, Apt A
Philadelphia, Pennsylvania 19146

From: Katherine Pietrangelo
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:21:21 PM

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Thank you.

Katherine Pietrangelo
kpietrangelo@gmail.com
1536 S 4th St
Philadelphia, Pennsylvania 19147

From: Katherine Urbaniak
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 3:05:00 PM

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Katherine Urbaniak
katherine.urbaniak@yahoo.com
913 PINE STREET APT 201
PHILADELPHIA, Pennsylvania 19107

From: keenan bloom
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 2:35:54 PM

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keenan bloom
keenanbloom@gmail.com
3526 Kirkwood Place
Boulder, Colorado 80304

From: Kerry Janson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:01:12 AM

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Kerry Janson
kjan1289@gmail.com
119 Morton Ave
Broomall, Pennsylvania 19008

From: kimbyj12@gmail.com
To: Philly Refinery Cleanup
Subject: Want to attend on 1/14 - Public Information Session
Date: Tuesday, January 12, 2021 3:24:41 PM
Importance: High

Hello,
I would like to attend this on Thursday. Please provide the Zoom link.
Thank you, Best, Kim

Kimberly J. Allen
Kimbyj12@gmail.com
(267) 253-4391

From: Kimberly Mehler
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 2:11:23 PM

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Kimberly Mehler
kimehler1121@gmail.com
651 Seminole Ave
Jenkintown, Pennsylvania 19046

From: Lacey Ranf
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:14:37 PM

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Lacey Ranf
laceyranf@gmail.com
874 sunshine canyon dr
Boulder, Colorado 80302

From: Laura Fotiou
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 3:08:02 PM

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Laura Fotiou
lfotiou28@gmail.com
1107 Latona street
Philadelphia , Pennsylvania 19147

From: Leah Chatterji
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:14:36 PM

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Leah Chatterji
leah.soccergal@gmail.com
1422 linden
Oakland , California 94607

From: Lily Cheng
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:56:58 PM

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Lily Cheng
chenglily01@yahoo.com
329 N Preston
Philadelphia, Pennsylvania 19104

From: Madeleine Dietrich
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:36:49 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Madeleine Dietrich
madeleinexdietrich@gmail.com
1613 upland ave
Jenkintown, Pennsylvania 19046

From: Maeve Masterson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:29:05 PM

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Maeve Masterson
mmaeve@sas.upenn.edu
216 S 41st St
Philadelphia, Pennsylvania 19104

From: Marisa Wilson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Sunday, January 10, 2021 7:20:17 PM

Evergreen Resources,

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Marisa Wilson
marisatwilson@gmail.com
4916 Hazel Ave, Apt 1
Philadelphia, Pennsylvania 19143

From:	Mark Barbash
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 11:15:21 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Mark Barbash
1907 Brandywine St
Philadelphia, PA 19130
(215) 756-1105

From: Maya Golan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:56:44 AM

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Maya Golan
mayagolan29@gmail.com
North foothills highway
Boulder , Colorado 80302

From: MC Mazzocchi
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 3:47:14 PM

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MC Mazzocchi
mmazzoc1@gmail.com
5503 Springfield Ave
Philadelphia, Pennsylvania 19143

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Date: Tuesday, January 12, 2021 3:47:14 PM

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MC Mazzocchi
mmazzoc1@gmail.com
5503 Springfield Ave
Philadelphia, Pennsylvania 19143

From: Megan Whitman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:03:19 AM

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Megan Whitman
megan2whitman@gmail.com
1311 n Hollywood
Philadelphia , Pennsylvania 19121

From: Megan Zhao
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:46:07 PM

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Megan Zhao
megan.zhao@pennmedicine.upenn.edu
128 S Bonsall Street
Philadelphia, Pennsylvania 19103

From: Melissa Ostroff
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:35:30 PM

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Melissa Ostroff
melissa.ostroff@gmail.com
740 S 5TH ST, 3rd Floor
Philadelphia, Pennsylvania 19147

From:	Merrily Williams
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 10:10:24 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Ms. Merrily Williams
230 S. 21st St.
Philadelphia, PA 19103
(215) 917-0356

From:	Michael Zuckerman
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:50:32 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

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Dear ,

Dear Evergreen Resources,

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Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Dr. Michael Zuckerman
3207 Winter St
Philadelphia, PA 19104
(609) 392-5729

From: Mikaela Roselli
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:05:42 PM

Evergreen Resources,

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Mikaela Roselli
mikaelaroselli@yahoo.com
820 clover lane
Plymouth meeting , Pennsylvania 19462

From: Mike Ryan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:31:11 AM

Evergreen Resources,

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Mike Ryan
mfryan88@gmail.com
3231 Almond Street
Philadelphia, Pennsylvania 19134

From: Natalie Walker
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:13:49 PM

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Natalie Walker
walkerns42@gmail.com
1935 Mt. Vernon St
Philadelphia, Pennsylvania 19130

From: Neil McVay
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:53:00 PM

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Neil McVay
goalie787@hotmail.com
4033 E 17th Ave Parkway
Denver, Colorado 80220

From: Nicole Farthing
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 1:16:27 PM

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We the people demand a safe environment to live in. Without the complete clean up of this site, we can not have that right to a safe and healthy life or future.

Nicole Farthing
nicolesigrie@gmail.com
12 W. Ward St
Ridley Park, Pennsylvania 19078

From: Nipun Kottage
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:38:59 PM

Evergreen Resources,

My name is Nipun Kottage and I moved to Philadelphia to attend medical school. During my brief time here I have become increasingly concerned about Hilco and Evergreen's plan to develop the PES Refinery Site responsibly and equitably. Please find copied below details of my concerns. Importantly, I believe that Hilco must provide up-to-date, factually correct, and timely information about the status of the site's pollution and the harm pollutants at the site (past, present, and future) and inflicting upon neighboring communities. Currently the burden of asthma and cancer around the site suggest that there are significant health risks that need to be remediated and addressed by Hilco. This solution must include more time for public comment and collaborative and meaningful engagement with residents of neighboring communities impacted by legacy contamination and who will be affected by development.

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Nipun Kottage
Nipun.Kottage@Pennmedicine.upenn.edu
2123 Carpenter Street
PHILADELPHIA, Pennsylvania 19146

From: Patric Spriggs
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:22:52 PM

Evergreen Resources,

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Patric Spriggs
sagetosomeone@yahoo.com
4256 Redwood Court
Boulder, Colorado 80301

From:	Peter Hecht
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:41:09 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Peter Hecht
704 Montrose St
Philadelphia, PA 19147
(215) 922-3384

From: Phoebe Bolz
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:14:49 PM

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Phoebe Bolz
pbolz10@gmail.com
101 N. Merion Ave, C 147
Bryn Mawr, Pennsylvania 19010

From: Rachel Fifer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 10:20:05 AM

Evergreen Resources,

Listen up!

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Rachel Fifer
rachel.fifer@gmail.com
4945 Hazel Avenue
Philadelphia, Pennsylvania 19143

From: Raleigh Drennon
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:32:43 PM

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Raleigh Drennon
imightbeanemic@gmail.com
825 Isabella St
Oakland, California 94607

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 1:07:31 PM

Name

ramiyah wilson

Email

7842374@philasd.org

Address

2127 anchor st
Philadephia, Pennsylvania 19124
United States
Map It

Report

Philadelphia Refinery_Lead HHRA _02-24-15

Comment

To Whom It May Concern,

My name is Ramiyah Wilson and I am a high school student in Philadelphia. I am in the 10th grade and live in the Northeast neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.

Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site..

I would like to begin by sharing my hope. I hope that it's used in a good way and cleaned right because we don't need those remaining chemicals still there affecting people. I hope this occurs because people of color make up 30% of the US population and 65% of the population living in neighborhoods with factories that leave toxic chemicals and I feel like it happened once with the Philadelphia Refinery blowing up before leaving chemicals in the air wasn't really good and we don't need a repeat.

Unfortunately, there are a few things that I am concerned with as well, including there still may be toxins left in the soil or just lying around and people can be harmed and make life-changing choices. and they may not really care about our health, they just want money. Also whoever cleans it up may become lazy and not properly clean it up. I'm worried about benzene because when the Refinery got caught on fire this one of the major chemicals released and it left five people severely harmed and we don't want that again

Another concern I have is about lead being released because this was another major chemical that we were breathing in back in 2019 when the fire happened and I just want it to be safe for all workers and cleaners.
Thank you for taking the time to read my comments. Recently, I learned a lot about Majora Carter, so I will leave you with this quote, " If we are going to be part of the solution, we have to engage the problems ."

Best Regards,
Ramiyah Wilson

From:	Randall Couch
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 10:23:44 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Randall Couch
423 East Allens Ln
Philadelphia, PA 19119
(215) 247-6877

From: Robert Brown
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:36:04 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
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Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Robert Brown
robrown1017@gmail.com
1809 s 13th Street
Philadelphia , Pennsylvania 19148

From:	Rona Rosen
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:56:43 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
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- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mrs. Rona Rosen
9862 Bonner St
Philadelphia, PA 19115
(215) 831-2975

From: Rudmila Rashid
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:50:45 PM

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Rudmila Rashid
rudmila.rashid@pennmedicine.upenn.edu
2101 Chestnut St
Philadelphia , Pennsylvania 19103

From: salynnsm@gmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 1:00:26 PM

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salynnsm@gmail.com
824 s st Bernard street
Philadelphia, Pennsylvania 19139

From: Samuel Faulkner
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:52:27 PM

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Samuel Faulkner
samfaulkner007@gmail.com
5029 cedar avenue apt 3
Philadelphia , Pennsylvania 19143

From: Sara Banbury
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:50:49 PM

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Sara Banbury
sara.banbury@pennmedicine.upenn.edu
2140 Christian St
Philadelphia, Connecticut 06883

From: Sarah Mohtes-Chan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:27:51 PM

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Sarah Mohtes-Chan
smohtesc@gmail.com
1901 Callowhill St APT 508
Philadlephia , Pennsylvania 19130

From: Scott Wushensky
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 1:10:56 PM

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Scott Wushensky
scott.wushensky@gmail.com
410 Hessian Drive
Kennett Square, Pennsylvania 19348

From: Sequoyah Healy-Louer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:51:45 PM

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Sequoyah Healy-Louer
sshealylouer@gmail.com
678 E. 4th Ave #4
Denver, Colorado 80203

From:	Sheila Siegel
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 4:51:20 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
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RE: Please strengthen cleanup plan for PES refinery

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Sincerely,
Ms. Sheila Siegel
604S.WashingtonSq.
Philadelphia, PA 19106
(267) 886-9610

From:	Sid Amster
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 10:36:44 AM

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P.O. Box 7275
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Sincerely,
Mr. Sid Amster
1401 Walnut St Apt 1205
Apt. 1205
Philadelphia, PA 19102
(267) 886-8971

From: Sidney Nunes
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:55:44 PM

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Sidney Nunes
lemmennunes@gmail.com
301 South 19th Street, Apt 7C
Philadelphia, Pennsylvania 19103

From: Sophie Friedenwald-Fishman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:17:13 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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Sophie Friedenwald-Fishman
sophieflora2000@gmail.com
101 N Merion Ave C-422
Bryn Mawr, Pennsylvania 19010

From: Stephen Pressman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 12:03:30 AM

Evergreen Resources,

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Stephen Pressman
spressman5@yahoo.com
1137 S 20th St
Philadelphia, Pennsylvania 19146

From:	Svetlana Milutinovic
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 10:26:32 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Dr. Svetlana Milutinovic
240 South 33rd Street
Philadelphia, PA 19104
(215) 573-6799

From: taralee0123@yahoo.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 4:41:54 PM

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taralee0123@yahoo.com
8911 Hester Beasley Rd.
Nashville, Tennessee 37221

From: Taylor Curtis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 8:30:54 AM

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Taylor Curtis
taylormcurtis@gmail.com
518 e cambria st
Philadelphia , Pennsylvania 19134

From: Tom Riese
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 11:48:47 AM

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Tom Riese
tomlriese@gmail.com
626 n 32nd St, Apt 3
Philadelphia, Pennsylvania 19104

From: Travis Wall
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:07:52 PM

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Travis Wall
twalldesign@gmail.com
1422 Linden St
Oakland, California 94607

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Tuesday, January 12, 2021 1:20:07 PM

Name

Trinity Clark

Email

trinityclark37@gmail.com

Address

Pennsylvania Philadelphia
United States
Map It

Report

Philadelphia Refinery_Lead HHRA _02-24-15

Comment

To Whom It May Concern,

My name is Trinity Autumn Clark and I am a high school student in Philadelphia. I am in the 10th grade and live in North Philadelphia/East Falls neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.

Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site..

I would like to begin by sharing my hope. I hope that the people that live in areas exposed to the refinery are relocated. I hope this occurs because There were incidents in places like New Orleans that led people exposed to chemicals set off by refineries to have respiratory and immune issues. A pipe leak even led a boy and older woman to death by an explosion who lived near the place.

Unfortunately, there are a few things that I am concerned with as well, including The explosion and dangerous chemical reactions. I'm worried about hydrofluoric Acid because it was proved to form toxic clouds that could cause severe health problems like chronic lung disease, and lead to death to people exposed to it long term.

Another concern I have is about Benzene because it can cause red blood cells to decrease, which can cause people to develop anemia.

Thank you for taking the time to read my comments. Recently, I learned a lot about Margie Eugene-Richard, so I will leave you with this quote, " We must do everything to improve human life, environmental issues should never be ignored."

Thank you,
Trinity A. Clark

From: Trinity Lyman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:27:31 PM

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Trinity Lyman
tlyman@cleanwater.org
5435 MacArthur Blvd
Oakland, Saare Maakond 94629

From:	Vic Compher Compher
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 10:34:07 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mr. Vic Compher Compher
604 S. Washington Square
Philadelphia, PA 19106
(267) 266-0842

From: Vinayak Ahluwalia
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 5:42:32 PM

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Vinayak Ahluwalia
vahluw@umich.edu
2130 Webster St
Philadelphia, Pennsylvania 19146

From: zannon miller
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Tuesday, January 12, 2021 1:30:26 PM

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

zannon miller
zannonmiller13@gmail.com
6023 SE 101st
portland, Oregon 97266

From:	Merle Savedow
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Tuesday, January 12, 2021 9:41:57 AM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Mrs. Merle Savedow
508 East Allens Lane
Philadelphia, PA 19119
(215) 242-4897

From:	Aaron Bauman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 8:44:44 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Aaron Bauman
1411 S Franklin St
Philadelphia, PA 19147

From: Abigail Mcguckin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 10:47:29 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
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Abigail Mcguckin
abby.mcguckin3@gmail.com
585 county line rd
Radnor, Pennsylvania Pa

From: Agnes Ezekwesili
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 10:32:51 AM

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Agnes Ezekwesili
agnes.ezekwesili@pennmedicine.upenn.edu
2423 Grays Ferry Ave
Philadelphia, Pennsylvania 19146

Lisa Alic

From: Albert Littlepage <apage1801@aol.com>
Sent: Wednesday, January 13, 2021 9:23 AM
To: Philly Refinery Cleanup
Subject: PES
Attachments: PBCDC Comment to Evergreen.docx

Please see attached document

From:	Allegra Armstrong
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 1:43:06 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Allegra Armstrong
237 a 18th st
Philadelphia, PA 19103

From: Amalia Aviles-Lugo
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 2:52:46 PM

Evergreen Resources,

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Amalia Aviles-Lugo
6.ailama@gmail.com
308 S 50th St, Apt 4
Phialdelphia, Pennsylvania 19143

From: Amanda Lapham
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:34:12 PM

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Amanda Lapham
amanda.lapham42@gmail.com
315 North 12th Street
Philadelphia, Pennsylvania 19107

From: Anastasia Lukovenko
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:41:54 PM

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Anastasia Lukovenko
anastasialukovenko@gmail.com
2248 S Bonsall St
Philadelphia, Pennsylvania 19145

From: Ann Dixon
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:23:32 PM

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Ann Dixon
anndixon4523@gmail.com
4523 Osage Avenue
Philadelphia, Pennsylvania 19143

From:	Ann Dixon
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 7:18:38 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ann Dixon
4523 Osage Avenue
Philadelphia, PA 19143

From: Anna Novikova
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:02:43 AM

Evergreen Resources,

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Anna Novikova
anna.novikova@ymail.com
1750 S 15th Street
Philadelphia, Pennsylvania 19145

From:	Annalyse Solitario
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 4:58:40 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Annalyse Solitario
604 S. Clifton street
Philadelphia, PA 19147

From: Annie Wilson
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:40:18 PM

Evergreen Resources,

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- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Annie Wilson
anne.macg.wilson@gmail.com
990 n Randolph st
Philadelphia, Pennsylvania 19123

From:	Arianne Allan
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:57:35 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Arianne Allan
12 Brookside Rd
Wallingford, PA 19086

From: atteach@hotmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:36:15 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

atteach@hotmail.com
2007 chestnut street
Philadelphia , Pennsylvania 19103

Lisa Alic

From: Brett Nedelkoff <Brett.Nedelkoff@Phila.gov>
Sent: Wednesday, January 13, 2021 7:47 PM
To: Philly Refinery Cleanup
Cc: rapatel@pa.gov; Kenyatta Johnson; Joshu Harris
Subject: Councilmember Kenyatta Johnson's Comments on Evergreen Remediation
Attachments: CMJohnson Evergreen Letter.pdf

To Whom it May Concern,

Please see the attached letter from Councilmember Kenyatta Johnson regarding his comments on Evergreen's planned remediation of the former Philadelphia refinery site. This letter is to be included on the record for public input for the consideration of Evergreen and the Pennsylvania Department of Environmental Protection (DEP).

If you have any questions about this letter, please feel free to reach out to our office.

Thank you,

Brett Nedelkoff
Legislative Assistant
Pronouns: She | Her
Office of Councilman Kenyatta Johnson
City Hall, Room 580
Philadelphia, PA 19107
(215) 686-3412
Brett.Nedelkoff@phila.gov

From: Brian Murray
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:42:39 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

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- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Brian Murray
bmurray@murraymfg.com
513 Cedar Lane, , false
SWARTHMORE, Pennsylvania 19081

From: Brighid Kelly
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:48:58 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Brighid Kelly
raybrigduke@yahoo.com
316 maple
Swarthmore, Pennsylvania 19081

From:	Britt Faulstick
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 12:56:59 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Britt Faulstick
2633 S. 17th St.
Philadelphia, PA 19145

From:	Brodie Weigelt
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:12:40 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Brodie Weigelt
201 s 25th street
Philadelphia, PA 19103

From:	Bryn Stull
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 12:17:14 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bryn Stull
2530 S Cleveland St
Philadelphia, PA 19145

From:	Cameron Adamez
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 1:50:09 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Cameron Adamez
1134 Mercy St
Philadelphia, PA 19148

From:	Catherine Ellenberg
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:46:35 PM

Dear phillyrefinerycleanup.info,

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Finally, it is my understanding that Evergreen has not conducted any sampling of the deep aquifer which supports sources of drinking water for New Jersey. Evergreen should expand their investigation to more thoroughly consider the potential for off-site groundwater contamination and the impacts on neighboring communities not limited to Philadelphia County.

Please take these comments seriously and make the necessary changes.

Sincerely,
Catherine Ellenberg
270 Genesee Road
Clarksboro, NJ 08020

From: Christopher Stephen
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:19:52 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Christopher Stephen
chris.m.stephen@gmail.com
1001 chestnut st
Philadelphia, Pennsylvania 19107

From:	Conrad Miller
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 11:00:14 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Conrad Miller
2142 S Lambert St
Philadelphia, PA 19145

From: Craig Johnson
To: Philly Refinery Cleanup
Subject: Environmental Monitoring
Date: Wednesday, January 13, 2021 7:45:33 PM

Evergreen Resources,

Immediate multiple station environmental sensing for air, water and soil is essential to establish a baseline of current and future conditions of the now Hilco owner of the refinery.

Craig Johnson
craig.johnson@interpretgreen.com
1100 LIVEZEY LN
Philadelphia, Pennsylvania 19119

From:	Dan Friedman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:26:32 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Dan Friedman
118 Queen Street
Philadelphia, PA 19147

From:	Dan Schupsky
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 1:01:38 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Lastly, why was Evergreen so delinquent in doing the outreach associated with the legal/contracted obligations to this site? Until the massive explosion, the community at large had not heard from them in years and their outreach/engagement was pitiful.

Please take these comments seriously and make the necessary changes.

Sincerely,
Dan Schupsky
2213 Pemberton Street
Philadelphia, PA 19146

From:	Dana Dentice
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:39:16 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health or equity for existing and future neighbors and users of the site.

I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes. We owe it to this community to protect their health to the maximum extent possible after decades of environmental and social injustice.

Thank you,
Dana Dentice

Sincerely,
Dana Dentice
920 S Saint Bernard St
Philadelphia, PA 19143

From: Dana Waldman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:18:38 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Dana Waldman
dwaldman05@gmail.com
175 Vincent Road
Paoli, Pennsylvania 19301

From:	Daniel Flinchbaugh
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:06:38 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Daniel Flinchbaugh
252 S. 45th St
PHILADELPHIA, PA 19107

From: Daniela Kaegi
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 4:52:51 PM

Evergreen Resources,

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Daniela Kaegi
dmkaegi@gmail.com
1224 East Snyder Ave
Philadelphia, Pennsylvania 19148

From:	David Szczepanik
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 11:32:34 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
David Szczepanik
1552 s Dover st
Philadelphia, PA 19146

From:	Dimitra Tsekoura
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:33:23 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Dimitra Tsekoura
219 S Bonsall St
Philadelphia, PA 19103

From: Elisa McCool
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:51:11 AM

Evergreen Resources,

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Elisa McCool
mccoolel@gmail.com
4916 Sansom St
Philadelphia, Pennsylvania 19139

From: Elizabeth González
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 1:31:38 PM

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Elizabeth González
elimariegonzalez@gmail.com
2501 Washington Avenue Apt. 303
Philadelphia , Pennsylvania 19146

From:	Elizabeth Hamann
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 4:21:54 PM

Dear phillyrefinerycleanup.info,

Make good on your promise to safely repair this scar in our city

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Hamann
732 S 21st Street
Philadelphia, PA 19146

From: Ellen Neises
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:58:10 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

I am writing to express concern about the level of investigation, reporting and public conversation about site contamination and clean up of the PES refinery site.

Evergreen should demonstrate that it is open to partnership with the public to prepare for the future of this site. This could be achieved by holding small-group meetings to allow for meaningful public engagement throughout the Act 2 process, and by creating a community-based advisory group to solicit questions and comments from the residents and businesses in the area.

I have reviewed Evergreen reports and attended public meetings along with many other concerned citizens. After exploring the materials at length, and attending meetings, many engaged Philadelphia residents don't agree that you are offering access to materials that facilitate public conversation about appropriate clean up measures. Delivering 1000-page documents for comment is not democratic. Your reports can easily be designed to make key data and decisions accessible to the public.

Creating living documents that update the state of knowledge about contamination, and incorporate public comment, will make for authentic public conversation about the future of this incredibly important place in our city. The recent NYT article about PES and Philly Thrive shows that the world is watching how we do this.

Many communities and cities are finding that COVID 19 doesn't have to stifle public debate. The South Philadelphia and Grays Ferry communities are comfortable with virtual tools that allow us to see and hear each other, as well as Evergreen. It is important that you adopt tools (which you likely use in your daily meetings with colleagues) that promote a true virtual public meeting.

Evergreen information sessions offer a strong basic primer on geology, groundwater and characterization of the contamination readings, and the presenters are very good at explaining things. Many engaged community members have already studied this material together, and with a variety of other subject matter experts, and are ready to move on to learning more about the key decisions being made now (or soon) about contamination management and clean up. Similarly, at the recent meeting held by SKEO and EPA, representatives were resistant to answering public questions beyond the scope of the TASC report. Limiting what information

will be given to the public to arbitrarily defined packages does not support “meaningful engagement” or transparency as defined by the law. I agree with other suggestions that Evergreen and others focus future discussion on critical paths for decisionmaking about management of risks to adjacent communities and the ecological future of the site.

It is important that public agencies at the state and city level ask more of Evergreen. Basic reporting, as required by state law, is not sufficient for this site. PFAS, for example, are likely highly concentrated here due to firefighting on site. I support the specific reporting measures recommended by the Clean Air Council in Mr. Minott’s op ed in The Inquirer this morning (January 13). This would be a big step forward.

Thank you for your attention to these concerns.
Ellen Neises

Ellen Neises
ellenneises@gmail.com
310 North 37th Street
Philadelphia, Pennsylvania 19104

From: Emily Wishnick
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:28:04 PM

Evergreen Resources,

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Emily Wishnick
emily.wishnick@gmail.com
4610 Chester ave, apt 1
Philadelphia , Pennsylvania 19143

From: Eve Lukens-Day
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:00:46 PM

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Eve Lukens-Day
elukensday17@gmail.com
352 E Roumfort Rd
Philadelphia, Pennsylvania 19119

From:	Eve Lukens-Day
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:57:39 AM

Dear phillyrefinerycleanup.info,

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Sincerely,
Eve Lukens-Day
352 E Roumfort Rd
Philadelphia, PA 19119

From: Fermin Morales
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:55:17 PM

Evergreen Resources,

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Fermin Morales
fuerzaycara@earthlink.net
2737 N. Reese St.
Pa, Pennsylvania 19133

From: Garth Connor
To: Philly Refinery Cleanup
Subject: South Philly Resident Public Comment
Date: Wednesday, January 13, 2021 6:48:47 PM

Subject: South Philly Resident Public Comment

Folks,

Hello, and I'm a South Philly resident and an environmental scientist. I'm especially interested in the Schuylkill River Bike Path improvements, and would like to get on your email list with redevelopment progress and updates. Thank you and good luck with the project,
Garth Connor

Sent from my iPhone

From: Gaye Wallace
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 10:33:34 AM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Gaye Wallace
gayeleah@gmail.com
5720 Wissahickon Avenue, E-5
Philadelphia, Pennsylvania 19144

From: Genny Silva
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:29:27 PM

Evergreen Resources,

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Genny Silva
gen.0808@gmail.com
2100 South Street #2
Philadelphia, Pennsylvania 19146

From:	Gianna Goldey
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:30:02 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gianna Goldey
327 Belgrade St.
Philadelphia, PA 19125

From: Heidi Sentivan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 4:29:16 PM

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Heidi Sentivan
hsentivan@gmail.com
2 Rutledge Ave
Rutledge, Pennsylvania 19070

From:	Jack Byerly
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:33:32 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jack Byerly
1234 S 7th St
Philadelphia, PA 19147

From: Jacob Kohler
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:31:31 PM

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Jacob Kohler
jake.kohler19@gmail.com
1448 S. Taylor St
Philadelphia, Pennsylvania 19146

From:	Jaime Wouters
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:03:26 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jaime Wouters
35 Campbell Rd
Hillsborough, NJ 08844

From:	Janet Lorenz
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 12:57:23 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Janet Lorenz
2103 Fitzwater Street
Philadelphia, PA 19146

From:	Joanna Roy
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:44:11 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Joanna Roy
917 S. 23rd Street
Philadelphia, PA 19146

From:	Joanne Kundrat
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 1:21:25 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

The current work cannot be evaluated until all analysis about the aquifers is completed. Without that information, the public does not have all of the information to evaluate decisions on soil and groundwater sampling.

Sincerely,
Joanne Kundrat
428 N 13 th St
Phildelphia, PA 19123

From:	John Londres
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:49:53 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
John Londres
1313 S Chadwick St
Philadelphia, PA 19146

From: Joshua Hubbard
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:57:58 AM

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Joshua Hubbard
joshhubbard997@gmail.com
1021 62nd street
Oakland, California 94608

From: Joy Chiu
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:16:08 AM

Evergreen Resources,

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Joy Chiu
joy.author@gmail.com
2201 Chestnut St
Philadelphia, Pennsylvania 19103

From: Justine Wang
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:14:09 PM

Evergreen Resources,

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Justine Wang
wang.justine@yahoo.com
3836 Spring Garden St.
Philadelphia, Pennsylvania 19104

From:	Katherine Canter
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 6:02:22 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Canter
3452 division street
Philadelphia, PA 19129

From: Katherine Stark
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 6:59:23 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Katherine Stark
kkstark@gmail.com
4523 Larchwood ave
Philadelphia, Pennsylvania 19143

From:	Katherine Stratton
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 12:04:06 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Stratton
2407 Madison Square
Philadelphia, PA 19146

From: Kathleen Raffaele
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 6:08:49 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Thank you,
Kathleen

Kathleen Raffaele
kathleer@yahoo.com
404 Drew Ave
Swarthmore , Pennsylvania 19081

From:	Katie Burrell
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:13:44 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katie Burrell
2242 Pemberton Street
Philadelphia, PA 19146

From: Kolson Schlosser
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 2:06:15 PM

Evergreen Resources,

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Kolson Schlosser
kolslaw@hotmail.com
1305 S Mole St
Philadelphia, Pennsylvania 19146

From:	Korin Tangtrakul
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:14:34 PM

Dear phillyrefinerycleanup.info,

As a Philadelphia resident and concerned citizen, I've been disturbed and frustrated to learn about the former PES refinery site and the legacy of toxins and pollutants it has left on the environmental justice community that surrounds the refinery. The opportunity to clean up and redevelop the refinery is a once in a lifetime chance to repair the biggest blight of our region. And as greenhouse gas emissions continue to rise and we know sea level rise, storm surge and precipitation events will continue to worsen. Evergreen must ensure its remedial investigation adequately addresses these future climate change conditions. For the +150 years this community has suffered from the presence of this refinery, we owe it to this community to ensure their health will be protected once this site is finally cleaned up.

Sincerely,
Korin Tangtrakul
2611 W Seybert St
Philadelphia, PA 19121

From:	Lauren Duhigg
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:02:26 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lauren Duhigg
778 South Front Street
Philadelphia, PA 19147

From: Lee Smithey
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 4:18:09 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Lee Smithey
lee_smithey@yahoo.com
218 Linden Avenue
Rutledge, Pennsylvania 19070

From: Linda Clark
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:07:02 AM

Evergreen Resources,

Over generations, the refinery has injured the health of Philadelphians, and we deserve a thorough clean up.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Linda Clark
lindapat49@gmail.com
221 Pelham Rd
Philadelphia , Pennsylvania 19119

From: LIndsey Walker
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:47:02 PM

Evergreen Resources,

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LIndsey Walker
lindseyannwalker@gmail.com
1518 S Camac St
Philadelphia, Pennsylvania 19147

From: LIsa Hastings
To: Philly Refinery Cleanup
Subject: Comments on Legacy Contamination RIRs
Date: Wednesday, January 13, 2021 9:36:20 PM
Importance: High

To Evergreen and PA DEP:

I worked in environmental quality, including in air and groundwater quality and with sites requiring major remediation for a decade, and have studied the RIRs in detail from that perspective. I am writing to state that the RIRs presented are so flawed that even those that were previously approved by DEP (without adequate public review) need to be rejected, improved significantly at least as described below and in other's detailed comments, and then resubmitted for public review and comment before they are used to develop long-term remediation plans. It is not necessary to stop ongoing remediation, but future remediation should not be limited by using incomplete and potentially inaccurate data.

*The site-specific clean up standard for lead needs to be withdrawn and replaced with a mandate to clean up the site and lead-polluted areas outside the property to a health-based standard. I'll defer to the Clean Air Council and health experts for the specifics on the number, but although it might be cheaper and easier to leave a high level of lead on and near the site, the site-specific standard not only does not protect human health, but it reduces the number of places that Evergreen needs to remediate any lead. That is, the "site-specific standard" would allow SUNOCO to legally leave dangerous lead contamination in place, continuing to imperil the lives of people who live and work at or near the site and leaving the area as a permanently polluted area unfit for human habitation. This is completely unacceptable. There are also high concentrations of lead in soil near areas where the groundwater aquifer is very shallow, and leaving this lead would potentially end up contaminating the groundwater and eventually the unconfined drinking water aquifer. This risk of not cleaning it up to at least a health-based standard is too high to allow.

*The data in these reports was mostly collected between 2011 and 2017, and are too old to be trusted to reflect the current conditions and contaminants in all areas. The amount of time passed, the additional pollution from several years of refinery operation and fires, and the heavy rainfall that the area has received in the past decade all probably resulted in changes or movement of some or all contaminants, including moving more off-site and into the lower aquifer. New sampling needs to be conducted in all areas, on land and in water, to both verify actual conditions and contaminants and to test for contamination that was not tested for at all (like PFAS compounds), and to test some areas, like both shallow and deep portions of the aquifer, more thoroughly. As new sampling is done, if it becomes apparent that the old "edges" of contamination have moved, the sampling areas need to be enlarged until new "edges" are well-established.

*30 contaminants were tested for. How was it determined which compounds to test for and which compounds to not look for? The lack of information on how potential contaminants were chosen or rejected for testing undermines trust in the objectivity and completion of the data.

*All areas that were not tested (example—close to the refinery facilities) need to be thoroughly

tested now and the results need to be released to the public for review and comment. This new data, any other data that has already been collected but are not reflected in the RIRs, as well as data from sampling for additional compounds and to verify or replace previous sampling, need to be collated into updated RIRs for all areas, which then need to be reopened for public review and comment BEFORE the RIRs are considered final or used as the basis for final remediation plans.

*Groundwater needs more attention and testing as well as soil. For one thing, an update is needed to reflect the conditions of both shallow and deep groundwater because of the length of time since the reported sampling, and after years of partial remediation. Contamination in groundwater aquifers does not stay in one place for years! I'm also concerned that the shallow and deep aquifers were presented as being separated by an aquitard, implying that the deeper drinking water aquifer was somehow protected from the high pollution in the more shallow areas. However, the shallow and deep aquifers are not continuously separated, leaving contamination to migrate between them. This is even more concerning since some shallow areas of the aquifer are very close to highly contaminated soil and thus very vulnerable to becoming more contaminated over time. Also, while pumping contamination out of the water has removed a lot of pollution, pumping also alters how quickly and in what direction groundwater (and contamination) moves, and may have increased the movement of contamination between these unconfined aquifers or how far from the refinery the contamination extends. Because of this, it would be prudent to conduct new tests as well as sampling a larger portion of both aquifers.

*Please remember that this aquifer supplies drinking water to NJ, and extend testing into NJ. While it is fortunate that Philadelphians do not use the aquifer for drinking water, that does not release Evergreen from cleaning it to drinking water standards.

*Most of the testing in all media was limited to the industrial site or very close to it. Since contamination from air pollution occurred continuously outside the site, since most contamination migrates and may change over time, depending on many factors, more extensive offsite testing for all compounds should be done.

*More testing for lead, benzene and other VOCs should be conducted in especially residential areas to protect public health. While initial ambient air testing was done within buildings *on the site*, this should be extended to testing basements in residential areas near VOC/benzene pollution for levels of ambient air contamination from these compounds. Even without fresh pollution coming in through their windows, people may be living in homes with unhealthy ambient air quality due to volatile compounds coming through their basement walls.

*Although the sources of benzene are disputed in the reports, the fact remains that benzene is a carcinogen and that at least some of it probably came from the refinery site. After the current extent of it is better established, it needs to be removed, both onsite and offsite even if Evergreen needs to enter into another agreement with another responsible party to do so. It is not acceptable, even if SUNOCO only created some of it, for Evergreen to "clean up" this site and leave a dangerous carcinogen because it wasn't "their problem".

*I realize that Evergreen is only "responsible" to identify and clean up the "Legacy pollution".

However, it is impossible to develop adequate remediation plans for any of the site without considering the current conditions at the site. More money and time would be wasted "cleaning up" an area using outdated, incomplete or inaccurate data than developing better, more recent and complete data and maybe removing some contamination that was not Evergreen's "responsibility".

Thank you.

Lisa K Hastings
2001 Hamilton St. P108
Philadelphia, PA 19130
215-575-0823
Lkh1066@earthlink.net

From: Lisa McCaffrey
To: Philly Refinery Cleanup
Subject: South Philly refinery cleanup
Date: Wednesday, January 13, 2021 10:41:11 AM

Dear Sir/Madam:

As a resident of South Philadelphia, I demand a thorough, accurate and complete investigation of environmental contamination at the former Philadelphia Energy Solutions refinery in South Philadelphia. The investigation should identify contamination so that the refinery site can be properly remediated. The investigation should include PFA's, impact on climate change, the evaluation of the steel wall and how humans could potentially be exposed to pollutants from the site through groundwater. I further demand that the DEP and Evergreen make public health a top priority during the cleanup of this site.

Sincerely

Lisa McCaffrey
1/13/21 @ 10:40 am

From: Lori Braunstein
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:01:17 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
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Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Lori Braunstein
braunsteinlori@gmail.com
2334 Perot Street
Philadelphia, Pennsylvania 19130

From: lydiarlutz@gmail.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 9:01:18 AM

Evergreen Resources,

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lydiarlutz@gmail.com
128 South Bonsall Street
Philadelphia, Pennsylvania 19103

From:	Lynne Flaxman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 11:59:38 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Lynne Flaxman
320 South Smedley Street
Philadelphia, PA 19103

From: Lynne Iser
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:20:21 PM

Evergreen Resources,

I am submitting comments on
The Community Outreach Plan;
Contaminants of Concern; and,
Unaddressed Issues -- all as part of the
120-day comment period that began on August 28, 2020. Thank you,

Comments on:
COMMUNITY OUTREACH PLAN
1. Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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CONTAMINANTS OF CONCERN
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UNADDRESSED ISSUES
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Lynne Iser
lpiser@aol.com
1016 West Upsal Street
Philadelphia, Pennsylvania 19119

From: Madeline Amalphy
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:58:56 PM

Evergreen Resources,

I lived in West Philadelphia for three years and often visited South Philadelphia during that time. I am extremely concerned about the impacts of pollution and the climate crisis on South Philadelphia communities. They are already suffering adverse health impacts like cancer and asthma from the inadequate cleanup after the 2019 oil refinery explosion.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Madeline Amalphy
radchic05@gmail.com
651 Saybrooke Oaks Boulevard
Gaithersburg , Maryland 20877

From: Maria Merolle
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 4:53:05 PM

Evergreen Resources,

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Maria Merolle
mimerolle@gmail.com
1530 spruce st
Philadelphia , Pennsylvania 19102

From: Marissa Donohue
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 6:27:46 PM

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Marissa Donohue
megamissa@gmail.com
1739 W Diamond St
Philadelphia, Pennsylvania 19121

From: Mark Smith
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 3:18:15 PM

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Mark Smith
mfsmith4@gmail.com
147 Tennis Ave
Glenside, Pennsylvania 19038

From:	Mary Ambros
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 7:35:46 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Ambros
6 Windsor Ave
Elkins Park, PA 19027

From:	Mary Loesch
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:06:26 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Loesch
1525 W Norris St Unit B
Philadelphia, NJ 19121

From:	Mary Papalaskari
To:	Philly Refinery Cleanup; rapatel@pa.gov
Subject:	Remediating the Former Philadelphia Refinery
Date:	Wednesday, January 13, 2021 9:17:51 PM

I would like to thank the Evergreen group for taking up the monumental task of cleaning up the refinery. I am encouraged that this work is underway and urge Evergreen to address more thoroughly the concerns brought up by many scientists and environmentalists regarding the cleanup at the former refinery site. For example:
1) Evergreen's proposed lead standards for surface soil are not in line with current science or with the governor's Lead Free PA initiative. Allowing the PES site to apply a lead standard that is twice the current value for non-residential soil (as well as the proposed revised one in the suggested update to the PA Dept of Environmental Protection regulations), and four times higher than the one required for soils that are near groundwater (as some of the site is) does not agree with these goals.
2) The PA Dept of Environmental Protection has added Per- and polyfluoroalkyl substances (PFAS) to the recent regulations for contaminants—likely present in refineries, since they are used in firefighting foams. Indeed, other states such as Alaska, Michigan, Colorado and Wisconsin found PFAS contamination in refineries, and are requiring or undergoing remediation of those sites. The site should be tested for these contaminants and required to address the contamination.
3) Evergreen needs to revise its remedial investigation reports to conform both with evolving scientific knowledge AND with the evolving state of our world due (at least in part) to changes brought on by climate change.
The reluctance to address changing standards is understandable. However, when dealing with a situation brought on by lax oversight in the first place, there is no excuse for lack of a full and thorough consideration of current scientific knowledge. Evergreen cannot operate under outdated rules or behind the times!
Evergreen's mission is too important. In the words of Pope Francis:

> There is a growing jurisprudence dealing with the reduction of pollution by business activities. But political and institutional frameworks do not exist simply to avoid bad practice, but also to promote best practice, to stimulate creativity in seeking new solutions and to encourage individual or group initiatives.
>
> - *Laudato Si (177)*

I sincerely hope Evergreen will do the right thing and be part of the solution for all of us.

--
Mary-Angela Papalaskari, PhD
Associate Professor Emerita
Dept. of Computing Sciences
Villanova University
800 E Lancaster Ave
Villanova, PA 19085
mary.papalaskari@villanova.edu

From: Melissa Mankin
To: Philly Refinery Cleanup
Subject: Refinery
Date: Wednesday, January 13, 2021 10:37:13 PM

I am a concerned resident of South Philly and I am requesting a complete investigation and disclosure of the explosion at the refinery. I believe residents have the right to know how this has impacted the environment, as well as potential exposures and side effects of those exposures.

Sincerely,
Melissa Mankin

From:	Melissa Mankin
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:37:32 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melissa Mankin
2236 S. 21st Street
Philadelphia, PA 19145

From:	Mia Johnson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:08:24 PM

Dear phillyrefinerycleanup.info,

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Sincerely,
Mia Johnson
426 MCclellan St.
Philadelphia, PA 19148

From: Michael Heaney
To: Philly Refinery Cleanup
Subject: Comments on PES Cleanup
Date: Wednesday, January 13, 2021 5:15:34 PM

Evergreen Resources,

Evergreen's priority during the cleanup should be beautifying the riverbank in a way that will adapt with rising water levels.

Michael Heaney
mtheaney@gmail.com
1530 Mt Vernon St
Philadelphia, Pennsylvania 19130

From:	Mitchell Bloom
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 7:20:16 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Mitchell Bloom
2042 South Colorado Street
Philadelphia, PA 19145

From: Moon Smith
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 10:50:26 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Moon Smith
moonesmith@gmail.com
512 W Allens Lane
Philadelphia, Pennsylvania 19119

From: Nat Lownes
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:56:16 PM

Evergreen Resources,

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Nat Lownes
lownes.nat@gmail.com
3424 Division St
Philadelphia, Pennsylvania 19129

From:	Nathan Fried
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 8:21:11 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg.

We just moved down here to south philly, are planning to be married this weekend and start a family. However, it's come to my attention the issues with this refinery clean up that negatively impact the health of my future family.

Should I stay and risk this? I dunno, but a thorough analysis of the site will go a long way to assuage resident concerns and protect the growth of philly's tax base, ya know?

Sincerely,
Nathan Fried
1418 Moore st
Puiladelphia, PA 19145

From: Nathaniel Philip
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:38:50 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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Comments on Contaminants of Concern:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Nathaniel Philip
ngp39@drexel.edu
4909 Pine Street
Philadelphia, Pennsylvania 19143

From:	Nathaniel Philip
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:39:02 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Nathaniel Philip
4909 Pine Street
Philadelphia, PA 19143

From: Nneanata Echetebu
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:08:25 AM

Evergreen Resources,

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Nneanata Echetebu
nnenne77@gmail.com
7277 Charlotte pike
Nashville , Tennessee 37209

From: Nora Elmarzouky
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 11:32:43 AM

Evergreen Resources,

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Nora Elmarzouky
nelmarzouky@powerinterfaith.org
907 S. Conestoga St.
Philadelphia, Pennsylvania 19143

From: Olivia Brown
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 6:36:53 PM

Evergreen Resources,

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Olivia Brown
oliviajenna8@gmail.com
1229 N 30 st
Philadelphia, Pennsylvania 19121

From: Olivia Dunlevy
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:52:15 PM

Evergreen Resources,

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Olivia Dunlevy
livxo976@comcast.net
20 Kathryn Court
Marlton, New Jersey 08053-2348

From: Pam Lewis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 3:54:28 PM

Evergreen Resources,

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Pam Lewis
pamlewis1234@icloud.com
3130 Wharton st
Philadelphia , Pennsylvania 19146

From:	Patrick Danas
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 7:07:42 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Patrick Danas
1814 N bouvier st
Philadelphia, PA 19121

From:	Paul Greco
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 2:01:35 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Paul Greco
18 Equestrian Lane
Blue Bell, PA 19422

From: Pratima Agrawal
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:43:48 AM

Evergreen Resources,

Clean up of the refinery requires thorough and complete removal of toxins that have caused generations of harm to the community. Anything less than that inadequate.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
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- Current Conditions - Investigation information is out of date; some data was collected over a

decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Pratima Agrawal
pratima.agrawal0224@gmail.com
1924 E. Dauphin St. #2R
Philadelphia, Pennsylvania 19125

From: Reba Price
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 8:37:20 AM

Evergreen Resources,

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Reba Price
tud16705@temple.edu
1556 n 29th st
Philadelphia, Pennsylvania 19121

From:	Rebecca Crane
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 4:57:35 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health nor does it consider environmental injustices to Philadelphia communities in the area and downstream.

I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Kindly,
Rebecca

Sincerely,
Rebecca Crane
1327 N Dover St
Philadelphia, PA 19121

From:	Rebecca Finkel
To:	Philly Refinery Cleanup
Subject:	Contamination at the PES refinery site
Date:	Wednesday, January 13, 2021 9:18:31 AM

To Whom it May Concern:

I am a New Jersey resident who is extremely concerned about the potential for groundwater contamination at the PES refinery site and how it could affect my young child. The area has been highly contaminated for a century, and residents of both Pennsylvania and New Jersey are now well aware of the dangers posed by groundwater contamination, following high-profile cases in Tom's River, NJ, and the now-confirmed systemic drinking water contamination occurring as a result of fracking the Marcellus Shale.

Please follow the advice of experts at the Clean Air Council and perform an immediate and thorough and plan to identify and remediate contamination. The public is now very well aware of the carcinogenic threats posed by your project and will be watching closely.

Thank you,
Rebecca Finkel

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Please follow the advice of experts at the Clean Air Council and perform an immediate and thorough and plan to identify and remediate contamination. The public is now very well aware of the carcinogenic threats posed by your project and will be watching closely.

Thank you,
Rebecca Finkel

From: Rev David Reppert
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 4:13:34 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Rev David Reppert
dreppert4601@gmail.com
1839 Powell St
Norristown, Pennsylvania 19401

From:	Robert DuPlessis
To:	Philly Refinery Cleanup
Subject:	Please strengthen cleanup plan for PES refinery
Date:	Wednesday, January 13, 2021 9:42:09 PM

Evergreen Resources -- Philly Refinery Cleanup
P.O. Box 7275
Wilmington, DE 19083
US

RE: Please strengthen cleanup plan for PES refinery

Dear ,

Dear Evergreen Resources,

I'm writing to call on you to strengthen the proposed cleanup and remediation plan for the South Philadelphia PES refinery site.

Specifically, I call on you to:
- Strengthen remediation standards for lead to mirror Pennsylvania's statewide standards for cleanup;
- Set standards for PFAS contaminants that may be found at the site;
- Address concerns about migration of contaminants that could pollute drinking water sources for New Jersey residents;
- Include research about the threat posed by rising sea level and extreme weather events that could be triggered by climate change.

Thank you in advance for including these criteria, and I look forward to hearing your response.

Sincerely,
Dr. Robert DuPlessis
413 S 24th St
Philadelphia, PA 19146
(267) 800-4133

From:	Roxanne Trachtenberg
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:27:13 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Roxanne Trachtenberg
39 Charles St Apt 4
Boston, MA 02114

From: Royce Dong
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:55:06 AM

Evergreen Resources,

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- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
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Comments on Unaddressed Issues:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Royce Dong
royce.dong@pennmedicine.upenn.edu
2326 Alter St
Philadelphia, Pennsylvania 19146

From:	Russ Allen
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 11:30:57 AM

Dear phillyrefinerycleanup.info,

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Finally, Evergreen must include remediation for chemicals such as PFAS in its report.

Please take these comments seriously and make the necessary changes.

Sincerely,
Russ Allen
1510 Grove Av.
Jenkintown, PA 19046

From: Ruth Conviser
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:56:51 PM

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Ruth Conviser
ruthconviser@gmail.com
5125 Cedar Avenue
Philadelphia, Pennsylvania 19143

From: Ryan Stauffer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 7:35:23 PM

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Ryan Stauffer
privateryan84@gmail.com
2509 south reese street
Philadelphia, Pennsylvania 19148

From: Sara Davis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:10:16 PM

Evergreen Resources,

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Sara Davis
literarysara@gmail.com
1316 JACKSON ST, APT C
PHILADELPHIA, Pennsylvania 19148

From:	Sara Labrum
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 10:48:01 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes in the interest of public health.

Sincerely,
Sara Labrum
2037 Catharine St
Philadelphia, PA 19096

From:	Sarah Dennin
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 5:28:39 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sarah Dennin
1102 North Street
Philadelphia, PA 19121

From:	Sarah Elichko
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:38:24 AM

Dear phillyrefinerycleanup.info,

Philadelphia residents and workers deserve an updated and accurate investigation into the environmental safety hazards at the former refinery site.

Evergreen completed its remedial investigation reports over three years ago. Given the fire incidents and other changes during that time, relying on older data seems questionable. Evergreen should provide evidence that data from these reports are still representative.

Evergreen has proposed a site-specific standard for surface soil lead levels (2,240 mg/kg). This is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen should be using the current science to set a site-specific standard that protects public health.

Given the expected rise in water levels along the Schuylkill, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. I'm particularly concerned about the migration of contaminants in the soil and groundwater.

I hope you'll take these concerns into account.

Sincerely,
Sarah Elichko
4643 Pine St C210
Philadelphia, PA 19143

From:	Saul Davis
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 9:32:42 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Saul Davis
1929 Chestnut St., Apt 2F
Philadelphia, PA 19103

From: Sheila Tripathy
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 12:52:50 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Sheila Tripathy
sheila.tripathy@gmail.com
32 Dartmouth Street
Arlington, Massachusetts 02474

From:	Sophie De Lancie
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 6:00:33 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sophie De Lancie
157 N 21st Street
Philadelphia, PA 19103

From:	Stuart Claire
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 8:42:01 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

As an environmental attorney, I am astounded that the DEP would even consider lead levels this high given what we are seeing in Detroit. We are doing the right thing by cleaning this up but do it the right way and protect our residents, future residents and our environment.

Sincerely,
Stuart Claire
2324 Catharine St
Philadelphia, PA 19146

From: Susanne Groenendaal
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Wednesday, January 13, 2021 5:28:13 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Susanne Groenendaal
stargazerlilly1@verizon.net
1313 Old Boalsburg Rd
State College, Pennsylvania 16801

From:	Taylor Sexton
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 6:19:06 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Taylor Sexton
3452 Division St
Philadelphia, PA 19129

From:	Teora Milson
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 6:00:32 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Teora Milson
266 W. Rittenhouse st.
Philadelphia, PA 19144

From:	Will Herzog
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 6:29:03 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Will Herzog
75 Church Road
Malvern, PA 19355

From:	William McKenna
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Wednesday, January 13, 2021 12:32:46 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
William McKenna
3349 pietro way
Philadelphia, PA 19145

From: Alf Din
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 12:59:35 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities. Specifically, because there's little federal or any guidance in regards to how to execute said fluorochemical remediation it is necessary to cite the processes currently being evaluated (in the academic space)for public consumption [https://pubs.acs.org/doi/abs/10.1021/jacs.7b02381]DOI,2017 article

Alf Din
alfdin@gmail.com
1946 Ashley St
Philadelphia, Pennsylvania 19138

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Thursday, January 14, 2021 2:29:47 PM

Name

Alissya Flood-Mazyck

Email

alissyaflood123@gmail.com

Address

5911 N 12th st
philadelphia, Pennsylvania 19141
United States
Map It

Report

Philadelphia Refinery_AOI 1 RIR_8-5-16

Comment

To Whom It May Concern,

My name is _Alissya Flood-Mayzck and I am a high school student in Philadelphia. I am in the 10th grade and live in Fern rock_ neighborhood. I am writing you this letter in regards to the AOI 1-11, Lead Human Health Risk Assessment Report.

Specifically, I would like to share with you my hope and concerns about this plan to remediate pollution at the former refinery site..

I would like to begin by sharing my hope. I hope that human health can increase in a positive matter_. I hope this occurs because the environment risks are high_.

Unfortunately, there are a few things that I am concerned with as well, including my neighborhood_ and family. I'm worried about air pollution _ because its causing us humans to increase the chances of lung cancer, heart diseases, and respiratory diseases

Another concern I have is about oil refinery because its is also increasing the chances of the following;

Thank you for taking the time to read my comments. Recently, I learned a lot about mari copeny, so I will leave you with this quote, "We need to protect dreamers ."

Thank you_ ,
Alissya Flood-Mayzck

From:	Allison Amodea
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 9:58:52 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Allison Amodea
1125 Lemon St
Philadelphia, PA 19123

From: Alysann Lewis
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:54:41 PM

Evergreen Resources,

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Alysann Lewis
Allyops12@gmail.com
1608 South 27th Street
Philadelphia , Pennsylvania 19145

From: Amber Cammarata
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 9:36:22 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Amber Cammarata
hello.for.amber@gmail.com
249 W Harvey St
Philadelphia, Pennsylvania 19144

From: Anais Reyes
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:53:44 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Anais Reyes
anaisvegareyes@gmail.com
194 Vernon Ave
Brooklyn, New York 11206

From:	Arjun Yodh
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 1:28:52 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Arjun Yodh
209 South 33rd Street
Philadelphia, PA 19104

From: Bradford Morris
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 5:37:49 AM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

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Bradford Morris
bradford.morris@gmail.com
5827A Henry Ave
Philadelphia, Pennsylvania 19128

From: Brandis Whitfield
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:31:47 PM

Evergreen Resources,

Every person has the right to have clean air water and land!

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Brandis Whitfield
brandisnw@gmail.com
1327 Webster St
Philadelphia, Pennsylvania 19147

From: Brenna Lilley
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 12:12:56 PM

Evergreen Resources,

As a medical student soon to graduate and become a physician this Spring, I know the impact environmental toxins have on communities and that this impact disproportionately affects communities of color. This is racism in action and I won't stand for it.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Brenna Lilley
brenna.lilley@gmail.com
418 S 45th St
Philadelphia, Pennsylvania 19104

From:	Bria Feaster
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 2:17:04 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bria Feaster
6421 Chelwynde Ave Apt B
Philadelphia, PA 19142

From: Bukola Adekoje
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 9:11:58 AM

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Bukola Adekoje
bukadekoje@gmail.com
1429 S 50th Street
Philadelphia, Pennsylvania 19143

From: Cagney Kelshaw
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:32:53 PM

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Cagney Kelshaw
cagneykelshaw@gmail.com
3820 Locust Walk
Philadelphia, Pennsylvania 19104

From:	Carly Frintner
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 6:49:33 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carly Frintner
1633 South Dover St.
Philadelphia, PA 19145

From: Caroline Houlihan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:07:39 PM

Evergreen Resources,

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Caroline Houlihan
crh97@drexel.edu
2024 South Garnet Street
philadelphia, Pennsylvania 19145

From: Catherine Weigley
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:42:59 PM

Evergreen Resources,

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Catherine Weigley
spota01@yahoo.com
2609 South Warnock Street
Philadelphia, Pennsylvania 19148

From: Catie Donselar
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:22:06 PM

Evergreen Resources,

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Catie Donselar
catiedonselar@gmail.com
116 Natures Drive
St. Marys , Georgia 31558

From:	Chris Ahlers
To:	phillyrefinerycleanup@ghd.com
Cc:	DOERR, TIFFANI L; Brown, C David; Dula, Justin; Patel, Ragesh
Subject:	Philadelphia refinery/Comments of Clean Air Council on Evergreen Reports
Date:	Thursday, January 14, 2021 11:57:31 PM
Attachments:	2021-01-14 FINAL Clean Air Council Comments - Evergreen Reports.pdf Attachment 1 -- Letter from Evergreen (02.11.2014).pdf Attachment 2 -- Letter from DEP, EPA (11.08.2011).pdf Attachment 3 -- Evergreen"s Q&A (downloaded 12.30.20).pdf Attachment 4 -- CAC Comments (FINAL) 04.30.2020 (file 1).pdf Attachment 5 -- CAC Attachments 1-26 (file 2).pdf

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phillyrefinerycleanup@ghd.com
TLDOERR@evergreenresmgt.com

cdbrown@pa.gov
jdula@pa.gov
rapatel@pa.gov

Evergreen,

Attached are the comments of Clean Air Council on the 19 remedial investigation reports and 2 risk assessments, for the public comment period ending on January 14, 2021.

Thank you for your consideration of our comments.

Attachment 6 -- CAC Attachments 27-30 (file 3).pdf

Attachment 7 -- CAC Attachments 31-33 (file 4).pdf

Attachment 8 -- CAC Attachments 34-53 (file 5).pdf

Chris

--
Christopher D. Ahlers
Staff Attorney
Clean Air Council
135 S.19th Street, Suite 300
Philadelphia, PA 19103
Telephone: 215-567-4004, ext. 125
*Licensed to Practice Law in Pennsylvania (Limited In-House Corporate Counsel)
*Licensed to Practice Law in New York

From: Dan Scholnick
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:54:43 PM

Evergreen Resources,

I am writing as a neighbor in West Philadelphia. I am deeply concerned with a number of aspects of the remediation reports. In particular, I would like to highlight the lack of appropriate consideration given to the inevitable sea-level rise affecting the tidal Delaware and Schuylkill Rivers, and how this site condition will affect the propensity for existing known contaminants to be released into the surrounding areas.

I would like to make it clear that I am in full support of Philly Thrive's efforts, and I believe that they represent my concerns with the remediation reports and plans.

For that reason, I am including below a full accounting of the specific areas of concern, which I am sure are being submitted by many others. It is essential that Evergreen and the DEP gets this right the first time.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.

- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.
- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Dan Scholnick
daniel.scholnick@gmail.com
810 S 49th St
Philadelphia, Pennsylvania 19143

From: Dara Bortman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 5:45:46 PM

Evergreen Resources,

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Dara Bortman
daramarkb@mail.com
1655 Fairfield Rd
Yardley, Pennsylvania 19067-3947

From: David Steinberg
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 6:45:55 PM

Evergreen Resources,

The dates for final completion was originally set for 12/31/2020 but was extended for 10 years to 12/31/2030. Why extend it?

David Steinberg
steinberg.david07@comcast.net
825 E Clements Bridge Road, Apartment 313
Runnemede, New Jersey 08078

From: David Steinberg
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 5:19:14 PM

Evergreen Resources,

Article I, Section 27 of the Pennsylvania Constitution states: “THE PEOPLE HAVE A RIGHT TO CLEAN AIR, PURE WATER, AND TO THE PRESERVATION OF THE NATURAL, SCENIC, HISTORIC, AND ESTHETIC VALUES OF THE ENVIRONMENT. PENNSYLVANIA'S PUBLIC NATURAL RESOURCES ARE THE COMMON PROPERTY OF ALL THE PEOPLE, INCLUDING GENERATIONS YET TO COME. AS TRUSTEE OF THESE RESOURCES, THE COMMONWEALTH SHALL CONSERVE AND MAINTAIN THEM FOR THE BENEFIT OF ALL THE PEOPLE.“

This overrides any action by SUNOCO, Evergreen, HILCO, PA DEP, and the EPA. How will the cleanup meet this requirement?

David Steinberg
steinberg.david07@comcast.net
825 E Clements Bridge Rd
825 E. Clements Bridge Road, Apt. #313 Runnemede, NJ 08078, New Jersey 08078

From: Debora Kodish
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 7:27:02 AM

Evergreen Resources,

I am a concerned resident. There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Debora Kodish
debora.kodish@gmail.com
4923 Larchwood
Phila, Pennsylvania 19143

From: doug@newdoorbooks.com
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:28:19 PM

Evergreen Resources,

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doug@newdoorbooks.com
2447 Fairmount Avenue
Philadelphia, Pennsylvania 19130

From: Duncan Wright
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:51:00 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Taking these steps can occur if the leaders of Evergreen change their minds. Among many obstacles to changing one's mind the belief that it shows indecisiveness. However,
"To change one's mind is not Aftterhought but Forethought" (Lucian 170 CE).
Respectfully,
Duncan Wright

Duncan Wright
cdwright95@gmail.com
3 N Columbus Blvd
Philadelphia , Pennsylvania 19106

From: Dyresha Harris
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 10:05:45 PM

Evergreen Resources,

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Dyresha Harris
dyreshas@yahoo.com
403 S 51 st St
Philadelphia, Pennsylvania 19143

From:	Eliza Alford
To:	Philly Refinery Cleanup; rapatel@pa.gov
Cc:	Katherine Gilmore Richardson
Subject:	Comment from Philadelphia City Council Committee on the Environment
Date:	Thursday, January 14, 2021 5:37:41 PM
Attachments:	image001.png[100].png 01.14.20 Evergreen Comment vFINAL.pdf

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Good evening,

Please find attached a comment on the legacy environmental clean-up of the former refinery site from the following members of the Philadelphia City Council Committee on the Environment: Councilmembers Katherine Gilmore Richardson, Cindy Bass, Kendra Brooks, Jamie Gauthier, Derek Green, and Helen Gym.

Thank you,

Eliza Alford
Policy & Communications Director
Office of Councilwoman Katherine Gilmore Richardson
Councilwoman At-Large
Room 581, City Hall
Philadelphia, PA 19107
(215) 686-0454 phone
Pronouns: she/her

From: Ellie Moonan
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 1:54:14 PM

Evergreen Resources,

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Ellie Moonan
lemoo848@aol.com
42 S 42nd Street
Philadelphia, Pennsylvania 19104

From:	Elliot Lipeles
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 11:00:55 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Elliot Lipeles
236 Queen St Unit B
Philadelphia, PA 19147

From: Eo Trueblood
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 11:33:30 PM

Evergreen Resources,

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Eo Trueblood
eotrueblood@gmail.com
403 S. 51 street
Philadelphia, Pennsylvania 19143

From: Erin Morris
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:09:29 PM

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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Erin Morris
morhecht@gmail.com
551 westmoreland ave
Syracuse, New York 13210

From: Eurhi Jones
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:19:24 PM

Evergreen Resources,

I have lived my whole life within a 12 mile radius of the refinery. I feel that all lives in our region are affected by the past and future of the refinery site.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
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- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
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Eurhi Jones
eurhijones@gmail.com
117 Jefferson Street
Bala Cynwyd , Pennsylvania 19004

From:	Franco Montalto
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 11:14:43 AM

Dear phillyrefinerycleanup.info,

In its remedial investigation, Evergreen should adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater to the river, and into adjacent residential neighborhoods.

Please take these comments seriously and make the necessary changes.

Sincerely,
Franco Montalto
1412 South 13th street
Philadelphia, PA 19104

From: Frank Ortiz
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 6:36:20 PM

Evergreen Resources,

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Frank Ortiz
hgsphilly@gmail.com
1633 S Dover St
Philadelphia , Pennsylvania 19145

From:	George Claflen
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 11:42:46 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
George Claflen
2201 Pennsylvania Ave
Philadelphia, PA 19130

From:	Gino Segre
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 12:32:22 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gino Segre
239 Rex Ave.
Philadelphia, PA 19118

From: Hai Nguyen
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:36:07 PM

Evergreen Resources,

Hi there! There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

You gotta do better with this jawn

Hai Nguyen
ljonesvc@gmail.com
5219 WEBSTER ST
PHILADELPHIA, Pennsylvania 19143-2626

From:	hugh kennedy
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 7:03:40 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
hugh kennedy
204 Carpenter St
Philadelphia, PA 19147

From:	Ian Snyder
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 2:31:31 PM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ian Snyder
1809 Pine Street
Philadelphia, PA 19103

From: Jan Chanin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 9:36:11 AM

Evergreen Resources,

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Jan Chanin
hjmgchanin@gmail.com
124 Tomlinson Rd
Philadelphia , Pennsylvania 19116

From:	Jessica Silverman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 1:33:33 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Silverman
6421 Chelwynde Ave
Philadelphia, PA 19142

From:	Jessica Walker
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 7:21:58 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Walker
1215 S 19th St
Philadelphia, PA 19146

From:	John Lehman
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 4:30:34 PM

Dear phillyrefinerycleanup.info,

As a resident of southwest center city for over 30 years, raising a family, and looking forward to future other families in these neighborhoods, a full and accurate site analysis and thorough remediation is vitally important before the refinery site is left for posterity.

While I recognize the century-long industrial use and the benefits of lesser environmental standards for brown-field development of such sites, several issues have been neglected thus far:
1) reportedly, the site-wide analysis has not included PFAS chemicals, well known as toxic;
2) potential groundwater pollution, whether shallow or deep, has not been fully investigated, and obviously, the migration characteristics of groundwater and its drinking water use makes a complete investigation vital;
3) Potential site pollutant migration into the Schuylkill River must be fully evaluated;
4) Accepting lead soil contamination at a level twice that of the Pennsylvania state nonresidential standard would be criminal.
5) Future pollutant spread through projected sea level rise must also be evaluated and addressed.

Now is the time to execute the remediation of the site thoroughly for the health of future Philadelphians, Pennsylvanians, and even New Jerseyans.
Respectfully,
John T. Lehman
Philadelphia

Sincerely,
John Lehman
1729 Bainbridge St
Philadelphia, PA 19146

From: Julia Tackett
To: Philly Refinery Cleanup
Subject: PES Refinery Development
Date: Thursday, January 14, 2021 2:13:32 PM

Evergreen Resources,

Good afternoon,
My name is Julia Tackett; I am a constituent from Philadelphia. It is imperative that the refinery site in South Philadelphia be remediated and contained in a SAFE and EQUITABLE manner. The residents around this site have been marginalized and taken advantage of for far too long.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Thank you for your consideration.

Sincerely,

Julia Tackett

Julia Tackett
juliatackett@gmail.com
1114 S Franklin St
Philadelphia, Pennsylvania 19147

From: Karen Orrick
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:49:14 PM

Evergreen Resources,

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Comments on Community Outreach Plan:
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Karen Orrick
karenorrick@gmail.com
5853 Ashland Ave
Philadelphia, Pennsylvania 19143

From:	Kate Mead
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 7:59:19 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Kate Mead
1811 Fitzwater Street Unit E
Philadelphia, PA 19146

From: Katherine Rapin
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:02:35 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Katherine Rapin
katherine.rapin@gmail.com
928 League St.
Philadelphia, Pennsylvania 19147

From:	Kelli Boyles
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 10:43:05 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kelli Boyles
210 Church St. Unit E
Philadelphia, PA 19106

From:	Louis Weil
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 10:26:02 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Louis Weil
1807 Gladstone Street
Philadelphia, PA 19145

From:	Lyndon DeSalvo
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 8:05:54 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lyndon DeSalvo
2625 PARRISH ST
Philadelphia, PA 19130

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Thursday, January 14, 2021 6:05:02 PM

Name

Lynn Robinson

Email

nixthegasplants@gmail.com

Address

44 Ashmead Place S.
Philadelphia, Pennsylvania 19144
United States
Map It

Report

Philadelphia Refinery_Lead HHRA _02-24-15

Comment

4 general comments:
1. Evergreen and Hilco may have a reasonable and actionable agreement about how the cleanup is divided between you, but the public has no idea whether there is one. It's illogical for Evergreen to be working on a remediation project, and do an incomplete job on an area because some of the contaminants arrived after PES bought it. Or vice-versa-
2. I support the use of mushrooms to extract lead and other heavy metals from the top few feet of soil, as long as the crop is disposed of safely. I'm not an expert but digging up the soil and removing it seems much more work intensive, more expensive, and involves transporting much more volume and weight. It's also not as safe for the community- the contaminated dust blowing into residential areas and then where will all that soil go safely? It seems better to extract it naturally, then compost the vegetation and collect the remaining lesser volume of heavy metal "sludge."

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Thursday, January 14, 2021 6:07:16 PM

Name

Lynn Robinson

Email

nixthegasplants@gmail.com

Address

44 Ashmead Place S.
Philadelphia, Pennsylvania 19144
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Benzene wherever it is lurking is a main concern. I have not heard of a way to deal with pools of it underground, or capturing it where it is sitting off the property. It seems to me that Evergreen should work with community members and politicians to activate any other industrial source of benzene nearby to cooperate with you and Hilco in a complete clean-up. Too many people have lost their lives to cancer. Would you consider that?

From: Madeleine Smith
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 5:36:23 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Madeleine Smith
smith.madeleineruth@gmail.com
501 S 49th Street, apt 1
Philadelphia , Pennsylvania 19143

From: Madeline Salino
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:01:38 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Madeline Salino
mnsalino@email.wm.edu
14 Chestnut Drive
Central Valley, New York 10917

From:	Mark Goulian
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 10:36:43 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mark Goulian
210 Church St. Unit E
Philadelphia, PA 19106

From:	Maurice Sampson
To:	Philly Refinery Cleanup
Cc:	Steven Hvozdovich
Subject:	Comments fron Clean Water Action - Legacy Environmental Cleanup of the former Philadelphia Refinery
Date:	Thursday, January 14, 2021 4:37:40 PM
Attachments:	CWA_PES Refinery Clean Up Comments.011421.pdf

Please see attached

Maurice M. Sampson II
Eastern Pennsylvania Director
Clean Water Action/Fund
www.cleanwateraction.org

1315 Walnut Street, Suite 1650
Philadelphia, PA 19107
p: 215.545.0250 ext. 263
m: 267 269 6912
msampson@cleanwater.org

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Thursday, January 14, 2021 9:03:21 AM

Name

Meenal Raval

Email

meenal.raval@gmail.com

Address

United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Comments on Legacy Remediation of the Philadelphia Refinery site

Philadelphians have lived through a refinery explosion, and we have awakened to the danger we've been living with for the past 150 years.

We need to acknowledge that the refinery site in Southwest Philadelphia will never be allowed to house a refinery again. Therefore, any remediation done to this land must be done with this in mind.

In reviewing the reports on the Philly Refinery Cleanup site, it appears that the Evergreen reports open for public comment are at least three years old and may not necessarily reflect current site conditions.

Of concern is the high lead levels on this site. We all know lead is bad for our health. My understanding from the CDC is that unsoiled “soil contains lead concentrations less than 50 parts per million (ppm), but soil lead levels in many urban areas exceed 200 ppm.” The same link states that the “EPA's standard for lead in bare soil in play areas is 400 ppm by weight and 1200 ppm for non-play areas”. If I understand correctly, our state had a threshold of 1000 ppm that was increased to 2500 ppm earlier this year. Current lead levels in residential areas near the refinery site have lead levels greater than 3000 ppm; see this screen shot from PennMedicine’s Center of Excellence in Environmental Toxicology’s map of our region.

Since this site will never be a refinery again, we need to remediate the soil on the site so that the lead concentration drops, if not to 50 ppm, then to 400 ppm.

I noticed that there was no reference to climate change nor rising sea levels, yet this is a concern for many residents.

Of the 10 areas of interest discussed on the Philly Refinery Cleanup site, six are low lying plots which will likely be flooded by sea level rise. Look at page 28 of the report by the Lindy Institute at Drexel University and the Clean Air Council. It shows that the Evergreen areas of interest 5, 6, 7, 8, 9 and 10 will be submerged. These especially need to be remediated to green space, to wetlands that can embrace the rising tides, and invite other species to nest and thrive along the shifting banks of the Delaware River.

Conventional land remediation consists of capping the contaminated soil with tarp and/or concrete; or hauling the soil someplace else. Capping ignores the problem for a few decades at most, until chemicals leach out. In this case, into the Delaware River. Hauling the soil elsewhere just pushes the problem of

leaching onto another bioregion. Neither of these methods is true remediation since we're either burning, burying, or relocating the contamination. Eco-remediation is the most cost effective method of remediating soil and water, per figure 98 in "Mycelium Running, Paul Stamets.

We understand that contamination has reached the deep aquifer (area of interest 11), which means we need to clean the water too. We've learned from the Clean Air Council that "while Evergreen has made available semiannual groundwater reports through the first half of 2020, that information is not part of the reports open for public comment".

In summary -- we need to get the lead, arsenic and other heavy metals out of this soil. This is why Evergreen was formed, and what Sunoco's insurance policy was for. Let's use it wisely, for the common good, for an evergreen delta where the Schuylkill River meets the Delaware River.

Meenal Raval, Philadelphia resident; volunteer member of Executive Committee of Sierra Club's Southeastern PA Group; lead organizer for Climate Action Philly; volunteer member of Councilmember Gilmore Richardson's Green Space team.

1. https://www.atsdr.cdc.gov/csem/csem.asp?csem=34&po=8
2. https://stateimpact.npr.org/pennsylvania/2020/03/05/pa-proposes-to-relax-non-residential-lead-cleanup-standards-2/
3. https://arcg.is/1fOv9n
4. https://phillyrefinerycleanup.info
5. https://drexel.edu/~/media/Files/lindyinstitute/_LindyReports/PESVisioningDoc.ashx?la=en
6. https://www.inquirer.com/opinion/commentary/south-philly-refinery-cleanup-contamination-pennsylvania-dep-20210113.html

From: Meg Arenberg
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:36:36 PM

Evergreen Resources,

Clean up on the former refinery site is extremely important to me, as a resident of Philadelphia and as someone concerned about what wetter conditions and the higher water table expected with climate change will mean for the future of the site and existing contamination.

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Meg Arenberg
Meg.arenberg@gmail.com
5007 Chestnut St
Philadelphia, Pennsylvania 19139

From:	Melanie Caltabiano
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 11:24:23 AM

Dear phillyrefinerycleanup.info,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melanie Caltabiano
1023 Emily st
Philanthropy, PA 19148

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Thursday, January 14, 2021 10:06:48 PM

Name

Michael Khoo

Email

mick_khoo@protonmail.com

Address

320 S 49th St
Philadelphia, Pennsylvania 19143
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Thank you for the responses at this week's meeting. Here's some references that I mentioned.

A 2014 Report by climate change consultants ICF was commissioned by the City of Philadelphia: 'Useful Climate Information for Philadelphia: Past and Future.'

https://www.phila.gov/media/20160505145605/Useful-Climate-Science-for-Philadelphia.pdf

The report states: "for decisions in Philadelphia for which
there is high aversion to risk, a scenario of 2 meters should be considered."

The 2014 ICF report informed the 2015 City report 'Growing Stronger: Toward a Climate Ready Philadelphia.'

https://www.phila.gov/departments/office-of-sustainability/programs/climate-adaptation-planning/

There is also geological subsidence (not connected with climate change) occurring along the NE Atlantic coast, at a rate very approximately of about 1.5mm(?)/year.

https://oceanservice.noaa.gov/facts/glacial-adjustment.html

I also recently saw a 2019 technical report from Tampa Bay, which has 8.5 feet as its high-end worst case scenario.

At the moment these high-end scenarios are not likely, but this could change.

Attachment 4

(Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

CLEAN AIR COUNCIL

Environmental Quality Board
(Department of Environmental Conservation)

Proposed Rulemaking
Administration of the Land Recycling Program
25 Pa. Code Chapter 250

50 Pa.B. 1011-1097 (February 15, 2020)

Written Comments by Clean Air Council

April 30, 2020

Via email -- RegComments@pa.gov

The Council appreciates the opportunity to provide these written comments on the proposed rulemaking of the Environmental Quality Board and the Department of Environmental Protection ("the Department") relating to Act 2, the state law regarding cleanup standards for voluntary and involuntary cleanups.

The Council is a non-profit environmental health organization headquartered at 135 South 19th Street, Suite 300, Philadelphia, Pennsylvania, 19103. The Council also maintains an office in Pittsburgh. The Council has been working to protect everyone's right to a clean environment for over 50 years. The Council has members throughout the Commonwealth who support its mission.

While the Environmental Quality Board is the government entity proposing the rulemaking, the Council will refer to the Department as the source of the proposed rulemaking, in the interest of clarity.

On Saturday, February 15, 2020 the Department published a notice of proposed rulemaking, setting a deadline of April 14, 2020 for the public comment period. 50 Pa.B. 1011-1097 (February 15, 2020). The deadline was extended to April 30, 2020 due to the ongoing COVID-19 pandemic. 50 Pa.B. 1650 (March 21, 2020).

Summary of Comments

The Council's comments are directed to the Department's proposed increase in the direct contact numeric value for lead in nonresidential soil from 1000 ppm to 2500 ppm. The proposal would not be protective of public health.

The proposal is erroneously based on a target blood concentration of 10 µg/dL for a fetus, which is based on a "level of concern" value set by the Centers for Disease Control in 1991 -- nearly thirty years ago. In 2012, the Centers for Disease Control lowered the number to 5 µg/dL, and since then it has used this number as a "reference value" for case management for pregnant women and children up to 5 years old. The Pennsylvania Department of Public Health, the Allegheny County Health Department, and the City of Philadelphia have also been using 5 µg/dL for case management.

There is no adequate public health justification for the proposal. There was no credible attempt to set an appropriate target blood concentration or direct contact numeric value. Minutes of meetings of the Cleanup Standards Scientific Advisory Board (CSSAB) and related documents do not reflect any meaningful discussion of the choice between a target blood concentration of 10 µg/dL and 5 µg/dL.

The proposal would be far weaker than comparable cleanup levels in five of the six states neighboring Pennsylvania.

The direct contact numeric value for lead in nonresidential soil is important to the ongoing remedial investigation at the Philadelphia oil refinery. This site is two and a half miles from the Council's office, and it is located in the poorest large city in the nation. In December 2019, the Department informed people in the community that the proposed direct contact numeric value would affect the cleanup at this site.

In using a target blood concentration of 10 µg/dL as a basis for the proposal, the Department makes the same error that it made when it approved a site-specific standard of 2240 ppm for the Philadelphia oil refinery in 2015. The proposal would endorse this error and enable property owners at contaminated sites to benefit from even less stringent site-specific standards for lead -- in the neighborhood of 2500 ppm. This would be material to a cleanup of the Philadelphia oil refinery, as it would result in a much smaller number of lead exceedances that would have to be dealt with by way of corrective action. For example, for two Areas of Interest (AOI-5 and AOI-9), this would mean only 10 or 11 exceedances each, rather than 55 exceedances each under a value of 1000 ppm.

In a legal challenge, the proposed direct contact numeric value of 2500 ppm would be unreasonable as a matter of law and "not in accordance with law."

The Department should not finalize the proposal. It should retain the current value of 1000 ppm.

Factual Background

"Any remediation standards adopted by this Commonwealth must provide for the protection of public health and the environment." Act 2, § 102(3).

Under the regulations, the Department must review new scientific information that is used to calculate Medium-Specific Concentrations (MSCs) and propose appropriate changes at least 36 months after the most recently promulgated MSCs:

> ***The Department will review new scientific information that relates to the basis of the MSCs as it becomes available*** and will propose appropriate changes for the consideration of the EQB as necessary, but in no case more than 36 months after the effective date of the most recently promulgated MSCs.

25 Pa. Code §250.11 (page 250-9) (bold italics added for emphasis). *See also* Proposed Rule, 50 Pa.B. 1011 (Section D. Background and Purpose).

In preparing this rulemaking, the Department sought the input of the Cleanup Standards Scientific Advisory Board (CSSAB):

> The Department worked with the Cleanup Standards Scientific Advisory Board (CSSAB) during the development of this proposed rulemaking. The CSSAB, which was established by section 105 of Act 2 (35 P.S.§ 6026.105), consists of persons representing a cross section of experience, including engineering, biology, hydrogeology, statistics, medicine, chemistry, toxicology and other related fields. The purpose of the CSSAB is to assist the Department and the Board in developing Statewide health standards, determining the appropriate statistically and scientifically valid procedures and risk factors to be used, and providing other technical advice as needed to implement Act 2.

Proposed Rule, 50 Pa.B. 1012 (Section D. Background and Purpose).

Currently, the nonresidential direct contact numeric value for lead is calculated based on a method developed by the Society for Environmental Geochemistry and Health (SEGH model). 25 Pa. Code §250.306(e), page 250-29, Chapter 250 regulations (pdf). Based on that model, the current regulations set the nonresidential direct contact numeric value for lead at 1000 ppm. *Id.*, 25 Pa. Code chapter 250, Appendix A, Table 4A, page 250-104.

A. The Department proposes to substitute the Adult Lead Methodology for the SEGH Model.

In the proposed rulemaking, the Department proposes to discontinue use of the SEGH model and instead adopt EPA's Adult Lead Methodology (ALM) for calculating the nonresidential direct contact numeric value for lead in soil. *See* Proposed Rule, 50 Pa.B. 1019 (to be codified at 25 Pa. Code §250.306(e)). As defined by EPA, the "(ALM) estimate[s] the concentration of lead in the blood of children, pregnant women and their developing fetuses who might be exposed to lead-contaminated soils." U.S. Environmental Protection Agency, Lead at Superfund Sites (Attachment 1). Because the ALM involves a formula, the Department has also proposed input variables for that formula. *See id.*, 50 Pa.B. 1097 (Draft Chapter 250 rulemaking Table 7, Attachment 2).

While the Department accepted the Centers for Disease Control and Prevention's baseline blood concentration of 0.6 µg/dL (which has decreased since 2012), it did not accept the reference value of 5 µg/dL (which the Centers for Disease Control and Prevention has used since 2012) as the target blood concentration. The Department's choice results in an increase in the direct contact numeric value for lead from 1000 ppm to 2517 ppm, which rounds to 2500 ppm.

B. The Department proposes using a target blood concentration ($PbB_{fetal,0.95}$) of 10 µg/dL.

In the notice of the proposed rulemaking the Department does not identify the target blood concentration that it used. Rather, it lists "TBD" as the target blood concentration ($PbB_{fetal,0.95}$). *See* 50 Pa.B. 1097 (Draft Chapter 250 rulemaking Table 7, Attachment 2).

In April 2018, minutes from a CSSAB meeting show that the Department was aware of adverse health effects associated with a lead blood concentration of 10 µg/dL, and requested guidance from the CSSAB as to which blood lead level, 5 µg/dL or 10 µg/dL, should be used to calculate the lead direct contact numeric value:

> ***EPA and Centers for Disease Control and Prevention (CDC) have determined that childhood blood lead concentrations at or above 10 micrograms of lead per deciliter (µg/dL) present risks to children's health. However, CDC has a blood lead action level of 5 µg/dL***. Additionally, the input parameters used in calculating the residential ingestion numeric value for lead in soil are based on EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model from 1990. Guidance was requested regarding which level should be used and whether DEP should update the model used for the input parameters. ***Ms. Guiseppi-Elie stated that blood lead action levels are a top priority for EPA and it is possible that the action level could go as low as 3 µg/dL***.

Cleanup Standards Scientific Advisory Board, Meeting Minutes, page 4 (April 4, 2018, Attachment 3) (bold italics added for emphasis).

Although the EPA member offered to research the issue and report back, the minutes from the subsequent meetings do not indicate any further discussion. *See* Department of Environmental Protection, Agendas and Handouts.

In August 2018, the Department made a presentation to the CSSAB at its meeting, noting the adverse health effects associated with a blood lead concentration of 10 µg/dL and that EPA was updating its strategy to address them:

> EPA – ***Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below***. OSRTI [Office of Superfund Remediation and Technology Innovation] is developing a new soil lead policy to address this new information.

Department of Environmental Protection, PowerPoint Presentation (August 1, 2018, Attachment 4), page 9 (bold italics added for emphasis). The CSSAB made a recommendation to use a target blood concentration of 10 µg/dL:

> ***CSSAB recommended that 10 µg/dL be used*** in the equation to calculate medium-specific concentrations (MSCs) for residential and non-residential lead exposure.

Cleanup Standards Scientific Advisory Board, Meeting Minutes, page 4 (August 1, 2018, Attachment 5) (bold italics added for emphasis). But the minutes do not provide any discussion or justification for this recommendation. *See id.* Among "potential action items," the meeting minutes mention the formation of a workgroup to further discuss lead blood level concentrations. *See id.*, page 5. It is not clear whether such a workgroup was ever formed.

In February 2019, the CSSAB held its next meeting, apparently reviewing a lead model comparison sheet prepared by the Department. *See* Department of Environmental Protection, Lead Model Comparison Sheet (undated, Attachment 6).[1] This sheet compares the current direct contact numeric value (1000 ppm) with two other values calculated using the ALM. With a target blood concentration of 5 µg/dL, the direct contact numeric value would be 1050 ppm. With a target blood concentration of 10 µg/dL, the direct contact numeric value would be 2517 ppm. (Apparently, the Department rounded down the 2517 ppm figure to arrive at the proposed value of 2500 ppm).

But the minutes from the CSSAB meeting provide no discussion of the choice between the two target blood concentrations. *See* Cleanup Standards Scientific Advisory Board, Meeting Minutes (February 13, 2019, Attachment 7).

For the February 2019 meeting, the Department's presentation demonstrates that the choice of a target blood concentration had been made before that meeting:

[1] Although undated, the document was posted among the materials for the February 13, 2019 meeting. *See* Department of Environmental Protection, Agendas and Handouts.

> Residential and non-residential direct contact values [were] calculated for lead using updated models and target blood lead level of 10 µg/dL.

Department of Environmental Protection, PowerPoint Presentation, page 12 (February 13, 2019, Attachment 8). Accordingly, the Department prepared a draft Table 4A for cleanup levels, containing a nonresidential direct contact numeric value of 2517 ppm. *See* Draft Chapter 250 rulemaking Table 4A (February 13, 2019, Attachment 9). However, draft Table 7 did not identify the chosen blood lead concentration, instead listing it as "TBD." *See* Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (February 13, 2019, Attachment 2).

For subsequent meetings of the CSSAB on June 12, 2019 and October 29, 2019, the Department posted updated versions of these proposed tables. For the nonresidential direct contact numeric value, the Department rounded down the 2517 ppm number to 2500 ppm. *See* Draft Chapter 250 rulemaking Table 4A (June 12, 2019, Attachment 10), Draft Chapter 250 rulemaking Table 4A (October 29, 2019, Attachment 11).

However, the Department continued to list the target concentration as "TBD," even though it had clearly made a determination to use a target blood lead level of 10 µg/dL. *See* Draft Chapter 250 rulemaking Table 7 (June 12, 2019, Attachment 12), Draft Chapter 250 rulemaking Table 7 (October 29, 2019, Attachment 13). This is also how the Tables appear in the notice of the proposed rulemaking. *See* 50 Pa.B. 1072 (Table 4A), 1097 (Table 7).

Comments

1. **It is the Policy of Public Health Agencies and Medical Organizations to Monitor Pregnant Women With Blood Lead Levels Over 5 ug/dL.**

The Department used the Adult Lead Methodology (ALM) as a basis for proposing the direct contact numeric value for lead. This methodology is designed to be protective of the fetus of a pregnant worker at a contaminated site. U.S. Environmental Protection Agency, Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology ("We assume that cleanup goals (preliminary remediation goals, or PRGs) that are protective of a fetus will also afford protection for male or female adult workers," Attachment 14). Accordingly, it is important to keep in mind the medical literature relating to fetal blood levels. A sample of that literature demonstrates that there is no "safe" maternal lead blood level for fetuses.

Maternal blood lead levels below 10 µg/dL have been linked to adverse birth outcomes (*See*, e.g., The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016, Attachment 15)). The World Health Organization states that "[t]here is no known 'safe' blood lead concentration; even blood lead concentrations as low as 5 µg/dL, may be associated with decreased intelligence in children, behavioral difficulties and learning problems. As lead exposure increases, the range and severity of symptoms and effects also increases." The World Health Organization, Lead Poisoning and Health, (August 23, 2019, Attachment 16).

The Committee on Obstetric Practice of the American College of Obstetricians and Gynecologists identifies pregnant women with blood lead levels higher than 5 µg/dL as requiring "avoidance of further exposure," "specific nutritional recommendations regarding calcium and iron supplementation" (to reduce risk from lead), and may be asked to discontinue breastfeeding their infants if the infant's blood lead level is higher than 5 µg dL. The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016, Attachment 15).

The Centers for Disease Control and Prevention notes that "If a pregnant or lactating woman has blood lead levels (BLLs) ≥5 µg/dL, the health care provider should attempt to determine the source(s) of lead exposure, working with the local health department and occupational medicine specialists as needed for environmental assessment and case management." Centers for Disease Control and Prevention, Breastfeeding (Attachment 17).

The National Capital Poison Center and HealthyChildren.org (associated with the American Academy of Pediatrics) also use a value of 5 µg/dL as a threshold for additional health interventions. *See* The National Capital Poison Center, Lead and Pregnancy ("If the level is 5 or above, repeat testing is needed. How often a woman is re-tested depends on her blood lead level. Pregnant women with lead levels of 5 mcg/dL or above also need extra calcium and iron in their diets. These supplements help prevent higher blood lead levels.", Attachment 18); *see also* HealthyChildren.org, Blood Lead Levels in Pregnant & Breastfeeding Moms ("Although most people will have some lead in their blood, levels greater than 5 micrograms per deciliter (µg/dL) indicate that there is some exposure that needs to be addressed.", Attachment 19).

In using a target blood concentration of 10 µg/dL for lead as a basis for calculating a proposed direct contact numeric value of 2500 ppm, the Department disregards policies set by the Centers for Disease Control and Prevention, the American College of Obstetricians and Gynecologists, and other medical organizations, putting pregnant women and their fetuses at risk.

2. <u>Public Health Agencies Use a Blood Lead Level of 5 µg/dL as a Basis for Managing Lead Exposure in Children 0-6, a Particularly Sensitive Population</u>.

The dangers of children's exposure to lead are well-documented and have been known for centuries. U.S. Department of Health and Human Services, National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead, page xv (June 2012, Attachment 20). Blood lead concentrations under 10 µg/dL are associated with reduced postnatal growth, decreased hearing, increased hypersensitivity to allergens, increased incidence of essential tremor, increased blood pressure, increased risk of hypertension, increased incidence of ALS, and increased cardiovascular-related mortality. *Id.*, Executive Summary, page xix, Table 1.1. The NTP Report "concludes that there is *sufficient* evidence for adverse health effects in children and adults at blood [lead] levels" less than 10 µg/dL and less than 5 µg/dL. *Id.*, Executive Summary, page xviii.

Federal and state public health agencies have applied a reference level of 5 ug/dL to guide their case management for children exposed to lead, starting at birth. Of course, any target blood concentration for a fetus should be as stringent or more stringent than an "elevated blood lead level" set by a public health agency for the protection of children.

A. The Centers for Disease Control and Prevention uses a reference level of 5 µg/dL for case management for children exposed to lead.

As part of the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention implements a lead poisoning prevention program. Centers for Disease Control and Prevention, Lead Poisoning Prevention (Attachment 21). Over time, the Centers for Disease Control and Prevention have lowered the concentration of lead in blood that is considered "elevated" in children, from 30 µg/dL to 25 µg/dL (in 1985), to 10 µg/dL (in 1991), and to 5 µg/dL (in 2012). *See* National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead, page xv (Attachment 20); *see also* Centers for Disease Control and Prevention, Blood Lead Levels in Children (Attachment 22).

In 2012, an advisory committee recommended that the Centers for Disease Control and Prevention eliminate the use of the phrase "level of concern" and lower the number from 10 µg/dL to 5 µg/dL:

> KEY POINTS/RECOMMENDATIONS
>
> Based on the scientific evidence, ***the ACCLPP recommends that the term "level of concern" be eliminated from all future agency***

> ***policies, guidance documents, and other CDC publications***, and that current recommendations based on the "level of concern" be updated according to the recommendations contained in this report.
>
> ***CDC should use a childhood BLL reference value based on the 97.5th percentile of the population BLL in children ages 1-5 (currently 5 µg/dL) to identify children and environments associated with lead-exposure hazards***. The reference value should be updated by CDC every four years based on the most recent population based blood lead surveys among children.

Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention, page 3 (January 4, 2012, Attachment 23) (bold italics added for emphasis).

The Centers for Disease Control and Prevention concurred with this recommendation, discontinuing the use of the phrase "level of concern" and adopting the term "reference value." Centers for Disease Control and Prevention, CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention", page 5, Recommendation I (June 7, 2012, Attachment 24). In addition, it lowered the number from 10 µg/dL to 5 µg/dL, committing to use the lower number for case management and distribution of public health information:

> In FY12, CDC will:
>
> a. ***Use the reference value*** in recommendations that ***involve follow-up evaluation of children*** after BLL testing.
>
> b. ***Use the reference value*** as defined to ***identify high-risk childhood populations*** and geographic areas most in need of primary prevention.
>
> c. ***Provide this information***, including specific high-risk areas, ***to a wide variety of federal, state, and local government agencies*** and nongovernment organizations interested in lead-poisoning prevention.

Id., pages 6-7, Recommendation II.

To illustrate, the website of the Centers for Disease Control and Prevention sets forth a matrix tailoring case management activities to particular blood lead levels (less than 5 µg/dL, 5–9 µg/dL, 10–19 µg/dL, etc.). Centers for Disease Control and Prevention, Recommended Actions Based on Blood Lead Level (Attachment 25). At blood lead levels of 5-9 µg/dL, "case management" includes follow-up testing, an investigation of potential sources of lead exposure, and nutritional counseling. *See id.*

B. The Department of Housing and Urban Development uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

The Department of Housing and Urban Development has adopted the 5 µg/dL reference value of the Department of Health and Human Services (Centers for Disease Control and Prevention) in its regulatory approach to exposure to lead-based paint in public housing. In 2016 and 2017, it proposed and finalized a rule that defined an "[e]levated blood lead level" as "a confirmed concentration of lead in whole blood of a child under age 6 equal to or greater than the concentration in the most recent guidance published by the U.S. Department of Health and Human Services (HHS) on recommending that an environmental intervention be conducted…."). Proposed Rule, 81 Fed. Reg. 60,304, 60,324 col. 1 (September 1, 2016), Final Rule, 82 Fed. Reg. 4151, 4167 (January 13, 2017) (to be codified at 40 C.F.R. 35.110 (Definitions)).

At the time of the rulemaking, the Centers for Disease Control and Prevention had already adopted the reference value of 5 µg/dL. *See* Proposed Rule, 81 Fed. Reg. 60,306 col. 2 ("CDC's current reference range level is 5 mg/dL (5 micrograms of lead per deciliter).").

For the Department of Housing and Urban Development, an "elevated blood lead level" is the threshold for lead in blood in a child that triggers a number of regulatory requirements for investigation. *See id.*, 82 Fed. Reg. 4167-4172 (to be codified at 40 C.F.R. §§35.325(a), 35.730(a), 35.830(a), 35.1130(a), 35.1225(a)).

C. The Pennsylvania Department of Health defines a blood lead level of 5 µg/dL as "elevated," requiring monitoring and case management for children.

The Pennsylvania Department of Health follows the Centers for Disease Control and Prevention's reference value of 5 µg/dL as an "elevated lead blood level" for children:

> Exposure to lead, even at low levels, can cause intellectual, behavioral and academic deficits. [footnotes omitted]. For this reason, ***in 2012, the Centers for Disease Control and Prevention (CDC) defined an elevated blood lead level (EBLL) as a blood lead level (BLL) ≥ 5 micrograms per deciliter (µg/dL).*** [footnote omitted]. ***This value is also used to identify children who require case management*** because, even at low levels, lead has been known to affect IQ, the ability to pay attention and educational achievement.

See Pennsylvania Department of Public Health, Childhood Lead Poisoning Prevention Program, 2018 Childhood Lead Surveillance Annual Report (January 2020, Attachment 26), page 3 (Executive Summary) (bold italics added for emphasis). The Department of Health applies this level for its own purposes by defining an elevated blood level as a level equal to or greater than 5 µg/dL. *See id.*, page 12 (Definitions) ("Elevated blood lead level (EBLL): A BLL ≥ 5 µg/dL"). The Department of Health also uses the terms "confirmed EBLL ≥ 5 µg/dL" and "confirmed EBLL ≥ 5 µg/dL," but only to differentiate among effects of different ranges, both of which are considered "elevated." *See id.* Those ranges become important in differentiating impacts and

responses. *See id.*, pages 17-47, Tables 1-14). To illustrate, in 2018, among children aged 0-71 months, 2.99% had elevated levels between 5 and 9.9 µg/dL, and 1.10% had elevated levels equal to or greater than 10 µg/dL. *Id.*, page 16 (Table 3).

The Department of Health then uses the 5 µg/dL level for monitoring children throughout the state in areas not subject to the jurisdiction of the county and municipal health departments:

> ***The Department's community health nurses (CHNs) continue to monitor elevated lead levels (≥ 5 µg/dL) in children aged 6 and under living in Pennsylvania***. The Department's community health nurses cover the counties and areas of the state not covered by the 10 county and municipal health departments (CMHDs). ***The CMHDs include six county (Allegheny, Bucks, Chester, Erie, Montgomery, and Philadelphia) and four municipal (Allentown, Bethlehem, Wilkes-Barre, and York city) health departments and have their own specific case management protocols***.

Id., page 5 (bold italics added for emphasis).

D. The Allegheny County Health Department uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

The Allegheny County Health Department has jurisdiction over the metropolitan area of Pittsburgh and neighboring communities in Allegheny County. Its universal lead testing regulation went into effect on January 1, 2018. *See* Article XXIII, Universal Blood Lead Level Testing Regulations, Section 10 (effective July 5, 2017, Attachment 27). It requires all children to be tested for lead exposure at approximately 9-12 months old and then again at approximately 24 months old. *See* Allegheny County Health Department, Blood Lead Level Testing (Attachment 28).

If the blood level is below 5 µg/dL, a follow-up test is not needed:

> **If the result is below 5 µg/dL:**
>
> - Your child's blood level is not elevated at this time. It is below the CDC's reference value, which is 5 µg/dL.
> - Your child does not need a follow-up test now.
> - If your child is younger than 2 years old, s/he will need another test when s/he is approximately 24 months old.
> - Your child may need another test if s/he moves to a different home, daycare, school, etc. that was built before 1978.
> - Go to our Prevention page to see how to keep your child safe from lead exposure.

Id. ("What Do the Test Results Mean?"). If the blood level is above 5 µg/dL, the Health Department considers the blood level to be elevated, requiring a confirmatory test:

If the result is at or above 5 µg/dL:

- Your child's blood level is elevated.
- If the test was a capillary test (in which blood is drawn from a finger stick) it needs to be confirmed with a venous test, in which blood is drawn from the arm. Capillary samples are easier to contaminate and sometimes the result is not accurate.
- Confirmatory tests need to be prescribed by your child's doctor. If your child is under- or uninsured, please see ACHD's Guide for Under and Uninsured Residents for a list of pediatric healthcare resources in Allegheny County that can help.
- Check the table below to see when your child should get a confirmatory test:

Recommended Schedule for Obtaining a Confirmatory Venous Sample

BLL (µg/dL)	Time to confirmation testing
<5	No confirmation required
5-9	1 week - 1 month[a]
10-44	1 week - 1 month[a]
45-59	48 hours
60-69	24 hours
≥70	Urgently as emergency test

[a] The higher the BLL on the screening test, the more urgent the need for confirmatory testing.

If the venous test confirms result at or above 5ug/dl, get more information on next steps by visiting My Child Has an Elevated Blood Lead Level.

Id. Like the Centers for Disease Control and Prevention and the Pennsylvania Department of Health, the Allegheny County Health Department draws an important line at 5 µg/dL.

E. The Philadelphia Department of Public Health uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

Like the state health department, the Philadelphia Department of Public Health defines an elevated blood level as a level equal to or greater than 5 µg/dL. *See* Philadelphia Department of Public Health, Childhood Lead Poisoning Surveillance Report (2017, Attachment 29), page 3 (Definitions) ("Elevated BLLs (EBLLs) in this report are classified as either 5-9 µg/dL or ≥10 µg/dL"). Like the state health department, it creates different categories of elevated blood levels (5-9 µg/dL and ≥10 µg/dL) for the purpose of gathering information and tailoring case management. To illustrate, in 2017, among children aged 0-71 months, 4.6% of newly identified blood lead levels were between 5 and 9 µg/dL, and 1.1% were equal to or greater than 10 µg/dL. *Id.*, page 10 (Table 4).

In using a target blood concentration of 10 µg/dL for lead as a basis for calculating a proposed direct contact numeric value of 2500 ppm, the Department disregards policies set by the Centers for Disease Control and Prevention, the Department of Housing and Urban Development, the Pennsylvania Department of Public Health, the Allegheny County Health Department, and the City of Philadelphia for children 0-6, and by extension the fetuses that are the target population of the ALM.

3. **The Proposed Direct Contact Numeric Value Would Have a Significant Negative Impact on Cleanups Throughout the Commonwealth.**

The Commonwealth of Pennsylvania recognizes the risks of exposure to lead and the prevalence of lead throughout the state. Joint State Government Commission, Advisory Committee and Task Force on Lead Exposure, Lead Exposure Risks and Responses in Pennsylvania (April 2019, Attachment 30). The conclusions of this state report are consistent with the conclusions about the detrimental health effects of lead outlined above. *See id.*, page 5 ("Children are at the greatest risk of lead poisoning, which can cause neurological damage, organ damage and death, but adults and the elderly can also suffer health concerns from lead exposure."), page 46 ("Intensive medical studies have found that young children are particularly vulnerable to the toxic effects of lead and can suffer profound and permanent adverse health effects, most notably affecting the development of a child's brain and nervous system.").

The state report noted that lead is a special concern in this Commonwealth due to "the age of Pennsylvania's infrastructure and history as an industrial center." *Id.*, page 5. The prevalence of elevated blood lead levels above 10 µg/dL in adults in Pennsylvania is among the highest in the nation:

> Of the 28 states reporting blood lead levels of greater than or equal to 10 µg/dL to the CDC under its Adult Blood Lead Epidemiology and Surveillance (ABLES) programs in 2013, ***Pennsylvania had the third highest prevalence rate at 49.1 per 100,000 employed adults aged 16 or older***. This is more than twice the average of 20.4. ***Pennsylvania had the highest prevalence rate for blood lead levels greater than or equal to 25 µg/dL at 25.7***. The average rate at this blood lead level was 5.2.

Id., page 46 (bold italics added for emphasis). But 10 µg/dL is not the goal. In the next sentence, the report notes that "[r]ecent studies have "found decreased renal function associated with BLLs at <5 µg/dL and increased risk of hypertension and essential tremor at BLLs <10 µg/dL." *Id.* (citing authority).

The proposed direct contact numeric value is not protective of human health because it is calculated using a target blood concentration for lead that is associated with significant negative health effects. Additionally, using this outdated target blood concentration enables remediators to develop site-specific standards that are not protective of public health. This is important because the flawed methodology would affect a broad range of sites.

A. The direct contact numeric value is not protective of human health.

In the notice of the proposed rulemaking, the Department erroneously asserts that the proposed direct contact numeric value for lead would protect public health:

> ***These proposed changes, based on new information, would protect public health and the environment*** and would provide the regulated community with clear information regarding the requirements of Act 2 and Chapter 250 related to the remediation of contaminated sites.

50 Pa.B. 1011, col. 1 (February 15, 2020) (bold italics added for emphasis). This statement is erroneous because the Department includes "new scientific information" that is favorable to a higher value (the baseline blood concentration), but does not include updated scientific information that is favorable to a lower value (the target blood concentration). *See* 25 Pa. Code §250.11 (requiring the Department to review "new scientific information" and propose "appropriate changes").

Numerically, the proposed direct contact numeric value is located in a table. 50 Pa.B. 1072 (proposing a direct contact numeric value of 2500 ppm, and deleting existing direct contact numeric value of 1000 ppm). The methodology for calculating the proposed standard is set forth in a subsection relating to ingestion numeric values. *See* 50 Pa.B. 1019-1020 (proposed regulatory text). The Department proposes to discontinue use of the existing model of the Society for Environmental Geochemistry (SEGH) and instead use the Adult Lead Methodology of EPA:

> (e) The residential ingestion numeric value for lead in soil was developed using the **[Uptake Biokinetic (UBK) Model for Lead (version 0.4)]** **Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children, Windows®® version (IEUBKwin v1.1 build 11) 32-bit version** developed by the EPA (U.S. Environmental Protection Agency. (**[1990]** **February 2010**) **[Uptake Biokinetic (UBK) Model for Lead (version 0.4). U.S. EPA/ECAO. August 1990,]** in lieu of the algorithms presented in subsections (a) and (b). Default input values are identified in Appendix A, Table 7. Because the **[UBK]** **IEUBK** model is applicable only to children, the nonresidential ingestion numeric value was calculated **[according to the method developed by the Society for Environmental Geochemistry and Health (Wixson, B. G. (1991)). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. *Trace Substances in Environmental Health*. (11-20), using the following equations:**

$$S = \frac{1000\left[\left(\frac{T}{G^n}\right) - B\right]}{\delta}$$

]

using EPA's Adult Lead Methodology (ALM) in accordance with the guidance, exposure factors, equations, and spreadsheets provided in EPA's *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil* (EPA-540-R-03-001, OSWER Dir # 9285.7-54, January 2003), *OLEM Directive 9285.6-56 "Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters"* (May 2017) and the associated June 14, 2017, version of the *Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee* spreadsheets. Table 7 identifies each of the variables **[in this equation] used to calculate the nonresidential ingestion numeric value for lead**.

Id. (proposed §250.306(e)) (emphasis in original; bold underlining in original represents new material; brackets in original represents deleted material).

The proposed rule states that the direct contact numeric value was calculated using the ALM and in accordance with the guidance, and spreadsheets, contained in three documents.

The first document is an EPA guidance document regarding the use of the ALM, published in 2003. U.S. EPA, Technical Review Workgroup for Lead, Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (EPA-540-R-03-001, January 2003, Attachment 31). At that time, EPA was recommending a target blood lead concentration of 10 µg/dL. *See id.*, page 6, Table 1. EPA published this document before the Centers for Disease Control lowered its threshold from 10 µg/dL to 5 µg/dL in 2012.

The second document is an update published by EPA in 2017 that addressed newer scientific information regarding blood levels. That document set forth a table of calculations for Preliminary Remediation Goals (essentially, cleanup levels), based on a "5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead target level":

Table 3. Current and previous PbB_0 and GSD_i parameter values shown in the ALM *PRG calculation* tab of the ALM spreadsheet. Calculations of PRGs 5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead target level.

Variable	Description of Variable	Units	Current GSDi and PbB_0 from Analysis of NHANES: 2009-2014	Previous GSDi and PbB_0 from Analysis of NHANES 1999-2004
$PbB_{fetal, 0.95}$	95th percentile PbB in fetus	µg/dL	5	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365
PRG	**Preliminary Remediation Goal Soil Lead Concentration where PbB_i = 5 µg/dL**	**ppm**	**1050**	**773**

U.S. EPA, OLEM Directive 9285.6-56, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable, page 6, Table 3 (May 2017, Attachment 32).

Attached to the two-page transmittal memorandum was a set of Frequently Asked Questions that stated that EPA was updating its soil lead strategy to incorporate new scientific information recognizing adverse health effects at blood lead concentrations below 10 µg/dL, and that the release date was pending:

> OLEM [Office of Land and Emergency Management] recognizes adverse health effects at blood lead concentrations below 10 µg/dL. ***Accordingly, OLEM is updating the soil lead strategy to incorporate this new information***. However, the release date for the updated strategy is pending.

Id., Transmittal Memorandum, page 3 (bold italics added for emphasis). In the meantime, the TRW Lead Committee recommended the following considerations for all non-residential risk assessments where lead is a contaminant of concern:

> 1. ***The updated NHANES values are appropriate for lead risk assessments for residential and non-residential exposures*** both in

> assessing risk and in developing preliminary remediation goals (PRGs) for your site.
>
> 2. ***Lead risk assessments should include a discussion of*** the most current toxicity information and ***Centers for Disease Control and Prevention Reference level***.
>
> 3. Consistent with risk management best practices, ***caution should be applied when implementing cleanup levels based on the updated NHANES values for non-residential scenarios (PRGs are greater than 2000 ppm using default values).*** Ineffective controls or incorrect land use assumptions could have potentially greater health consequences on children who are exposed (e.g., by visiting, trespassing, or tracking the material to the residence) to these high concentrations (especially given the new toxicity information).
>
> Users are encouraged to contact the technical support hotline, TRW Lead Committee, or regional risk assessor with any questions.

Id. (bold italics added for emphasis).

The third document represents an Excel spreadsheet prepared in 2017 by EPA for calculating Preliminary Remediation Goals for nonresidential soils based on the new scientific information, including the updated target blood concentration. U.S. EPA Technical Review Workgroup for Lead, Spreadsheet for Calculation of PRGs: Appendix B of ALM document(2 pp, 18 K) (June 14, 2017, Attachment 33).[2] In this document there are two sheets: (1) one sheet for Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas and (2) one sheet for Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas. *See id.* Rather than using 10 µg/dL, EPA used 5 µg/dL as the target blood concentration in both sheets. *See id.* Together with other inputs, this leads to a Preliminary Remediation Goal of 1050 ppm. *See id.*

The use of the 5 µg/dL target blood concentration in this spreadsheet is significant because this spreadsheet was based on a template attached to the 2003 guidance document, which had used 10 µg/dL as the target blood concentration. See Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (January 2003, Attachment 31), Appendix B ("Calculations of Preliminary Remediation Goals (PRGs)," page B-1.

The Department was aware that EPA recognized adverse health effects below 10 µg/dL, and even quoted cautionary language from EPA in its lead model comparison sheet:

[2] The link is on EPA's website: Lead at Superfund Sites: Software and Users' Manuals.

> EPA's lead guidance website states, ***'Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below***. OSRTI is developing a new soil lead policy to address this new information.
> ….
>
> ***EPA's guidance for the ALM cautions that the values calculated using this new model are high and may not be protective of all receptors, i.e. a school or playground that borders a non-residential property***. This is not necessarily in-line with the purpose of the statewide health standard which should be protective across the entire state.

See Department of Environmental Protection, Lead Model Comparison Sheet (undated, Attachment 6) (bold italics added for emphasis). Still, the Department used 10 µg/dL, rather than 5 µg/dL.

In fact, in the notice of the proposed rulemaking the Department suggests that new scientific information regarding lead exposure leads to the conclusion that the direct contact numeric value should be *weakened*, rather than strengthened:

> The soil numeric values represent a proposed decrease for approximately 83% of the values and an increase for 17% of the values. For groundwater, the proposed changes reflect a decrease for approximately 92% of the values and an increase in approximately 8% of the values. Lowering the values may indicate a more stringent cleanup is required at a site ***and increasing the values may indicate a less stringent cleanup is required at a site***. ***These proposed changes reflect updated information related to exposure limitations to these substances and recognize that a higher or lower standard is better representative of those substances' exposure thresholds***.

See 50 Pa.B. 1012 col. 1 (bold italics added for emphasis). But the Department is going in the *opposite* direction of the science. In the context of a lack of a safe level of exposure to lead, the public health agencies have been focusing on lower blood lead levels, not higher levels. *See* discussion in Comment #2, above.

In the calculation of the direct contact nonresidential soil standard of 2500 ppm, the Department used all the default parameters provided in the 2017 Adult Lead Methodology (Attachment 33), *except* for the target blood level (Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7, February 13, 2019, Attachment 2). In response to an inquiry regarding the development of the proposed direct contact numeric value, the Department stated that "DEP is using EPA's lead methodologies, generally with EPA's default values." *See* Attachment 34 -- Email from C. David Brown to Peter Winslow, dated January 3, 2020.

By asserting that it "generally" used EPA's default values, the Department demonstrated that it was ignoring a value that it considered to be a default value in EPA's 2017 spreadsheet.

In 2020, the Department may not cherry-pick new scientific information -- at least not reasonably. It cannot apply new scientific information that tends to make a standard less stringent (the baseline blood concentration) while ignoring other new scientific information that tends to make a standard more stringent (the target blood concentration). In proposing the direct contact numeric value, the Department adopted the 10 μg/dL target blood concentration in EPA's 2003 guidance document, ignoring the 5 μg/dL target blood concentration in EPA's 2017 guidance document, and ignoring the 5 μg/dL target blood concentration in EPA's 2017 spreadsheet.

Because the target blood concentration used by the Department is not protective of public health, the proposed direct contact numeric value is not protective of public health.

B. The proposed direct contact numeric value would make site-specific standards for lead not protective of public health.

In addition to causing a dramatic increase in the proposed direct contact numeric value, the Department's use of the 10 μg/dL target blood concentration would enable owners of contaminated sites to develop site-specific standards that are not protective of public health.

It does this in two ways. First, it increases the threshold at which a property owner will have an incentive to request a site-specific standard, where the direct contact numeric value prevails over the soil-to-groundwater numeric value. Under the regulations, sometimes the medium-specific concentration is set by the direct contact numeric value, and other times it is set by the soil-to-groundwater numeric value. *See* 25 Pa. Code §250.305(d)(1)-(2). Second, its use of the 10 μg/dL target blood concentration validates the development of a site-specific standard near 2500 ppm, superseding both the direct contact numeric value and the soil-to-groundwater numeric value.

The Department recognizes that the proposed amendments do not change the statutory right of a remediator to develop a site-specific standard for lead:

> ***The proposed amendments to Statewide health standard MSCs would not affect the cleanup options available to remediators under other cleanup standards***. Persons conducting remediation under Act 2 may choose from three different cleanup standards: background, Statewide health ***or site-specific***.

See 50 Pa.B. 1015 col. 1 (bold italics added for emphasis).

Under the statute, a property owner has the option of developing a site-specific standard rather than applying a statewide health standard:

> Section 301. Remediation standards.
>
> (a) Standards.--***Any person*** who proposes or is required to respond to the release of a regulated substance at a site and ***who wants to be eligible for the cleanup liability protection under Chapter 5 shall select and attain compliance with one or more of the following environmental standards when conducting remediation activities***:
>
> (1) a background standard which achieves background as further specified in section 302;
>
> (2) ***a Statewide health standard adopted by the Environmental Quality Board*** which achieves a uniform Statewide health-based level so that any substantial present or probable future risk to human health and the environment is eliminated as specified in section 303; or
>
> (3) ***a site-specific standard which achieves remediation levels based on a site-specific risk assessment*** so that any substantial present or probable future risk to human health and the environment is eliminated or reduced to protective levels based upon the present or currently planned future use of the property comprising the site as specified in section 304.

See Act 2 of 1995, §301(a) (bold italics added for emphasis). The regulations also contemplate the use of a risk assessment for developing a site-specific standard. *See* 25 Pa. Code §250.402 ("The development of site-specific standards shall be based on a site-specific risk assessment, if required.").

For lead in soil, this would mean that a site-specific standard would "almost always" be based on EPA's Adult Lead Methodology:

> I'm assuming the ALM was used to calculate the non-residential site-specific lead standard at the Philadelphia Refinery which resulted in a value of 2,240 mg/kg. ***When we calculated the non-residential direct contact value for the proposed rulemaking using the ALM default exposure factors we ended up with a very similar number of 2,500 mg/kg***. Thus, it is probably safe to say that the differences in the default exposure factors from the SEGH model and the ALM resulted in the difference between the current non-residential direct contact lead value and the site-specific value calculated for the Philadelphia Refinery.
>
> Keep in mind that the non-residential direct contact numeric value will never be the MSC because it is higher than the generic soil to groundwater numeric value of 450 mg/kg. So in cases where the

> SHS is being used, the soil MSC for lead will always be 450 mg/kg. ***For site-specific analyses, such as the Philadelphia Refinery, the ALM is almost always used which results in a value closer to our proposed direct contact non-residential soil lead value***.

Attachment 35, Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019 (bold italics added for emphasis).

In fact, the consultant used the ALM when it developed a site-specific standard of 2240 ppm for its remedial investigation at the Philadelphia oil refinery in 2015, based on a target blood concentration of 10 µg/dL. *See* Evergreen Resources Group, LLC, Human Health Risk Assessment, Section 8.0 (Risk Characterization), pages 9-11 (February 24, 2015, Attachment 36).

The Department approved the site-specific 2240 ppm standard several months later. *See* Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields) (April 30, 2015, Attachment 37) (recommending approval of 2240 ppm standard), Approval Letter from C. David Brown to Evergreen Resources Management Operations (May 6, 2015, Attachment 38).

The Department not only approved the site-specific standard of 2240 ppm for the Philadelphia oil refinery, but also endorsed the use of 10 µg/dL; *See* Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields), page 2 ("The target blood lead concentration is 10 µg/dL, which is considered to be a level in a pregnant worker above which fetal neurological damage could occur," Attachment 37).

The site-specific standard of 2240 ppm for the Philadelphia oil refinery and the Department's proposed nonresidential soil direct contact standard of 2500 ppm were both calculated using the same model (ALM) and the same target blood concentration (10 µg/dL). The minor difference in the two resulting values is due to the Department's use of EPA's updated values for the other model parameters. *See* Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K), June 14, 2017, Attachment 33).

C. The proposed direct contact numeric value would not be protective of public health at a broad range of nonresidential properties.

The Department's proposed increase in the direct contact numeric value from 1000 ppm to 2500 ppm would apply to nonresidential sites undergoing cleanups throughout Pennsylvania. The term "nonresidential" is broadly defined to include all industrial and commercial uses of land, as well as related administrative activities:

> ***Any real property on which commercial, industrial, manufacturing or any other activity is done to further either the development, manufacturing or distribution of goods and***

> ***services, intermediate and final products***, including, but not limited to, ***administration of business activities***, research and development, warehousing, shipping, transport, remanufacturing, stockpiling of raw materials, storage, repair and maintenance of commercial machinery and equipment, and solid waste management. This term shall not include schools, nursing homes or other residential-style facilities or recreational areas.

See Act 2 of 1995, §103 (bold italics added for emphasis). Nonresidential means not only oil refineries, but also office buildings and commercial properties. It means properties in both urban and rural areas. Because the proposed direct contact numeric value is not protective of public health, people working on nonresidential properties could be exposed to harmful levels of lead.

The Department proposes a direct contact numeric value that is not protective of human health and enables remediators developing their own site-specific standards to do the same. This is especially inappropriate given the wide range of nonresidential properties to which such standards would apply.

D. The proposed direct contact numeric value would be much greater than comparable cleanup levels in most of the states neighboring Pennsylvania.

With one exception, the states neighboring Pennsylvania have comparable cleanup levels for lead in nonresidential soil that are much lower than the proposed direct contact numeric value of 2500 ppm. The Department should follow the states that recognize harm at lower levels, and maintain the existing direct contact numeric value of 1000 ppm.

Maryland applies a cleanup level of 800 ppm for nonresidential soil in its guidance document. Maryland Department of the Environment, Cleanup Standards for Soil and Groundwater, Interim Final Guidance (Update No. 3) (October 2018, Attachment 39), page 24, Table 1 (setting forth non-residential clean-up standard of 800 mg/kg for soil).

Delaware applies a cleanup level of 1000 ppm in its guidance document. *See* Delaware Department of Natural Resources and Environmental Control, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act (Revised December 1999, Attachment 40), page 12 (defining "restricted use setting" to essentially mean nonresidential use), Attachment 3, page 8 (1000 mg/kg for restricted use). *See also* Delaware Department of Natural Resources and Environmental Control, Guidance for Human Health Risk Assessments (HHRA) under the Hazardous Substance Cleanup Act (HSCA) (October 2017, Attachment 41), page 19 ("Remediation for lead will normally be required if the EPC [Exposure Point Concentration] is greater than 400 mg/kg (or 800 mg/kg for restricted use sites").

New Jersey applies a cleanup level of 800 ppm in its regulations for nonresidential soil. *See* N.J.A.C. 7:26D (Remediation Standards) (last amended September 18, 2017, Attachment 42), Appendix 1, page 19, Table 1B (setting forth non-residential direct contact soil remediation standard of 800 mg/kg).

Ohio applies a cleanup level of 800 ppm in its regulations. *See* Ohio Environmental Protection Agency, VAP Rules Effective October 17, 2019, OAC 3745-300-08 Appendix A, page 42, Table III (Attachment 43) (setting forth direct-contact soil standard of 800 mg/kg for commercial and industrial land use).

West Virginia applies a cleanup level of 1000 ppm in its legislative rule. West Virginia Department of Environmental Protection, Technical Guidance and Templates, Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3) (effective April 1, 2018, Attachment 44), page 3, §60-3-2.24 (defining "industrial land use" to include "land used for commercial establishments"), page 80, Table 60-3B (setting forth risk-based concentration of 1000 mg/kg for industrial soil).

Unlike other neighboring states that set a single standard for nonresidential sites (applying to both commercial and industrial use), New York has set different standards for commercial and for industrial use. For commercial use, New York has set a soil cleanup objective of 1000 ppm, which is the current direct contact numeric value in Pennsylvania (6 CRR-NY 375-6.8(b): Restricted Use Soil Cleanup Objectives, Attachment 45).

For industrial use, New York has set a soil cleanup objective of 3900 ppm (*See* 6 CRR-NY 375-6.8(b): Restricted Use Soil Cleanup Objectives, Attachment 45). New York set this soil cleanup objective in 2006 -- six years before the Centers for Disease Control and Prevention embraced a reference value of 5 µg/dL. *See* 6 NYCRR PART 375 (Effective December 14, 2006, Attachment 45). Moreover, the Technical Support Document in that rulemaking notes that it was following the Centers for Disease Control and Prevention's "level of concern" from 1991:

> ***The blood lead level is typically 10 mcg/dL*** (micrograms of lead per deciliter of blood), ***which is the Centers for Disease Control and Prevention (CDC) level of concern for blood lead in young children*** (ATSDR, 1999; ***CDC, 1991***). In most cases, the guidelines are derived so that the blood levels of almost all children exposed at the guideline would be below 10 mcg/dL. ***This is the approach taken in the derivation of the SCOs for lead*** (see Section 5.3.4 Chronic Lead SCOs).

See New York State Department of Environmental Conservation and New York State Department of Health, Technical Support Document (September 2006, page 40, Attachment 46). The fact that New York has not amended its soil cleanup objective for industrial use to catch up with the science is not a justification for Pennsylvania to do the same for all nonresidential uses -- including both commercial and industrial uses.

4. <u>The Soil-to-Groundwater Numeric Value Does Not Render the Proposed Direct Contact Numeric Value Meaningless.</u>

The Department has asserted that the proposed direct contact numeric value for lead has no legal effect because it will always be superseded by a more stringent soil-to-groundwater numeric value. This is incorrect. Moreover, if the Department truly believes this, it should not

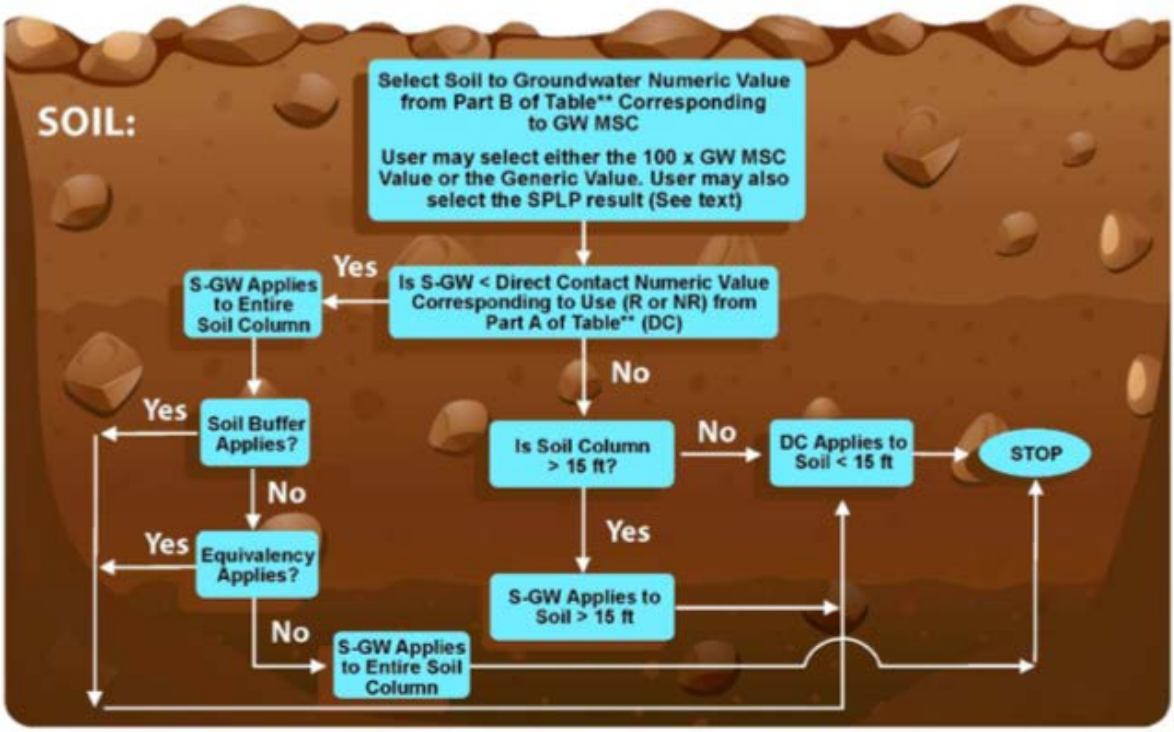
have any objection to not finalizing its proposed direct contact numeric value and retaining the current value of 1000 ppm in the regulations.

The source of the Department's position appears to be an email to the Southeast Regional Office relating to the remedial investigation at the Philadelphia oil refinery:

> Keep in mind that the non-residential direct contact numeric value will never be the MSC because it is higher than the generic soil to groundwater numeric value of 450 mg/kg. ***So in cases where the SHS is being used, the soil MSC for lead will always be 450 mg/kg***.

See Attachment 35, Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019 (bold italics added for emphasis). This statement framed the Department's erroneous press release relating to the proposed direct contact numeric value. *See* Department of Environmental Protection, Press Release, dated March 16, 2020 (Attachment 47), asserting that "[t]he non-residential statewide health standard of 450 ppm will remain unchanged."

The process of selecting statewide health standards is illustrated in the following decision tree [Figure II-11: Decision Tree for Selecting Statewide Health Standard MSCs for Groundwater and Soil)]



See Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019, Attachment 48), Section II (Act 2 Remediation Process), page II-52.

The Department is incorrect in asserting that a soil-to-groundwater numeric value will always prevail over a direct contact numeric value. In support of its argument, the Department relies on a subsection of the regulations that defines a medium-specific concentration as the lowest of three numbers -- the ingestion numeric value, the inhalation numeric value, and the soil-to-groundwater numeric value. *See* 25 Pa. Code §250.305(d)(1)(i)-(iii). But that is one-half the definition. The Department ignores the other half.

The other half of the definition defines a medium-specific concentration as the lowest of the first *two* numbers -- the ingestion numeric value and the inhalation numeric value, *without regard to the soil-to-groundwater numeric value*. *See id.*, §250.305(d)(2). To satisfy that other half of the definition, a remediator must perform a demonstration of the soil-to-groundwater pathway soil buffer or a soil-to-groundwater pathway equivalency demonstration. *See id.*, §250.305(d)(2)(i)-(iii).

The first demonstration involves a showing that "[t]he concentration of the regulated substance cannot exceed the limit related to the PQL [Practical quantitation limit] or background throughout the soil buffer," among other things. *See id.*, §250.308(b)(2). The soil buffer depth for lead is set at 10 feet. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4B (Attachment 10).

The second demonstration involves a showing that the regulated substances will not migrate to bedrock or the groundwater within 30 years at concentrations exceeding the greater of the groundwater medium-specific concentration or background in groundwater as the endpoint in soil pore water directly under the site, among other things. *See id.*, §250.308(d)(1).

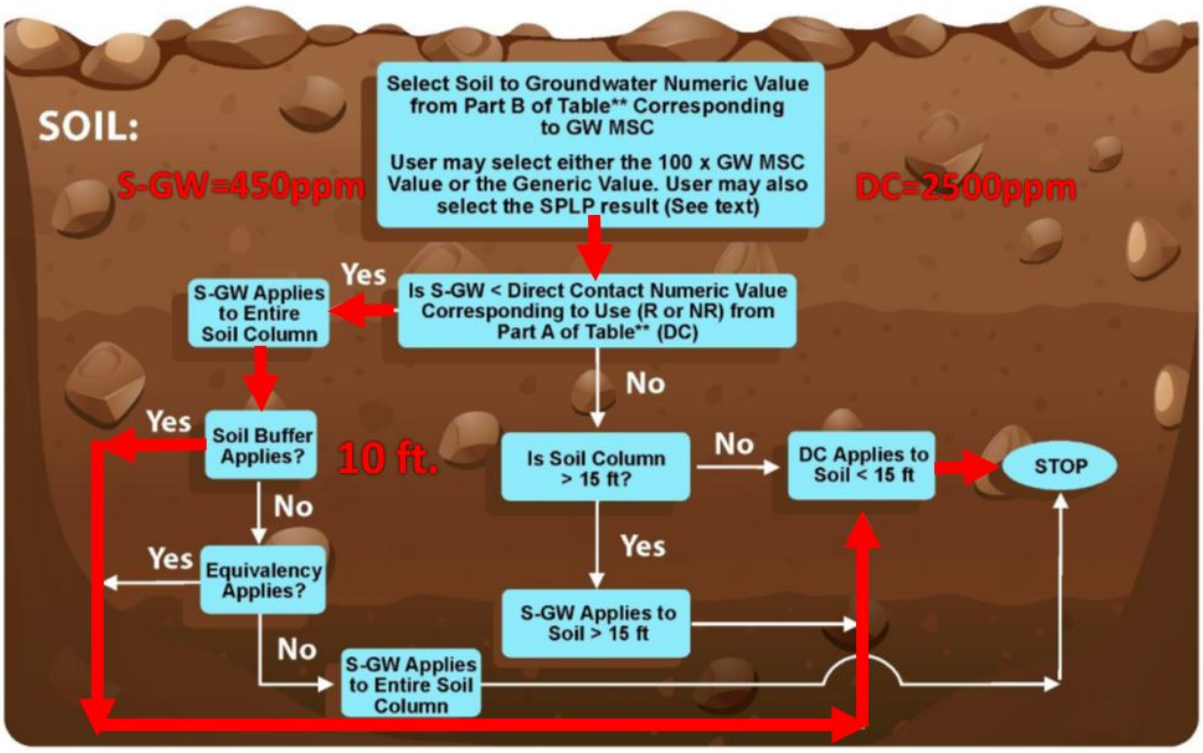
Assuming either demonstration is met, the soil-to-groundwater numeric value would not determine the medium-specific concentration. *See id.*, §250.305(d)(2).

In its own Technical Guidance Manual, the Department makes it clear that when either demonstration is met, the medium-specific concentration for soil will be the direct contact numeric value:

> ii) Determining Soil MSCs
>
> In determining the applicable soil standard, the remediator must compare the appropriate soil-to-groundwater numeric value to the direct contact numeric value for the corresponding depth interval within 15 feet from the ground surface. The lower of these two values is the applicable MSC for soil. ***If either the soil buffer distance (described in 25 Pa. Code § 250.308(b) and (c)) or the equivalency demonstration (described in 25 Pa. Code § 250.308(d)) is met, the soil-to-groundwater numeric value will be deemed to be satisfied, and the soil MSC will be the direct contact numeric value***. The soil-to-groundwater numeric value is the MSC

> for soil at depths below 15 feet, unless either the soil buffer distance or the equivalency demonstration is met.

See Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019, Attachment 48), Section II (Act 2 Remediation Process), page II-51 (bold italics added for emphasis).[3] To demonstrate how the direct contact numeric value of 2500 ppm for lead could apply, the Council has highlighted the following route in red below:



See id., page II-52 (arrows, lines, and text in red added for emphasis).

Therefore, there is no merit to the Department's argument that the proposed direct contact numeric value has no legal effect.

Moreover, it is presumed that when an agency proposes to do something, it intends some effect. In the past, the Department has told the Independent Regulatory Review Commission that its statewide health standards (including its direct contact numeric values) are important for the protection of public health:

> The Land Recycling Act requires the EQB to establish by regulation ***a uniform Statewide health standard that can be used to eliminate any substantial present or probable future risk to human health, welfare, and the environment***. The original standards were promulgated in 1997 and codified in Chapter 250.

[3] The document is on the Department's Web Page for Technical Guidance Manual.

> Section 104(a) of the Land Recycling Act explicitly recognizes that these standards would need to be updated over time as better science became available and as the need for clarification or enhancement of the program became apparent. ***Updating the standards serves the public, as DEP is able to use the most up-to-date health and scientific information to establish the cleanup standard for exposure to substances that cause cancer or have other toxic effects on human health or welfare***. The Statewide health standard is expressed as a list of MSCs, which apply to either soil or groundwater contamination and to residential and non-residential exposure scenarios as authorized under the Land Recycling Act.
>
> ***The changes in the MSCs in these amendments to Chapter 250 serve both the public and the regulated community as they provide clear information on what is required at contaminated sites***. Having access to that information allows the public to know the acceptable level of contamination at a site based on the intended use of the property, and it provides remediators with a uniform endpoint to the remediation process. ***Because each site and situation is unique, it is necessary to provide different MSCs for***: 1) specific constituents in groundwater at points of compliance, 2) ***specific constituents in soil, where there may be direct contact through ingestion or inhalation***, and 3) specific constituents in soil that may leech [sic] into groundwater. ***Each of these MSCs is based on the physical, toxicological, and esthetic properties of a specific regulated substance, which are based on scientific sources of information***.

Department of Environmental Protection, Regulatory Analysis Form, filed May 13, 2016, pages 2-3, Box No. 10 (Attachment 49. Bold italics added for emphasis).

If the Department feels compelled to come up with a number simply because it had to do so (as it has suggested), the Department should maintain the current direct contact numeric value of 1000 ppm.

5. <u>As a Matter of Law, the Proposed Direct Contact Numeric Value is Unreasonable</u>.

The Department has cherry-picked scientific information for the Adult Lead Methodology. It has used new scientific information that tends to make a standard less stringent (the baseline blood concentration) while ignoring other new scientific information that tends to make a standard more stringent (the target blood concentration). This is legally unreasonable.

It is significant that the target blood concentration is the only value in the EPA 2017 spreadsheet that the Department did *not* use when it calculated the proposed direct contact numeric value of 2500 ppm. *See* 50 Pa.B. 1097 (Appendix A, Table 7 ("Input Values Used in

the Adult Lead Model"); *see also* Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K) (June 14, 2017, Attachment 33).

As a basis for its choice of a target blood concentration of 10 µg/dL, the Department apparently relies solely on the EPA guidance document from 2003, ignoring new scientific information reflected in the 2017 EPA guidance document and the 2017 EPA spreadsheet. The Department has not identified any other documentary justification as a basis for using 10 µg/dL.

The meeting minutes of the CSSAB do not contain any discussion of arguments for or against a target blood concentration of 10 µg/dL or 5 µg/dL. The minutes only state that the Department sought input regarding the choice between these target blood concentrations, and that the CSSAB recommended the less protective one. *See* Meeting Minutes (April 4, 2018, Attachment 3), Meeting Minutes (August 1, 2018, Attachment 5), Meeting Minutes (February 13, 2019, Attachment 7).

Apart from the EPA representative, the only academic representative on the CSSAB has a field of expertise outside of environmental remediation and public health. *See* Cleanup Standards Scientific Advisory Board Members, Membership List (Updated June 2018, Attachment 50) (Tina M. Serafini, D.Sc.). The other members are representatives of business and industry.

One member of the CSSAB who was present at all three meetings is a consultant who prepared remedial investigation reports for lead contamination for the Philadelphia oil refinery. *See* Colleen Costello, Linkedin Page (employed with GHD from March 2015-March 2020, Attachment 51). Her company performed ongoing work relating to the delineation of lead contamination in the soil and anticipated remedies under the site-specific standard for lead approved in 2015. *See* Colleen Costello, GHD, Remedial Investigation Report (November 21, 2017, Attachment 52), Section 9.6 ("AOI 6 areas with identified soil exceedances of the direct-contact MSC for BaP and benzene, with the exception of BH-16-025, and SSS for lead have been delineated and remedies will be addressed in future Act 2 submissions, including a Facility-Wide Cleanup Plan."); *see also* Colleen Costello, GHD, Letter to David Brown (April 30, 2018, Attachment 53), page 1 ("Additionally, lead in the area between BH-17-004 and the bulkhead will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report or the site-wide Cleanup Plan. Additional sampling is anticipated to support either the Risk Assessment or the Cleanup Plan activities."). In addition, another representative of GHD (who was not a member of the CSSAB) attended the second and third meetings.

Neither the CSSAB's recommendation of 10 µg/dL nor the Department's acceptance of the recommendation was credible. Given the science and the implementation of policy by federal and state health agencies, the selection of 10 µg/dL was unreasonable as a matter of law.

6. As a Matter of Law, the Proposed Direct Contact Numeric Value is "Not in Accordance with Law."

According to the Pennsylvania state courts, the pre-enforcement doctrine generally forecloses a party from immediately challenging a final rulemaking. However, such a party does not forfeit the right to challenge the regulation. When the regulation is implemented in such a manner as to cause harm, a party with standing may commence a legal challenge at that time. *See Rand v. Pennsylvania State Bd. of Optometry*, 762 A.2d 392 (Cmwlth., 2000) (regulation establishing a testing deadline to qualify for a license invalidly exceeded the agency's statutory authority, where the deadline was unnecessary to advance the intent of the act and therefore outside the grant of authority).

This is not an academic point. The proposed direct contact numeric value would have an effect on the remedial investigation at the Philadelphia oil refinery, either by setting a medium-specific concentration or by affecting a site-specific standard. If and when the Department makes another determination regarding the applicability of cleanup standards for that project, a party with standing will have the opportunity to challenge the proposed direct contact numeric value (if finalized) at that time.

On a number of accounts, the proposed direct contact numeric value is legally flawed. Because it violates a number of statutory and regulatory requirements, it is "not in accordance with law."

A. The proposed direct contact numeric value violates a number of statutory requirements.

A state court may strike down a regulation that is "not in accordance with law." *See* 2 Pa.C.S. § 704, Pennsylvania Consolidated Statutes, Title 2. Because the proposed direct contact numeric value violates a number of statutory requirements, it is "not in accordance with law."

According to the declaration of policy in the statute, "[a]ny remediation standards adopted by this Commonwealth must provide for the protection of public health and the environment." Act 2, § 102(3). As discussed above, the Department proposes a direct contact numeric value based on a target blood lead concentration that has been linked to serious and irreversible health effects. Because the proposed direct contact numeric value was calculated using this variable (as will almost all site-specific standards for lead), the resulting standards would not be protective of public health, causing them to violate this declaration of policy.

The declaration of policy also states that "[p]ublic health and environmental hazards cannot be eliminated without clear, predictable environmental remediation standards and a process for developing those standards." Act 2, §102(3). But the Department's presentation and discussion of the proposed direct contact numeric value has not been clear and predictable. The Department asserts that the proposed direct contact numeric value would have no legal effect, under the mistaken rationale that a much lower soil-to-groundwater value will always apply. In addition, it ignores the fact that it would have a significant legal effect by enabling property owners to develop site-specific standards near 2500 ppm, by endorsing a target blood

concentration that is two times the blood lead level used by public health agencies for dealing with children exposed to lead.

The lack of clarity is compounded by the fact that the Department did not include the target blood concentration of 10 µg/dL anywhere in the notice of the proposed rulemaking. It actually set forth "TBD" (presumably, "to be determined") as the target blood concentration in the proposed table. *See* 50 Pa.B. 1097 (Appendix A, Table 7 ("Input Values Used in the Adult Lead Model"). This makes it difficult for the public to recognize the connection between the proposed direct contact numeric value and site-specific standards for lead -- a connection that the Department has emphatically denied.

By asserting that the proposed direct contact numeric value is essentially meaningless, and by listing a key variable used to calculate that value as "TBD," the Department proposes a regulation that lacks "clear, predictable" standards, in violation of the declaration of policy in Act 2.

The statute also requires the Environmental Quality Board to promulgate Statewide health standards "along with the methods used to calculate" those standards." Act 2, §303(a) ("The Environmental Quality Board shall promulgate Statewide health standards for regulated substances for each environmental medium.... The Environmental Quality Board shall also promulgate along with the standards the methods used to calculate the standards."). Again, the Department does not identify the target blood concentration for determining the proposed direct contact numeric value of 2500 ppm. Rather, it merely identifies it as "TBD." *See* 50 Pa.B. 1097 (Appendix A, Table 7). The fact that the Council was able to deduce that the Department is using a 10 µg/dL target blood concentration does not excuse this violation of the statute.

The statute requires the direct contact numeric value to be based on "valid scientific methods." *See* Act 2, §303(b)(5) ("For the nonresidential standard, the concentration of a regulated substance in soil shall not exceed either the direct contact soil medium-specific concentration based on nonresidential exposure factors within a depth of up to 15 feet from the existing ground surface using valid scientific methods reflecting worker exposure or the soil-to-groundwater pathway numeric value determined in accordance with paragraph (4)"). The Department's use of EPA's model with only *some* of EPA's updated default variables makes this proposal scientifically invalid and, therefore a violation of Act 2.

The statute also requires that exposure scenarios for medium-specific concentrations for nonresidential conditions be based on "valid scientific methods." *Id.*, §303(b)(6) ("Exposure scenarios for medium-specific concentrations for nonresidential conditions shall be established using valid scientific methods reflecting worker exposure."). For the same reason as above, the proposal violates this requirement.

Finally, the statute requires site-specific standards to be based on "sound scientific principles." *Id.*, §304(e) ("Concentrations of regulated substances in soil shall not exceed values calculated in accordance with subsections (b) and (c) based on human ingestion of soil where direct contact exposure to the soil may reasonably occur; .... Such determinations … shall be based on sound scientific principles …."). The proposal enables property owners to violate this

requirement by endorsing the use of methods and variables that are based on outdated information.

B. The proposed direct contact numeric value violates existing regulations.

The Department is required to "review new scientific information that relates to the basis of the MSCs as it becomes available" and "propose appropriate changes for the consideration of the EQB as necessary." 25 Pa. Code §250.11. The proposal violates this requirement by *ignoring* new scientific data and by proposing a change to the nonresidential direct contact value for lead based on outdated information.

A person is required to "implement a remedy under the Statewide health standard that is protective of human health and the environment." 25 Pa. Code §250.305(a). As discussed above, the proposed nonresidential direct contact value is not protective of human health. The proposal enables parties remediating a site to a Statewide health standard or site-specific standard to implement a remedy that violates the regulation.

For all these reasons, the proposal is unreasonable, violates statutory and regulatory requirements, and would not survive a legal challenge under 2 Pa.C.S. § 704.

Conclusion

The Department should not finalize the proposed direct contact numeric value of 2500 ppm. It should retain the current value of 1000 ppm.

Thank you for your consideration of the Council's comments.

Sincerely,

Joseph Otis Minott, Esq.
Executive Director and Chief Counsel

Christopher D. Ahlers, Esq.
Staff Attorney

Michelle Tolodziecki
Law Student Volunteer
Temple Law School (class of 2020)

Nily Dan, Ph.D (Chemical Engineering)
Engineering Volunteer
Consultant

Clean Air Council
135 S. 19th St., Suite 300
Philadelphia, PA 19103
215-567-4004 x116
joe_minott@cleanair.org
cahlers@cleanair.org

Table of Attachments

1. U.S. Environmental Protection Agency, Lead at Superfund Sites

2. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (February 13, 2019)

3. Cleanup Standards Scientific Advisory Board, Meeting Minutes (April 4, 2018)

4. Department of Environmental Protection, PowerPoint Presentation (August 1, 2018)

5. Cleanup Standards Scientific Advisory Board, Meeting Minutes (August 1, 2018)

6. Department of Environmental Protection, Lead Model Comparison Sheet (undated)

7. Cleanup Standards Scientific Advisory Board, Meeting Minutes (February 13, 2019)

8. Department of Environmental Protection, PowerPoint Presentation (February 13, 2019)

9. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (February 13, 2019)

10. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (June 12, 2019)

11. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (October 29, 2019)

12. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (June 12, 2019)

13. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (October 29, 2019)

14. U.S. Environmental Protection Agency, Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology

15. The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016)

16. The World Health Organization, Lead Poisoning and Health, (August 23, 2019)

17. Centers for Disease Control and Prevention, Breastfeeding

18. The National Capital Poison Center, Lead and Pregnancy

19. HealthyChildren.org (associated with the American Academy of Pediatrics), Blood Lead Levels in Pregnant & Breastfeeding Moms

20. U.S. Department of Health and Human Services, National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead (June 2012)

21. Centers for Disease Control and Prevention, Lead Poisoning Prevention

22. Centers for Disease Control and Prevention, Blood Lead Levels in Children

23. Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention (January 4, 2012)

24. Centers for Disease Control and Prevention, CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention" (June 7, 2012)

25. Centers for Disease Control and Prevention, Recommended Actions Based on Blood Lead Level

26. Pennsylvania Department of Public Health, Childhood Lead Poisoning Prevention Program, 2018 Childhood Lead Surveillance Annual Report (January 2020)

27. Allegheny County Health Department, Universal Blood Lead Level Testing Regulations

28. Allegheny County Health Department, Blood Lead Level Testing

29. Philadelphia Department of Public Health, Childhood Lead Poisoning Surveillance Report (2017)

30. Joint State Government Commission, Advisory Committee and Task Force on Lead Exposure, Lead Exposure Risks and Responses in Pennsylvania (April 2019)

31. U.S. EPA, Technical Review Workgroup for Lead, Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (EPA-540-R-03-001, January 2003)

32. U.S. EPA, OLEM Directive 9285.6-56, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable (May 2017)

33. U.S. EPA Technical Review Workgroup for Lead, Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K) (June 14, 2017)

34. Email from C. David Brown to Peter Winslow, dated January 3, 2020

35. Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019

36. Evergreen Resources Group, LLC, Human Health Risk Assessment (Risk Characterization) (February 24, 2015)

37. Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields) (April 30, 2015)

38. Approval Letter from C. David Brown to Evergreen Resources Management Operations (May 6, 2015)

39. Maryland Department of the Environment, Cleanup Standards for Soil and Groundwater, Interim Final Guidance (Update No. 3) (October 2018)

40. Delaware Department of Natural Resources and Environmental Control, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act (Revised December 1999)

41. Delaware Department of Natural Resources and Environmental Control, Guidance for Human Health Risk Assessments (HHRA) under the Hazardous Substance Cleanup Act (HSCA) (October 2017)

42. State of New Jersey, N.J.A.C. 7:26D (Remediation Standards) (last amended September 18, 2017)

43. Ohio Environmental Protection Agency, VAP Rules Effective October 17, 2019, OAC 3745-300-08 Appendix A

44. West Virginia Department of Environmental Protection, Technical Guidance and Templates, Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3) (effective April 1, 2018)

45. New York State Department of Environmental Conservation, 6 NYCRR PART 375 (Effective December 14, 2006)

46. New York State Department of Environmental Conservation and New York State Department of Health, Technical Support Document (September 2006)

47. Department of Environmental Protection, Press Release (March 16, 2020)

48. Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019)

49. Department of Environmental Protection, Regulatory Analysis Form, filed May 13, 2016

50. Cleanup Standards Scientific Advisory Board Members, Membership List (Updated June 2018)

51. Colleen Costello, Linkedin Page

52. Colleen Costello, GHD, Remedial Investigation Report (November 21, 2017)

53. Colleen Costello, GHD, Letter to David Brown (April 30, 2018)

From: Mira Treatman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 2:53:25 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

Comments on Unaddressed Issues:
- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Mira Treatman
miraitreatman@gmail.com
930 Spruce Street, Apt 6
Philadelphia, Pennsylvania 19107

From: Nancy Wygant
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 1:18:48 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

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- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Nancy Wygant
nwygant@gmail.com
815 S. St. Bernard
Philadelphia, Pennsylvania 19143

From:	Cahill, Natasha
To:	rapatel@pa.gov; Philly Refinery Cleanup
Cc:	Donnelly, George
Subject:	Comment on Proposed Site-Specific Lead Levels from Senator Saval
Date:	Thursday, January 14, 2021 10:51:11 AM
Attachments:	image002.jpg image004.jpg image006.jpg Senator Saval_PES Refinery Site Lead Level Comments.pdf
Importance:	High

Dear Mr. Patel and Evergreen Resources Group Managers,

Attached with this message, please find State Senator Nikil Saval's comments for submission on the proposed site-specific lead levels at the former Philadelphia Energy Solutions refinery site.

We appreciate your consideration of requests to amend the proposed lead levels. Please don't hesitate to be in touch with any questions or concerns.

Sincerely,
Natasha

Natasha Cahill (she/her)
Communications Director
Office of State Senator Nikil Saval

www.pasenatorsaval.com

Email: natasha.cahill@pasenate.com
Cell: 610-247-9754

From: Natalie Goldring
To: Philly Refinery Cleanup
Subject: Comments on the plan for cleanup of the Philly refinery
Date: Thursday, January 14, 2021 5:52:00 PM

Evergreen Resources,

To whom it may concern:

I was in Philadelphia on 19 June 2019. I remember the fear of not knowing whether my child's friends in the area were alive after the explosions. We didn't learn how much danger my two children and I had been in until four months later, when the Chemical Safety Board reported on the release of hydrofluoric acid from the site.

The harm the refinery caused while it was in operation has been well documented. Fenceline residents are already dealing with the short- and long-term health and economic costs of the refinery's past operation.

It is critically important that future work at the site remedy that harm and focus on the short- and long-term needs of the community. The current plan does not adequately address the risks to the community or provide a real voice for the community in the process.

One example of the failure to address the needs of the community is the lack of attention to the full range of contaminants in and around the site. This is exacerbated by the safety standard for floods. In an era of climate change, past definitions of "100 year floods" are no longer relevant. For one example of why this is the case, see https://fivethirtyeight.com/features/its-time-to-ditch-the-concept-of-100-year-floods/ With a home with a 30-year mortgage having more than a one in four chance of "being inundated at least once" by a flood, that standard is remarkably inappropriate for a site as dangerous as the former PES site.

Philly Thrive has provided many other examples of the shortcomings of the current plan; I fully support their analysis and comments. This letter should be read in conjunction with their submissions.

Sincerely,
Natalie Goldring

Natalie Goldring
chezmerrigold@gmail.com
882 N Jefferson Street
Arlington, Virginia 22205

From:	Nicole Mount
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 9:08:17 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Nicole Mount
910 New Market Street
Philadelphia, PA 19123

From: Peter Winslow
To: Philly Refinery Cleanup
Subject: Comments on Outreach Plan
Date: Thursday, January 14, 2021 4:46:16 PM

Evergreen Resources,

The public has a right to know what the conditions are at the refinery site that can affect the health and safety of the community. And, Evergreen - along with HRP, PADEP, EPA and the City - has a duty to involve the public in meaningful consultation about all aspects of the the investigations of conditions at the site.

- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Furthermore, Evergreen should investigate and address all of the hazardous conditions at the site, not just those that are required by regulations.

- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Peter Winslow
pjwinslow@gmail.com
7034 Marion Lane
Philadelphia, Pennsylvania 19119-3443

From:	Peter Winslow
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 4:27:48 PM

Dear phillyrefinerycleanup.info,

The refinery site is adjacent to a dense urban area that is an environmental justice zone. Standards for remediation should be no less stringent than the statewide standards for lead and all other contaminants.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Peter Winslow
7034 Marion Ln
Philadelphia, PA 19119

From: R MG
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:38:16 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

R MG
remerrimangold@email.wm.edu
4727 Springfield Ave, 1F
Philadelphia, Pennsylvania 19143

From:	Randall Kamien
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 10:31:46 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Randall D. Kamien
Vicki and William Abrams Professor in the Natural Sciences
University of Pennsylvania

Sincerely,
Randall Kamien
79 E Bells Mill Rd
Philadelphia, PA 19118

From:	Ravi Sheth
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 10:24:32 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Ravi K Sheth
Professor of Physics and Astronomy
University of Pennsylvania

Sincerely,
Ravi Sheth
2001 Hamilton St Unit 1608
Philadelphia, PA 19130

From: Rebecca Richman
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 9:21:49 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
- Benzene - High levels of benzene are present extensively at the site, and benzene is currently being emitted into the atmosphere.
- MBTE - Methyl Tert-butyl Ether (MTBE) is present in concentrations that are over 100 times higher than the state-wide health standard.
- Locations and concentrations of 30 contaminants of concern - including chrysene, naphthalene, mercury, and arsenic - were identified individually but their cumulative significance was not addressed.
- Over its lifespan, this refinery used over a hundred chemical compounds. Why are only 30 of these sampled for on site? What is the rationale for not sampling the others?
- Deep Aquifer - Evergreen states a layer of clay and mud partly separates the upper, “water table” aquifer from a lower, “deep” aquifer. This barrier is not continuous, though, and fails to protect the deep aquifer from contamination. Since the deep aquifer supplies drinking water to communities in New Jersey, Evergreen needs to specify the actions it will take to investigate and clean up any contamination affecting the deep aquifer and public water supplies.

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- Current Conditions - Investigation information is out of date; some data was collected over a decade ago. Accurate, current conditions must be understood, using recent data, to develop appropriate remediation plans.

- Off-Site Contamination - Benzene pools extend beyond the property fence line but have not been mapped. Evergreen fails to acknowledge potential responsibility for cleaning up off-site contamination of benzene or other contaminants.
- Water Treatment - Evergreen has described petrochemical recovery results. But information has not been provided about how contamination conditions have changed over time or what the current situation is. Hilco plans to replace the existing systems, but no information has been provided as to what or why such replacement is appropriate.
- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Rebecca Richman
becca.ilana@gmail.com
901 S 48th St, Apt 2
Philadelphia, Pennsylvania 19143

From:	Robert Stanley
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 3:24:16 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Robert Stanley
549 Rutgers Ave
Swarthmore, PA 19081

From: Ryan McCormick
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:45:37 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
- Evergreen has refused to address issues of concern to the community in ways that relate to the people rather than just the Act 2 requirements.
- Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Comments on Contaminants of Concern:
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Ryan McCormick
ryan.in.philly@gmail.com
819 S Warnock Street
Philadelphia, Pennsylvania 19147-2705

From: Saskia Randle
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 4:29:47 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Saskia Randle
saskia.randle@gmail.com
108 Lincoln Street 6B
Boston, Massachusetts 02111

From:	Scott Weinstein
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 11:25:55 AM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Scott Weinstein
2042 Pine Street
Philadelphia, PA 19103

From: Suki Sax
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Friday, January 15, 2021 1:37:15 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
- Evergreen has not provided sufficient time following explanations for the community to digest the information provided. 120 days is insufficient.
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- Lead - High levels of lead are present at multiple locations. PADEP is allowing Evergreen to use a “site-specific lead standard” of 2240 PPM even though the statewide health limit is 1000 PPM.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Suki Sax
sosilverblades@gmail.com
4535 4th Rd N
Arlington, Virginia 22203

From: Susan Saxe
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 3:53:03 PM

Evergreen Resources,

I am writing to support meaningful community involvement in any plan for the future of the former Sunoco/PES refinery site. It is unfair to the long-suffering fence-line neighbors to deny them the right to decide on issues that directly affect their health and safety. A fully transparent and inclusive process must be held with the goal of a complete clean/up of all toxins on the site and a development plan that provides economic justice in the form of well-paying, permanent jobs with hiring preferences for people from the impacted community.
I support the three sets of comments below.
There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

Comments on Community Outreach Plan:
- Evergreen has refused to provide “meaningful public involvement” in the Act 2 processes. The Public Involvement Process (PIP) is inadequate.
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- PFAS - Fire fighting and training exercises have released PFAS (“forever carcinogens”) at the site. Evergreen ignores this legacy and recent contamination. PFAS should be sampled for and included in remediation planning and activities.

Susan Saxe
saxesmith@earthlink.net
512 West Allens Lane
Philadelphia, Pennsylvania 19119

From: Sylvia Greer
To: Philly Refinery Cleanup
Subject: Comments on AOI 1-11, Lead Report, & Outreach Plan
Date: Thursday, January 14, 2021 1:57:47 PM

Evergreen Resources,

There are three sections of comments I would like to submit as part of the 120-day comment period that began on August 28, 2020: Process Comments, Issue Comments, and Unaddressed issues.

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Sylvia Greer
sylvie.greer@gmail.com
3604 Tallwood Terrace
Falls Church , Virginia 22041

From:	Tracy Carluccio
To:	Philly Refinery Cleanup
Subject:	Comment to Evergreen re. Philadelphia Refinery Operations remediation
Date:	Thursday, January 14, 2021 2:18:59 PM
Attachments:	DRN comment to Evergreen 1.13.21.pdf

Please find attached written comments submitted by Delaware Riverkeeper Network.
Thank you,
Tracy Carluccio

Tracy Carluccio
Deputy Director
Delaware Riverkeeper Network
tracy@delawareriverkeeper.org
www.delawareriverkeeper.org
215.369.1188 x104

From:	Walter Bilderback
To:	Philly Refinery Cleanup
Subject:	Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Thursday, January 14, 2021 2:47:02 PM

Dear phillyrefinerycleanup.info,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Walter Bilderback
321 S. 43rd St.
Philadelphia, PA 19104

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Saturday, February 20, 2021 10:01:41 AM

Name

Michael Khoo

Email

mick_khoo@protonmail.com

Address

320 S 49th St Philadelphia PA 19143
PHILADELPHIA, Pennsylvania 19143
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Topic: Climate Change. This question is a request for clarification. In reply to a previous question on how Evergreen will account for climate change, it was stated that "It is Evergreen's intent to consider climate changes predicted to occur within the timeframe of cleanup of the former Sunoco refinery. In general, this timeframe would be considered "long term" as petroleum contaminants in groundwater may take decades to remediate and/or degrade to concentrations below regulated standards."

In the zoom meeting of December 2020, it waspointed out that climate change will continue after the remediation. The Evergreen position was clarified to state that Evergreen will follow climate change data and predictions up until 2100, which is the current limit for reliable modeling that is accepted in the wider scientific community.

Can you confirm that this is Evergreen's policy? Thank you.

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Saturday, February 20, 2021 10:18:56 AM

Name

Michael Khoo

Email

mick_khoo@protonmail.com

Address

320 S 49th St Philadelphia PA 19143
PHILADELPHIA, Pennsylvania 19143
United States
Map It

Report

Philadelphia Refinery_AOI 11 Final Report_06-21-2013

Comment

Topic: RIR - Specific Questions. This is a followup question.
PREVIOUS QUESTION
Two questions on fill:
1) Could you talk more about the topmost 'fill' layer in the Environmental Setting slides … how deep is this fill, what is it composed of? When was it added there? Thank you!
2)What is the composition of the layer labeled 'Fill'? Does Evergreen know from where the fill was obtained? Is river dredging/channel widening one possible source for this fill?
EVERGREEN REPONSE
Much of the former refinery and surrounding area is underlain by historic fill material, which was primarily placed for the purpose of reclaiming lowlands along the banks of the tidal Delaware and Schuylkill Rivers during industrialization. The fill materials are heterogeneous in nature and have been characterized as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where historic land surfaces were highest to more than 20 feet within the locations of former lowlands such as stream valleys, marshes, and open pits.

THREE FOLLOWUP QUESTIONS
Thank you for this response, which characterized the fill layer in general.
1. Is the fill layer also characterized at each of the individual test boreholes?
2. I'm assuming so, and if so, is there an 'easy' way to access this data? (Any guide to this would be much appreciated. There's a large volume (GB, pages) of reports to look through.)
3. (Repeat of question above.) Does Evergreen know from where the fill was obtained? Is river dredging/channel widening one possible source for this fill?
Thank you!

From: noreply@phillyrefinerycleanup.info
To: DOERR, TIFFANI L
Subject: New submission from Comment Submission Form
Date: Saturday, February 20, 2021 10:09:03 AM

Name

Michael Khoo

Email

mick_khoo@protonmail.com

Address

320 S 49th St Philadelphia PA 19143
PHILADELPHIA, Pennsylvania 19143
United States
Map It

Report

Community Outreach Plan Revised (draft) - August 11 2020

Comment

Topic: Climate Change. This question is a request for clarification. In reply to a previous question on how Evergreen will account for climate change, it was stated that "It is Evergreen's intent to consider climate changes predicted to occur within the timeframe of cleanup of the former Sunoco refinery. In general, this timeframe would be considered "long term" as petroleum contaminants in groundwater may take decades to remediate and/or degrade to concentrations below regulated standards."

Can you expand on your use of quotes for "long term" in this reply. Do you consider this a reference to Act 2, Sec. 304 - Site Specific Standards? Thank you.

APPENDIX C

COPIES OF LETTERS

From:	Maurice Sampson
To:	Philly Refinery Cleanup
Cc:	Steven Hvozdovich
Subject:	Comments fron Clean Water Action - Legacy Environmental Cleanup of the former Philadelphia Refinery
Date:	Thursday, January 14, 2021 4:37:40 PM
Attachments:	CWA_PES Refinery Clean Up Comments.011421.pdf

Please see attached

Maurice M. Sampson II
Eastern Pennsylvania Director
Clean Water Action/Fund
www.cleanwateraction.org

1315 Walnut Street, Suite 1650
Philadelphia, PA 19107
p: 215.545.0250 ext. 263
m: 267 269 6912
msampson@cleanwater.org

CLEAN WATER ACTION

January 11, 2021

On behalf of Clean Water Action and our roughly 8,600 Philadelphia area members, we urge you to take additional measures to better protect public health during the cleanup of the former Philadelphia Refinery.

There are a number of serious concerns about Evergreen's proposed lead standard for surface soil.

The proposed site-specific standard for lead in surface soil at the former refinery site is more than twice the direct contact numeric value for lead in soil, part of Pennsylvania's statewide health standards. Using this inappropriate value will not be protective of public health; especially considering lead is a highly toxic chemical known to impair brain function and would result in regulatory agencies requiring Evergreen to take corrective action on a much smaller fraction of the site than would be required with the correct value. We strongly urge you to withdraw the proposal and require Evergreen to use current science to set a site-specific standard for this site.

In addition, Evergreen's investigation reports for environmental contamination are flawed in a number of ways. They are supposed to identify the nature and extent of contamination in soils and the movement of contaminants in groundwater to evaluate what needs to be remediated. Evergreen did not consider the impacts of climate change on existing soil and groundwater contamination at the site. It failed to consider sea-level rise, storm surges, and the increased frequency and volume of events like superstorms-impacts that could occur before, during, and after remediation. Evergreen also completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should be required to revise its remedial investigation reports.

Please take these comments seriously and make the necessary changes to better protect public health.

Sincerely,

Maurice Sampson, Eastern Pennsylvania Director

PHILADELPHIA
1315 Walnut Street, Suite 1650
Philadelphia, PA 19107
Tel. 215.545.0250

PITTSBURGH
100 Fifth Avenue, Suite 1108
Pittsburgh, PA 15222
Tel. 412.765.3053

NATIONAL
1444 Eye Street NW, Suite 400
Washington, DC 20005
Tel. 202.895.0420

@CleanH2OPA | Facebook.com/CleanWaterActionPA | www.cleanwater.org/pa

From:	Chris Ahlers
To:	phillyrefinerycleanup@ghd.com
Cc:	DOERR, TIFFANI L; Brown, C David; Dula, Justin; Patel, Ragesh
Subject:	Philadelphia refinery/Comments of Clean Air Council on Evergreen Reports
Date:	Thursday, January 14, 2021 11:57:31 PM
Attachments:	2021-01-14 FINAL Clean Air Council Comments - Evergreen Reports.pdf Attachment 1 -- Letter from Evergreen (02.11.2014).pdf Attachment 2 -- Letter from DEP, EPA (11.08.2011).pdf Attachment 3 -- Evergreen"s Q&A (downloaded 12.30.20).pdf Attachment 4 -- CAC Comments (FINAL) 04.30.2020 (file 1).pdf Attachment 5 -- CAC Attachments 1-26 (file 2).pdf

---

phillyrefinerycleanup@ghd.com
TLDOERR@evergreenresmgt.com

cdbrown@pa.gov
jdula@pa.gov
rapatel@pa.gov

Evergreen,

Attached are the comments of Clean Air Council on the 19 remedial investigation reports and 2 risk assessments, for the public comment period ending on January 14, 2021.

Thank you for your consideration of our comments.

Attachment 6 -- CAC Attachments 27-30 (file 3).pdf

Attachment 7 -- CAC Attachments 31-33 (file 4).pdf

Attachment 8 -- CAC Attachments 34-53 (file 5).pdf

Chris

--
Christopher D. Ahlers
Staff Attorney
Clean Air Council
135 S.19th Street, Suite 300
Philadelphia, PA 19103
Telephone: 215-567-4004, ext. 125
*Licensed to Practice Law in Pennsylvania (Limited In-House Corporate Counsel)
*Licensed to Practice Law in New York

CLEAN AIR COUNCIL

Evergreen Resources Management Operations
a series of Evergreen Resources Group, LLC
On behalf of Sunoco, Inc. (R&M), now known as Sunoco (R&M), LLC

Pennsylvania Department of Environmental Protection

Site Characterization/Remedial Investigation Reports/Risk Assessments
Philadelphia Refinery Complex
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Written Comments by Clean Air Council

Clean Air Council ("the Council") appreciates the opportunity to provide comments on Evergreen Resources Management Operations' ("Evergreen's") Site Characterization Reports and Remedial Investigation Reports regarding contamination at the former Philadelphia refinery. The reports were prepared by Evergreen on behalf of Sunoco, Inc. (R&M), now known as Sunoco (R&M), LLC ("Sunoco"). Sunoco is the party legally responsible for contamination prior to its sale of the property in 2012.

The Council is a non-profit environmental organization headquartered at 135 South 19th Street, Suite 300, Philadelphia, Pennsylvania, 19103. For 50 years, the Council has worked to improve air quality across Pennsylvania. The Council has members throughout the Commonwealth who support its mission to protect everyone's right to breathe clean air, including members in Allegheny County. The Council has approximately 35,000 activist members.

Evergreen submitted the reports to the Pennsylvania Department of Environmental Protection ("the Department") under Act 2 of 1995. *See* Evergreen, Act 2 Documents. The reports were submitted pursuant to the Consent Order and Agreement (2003) and the Consent Order and Agreement (2012). There are 19 remedial investigation reports and 2 risk assessments, listed in the Table of Reports on page 4. The comments also address work under the corrective action provisions of the Resource Conservation and Recovery Act ("RCRA"). Evergreen submitted reports relating to this work to EPA pursuant to the Settlement Agreement (2012). The work under Act 2 and RCRA are under the One Cleanup Program. Evergreen, Site History.

All documents cited in these comments are hyperlinked or attached.

Index to Comments

Table of Attachments

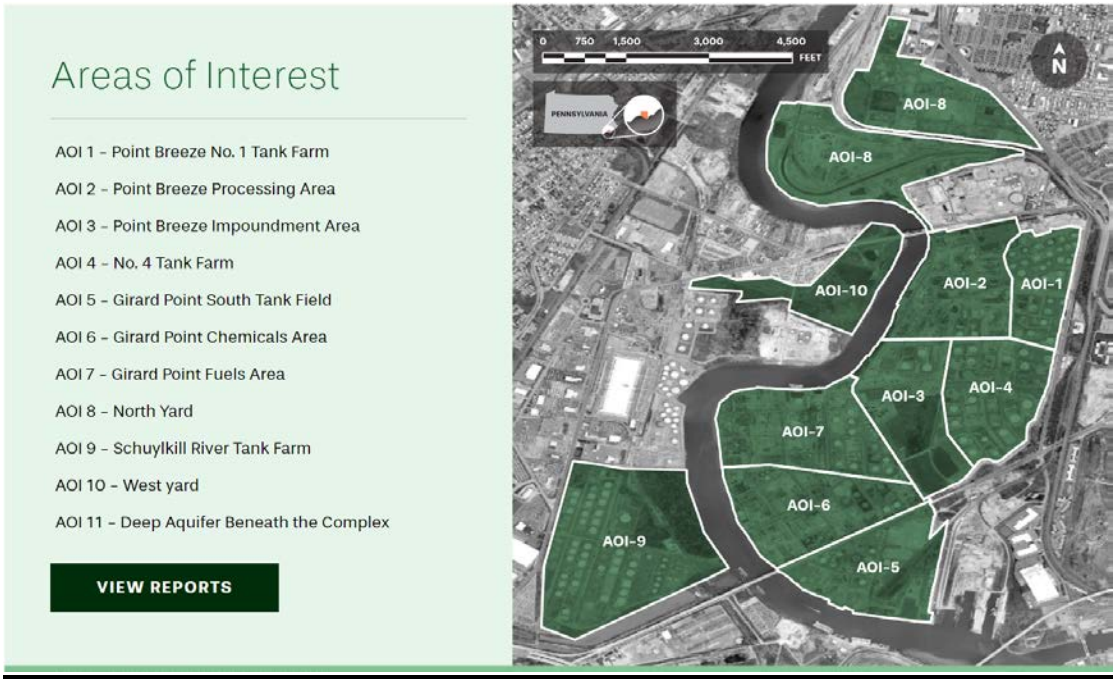
Table of Reports

(Remedial Investigation Reports and Risk Assessments)

Area of Interest	Title	Date
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report (part 1) 2016 Report (part 2) (approved)	August 5, 2016
AOI-2 Point Breeze Processing Area	2017 Report (part 1) 2017 Report (part 2) (approved)	July 20, 2017
AOI 3 Point Breeze Impoundment Area	2017 Report (part 1) 2017 Report (part 2) (approved)	March 20, 2017
AOI-4 No. 4 Tank Farm	2013 Report (disapproved) 2017 Report (part 1) 2017 Report (part 2) (disapproved)	November 16, 2013 March 24, 2017
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan (disapproved) 2017 Report (part 1) 2017 Report (part 2) (approved)	December 13, 2011 January 16, 2017
AOI-6 Girard Point Chemicals Area	2013 Report (part 1) 2013 Report (part 2) (disapproved) 2017 Report (part 1) 2017 Report (part 2) (approved)	September 3, 2013 November 21, 2017

AOI-7 Girard Point Fuels Area	2012 Report (disapproved) 2013 Addendum to Report (disapproved) 2017 Report (part 1) 2017 Report (part 2) (approved)	February 29, 2012 September 19, 2013 June 9, 2017
AOI-8 North Yard	2012 Report (part 1) 2012 Report (part 2) (approved) 2017 Report (part 1) 2017 Report (part 2) (approved)	January 31, 2012 December 21, 2017
AOI-9 Schuylkill River Tank Farm	2015 Report (part 1) 2015 Report (part 2) (disapproved) 2017 Report Addendum (part 1) 2017 Report Addendum (part 2) (disapproved)	December 31, 2015 February 8, 2017
AOI-10 West Yard	2011 Report (approved) 2016 Ecological Risk Assessment (approved)	June 29, 2011 September 16, 2016
AOI-11 Deep Aquifer Beneath Complex	2011 Report (part 1) 2011 Report (part 2) 2013 Report (part 1) 2013 Report (part 2) (disapproved)	September 12, 2011 June 21, 2013
Site-Wide Reports (Lead in Surface Soils)	2015 Human Health Risk Assessment Report (approved)	February 25, 2015

Areas of Interest



Source: Evergreen, Home - PRLR

Summary of Comments

The Council is providing comments on Evergreen's remedial investigation reports on the nature and extent of contamination in the soil and groundwater at the former Philadelphia refinery.

Throughout these comments, the Council will be referring to Evergreen as the author of the reports, but it should be made clear that it is Sunoco, Inc. (R&M), now known as Sunoco (R&M), LLC ("Sunoco") that is the party legally responsible for the contamination prior to its sale of the property in 2012. Evergreen has prepared these reports as an agent, consultant, and corporate affiliate of Sunoco. Evergreen was formed in 2013 to manage Sunoco's environmental liabilities. *See* Attachment 1 -- Letter from Evergreen dated February 11, 2014. Under applicable environmental laws, a private agreement does not nullify statutory obligations.

In the interest of avoiding confusion, the Council may at times generally refer to the reports as Evergreen reports, despite the fact that some of them were prepared by Sunoco before Evergreen was formed. This is consistent with the spirit of that relationship structured by Sunoco, the responsible party. With respect to individual reports, the Council will refer to Evergreen or Sunoco, as appropriate based on the context.

In terms of procedure and process, these comments provide a history of the lack of public involvement in the preparation of the reports, with an eye toward making sure that the public is involved in the future.

The Council wishes to clarify that this remediation project is not a "voluntary cleanup," because it is being done pursuant to a series of consent orders dating back to at least 2003. The fact that an order is a labelled a "consent order" does not make it voluntary.

The Council asks that Evergreen make available all relevant historical reports on its website, and make changes to the website to make it more accessible.

The Council is also commenting collectively on Evergreen's answers to questions on the Q&A section of its website, which presumably reflects Evergreen's most recent thoughts on the remedial investigation.

As for the content of the remedial investigation reports, Evergreen's Conceptual Site model is fundamentally flawed due to insufficient analysis and synthesis of information relating to the soil and groundwater investigation. To properly revise the reports, Evergreen would have to dramatically change its approach, with the result that it would change the nature of the reports and the characterization of contamination. Accordingly, the public should be given another opportunity for public comment before the submission of revised reports to the Department.

Because the public is commenting on reports that are all at least three years old, Evergreen should revise them and synthesize them with other information, data and analysis

from other sources, including groundwater remediation status reports. The public should not be put into the position of commenting on reports that may be stale.

Evergreen has not delineated the nature and extent of contamination in the deep aquifer and the unconfined aquifer (water table). It has not completely delineated contamination of the aquifer that provides a source of water supply in New Jersey.

Evergreen has failed to delineate contamination for metals in groundwater, paring down its list of Constituents of Concern over time and discontinuing sampling for chemicals such as arsenic and manganese, without sufficient explanation.

Although Evergreen cites the existence of an 8400-foot sheet pile wall as a buffer against the migration of contamination toward the adjacent Schuylkill River, Evergreen provides no meaningful discussion of the protectiveness of this wall, making circular assertion that "groundwater behind the sheet pile wall can discharge no faster to the Schuylkill River than the sheet pile wall permits."

Evergreen fails to consider the impacts of climate change (including sea level rise and storm surges) on the soil and groundwater contamination. This is material and significant because the Schuylkill River is expected to experience a sea level rise of 2 feet by 2050, and there is widespread lead contamination in surface soil (0-2 feet) on the site.

It would be inappropriate and unfair for Evergreen to fragment these remedial investigation reports by diverting a discussion of the deficiencies in these reports into yet another remedial investigation report to be made available later in 2021. The public cannot submit complete comments now in the absence of a promised Fate and Transport Analysis. Moreover, if the current reports are approved Evergreen will argue that material in the current reports may not be reopened in a public comment period on that carved-out report later this year. The material is interrelated.

Throughout the reports, Evergreen marginalizes the soil-to-groundwater numeric value (typically, the more stringent of numeric values under Act 2) in favor of a less stringent direct contact numeric value and an even less stringent proposed site-specific standard for lead. The problem is most notable in the case of lead, but it is common to other contaminants as well.

Evergreen should abandon its proposed site-specific standard of 2240 mg/kg for lead in surface soils (0-2 feet). This was based on a target blood lead level of 10 ug/dL in a human fetus, which is two times the level that the Centers for Disease Prevention and Control was using for case management for children exposed to lead even at the time when Evergreen made this proposal. On its website, Evergreen has committed to changing this proposal if the Department changes its target blood lead level. Because the Department has done this in a pending Act 2 rulemaking, Evergreen should abandon its proposal.

Because the reports define exceedances (that is, concentrations above an applicable standard) in terms of that flawed proposed standard, the reports do not provide a complete and

accurate picture of the lead contamination and its significance in the context of appropriate standards.

Finally, Evergreen should prepare a work plan and revise the reports to include Per- and Polyfluoroalkyl Substances (PFAS) as a constituent of concern. Other states have required this in remedial investigations, and the Department recently proposed to add Medium-Specific Concentrations for three PFAS chemicals in the Act 2 regulations.

Data overload is not a substitute for analysis and synthesis. This comment period concerns a large number of documents -- 19 remedial investigation reports and two risk assessments. Evergreen has collected a large amount of data from soil samples and groundwater samples. Similar efforts to gather data were made by other consultants before Evergreen was formed. The number of pages and the amount of data do not cure the analytical flaws in the reports.

Sometimes, deficiencies in reports may be easily cured. That is not the case here. The flaws in these reports are so widespread that substantial revisions are necessary. Evergreen should revise its reports to address these comments, and it should schedule another public comment period before any revised reports are submitted to the Department.

Comments

1. **The Council Appreciates the Proactive Revision of the Public Involvement Plan and the Reopening of the Public Comment Period For 19 Remedial Investigation Reports and 2 Risk Assessments.**

The Council appreciates the opportunity to provide these comments on remedial investigation reports and risk assessments prepared by Evergreen on behalf of Sunoco. Evergreen provided this comment period in response to concerns that the public involvement requirements and objectives of Act 2 had not been met. In this comment, the Council sets forth its best understanding of what happened and why. The Council hopes that this will help decision makers avoid a similar situation in the future.

This is not meant to be a meaningless exercise in checking boxes--but instead should reflect a serious obligation of the local government, the public and especially impacted neighbors.

A. Consistent with Act 2, the Public Involvement Plan should include measures to involve the public in the development and review of reports, include a proactive community information and consultation program.

There are two important public involvement provisions in Act 2 that apply to this remedial investigation and cleanup. First, a responsible party utilizing a site-specific standard:

> (n) Notice and review provisions.--***Persons utilizing the site-specific standard shall comply with the following requirements for notifying the public and the department of planned remediation activities***:
>
> (1)(i) A notice of intent to remediate a site shall be submitted to the department which provides, to the extent known, a brief description of the location of the site, a listing of the contaminant or contaminants involved and the proposed remediation measures. The department shall publish an acknowledgment noting receipt of the notice of intent in the Pennsylvania Bulletin. At the same time a notice of intent to remediate a site is submitted to the department, a copy of the notice shall be provided to the municipality in which the site is located, and a summary of the notice of intent shall be published in a newspaper of general circulation serving the area in which the site is located.
>
> (ii) The notices required by this paragraph shall include a 30-day public and municipal comment period during which the municipality can request to be involved in the development of the remediation and reuse plans for the site. ***If requested by the***

municipality, the person undertaking the remediation shall develop and implement a public involvement program plan which meets the requirements of subsection (o). Persons undertaking the remediation are encouraged to develop a proactive approach to working with the municipality in developing and implementing remediation and reuse plans.

(2) ***The following notice and review provisions apply each time a remedial investigation report, risk assessment report, cleanup plan and final report demonstrating compliance with the site-specific standard is submitted to the department***:

(i) When the report or plan is submitted to the department, a notice of its submission shall be provided to the municipality in which the site is located, and a notice summarizing the findings and recommendations of the report or plan shall be published in a newspaper of general circulation serving the area in which the site is located. ***If the municipality requested to be involved in the development of the remediation and reuse plans, the reports and plans shall also include the comments submitted by the municipality, the public and the responses from the persons preparing the reports and plans***.

(ii) The department shall review the report or plan within no more than 90 days of its receipt or notify the person submitting the report of deficiencies. If the department does not respond with deficiencies within 90 days, the report shall be deemed approved.

(3) If the remedial investigation report, risk assessment report and cleanup plan are submitted at the same time to the department, the department shall notify persons of any deficiencies in 90 days. If the department does not respond with deficiencies within 90 days, the reports are deemed approved.

See Act 2, §304(n) (emphasis added), 35 P.S. §6026.304(n) (same, unofficial statute).

Because Sunoco intended to use a site-specific standard, the law required Sunoco to provide notice in the first instance. *See* Act 2, §304(n)(2)(i) (requiring "a notice summarizing the findings and recommendations of the report or plan shall be published in a newspaper of general circulation serving the area in which the site is located"), 35 P.S. §6026.304(n)(2)(i) (same, in unofficial statute), 25 Pa. Code 250.6. In addition, because the City of Philadelphia requested to be involved in the development of the remediation and reuse plans, Sunoco was required to prepare a Public Involvement Plan and include in its reports to the Department comments received from the public.

Second, if the municipality requests to be involved in the remediation and reuse plans for the site, the responsible party must develop a public involvement plan that involves the public in the cleanup and use of the property:

> (o) Community involvement.***--Persons using site-specific standards are required to develop a public involvement plan which involves the public in the cleanup and use of the property*** if the municipality requests to be involved in the remediation and reuse plans for the site.

See Act 2, §304(o) (emphasis added), 35 P.S. §6026.304(o) (same, in unofficial statute). The statute requires the plan to include measures to involve the public in the development and review of a remedial investigation report as well as a risk assessment report:

> The plan ***shall propose measures*** to ***involve the public*** in the ***development and review*** of the ***remedial investigation report, risk assessment report***, cleanup plan and final report.

Id. (bold italics added for emphasis). Therefore, these requirements extend not only to the 20 remedial investigation reports, but also to the Human Health Risk Assessment for lead (a risk assessment report).

Finally, the state provides a list of techniques that may be included in these measures, including a "proactive community information and consultation program":

> Depending on the site involved, ***measures may include techniques such as*** developing a ***proactive community information and consultation program*** that includes door step notice of activities related to remediation, public meetings and roundtable discussions, convenient locations where documents related to a remediation can be made available to the public and designating a single contact person to whom community residents can ask questions; the formation of a community-based group which is used to solicit suggestions and comments on the various reports required by this section; and, if needed, the retention of trained, independent third parties to facilitate meetings and discussions and perform mediation services.

Id. The word "proactive" is important for unraveling what happened with public participation in the case of the former refinery. Although not strictly required by the language of the statute, a proactive program would be one calculated to make sure that the community is actively participating in a project and submitting comments on reports where there is evidence that it is not.

B. While the 2007 plan contemplated only the sharing of information about the project, the 2019 plan now contemplates a nested public comment period for reports.

After a Notice of Intent to Remediate was submitted in 2006, the City of Philadelphia requested that Sunoco develop a Public Involvement Plan. *See* Evergreen, Public Involvement. In response, Sunoco prepared a plan in 2007, several years before the 2012 transaction. *See* Sunoco, Public Involvement Plan (2007). The notice provisions are set forth as follows:

> The Act 2 Report submittals will include the appropriate municipal and public notice requirements in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in at least one local newspaper. As part of the Public Involvement Plan, ***Sunoco intends to hold an initial public meeting and subsequent meetings on an as-needed basis upon request of the City of Philadelphia to give status updates of the project***. EPA will complete additional public involvement through activities, such as notices under Corrective Action Program and by updating its online Fact Sheet for the refinery.

Id. (bold italics added for emphasis). The plan also contemplated making documents available and scheduling an initial public information session. *Id.* But it does not speak in terms of receiving comments on proposed reports, or even in terms of public comment periods. It does not even use the term "comment" at all. Rather, it only contemplates sharing information about the project.

Evergreen has attempted to address this deficiency in a second Public Involvement Plan prepared in 2019, several years after the 2012 transaction. This second plan uses the word "comment" repeatedly, and it explains how future reports will be made available for a nested public comment period between Evergreen and the public, before the reports are submitted to the Department:

> All future Act 2 report submittals will have public notices as per above including the newspaper notices and correspondence. ***The notices will be sent/published prior to submittal of the reports, and will include a 30-day public comment period per Act 2 guidelines***. Reports will be posted to the website and library branches prior to initiation of the 30-day comment period. Upon conclusion of the 30-day public comment period, the ability to comment on the reports via the website will be closed, and no further comments accepted. ***Evergreen will summarize and respond to comments received during the 30-day comment period and will submit them in document form to PADEP, USEPA, and the City of Philadelphia***.

See Evergreen, Public Involvement Plan (June 19, 2019). This is a "proactive" way of addressing the requirements of Act 2. *See* Act 2, §304(n) ("[i]f the municipality requested to be involved in the development of the remediation and reuse plans, the reports and plans shall also include the comments submitted by the municipality, the public and the responses from the persons preparing the reports and plans"), 35 P.S. §6026.304(n) (same, in unofficial statute).

C. The 2011 Work Plan incorporated only "aspects of public involvement."

Prior to the 2012 transaction, Sunoco prepared a work plan to address contamination under the 2003 consent order. Attaching the Public Involvement Plan discussed above, it spoke in terms of holding meetings and giving updates on the project:

> 4 Public Involvement
>
> The Public Involvement Plan is provided in Appendix E. ***This plan incorporates aspects of public involvement under both PADEP's Act 2 program and EPA's RCRA Corrective Action program***. The Act 2 report submittals will include the appropriate municipal and public notice requirements in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in four local newspapers, including the Philadelphia Daily News, South Philly Review, Philadelphia Inquirer and, Philadelphia Globe Times. As part of the public involvement plan, ***Sunoco intends to hold an initial public meeting in the city of Philadelphia to present the strategy and give status updates of the project at the CAP meeting on an annual basis***.
>
> EPA will complete its own public involvement through notices under the Corrective Action Program and by updating its online Fact Sheet for the refinery.

See Sunoco, Interim Activities Workplan (2011), Section 4.4, page 13. But Sunoco should have done more. While the work plan stated that the plan "incorporates aspects of public involvement" under the law, it does not specifically offer comment periods on individual reports.

D. Newspaper notices did not provide meaningful notice of an opportunity for public comment.

Based on a sampling of Sunoco's newspaper notices for AOI-5, it is clear that they do not provide sufficient information to inform people of the availability of a public comment period. The following three notices did not acknowledge the opportunity for public comment, they did not invite public comment, and they did not provide any contact information for people

who might have been inclined to submit comments if they had been aware that they had such an opportunity. The notices did not even use the word "comment."

In 2011, Sunoco apparently published the following notice in the newspaper:

> Notification of Receipt of Site Characterization/Remedial Investigation Report/Cleanup Plan
>
> ***Notice is hereby given that Sunoco Inc. (R&M) (Sunoco) is in the process of submitting a Site Characterization/ Remedial Investigation Report/Cleanup Plan to the Pennsylvania Department of Environmental Protection (PADEP),*** Southeast Regional Office for Area of Interest 5 (AOI 5) located at the Sunoco Philadelphia Refinery, Philadelphia, Pennsylvania. ***Sunoco has indicated in the report that site characterization activities have been completed at AOI 5*** in accordance with the Land Recycling and Environmental Remediation Standards Act and the 2004 Memorandum of Agreement between the PADEP and U.S. Environmental Protection Agency (EPA) (a.k.a., the PA One Cleanup Program). ***This notice is made under the provision of the Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2.***

See Sunoco, Copy of Notice of Publication (November 14, 2011). The notice merely stated that Sunoco is in the process of submitting a report, that it believes site characterization activities have been completed, and that the notice is being made under Act 2.

In 2015, Evergreen apparently published the following notice in the newspaper:

> Notification of Submittal of a Remedial Investigation Report
>
> ***Notice is hereby given that Evergreen Resources Group LLC (Remediator), is in the process of submitting a Remedial Investigation Report to the Pennsylvania Department of Environmental Protection***, Southeast Regional Office for Area of Interest 5 located at the Philadelphia Energy Solutions Refining and Marketing LLC Facility, Philadelphia County, Philadelphia, PA. The report is being submitted in accordance with the site-specific remediation standards established under the Land Recycling and Environmental Remediation Standards Act. ***This notice is made under the provision of the Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2.***

See Evergreen, Copy of Notice of Publication (March 19, 2015). This is like the first notice.

In 2017, Evergreen apparently published the following notice in the newspaper:

> Notification of Submittal of a Remedial Investigation Report
>
> ***Notice is hereby given that Evergreen Resources Group LLC (Remediator), is in the process of submitting a Remedial Investigation Report to the Pennsylvania Department of Environmental Protection,*** Southeast Regional Office for Area of Interest 5 located at the Philadelphia Energy Solutions Refining and Marketing LLC Refining Complex, Philadelphia County, Philadelphia, PA. The report is being submitted in accordance with the site-specific remediation standards established under the Land Recycling and Environmental Remediation Standards Act. ***This notice is made under the provision of the Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L. #4, No. 2***.

See Evergreen, Copy of Notice of Publication (February 3, 2017). This notice is like the first and second notices.

The notices were not proactive. They merely asserted that Sunoco and Evergreen were in the process of submitting a report to the Department. Based on that limited information, a reasonable person would not understand that there was an opportunity for public comment.

E. Sunoco narrowly construed public participation requirements as only requiring it to "inform" the public about the project.

Sunoco submitted two reports relating to these three notices (the second report relates to the second and third notices). In these reports Sunoco did not refer to the public comment process and it did not attach any public comments -- implying that it received none in response to the vague newspaper notices above.

In a 2011 report, Sunoco indicated it would be giving status updates to the community on an annual basis. Apparently, this meant only that it would inform the community about what it would be doing:

> 12.0 COMMUNITY RELATION ACTIVITIES
>
> A Community Relation Plan (CRP) that includes ***public involvement with local residents to inform them of the anticipated investigations and remediation activities*** was completed as part of the NIR submittal in 2006. The purpose of this CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens ***to be***

> ***informed of on-site activities related to the investigation activities at the Site***. This plan ***incorporates aspects of public involvement under both PADEP's Act 2 program and EPA's RCRA Corrective Action program.*** This report and future Act 2 reports will include the ***appropriate municipal and public notices*** in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper. As part of the CRP, Sunoco intends to hold an initial public meeting in the city of Philadelphia ***to present the strategy and give status updates of the project at the CAP meeting on an annual basis***.
>
> A copy of the NIR and the Act 2 report notifications for this SCR/RIR are included in Appendix A.

See 2011 Report (AOI-5), Section 12.0, page 47. In two places in the paragraph above, Sunoco makes it clear that the purpose of the plan is to "inform" the public. It states that the plan incorporates "aspects of public involvement" under the law (see the discussion on that in the Council's comment above), and it does not mention the ability to submit comments on reports. The attachments to the report do not include any public comments, implying that none were received in response to the vague newspaper notices. *See also* 2011 Report (AOI-5), part 2, including Appendix A.

In the 2017 report, Evergreen made very similar statements, again framing the process in terms of informing the public of what it would be doing, and ignoring the role of public comment.

> 10.0 COMMUNITY RELATION ACTIVITIES
>
> A Community Relation Plan (CRP) that includes public involvement with local residents ***to inform them of the anticipated investigations and remediation activities*** was completed as part of the original NIR submittal in 2006. A revised NIR was submitted in 2014. The purpose of the CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens ***to be informed of on-site activities*** related to the remediation
> program at the Site. ***This plan incorporates aspects of public involvement under both PADEP's Act 2 program and EPA's RCRA Corrective Action program***. Sunoco held an initial public meeting ***to present the strategy and give a status update of the project***. As part of the CRP, ***Sunoco has presented updates*** on the remediation program to the Community Action Plan (CAP) ***on an as requested basis***. The CAP meets on a monthly basis and

> includes members of the community, local officials and PES employees.
>
> This report and future Act 2 reports will include the ***appropriate municipal and public notices*** in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper. A copy of the original NIR, the
> 2014 NIR and the Act 2 report notifications for this RIR are included in Appendix A.

See 2017 Report (AOI-5), Section 10.0, page 63. The attachments to the report do not include any public comments, implying that none were received in response to the vague newspaper notices. *See* 2017 Report (AOI-5), part 2.

F. The Department did not address public involvement requirements in its responses to the reports.

In its review of the submitted reports for AOI-5, the Department does not question whether the public involvement requirements were met. *See* 2012 Disapproval Letter (AOI-5), 2012 Comments (AOI-5); *see also* 2017 Approval Letter (AOI-5), 2017 Comments (AOI-5), 2017 Memorandum (AOI-5). Rather, it limits its comments to the technical aspects of the reports. The same is true for comments and memoranda for the other reports. *See* Evergreen, Act 2 Documents.

In conclusion, Sunoco did not draft notices sufficient to inform the community of the opportunity to provide public comments, or of the existence of a public comment period. This did not comply with the public involvement provisions of Act 2. It is not enough to simply make a large number of documents available and inform the public what one is doing. It is important to be "proactive," as allowed by the law.

In its 2019 Public Involvement Plan, Evergreen has taken a positive step by structuring public involvement around subsequent public comment periods. Still, this is something that should have been done a long time ago. Public comment is a fundamental aspect of public involvement. Without it, a Public Involvement Plan cannot be meaningful.

Of course, public comment is not sufficient to give meaning to the public involvement requirements of Act 2. Ultimately, it is important that the opportunities for public comment and public involvement are meaningful. To make them meaningful, Evergreen should by doing other things to facilitate public understanding of its work, as it has recently done its website. The Council makes additional recommendations for making public involvement more meaningful, with respect to the posting of documents on Evergreen's website. *See* Comment #3, below.

2. Evergreen Should Not Characterize This Remediation Project as a Voluntary Cleanup.

Perhaps unintentionally, Evergreen has provided the public impression that this is a voluntary cleanup, rather than an involuntary one. This is an incorrect impression because the remedial investigation and cleanup are being done pursuant to a series of consent orders dating back to 2003 -- nearly twenty years. (There was also a consent order in 1993). The fact that a cleanup is done pursuant to a consent order does not make it voluntary.

On its website, Evergreen makes two errors -- (1) equating the Voluntary Cleanup Program with Act 2, and (2) giving the impression that its work is being done under the Voluntary Cleanup Program because the work is being done under the One Cleanup Program:

> The PADEP and USEPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or One-Cleanup Program)" in 2004, ***which clarifies how sites remediated under Pennsylvania's Voluntary Cleanup Program (Act 2) may also satisfy RCRA corrective action requirements*** through characterization and attainment of remediation standards established under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (statutory name for Act 2). ***In November 2011, the facility was entered into the One Cleanup Program with the USEPA Region III and PADEP***, though both agencies had substantial involvement in the progress of the environmental activity at the complex prior to that time. In November 2011, Sunoco submitted a revised Work Plan for Sitewide Approach under the One Cleanup Program (Work Plan for Sitewide Approach).

See Evergreen, Site History (visited December 26, 2020) (emphasis added).

A. Act 2 applies to all cleanups, whether voluntary or involuntary.

Evergreen has conflated the Voluntary Cleanup Program with Act 2. These two things are not synonymous. Act 2 is a state law that applies not only to voluntary cleanups, but also to those required by a number of state environmental laws:

> Section 106. Scope.
>
> (a) ***Remediation standards***.--The environmental remediation standards established under this act ***shall be used whenever site remediation is voluntarily conducted or is required under*** the act of June 22, 1937 (P.L.1987, No.394), known as The Clean Streams Law, the act of January 8, 1960 (1959 P.L.2119, No.787), known as the Air Pollution Control Act, ***the act of July***

> ***7, 1980 (P.L.380, No.97), known as the Solid Waste Management Act***, the act of July 13, 1988 (P.L.525, No.93), referred to as the Infectious and Chemotherapeutic Waste Law, ***the act of October 18, 1988 (P.L.756, No.108), known as the Hazardous Sites Cleanup Act, and the act of July 6, 1989 (P.L.169, No.32), known as the Storage Tank and Spill Prevention Act, to be eligible for cleanup liability protection under Chapter 5***. In addition, the remediation standards established under this act shall be considered as applicable, relevant and appropriate requirements for this Commonwealth under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Public Law 96-510, 42 U.S.C. § 9601 et seq.) and the Hazardous Sites Cleanup Act.

See Act 2, §106(a) (emphasis added), 35 P.S. §6026.106(a) (same, in unofficial statute).

B. This is not a voluntary cleanup under the 2003 consent order with the Department of Environmental Protection.

In reality, the remedial investigation is required by a series of consent orders dating back to at least December 17, 2003. *See* 2003 Consent Order and Agreement, pages 4-7, Sections 3-4 (setting forth corrective action requirements, including Phase One and Phase Two requirements). That consent order did not use the word "voluntary." *See generally id.* Rather, the agreement was executed so that the Department would not bring a lawsuit against Sunoco for noncompliance with the law:

> After full and complete negotiation of all matters set forth in this CO&A and upon mutual exchange of covenants contained herein, ***the parties desiring to avoid litigation and intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by Sunoco as follows***:
>
> 1. ***Authority***. This CO&A is an Order of the Department authorized ***and issued pursuant to Sections 5 and 316 of the Clean Streams Law, 35 P.S. §§ 691.5, 691.316***; and Section 1917-A of the Administrative Code, supra.

Id., page 3 (bold italics added for emphasis). (As noted earlier, Act 2 applies to cleanups required under the statute highlighted above).

It is true that DEP did not assess civil penalties because the responsible party had undertaken considerable work to date:

> Civil Penalties. The Department recognizes that Sunoco began operations at a portion of the Philadelphia Refinery and Belmont

> Terminal in 1988, and began operations at another portion in 1994, ***and that Sunoco has undertaken considerable work to address contamination at these facilities***, and that contamination was present at the facilities for decades prior to Sunoco's operations. Accordingly, no Civil Penalties are assessed to Sunoco except as provided in Paragraph 13 (Stipulated Penalties).

See id. at Section 12, page 7 (bold italics added for emphasis). But that did not make the work required by the consent order "voluntary."

C. This is not a voluntary cleanup under the One Cleanup Program.

In the original notice of intent to remediate on October 12, 2006, Sunoco does not refer to a "Voluntary Cleanup Program," and it does not make a request for this to be considered a voluntary cleanup. *See* Sunoco, Initial Notice of Intent to Remediate (October 2006). Rather, it merely expressed an intent for the work to be done under the One Cleanup Program. *See id.* ("[t]his NIR is being submitted with the intent to enter the Sunoco Philadelphia Refinery into the One Cleanup Program with PaDEP and the USEPA."). It stated that the work was to be done under the 2003 consent order:

> This NIR covers remediation being done as part of the 2003 Consent Order and Agreement (CO&A) at Point Breeze, Girard Point and Schuylkill River Tank Farm.

Id. at 1. Subsequent notices of intent to remediate did not suggest this was a voluntary cleanup. *See* Evergreen, Update of Notice of Intent to Remediate (November 2014); *see also* Evergreen, Update of Notice of Intent to Remediate (December 2016).

In response to the original notice of intent to remediate, the Department and EPA never agreed that this was a voluntary cleanup. Rather, they only agreed to Sunoco's participation in the One Cleanup Program. *See* Attachment 2 -- Letter dated November 8, 2011 ("[t]he EPA agrees to your participation in the One Cleanup Program per your wish to select this option within the NIR.").

The One Cleanup Program is simply an administrative agreement between the Department and the Environmental Protection Agency to cooperate with respect to their oversight of a cleanup subject to both state law (Act 2) and federal law:

> **One Cleanup Program**
>
> In 2004, Pennsylvania DEP and the U.S. Environmental Protection Agency signed an historic Memorandum of Agreement (MOA) that ***outlines a procedure where sites remediated according to Pennsylvania's Land Recycling Program may also satisfy requirements for three key federal laws***: the Resource

> Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation Liability Act (CERCLA or Superfund) and the Toxic Substances Control Act (TSCA).
>
> By opting into this program, a remediator/facility can be provided with a "one-stop shop" for state and federal standards guiding the cleanup of brownfield sites. ***Sites owners or operators subject to RCRA Corrective Action may be able to satisfy federal RCRA obligations and[1] obtain liability relief under Pennsylvania's Act 2 program***.

See DEP, One Cleanup Program (bold italics added for emphasis); *see also* One Cleanup Program Memorandum of Agreement (April 21, 2004).

It may be the case that the Department has indiscriminately conflated the terms "Voluntary Cleanup Program" with the term "Act 2." Currently, its website does this. *See* DEP, Land Recycling Program (last visited December 26, 2020) ("Pennsylvania's Land Recycling Program (Voluntary Cleanup Program) was established by a series of legislation enacted in 1995").

But any error by the Department does not make this a voluntary cleanup.

D. This is not a voluntary cleanup under the 2012 consent order with the Department of Environmental Protection.

Nothing in the August 14, 2012 consent order with the Department makes this a voluntary cleanup. *See* 2012 Consent Order and Agreement, page 6, Section 4(a) ("Seller's Obligations. Seller shall: a. Attain and demonstrate compliance with the Site-Specific Standard for all Pre-Existing Contamination in accordance with the Department-approved Plans and Act 2, by December 2020 ….". This legal agreement setting a deadline for attainment of a remediation standard does not use the word "voluntary." Again, the Department ordered the responsible party to comply with the terms of the document:

> After full and complete negotiation of all matters set forth in this Agreement, and upon mutual exchange of the covenants contained herein, ***the Parties intending to be legally bound, it is hereby ORDERED by the Department and AGREED TO by Seller and Buyer as follows***:
>
> 1. Authority. This Agreement is an Order of the Department authorized and ***issued pursuant to*** the environmental laws of the Commonwealth listed in Paragraph A, particularly ***Sections 5, 316, 402 and 610 of the Clean Streams Law***, 35 P.S. §§ 691.5,

[1] The word "and" is in bold in the original.

> 691.316, 691.402 and 691.610; ***Sections 4 and 602 of the Solid Waste Act***, 35 P.S. §§ 6018.4 and 6018.602; ***Sections 107 and 1309 of the Storage Tank Act***, 35 P.S. §§ 6021.107 and 6021.1309; and 71 P.S. § 510-17.

See id., pages 4-5 (bold italics added for emphasis). (As noted earlier, Act 2 applies to cleanups required under the three statutes highlighted above).

As in the case of the 2003 consent order, this did not make this a voluntary cleanup.

E. This is not a voluntary cleanup under the 2012 prospective purchaser agreement with the Environmental Protection Agency.

Nothing in the prospective purchaser agreement with the Environmental Protection Agency makes this a voluntary cleanup. While that agreement contemplated a settlement and covenant not to sue, that arrangement was with the prospective purchasers, and not with Sunoco:

> The Parties agree to undertake all actions required of each of them by the terms and conditions of this Settlement Agreement. ***The purpose of this Settlement Agreement as it pertains to the Parties, is to settle and resolve***, subject only to reservations and limitations contained in Sections VIII (Certification), IX (Covenant Not to Sue), X (Reservation of Rights), and XI (Settling Respondents' Covenant Not to Sue), ***the potential liability of the Settling Respondents for the Existing Contamination at the Property which would otherwise result from PES R&M LLC becoming the owner and/or operator of the Property***.

See 2012 Settlement Agreement and Covenant Not to Sue, page 4, paragraph 5 (bold italics added for emphasis). The Settling Respondents were Philadelphia Energy Solutions LLC and Philadelphia Energy Solutions Refining and Marketing LLC -- not Sunoco. *See id.*, page 1.

Nevertheless, the agreement contained provisions applicable to Sunoco, to ensure that it would meet its corrective action requirements under federal law:

> ***Sunoco agrees to undertake all actions required by Section XVII (Obligations by Sunoco)*** of this Settlement Agreement. ***The purpose of this Settlement Agreement as it pertains to Sunoco is to provide assurances that Sunoco will implement its corrective action obligations under RCRA at the Property***. Furthermore, Sunoco agrees that the actions to be undertaken pursuant to the terms and conditions of this Settlement Agreement are in its benefit.

See id., page 4, paragraph 5 (bold italics added for emphasis). Under the agreement, Sunoco was *required* to do a number of things for assurances of financial responsibility for its corrective action obligations. *See id.*, paragraphs 27-33, pages 57-71. This was not voluntary.

True, the Settlement Agreement states that Sunoco had entered into the Voluntary Cleanup Program on October 12, 2006. *See id.*, paragraph 17, page 10 ("Sunoco voluntarily entered into the Act 2 Program on October 12, 2006. PADEP and EPA are addressing the Site under the One Cleanup Program Memorandum of Agreement ("MOA") signed by PADEP and EPA in 2004."). But this simply repeats the error made by the Department in characterizing Act 2 as a Voluntary Cleanup Program.

F. This is not a voluntary cleanup under the 2020 First Amendment to Consent Order and Agreement.

Finally, nothing in the 2020 consent order makes this a voluntary cleanup. *See* 2020 First Amendment to Consent Order and Agreement. Amending the 2012 consent order to acknowledge Hilco's new ownership of the owner/operator (Philadelphia Energy Solutions Refining and Marketing LLC), it sets forth a new timeline for the submission of remedial investigation reports and cleanup reports. *See id.*, pages 4-5 (requiring attainment with cleanup standards by December 31, 2030).

Accordingly, Evergreen should not characterize this as a voluntary cleanup.

3. **Evergreen Should Make Available on its Website All Historical Reports Referenced in Appendix A of the 2004 Current Conditions Report**.

Evergreen has prepared a website that is helpful for locating the available remedial investigation reports, and it is neatly organized according to Area of Interest. *See* Evergreen, Act 2 Documents. Linked from this webpage, Evergreen has created a webpage for groundwater monitoring reports for 2015-present, which is also clear and well-organized. *See* Evergreen, Semi-Annual Remediation Status Reports.

However, Evergreen's webpage for historical reports is unorganized and incomplete. *See* Evergreen, Referenced Historical Reports ("Referenced Historic Reports"). It is helpful that this webpage is also linked from the webpage for the Act 2 Reports. However, the documents are listed in alphabetical order according to the title of the saved document. Without point headings or some other outline, this webpage is difficult to navigate. Evergreen should reorganize this webpage according to some criterion that would help the public to better understand the project (by Area of Interest, chronological order, etc.).

Finally, Evergreen should post all the historical reports set forth in Appendix A of the 2004 Current Conditions Report on its webpage. *See* 2004 Current Conditions Report and Comprehensive Remedial Plan (all Areas of Interest), pdf pages 150-153. It appears that Evergreen has already posted a number of these reports on its webpage. In addition, at the request of the Council, Evergreen recently posted 15 of the remaining reports from Appendix A at the top of that webpage. The Council appreciates Evergreen doing this.

The Council made that request because it was looking for documentation relating to the sheet pile wall, which provides the last line of defense against the migration of contaminated groundwater to the Schuylkill River. (*See* Comment #9, below). The documents recently posted by Evergreen do not provide any more detail on the sheet pile wall, beyond the minimal detail provided in Evergreen's reports. Posting all the historical reports would help the public gather documents relating to this issue as well as other issues regarding the remedial investigation.

Finally, the Council requests that Evergreen make available on its website geological logs and detailed well construction information for all the monitoring well and remedial well network. This would help the public in providing a detailed review and comments to the remedial investigations. *See* Comment #7, below.

The Council requests that Evergreen make the documents word-searchable before posting them. Many of the documents posted on the website are word-searchable, but many are not. Depending on the length of the document, it may take as much as half an hour for a user to make a document word-searchable.

4. <u>Evergreen Has Not Sufficiently Answered Questions From the Public on its Q&A Webpage</u>.

Evergreen has dedicated a webpage to address comments from the public on an ongoing basis. *See* Evergreen, Q & A. In theory, this is a good practice. However, a number of Evergreen's responses did not answer the question or inappropriately deferred answers to a future report. Evergreen will be submitting the Q&A to the Department. *See id.* ("The questions and comments below have been generated from website comment forms, emails, and public meeting comments. These will be updated periodically and will be included in the Public Comment Remedial Investigation Report to be submitted to the agencies upon completion of the public comment period."). Therefore, the Council is commenting directly on the Q&A, which are separately attached and numbered to facilitate a discussion regarding them. *See* Attachment 3 -- Evergreen's Q&A (downloaded on December 30, 2020).

As a preliminary matter, it would be helpful if Evergreen were to organize the Q&A on its website according to some numbering system, to make it easier for the public to track. (This is why the Council downloaded all the Q&A on December 30, 2020 and assigned numbers to them). Also, additional Q&A were added since that time. Without some sort of tracking system, it is very difficult to even identify changes to the webpage.

A. <u>Public involvement</u>
Q&A 58

In response to a question why it took so long to engage the public in the preparation of the remedial investigation reports, Evergreen merely describes the notifications that were made. But it does not answer the question:

> [Q&A 58]
>
> Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?
>
> Since Atlantic/Sunoco purchased the refinery, there have been 21 Act 2 reports submitted and, ***at the time of each submission (as well as at the time of each of three Notices of Intent to Remediate (NIR) submitted for the property), a letter was sent to the City of Philadelphia and notices appeared in a local newspaper informing the public of each submittal and their opportunity to comment on the submittals***. In August 2018, DEP requested that Evergreen revisit the previous public involvement plan with the City of Philadelphia. After a meeting with DEP, EPA and City officials in November 2018, Evergreen began developing the www.phillyrefinerycleanup.info website in preparation for a public meeting. The fire at PES' facility occurred after this effort was underway, in June of 2019. At that time, Evergreen suggested

> opening the website prior to announcing a date for a legacy remediation public meeting to allow the agencies to share the website in order to aid in answering questions that were being posed about Sunoco's legacy remediation program. The June 2019 fire at the PES facility does not relate to Evergreen's Act 2 submittals or public involvement plan.

See id., Q&A 58. In the present comments, the Council is setting forth its own answer to the question. *See* Comment #1, above.

B. Proposed site-specific standard for lead
Q&A 12, 36, 43, 44, 70, 72, 90, 91, 94, 95, 98, 99, 100, 101, 102, 103

In the past, Evergreen took the position that its proposed site-specific standard was appropriate because it asserted that a target blood level of 10 ug/dL was appropriate. *See* Attachment 3 -- Q&A 70 ("Evergreen derived a site-specific direct contact numeric value in their 2015 risk assessment based on a target blood lead level of 10 mg/dL.").[2] But in response to two recent questions, Evergreen has stated that "[i]f the PADEP changes their assumptions related to lead, such as permissible blood lead levels, Evergreen will update the SSS accordingly." *Id.*, Q&A 100, 102.

In December 2020, the Department decided to change its assumption regarding a target blood lead level. In the pending rulemaking, it is now proposing a direct contact numeric value based on a target blood lead level of 5 ug/dL:

> Decisions Based on Workgroup Analysis
>
> - ***Use a Target Blood Lead Level of 5 ug/dL***
> - Use a Probability of Exceeding the Target Blood Lead Level of 5%
> - Use all environmental media inputs
> - Resulting lead values in Table 4A:
> o Non-residential direct contact value = 1,100 mg/kg
> o Residential direct contact value = 150 mg/kg
> (Both rounded to two significant figures)

DEP, Overview of Chapter 250 Draft-Final Rulemaking, page 9 (slide presentation, December 16, 2020) (bold italics added for emphasis); *see also* DEP, Draft Chapter 250 Rulemaking Table 4A (December 16, 2020) (striking "2,500" and inserting "1,100" for proposed direct contact

[2] In this Q&A there is a typographical error with respect to the units. Evergreen assumed a target blood lead level of 10 ug/dL, not 10 mg/dL. The error is not material to the analysis.

numeric value); *cf.* 50 Pa. B. 1011, 1072, Table 4A (February 15, 2020) (initially proposing direct contact numeric value of 2,500 mg/kg).[3]

Evergreen should follow through with its responses and abandon its proposed site-specific standard of 2240 mg/kg.

The Council will address the proposed site-specific standard in more detail in Comment #13, below. The Council is also attaching its comments on the proposed Act 2 Rulemaking, explaining why the Department should use a target blood lead level of 5 ug/dL, rather than 10 ug/dL. *See* Attachments 4-8 -- Comments of Clean Air Council, dated April 30, 2020. The reasoning set forth in the Council's comments to the Department is also applicable to Evergreen's proposed site-specific standard.

C. Fate and Transport Remedial Investigation Report
Q&A 7, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 26, 30, 31, 32, 66, 75, 84, 94, 99)

The Technical Guidance Manual recognizes that a fate and transport analysis is a part of a remedial investigation. *See* Comment #11, below. However, Evergreen asserts that it is necessary to have all of the present remedial investigation reports approved before it completes a fate and transport model:

> [Q&A 23]
>
> How much more information do you need to complete the fate and transport model?
>
> We believe we have sufficient information to complete the model. ***However, we need to have agreeance on that from DEP prior to submittal. In other words, all of the Remedial Investigation Reports must be approved first (meaning, that DEP feels we have sufficiently defined the contamination so that a model can be accurate and complete).*** Once the RIR Addendums for AOI's 4 and 9 are submitted and approved, the fate and transport model will be finalized and submitted to PADEP for approval.

See Attachment 3 -- Q&A 23 (bold italics added for emphasis). But Evergreen makes this assertion only because Evergreen persuaded the Department to allow this. *See e.g.*, 2017 Approval Letter (AOI-5) ("Evergreen will complete separate Act 2 reporting to satisfy additional remedial investigation requirements for a fate-and-transport analysis (Title 25 Pa.

[3] The December 2020 materials are available on the Department's webpage for the meeting of the Cleanup Standards Scientific Advisory Board. *See* DEP, December 16, 2020 – Cleanup Standards Scientific Advisory Board Meeting (virtual meeting via WebEx).

Code Section 250.408(a)"). (Similar statements are made in the Department's approval letters for AOI-1, AOI-2, AOI-3, AOI-4, AOI-6, AOI-7, and AOI-9).

Moreover, the legal authority cited in the Department's letter does not compel the conclusion that a remedial investigation report should be fragmented in the manner sought by Evergreen. It merely sets forth requirements for a remedial investigation where a site-specific standard is sought. *See* 25 Pa. Code Section 250.408(a). In fact, that section refers to a "site characterization" and a "report" in the singular, not in the plural. *See id.*

Apparently, Evergreen assumes that the remedial investigation report for AOI-11 was disapproved only because of a flawed fate and transport analysis. Indeed, Evergreen draws the erroneous conclusion that the reports for AOI-11 were approvable apart from the fate and transport analysis:

> [Q&A 12]
>
> 1)We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk.
> ***2) Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifer.***
> 3) The work done so far does not consider the impacts of climate change, rising sea level and worsening storms. Note: for the purpose of response, this comment was split into three topics by Evergreen.
>
> ….
>
> 2)DEP did not approve two of the RIRs – AOI-4 and AOI-9 – based on the need for additional offsite characterization, not a level of contamination over other AOIs. ***The characterization portion of the AOI-11 report was sufficient for approval; however, the fate and transport portion of the AOI-11 reports was not, which is why the report was not approved***. Data has been collected from the lower aquifer wells as part of the other AOI remedial investigations since 2013 and reported in the Remedial Investigation Report submitted since 2013.
>
> ….

See Attachment 3 -- Evergreen's Q&A 12.

> [Q&A 75]

> ***Can you comment on why AOI11 deep groundwater report has not yet been approved?"***
>
> ***There were both an AOI 11 Remedial Investigation Report and a Final Report that were submitted. Both were disapproved solely for the fate and transport analysis that was included in the reports. The remedial investigation portion of those reports were good***. Note that before we started a site wide model concept, each of the AOI reports had separate individual models completed, but we have since updated that approach because the only disapproval points for those reports were based on the fate and transport, In subsequent talks with PADEP, we decided that the next phase of reporting for AOI 11 would be in the site-wide Fate and Transport RI report. Also note that AOI 11 has been monitored continually and data reported in other AOI RIRs.

See id., Q&A 75.

Evergreen goes even further, making the flawed assertion that conditions are protective of human health both onsite and offsite:

> [Q&A 26]
>
> ***There has been some concern that because of the aquifer under the water, pollutants from the refinery may impact drinking water in downstream New Jersey. Do you think this was ever a concern?*** If yes, will it continue to be one even as the refinery shuts down?
>
> Evergreen's role is to evaluate and remediate groundwater conditions created based on use of the facility up through 2013. Based on extensive data collected over the last 20+ years, and groundwater modeling performed to date, it is highly unlikely that those groundwater impacts affect drinking water quality in New Jersey. As part of the Act 2 process, Sunoco and Evergreen have performed several preliminary risk assessments, including accounting for the projection of dissolved contaminant migration in groundwater. ***All assessments to date have shown that conditions with respect to groundwater beneath the facility are protective of human health both onsite and offsite***. Evergreen is working on a complete groundwater fate and transport analysis, which projects where and how far contaminants will travel and at what concentrations, as well as other reports that will provide additional and more detailed analysis.

See id., Q&A 26.

The Council submits that this is not the case. For reasons set forth throughout the Council's comments, there are a number of flaws in the reports' discussion of the deep aquifer, including Evergreen's insufficient characterization of the relationship between the unconfined aquifer and the deep aquifer. Contrary to Evergreen's assertions, it is not true that "[t]he characterization portion of the AOI-11 report was sufficient for approval," or that "[t]he remedial investigation portion of those reports were good." The whole thing was a remedial investigation report and the report for the remedial investigation was disapproved.

Despite its assertions to the contrary, Evergreen actually acknowledges that its characterization of the relationship between the unconfined aquifer and the deep aquifer is flawed, when it promises "pressure gradients" and mapping of the clay layer in a future Fate and Transport Remedial Investigation Report:

> [Q&A 19]
>
> When will Evergreen conduct the fate and transport analysis for the lower aquifer? ***There is no aquitard between upper and lower aquifer across most of the site. Won't the heavily contaminated shallow aquifer gradually leach contaminants into the lower aquifer?*** (a critical drinking water source for New Jersey)
>
> The fate and transport analysis for the lower aquifer will be performed once the Remedial Investigation Reports for AOI 4 and AOI 9 have been approved. ***There are areas beneath the Site where connections exist between the lower aquifer and water table aquifer are less extensive than the areas where we have that important clay layer present***. The cross section shown during the August 27th Public Information Session was just one example from the site model that straddles the Schuylkill River where the aquitard is interpreted to be missing. ***Other cross sections show the continuity of that clay layer***. Even where the aquitard is missing, it does not necessarily mean that water and contaminants will move down into the deeper aquifer. ***That potential has to do with pressure gradients that the model can simulate. The fate and transport model will simulate future scenarios based upon current conditions***.
>
> ***It is noted that the fate and transport analysis will include mapping of the middle clay unit aquitard***. Water quality in the lower aquifer is monitored through routine sampling of groundwater from approximately 80 wells, and to date significant contamination has not been observed in the lower aquifer beneath the Site. Considering the aging and degrading petroleum sources

> in the water table from historic Sunoco sources, we do not expect groundwater hydrocarbon plumes to expand under current groundwater conditions.

See id., Q&A 19.

But Evergreen cannot have it both ways. It asserts that the future report is dependent on the present reports, at the same time that it asserts that the present reports are dependent upon the future report. Stated differently, all that Evergreen does is validate the notion that the material is interrelated, and Evergreen wants to break it apart. Moreover, in promising "pressure gradients" and mapping of the middle clay unit aquitard in a future remedial investigation report, Evergreen appears to be offering new data and information not present in the current reports. Accordingly, they are really one report and Evergreen is trying to break it apart.

Evergreen incorrectly assumes that the present remedial investigation reports reflect current conditions:

> [Q&A 13]
>
> Why is there no mention of climate change in discussion of the Water-table aquifer? ***These levels could change by multiple feet in the next few decades.***
>
> One of Evergreen's primary objectives through the remedial investigations under Act 2 was to characterize the facility's geologic framework and the water-bearing units it supports. Potential flow pathways for contaminant transport could be evaluated in this manner using recent groundwater observations from hundreds of wells at the facility. ***Evergreen's groundwater model is calibrated and validated to these recent groundwater data to provide defensible fate and transport simulations that are based on current conditions***. A sensitivity analysis was performed on the groundwater model to evaluate the impact of changes to inputs on performance and increase confidence in its ability to make predictions.
>
> Evergreen recognizes that climate changes are predicted that could alter local hydrologic conditions near the facility, such as higher water levels in the water-table aquifer or higher tides in the Schuylkill River. An assessment of climate change from available, published resources and the potential implications to Evergreen's groundwater model will be included in the upcoming Fate and Transport RIR.

See id., Q&A 13. As discussed in Comment #6 above, the public is commenting on remedial investigation reports that are all at least three years old, and Evergreen has not integrated the data, information, and analysis of its recent groundwater remediation status reports into these remedial investigation reports.

Now we know that Evergreen could have done the fate and transport analysis for the present public comment period, but it chose not to do so. In response to a question from a commenter, it admits that its groundwater flow model is complete:

> [Q&A 17]
>
> What is the status of your groundwater and aquifer modeling for all pollutants?
>
> ***The groundwater flow model has been completed but cannot be finalized and submitted until all Remedial Investigation Reports are approved as data collected for these reports are used as the basis for the groundwater flow model***. Groundwater contaminant fate and transport model efforts will be conducted subsequent to approval of the Remedial Investigation Reports ***since the fate and transport modeling is dependent upon the information in the Remedial Investigation Reports*** and the groundwater flow model.

See id., Q&A 17. There is no apparent reason why Evergreen would need nearly a year after the end of this public comment period to prepare a report.

In fact, the public has every reason to fear being sandbagged by fragmenting the remedial investigation reports in this manner. If the current reports are approved, that could freeze data, information, and analysis and make it difficult for the public to make future comments on a fate and transport model that depend on these reports. Evergreen makes this clear in a response to a question from a commenter, when it states that reports do not get updated once approved:

> [Q&A 67]
>
> ***Many of the finalized online reports reflect reviews done between 2011 to 2016 with no updates. How can I learn what happened next?*** Is there a person to contact with specific, referenced questions, which would be onerous for a Zoom conference?
>
> ***RIR reports do not get updated once approved***. Once RIRs are completed and approved, other report types are submitted with additional information, activities, and updates in the Act 2 process. Evergreen has multiple reports planned for 2021 and will provide a draft schedule on the website of upcoming reports.

> We have also provided copies of the semi-annual update reports on the website, which are not Act 2 submittals, but provide a routine update on remediation activities at the facility. You can ask questions in writing via email or live during the next Zoom meeting. In addition, Evergreen is currently planning smaller group meetings in the future which may make communication easier.

See id., Q&A 67 (bold italics added for emphasis).

Hypothetically, there could be circumstances that might compel a remedial investigation report to be finalized as a condition for preparing another report. For example, this might be the scenario for a cleanup plan. But that is not what is contemplated by Evergreen. It does not attempt to characterize it as a risk assessment, which Evergreen characterizes as separate from the present reports:

> [Q&A 94]
>
> It may have been more effective if this presentation was made available a week ago and we could have spent these two hours asking pertinent questions, ***such as: 1. what are the critical paths for considering the risks of lead and benzene to the adjacent communities;*** 2. how are increased climate-change risks being assessed; 3. how is ground and surface water run off being considered in the plans; 4. how is Hilco assessing the additional risks of (what looks like will be) hard scape pavement of 85-90% of the site?
>
> 1-Pathways and routes of exposure are discussed in the RIRs and they will be presented in more detail in the Risk Assessment Report. ***The Risk Assessment Report will be submitted after the public comments on the Remedial Investigation Reports, and after completion of the Public Comment RIR and the Fate and Transport RIR***.
>
> ….

See id., Q&A 94 (bold italics added for emphasis). Rather, Evergreen simply contemplates diverting material that should be in the current remedial investigation reports into another remedial investigation report to be made available later this year, under the name "Fate and Transport Remedial Investigation Report."

Stated differently, that future remedial investigation report is simply the long-awaited remedial investigation report for AOI-11, following the disapproval of the report for AOI-11 over seven years ago. The subject matter of the AOI-11 report was shifted into the individual

reports for the other individual Areas of Interest, and now Evergreen is attempting to shift them out into a standalone report again. Evergreen may not launder the deficiencies and fragment the remedial investigation reports in this manner.

The Council will address this in more detail in Comment #11, below.

D. Water quality and compliance with permit requirements (Q&A 82, 85)

Two commenters posed questions regarding the quality of water discharged from remediation systems and Evergreen's compliance with permit requirements. In response, Evergreen did not answer these questions. Evergreen should answer the questions.

In response to Question 83, Evergreen summarizes the nature of the process of sampling, but it does not answer the question regarding the quality of the water discharged from the remediation system:

> [Q&A 83]
>
> ***What is the quality of the water discharged from the Pollock St well system into the Schuylkill?***
>
> Groundwater collected from the Pollack St well system is not discharged directly to the Schuylkill River. Groundwater discharged from any remediation system is either processed through the facility's wastewater treatment plant which operates under a National Pollutant Discharge Elimination System (NPDES) permit held by PES ***or discharged to the Philadelphia Water Department (PWD) sewer system via a Groundwater Discharge Permit held by Evergreen***. ***Evergreen samples groundwater discharge to the PWD sewer per the permit requirements*** and the discharge from the facility's wastewater treatment plant is sampled by PES in accordance with their NPDES Permit.

See Attachment 3 -- Q&A 83. To be sure, Evergreen has a permit for an indirect discharge and the property owner Philadelphia Energy Solutions Refining and Marketing LLC (now owned by Hilco) has a permit for a direct discharge to the Schuylkill River. But this is a legal distinction that avoids the question posed about water quality. Certainly, Evergreen has the ability to obtain information regarding the quality of water discharged to the Schuylkill River, even though it is not a direct discharger.

In response to Question 85, Evergreen acknowledges that there are monthly discharge monitoring requirements, but does not answer the question whether permit requirements have been met:

> [Q&A 85]
>
> Is there a permit for the discharge of water from the wastewater treatment system to the PWD, who is the permit holder, ***and have the permit requirements been met?***
>
> Evergreen has a permit for any contaminated water that we discharge to PWD, and Evergreen is the permittee. ***The permit has monthly discharge monitoring requirements that need to be achieved to meet the requirements of the permit***. Some of the discharge from Evergreen's systems go directly to the PES wastewater treatment plant. PES had a NPDES permit to operate their wastewater treatment plant, which is permitted through the PADEP, which is different from a PWD permit. Hilco Redevelopment Partners (HRP) will now be running the waste water treatment plant and will be permittee for the NPDES permit.

See id., Q&A 85.

Evergreen should properly answer the two questions.

E. Air quality and soil vapor intrusion
Q&A 10

One commenter posed a question about soil vapor intrusion and whether sampling for air quality would be done in residential areas nearby. Applying circular reasoning, Evergreen asserts that sampling is not warranted because there is no known contamination:

> [Q&A 10]
>
> Air quality measurements were made within existing buildings, ***but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations***.
>
> Evergreen must investigate air quality stemming from subsurface contamination only, not from refinery operations above ground. As documented in the Remedial Investigation Reports, air samples were collected from inside site buildings, and from outdoor air locations both as background and above areas of known LNAPL plumes. ***There are no known residential areas where the contaminated groundwater has migrated from the facility to beneath those areas, which would possibly warrant sampling***. Also, future movement of contaminant plumes over time will be part of future site activities, including fate and transport modeling

> and evaluation of any potential risk associated with the migration of offsite plumes as part of a vapor intrusion assessment.

See id., Q&A 10. Of course, the only way one would have knowledge of contamination would be through sampling. Not having taken samples, Evergreen says it has no knowledge of contamination that would justify taking samples. And Evergreen will not have knowledge of contamination if it does not take samples. Evergreen should provide a better answer than this.

The last sentence of the response is not adequate because it is a vague reference to future fate and transport modeling that would avoid the question posed and would fragment this remedial investigation. Evergreen admits it has taken air samples from buildings onsite, and it has not relied solely on future fate and transport modeling in place of taking those samples. It should provide an explanation why air sampling in neighboring residential areas should be treated differently.

F. Delineation of nature and extent of lead contamination
Q&A 103

One commenter posed a question how Evergreen could have delineated the extent of lead contamination, having used an inappropriate site-specific standard. In response, Evergreen states that it compared the concentrations of soil samples to both the soil-to-groundwater numeric value and the site-specific standard, in the context of its tables attached to the reports:

> [Q&A 103]
>
> Since Evergreen used an inappropriate standard as a basis for its remedial investigation reports, ***how does it justify that it has correctly defined the extent of lead contamination?***
>
> As noted in response to other questions concerning the lead, the calculation of the site-specific standard was appropriate in accordance with the Act 2 regulations and recommendations from the USEPA and the PADEP. As part of the remedial investigations, ***the lead data was compared to the Act 2 SHS MSC, which is 450 ppm, based on the soil to groundwater pathway, to define the extent of lead contamination. This comparison is shown on the figures/tables in the RI Reports and in the 8/27/20 Public Information Session, so the extend [sic] of lead has been delineated to 450 ppm at the Site. Data was also compared to the site-specific standard.***

See id., Q&A 103. This is misleading because the soil-to-groundwater numeric value and the site-specific standard do not receive the same consideration in terms of Evergreen's synthesis and narration of the data.

When Evergreen asserts that "the lead data was compared to the Act 2 SHS MSC, which is 450 ppm, based on the soil to groundwater pathway, to define the extent of lead contamination," it is merely pointing out that it dropped a column in a spreadsheet to set forth both the soil-to-groundwater numeric value and the site-specific standard. This does not mean that this received any meaningful analysis in the narrative text of the reports -- which it did not.

Moreover, the following illustration from the 2017 report for AOI-5 demonstrates that Evergreen's assertion is simply incorrect. The spreadsheet of data only includes a column for the site-specific standard (2240 mg/kg), and there is no column for the soil-to-groundwater numeric value (450 mg/kg) or the direct contact numeric value (1000 mg/kg):

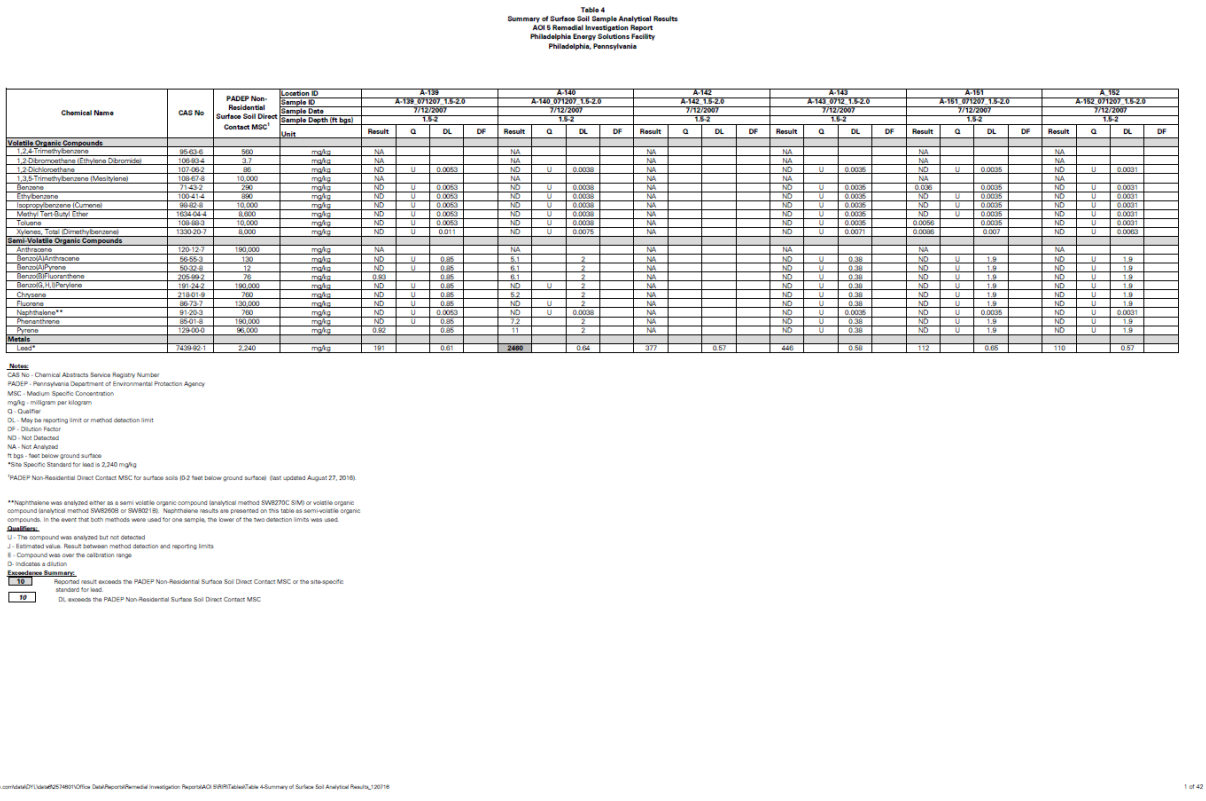


Table 4
Summary of Surface Soil Sample Analytical Results
AOI 5 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Chemical Name	CAS No	PADEP Non-Residential Surface Soil Direct Contact MSC[1]	Unit	Location ID	A-139				A-140				A-142				A-143				A-151				A_152			
				Sample ID	A-139_071207_1.5-2.0				A-140_071207_1.5-2.0				A-142_1.5-2.0				A-143_0712_1.5-2.0				A-151_071207_1.5-2.0				A-152_071207_1.5-2.0			
				Sample Date	7/12/2007				7/12/2007				7/12/2007				7/12/2007				7/12/2007				7/12/2007			
				Sample Depth (ft bgs)	1.5-2				1.5-2				1.5-2				1.5-2				1.5-2				1.5-2			
					Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																												
1,2,4-Trimethylbenzene	95-63-6	560	mg/kg		NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	mg/kg		NA				NA				NA				NA				NA				NA			
1,2-Dichloroethane	107-06-2	86	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		ND	U	0.0035		ND	U	0.0031	
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	10,000	mg/kg		NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		0.036		0.0035		ND	U	0.0031	
Ethylbenzene	100-41-4	990	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		ND	U	0.0035		ND	U	0.0031	
Isopropylbenzene (Cumene)	98-82-8	10,000	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		ND	U	0.0035		ND	U	0.0031	
Methyl Tert-Butyl Ether	1634-04-4	8,600	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		ND	U	0.0035		ND	U	0.0031	
Toluene	108-88-3	10,000	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		0.0056		0.0035		ND	U	0.0031	
Xylenes, Total (Dimethylbenzenes)	1330-20-7	8,000	mg/kg		ND	U	0.011		ND	U	0.0075		NA				ND	U	0.0071		0.0086		0.007		ND	U	0.0063	
Semi-Volatile Organic Compounds																												
Anthracene	120-12-7	190,000	mg/kg		NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	130	mg/kg		ND	U	0.85		5.1		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Benzo(A)Pyrene	50-32-8	12	mg/kg		ND	U	0.85		6.1		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Benzo(B)Fluoranthene	205-99-2	76	mg/kg		0.93		0.85		6.1		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Benzo(G,H,I)Perylene	191-24-2	190,000	mg/kg		ND	U	0.85		ND	U	2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Chrysene	218-01-9	760	mg/kg		ND	U	0.85		5.2		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Fluorene	86-73-7	130,000	mg/kg		ND	U	0.85		ND	U	2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Naphthalene**	91-20-3	760	mg/kg		ND	U	0.0053		ND	U	0.0039		NA				ND	U	0.0035		ND	U	0.0035		ND	U	0.0031	
Phenanthrene	85-01-8	190,000	mg/kg		ND	U	0.85		7.2		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Pyrene	129-00-0	96,000	mg/kg		0.82		0.85		11		2		NA				ND	U	0.38		ND	U	1.9		ND	U	1.9	
Metals																												
Lead*	7439-92-1	2,240	mg/kg		191		0.61		2460		0.64		377		0.57		446		0.58		112		0.65		110		0.57	

Notes:
CAS No - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection Agency
MSC - Medium Specific Concentration
mg/kg - milligram per kilogram
Q - Qualifier
DL - May be reporting limit or method detection limit
DF - Dilution Factor
ND - Not Detected
NA - Not Analyzed
ft bgs - feet below ground surface
*Site Specific Standard for lead is 2,240 mg/kg

[1]PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated August 27, 2016).

**Naphthalene was analyzed either as a semi volatile organic compound (analytical method SW8270C SIM) or volatile organic compound (analytical method SW82608 or SW80218). Naphthalene results are presented on this table as semi-volatile organic compounds. In the event that both methods were used for one sample, the lower of the two detection limits was used.

Qualifiers:
U - The compound was analyzed but not detected
J - Estimated value. Result between method detection and reporting limits
E - Compound was over the calibration range
D- Indicates a dilution

Exceedance Summary:
10 Reported result exceeds the PADEP Non-Residential Surface Soil Direct Contact MSC or the site-specific standard for lead.
10 DL exceeds the PADEP Non-Residential Surface Soil Direct Contact MSC

\\langan.com\data\DH\Data\625748\01\Office Data\Reports\Remedial Investigation Report\AOI 5\RIR\Tables\Table 4-Summary of Surface Soil Analytical Results_120716 1 of 42

See 2017 Report (AOI-5), Table 4 (Summary of Surface Soil Sample Analytical Results), pdf pages 86-127. This means that Evergreen disregarded the lower soil-to-groundwater numeric value (450 mg/kg) when it delineated the contamination.

This is not just a matter of one spreadsheet. In just this one report, there are 42 of these spreadsheets for lead in surface soil. There are nine other areas of interest in which lead samples were taken, and some of them have two reports, and not just one report. Evergreen should explain why it made the assertion in the Q&A that it compared the concentrations of soil samples with the two numeric values. The Council addresses this in more detail in Comment #12, below.

Evergreen should also explain why merely inserting a column listing the two numeric values would be sufficient to delineate the contamination with respect to those values. Again, what is important is that there be meaningful public participation in this process. *See* Comment #1, above. When Evergreen simply points to long data tables, that does not provide a meaningful public understanding. It needs to do analysis and synthesis, and it needs to explain things better.

G. Pre-2012 and post-2012 contamination
Q&A 56, 87 (duplicate)

One commenter posed the question about dividing contamination into pre-2012 contamination and post-2012 contamination, to allocate responsibility following the 2012 sale by Sunoco to the current owner Philadelphia Energy Solutions Refining and Marketing LLC. (The latter continues to be the owner/operator in 2021, as a subsidiary of Hilco).

In response, Evergreen acknowledged that there has been post-2012 contamination and that in some instances responsibility has been divided between Sunoco and the owner:

> [Q&A 56, 87]
>
> ***How is it determined what ground pollution is from 2012 and before…and what is from 2012 to the present?***
>
> When the facility was sold to PES in 2012, Sunoco had a good understanding of the nature and extent of contamination at the facility. It was assumed that any known contamination at the time of the sale was Sunoco's responsibility to cleanup. After the sale of the property, if changes in the contaminant profile on-site occurred, or known spills happened, the resulting cleanup became PES' responsibility. ***In some instances, new contamination co-exists with old contamination, and the responsibility is shared***.

See Attachment 3 -- Q&A 56, 87. Evergreen should provide a more detailed explanation regarding post-2012 contamination and how it is shared.

This is important for several reasons. First, to the extent there has been post-2012 contamination (e.g., contamination resulting from releases due to the fire in June 2019), that would tend to avoid review in Evergreen's reports, unless there has been an overlap of contamination or data. If that is the case, the public would like to know where it could obtain information about such post-2012 contamination.

Second, this concern is even greater for releases of hazardous substances during the past three years. The remedial investigation reports are at least three years old and they would not reflect releases in the past three years.

5. <u>Evergreen's Conceptual Site Model is Fundamentally Flawed, Necessitating Substantially Revised Reports for Public Comment Before Submission to the Department.</u>

In the reports, Evergreen has set forth a Conceptual Site Model (CSM) that reflects its view of geologic conditions and the contamination of the soil and groundwater. The "model" literally takes the form of a narrative text that has evolved over time, through the following documents: (1) 2003 Consent Order, (2) 2003 Phase I Remedial Plan, (3) 2004 Current Conditions Report, and (4) reports for the individual Areas of Interest. As developed and revised by Evergreen, this model is flawed in a number of ways, set out more fully in Comments #6, 7, 8, 9, 10, 11, 12, 13, 14, and 15.

The Conceptual Site Model is at least three years old, with the last report being submitted in 2017. While Evergreen has prepared groundwater remediation status reports since that time, Evergreen has not synthesized material from those reports with the remedial investigation reports that are the subject of this comment period. *See* Comment # 6, below. Evergreen should bring the information and analysis up-to-date.

The model does not appropriately characterize geologic conditions (including the relationship between the unconfined aquifer (water table) and the deep aquifer). Evergreen's inadequately attempts to address concerns regarding the potential pathway of migration of contamination by way of the deep aquifer to water supplies in New Jersey. *See* Comment # 7, below.

Evergreen does not analyze the apparent Light Non-Aqueous Phase Liquids in combination with groundwater flow direction data and exceedances for Semi-Volatile and Volatile Organic Compounds and metals in the deep aquifer. Evergreen has not provided a meaningful analysis and synthesis of shallow and deep aquifer monitoring data.

The model does not provide a complete delineation of metals in the deep aquifer. With respect to the investigation of AOI-11, Evergreen sampled for a wider range of metals including arsenic and manganese before 2013. But since that time, it has scaled back this effort in the reports for the other Areas of Interest, without providing a meaningful explanation. *See* Comment # 8, below.

Evergreen provides no meaningful analysis regarding the sheet pile wall -- the last line of defense against the migration of contaminated groundwater, which tends to flow toward the Schuylkill River, as admitted by Evergreen. This is an 8400-foot wall along the perimeter of AOI-5, AOI-6, AOI-7, and AOI-2. Repetitive statements about it being protective are conclusory and circular. *See* Comment # 9, below.

Evergreen does not consider climate change in delineating contamination for a site that has a high water table and neighbors the Schuylkill River, which is anticipated to experience sea level rise of two feet by 2050. This is significant given the widespread lead contamination in the surface soils (0-2 feet) throughout the site. *See* Comment # 10, below.

To address numerous deficiencies in the reports, Evergreen has attempted to divert them into a Fate and Transport Remedial Investigation Report to be prepared later in 2021. *See* Comment # 11, below. This would put the public into the awkward position of commenting on only part of a remedial investigation, with an important part missing. These parts are interrelated. In addition, if the current reports were to be approved, an objection would inevitably be made that the scope of future public comments should exclude material relating to the current reports. This would result in fragmentation of the remedial investigation reports and it would be fundamentally unfair to the public.

Evergreen skips important steps in delineating soil contamination according to numeric values of the Act 2 regulations. Areas of the site have a high water table (at times, it is less than ten feet from the surface of the soil). Where the soil buffer distance for a particular contaminant is less than the depth of the water table, Evergreen should have characterized exceedances of the more stringent soil-to-groundwater numeric value (450 mg/kg, for lead), rather than the less stringent direct contact numeric value (1000 mg/kg, for lead). *See* Comment # 12, below. Where Evergreen has referred to the soil-to-groundwater numeric value, it has marginalized its significance, relegating it to data in long tables and not providing a proper focus in the narrative text. In some instances, the reports have erroneously ignored the soil-to-groundwater numeric value altogether.

The model mistakenly relies on a proposed site-specific standard for lead in residential soils of 2240 mg/kg, calculated in 2015 based on an assumed target blood level of 10 ug/dL. Even at that time, that value was contradicted by the Centers for Disease Control and Prevention, which used a reference value of 5 ug/dL for case management for children exposed to lead. *See* Comment # 13, below. Last month, the Department changed its mind regarding a proposed direct contact numeric value of 2500 mg/kg for lead, which had been calculated assuming a target blood level of 10 ug/dL. *See* Comment # 4, above. Because the Department is now assuming a target blood lead level of 5 ug/dL in support of a proposed direct contact numeric value of 1100 mg/kg, Evergreen should abandon the proposed site-specific standard.

The flaws in this approach have a significant impact on the nature and characterization of lead in the surface soils. *See* Comment # 14, below. This is especially the case for AOI-5 and AOI-9 -- two of the more heavily contaminated areas of the site.

When revising the reports, Evergreen should prepare and submit a work plan to include Per- and Polyfluoroalkyl Substances (PFAS) as a Constituent of Concern in this remedial investigation. *See* Comment # 15, below. These substances are associated with the use of foams provided for firefighting. There is a history of catastrophic fires at the refinery -- including a terrible fire that resulted in the deaths of eight firefighters in 1975. PFAS has been the subject of remedial investigations in other states. In a pending rulemaking, the Department has proposed to establish Medium-Specific Concentrations for three PFAS chemicals.

To properly address these flaws, Evergreen will have to make significant revisions that will change the reports in a material way. Therefore, the public should be allowed an

opportunity to comment on them again before submission to the Department. No prejudice to Evergreen will result from this. It currently has a ten-year timetable to come into attainment with applicable remediation standards. *See* 2020 First Amendment to Consent Order and Agreement, page 5 of 77. The last report was submitted over three years ago. Evergreen has not yet corrected deficiencies in a report relating to the deep aquifer that was disapproved by the Department in 2013 -- over seven years ago.

Under the revised consent order, Evergreen must provide a public comment period on the current reports by March 23, 2021. *See* 2020 First Amendment to Consent Order and Agreement, page 5 of 77. But the consent order is silent as to when Evergreen must submit the reports once it has received public comments. *See id.* Therefore, Evergreen has time to address the flaws in the model and the Department can require another public comment period before the submission of those revised reports.

6. **Evergreen Should Revise the Reports to Reflect Up-To-Date Material (Including Data and Analyses From Groundwater Monitoring Status Reports).**

While the Council appreciates the reopening of the public comment period for the reports, the public is now in the awkward position of providing comments on reports containing information, data, and analyses that may be out-of-date. The most recent report was submitted for AOI-8 in December 2017 -- over three years ago. *See* Evergreen, Act 2 Documents. In order for this public comment process to be meaningful, Evergreen should revise the reports to reflect more recent information, data, and analyses. It should also make the revised reports available for public comment again before submission to the Department.

The Department recognizes that a remedial investigation should address recent data that are representative of soil and groundwater conditions. According to its guidance document, soil data that are over two years old may be used in a site characterization only if conditions are not reasonably expected to change:

> Historical data (i.e., data more than two years old) can be used during site characterization ***if there is no reasonable expectation that the site conditions associated with the release being investigated have changed*** (e.g., changes in property use resulting in changes in exposure).

DEP, Technical Guidance Manual, Section II(A)(4)(b)(i), page II-13 (bold italics added for emphasis). The Department makes a similar statement regarding groundwater data for a site characterization:

> Remediators can use historic data for identifying trends at sites ***that are not reasonably expected to have changes in site conditions associated with the release being investigated*** (e.g., natural attenuation or degradation).

Id., Section II(A)(4)(b)(ii), page II-15 (bold italics added for emphasis).

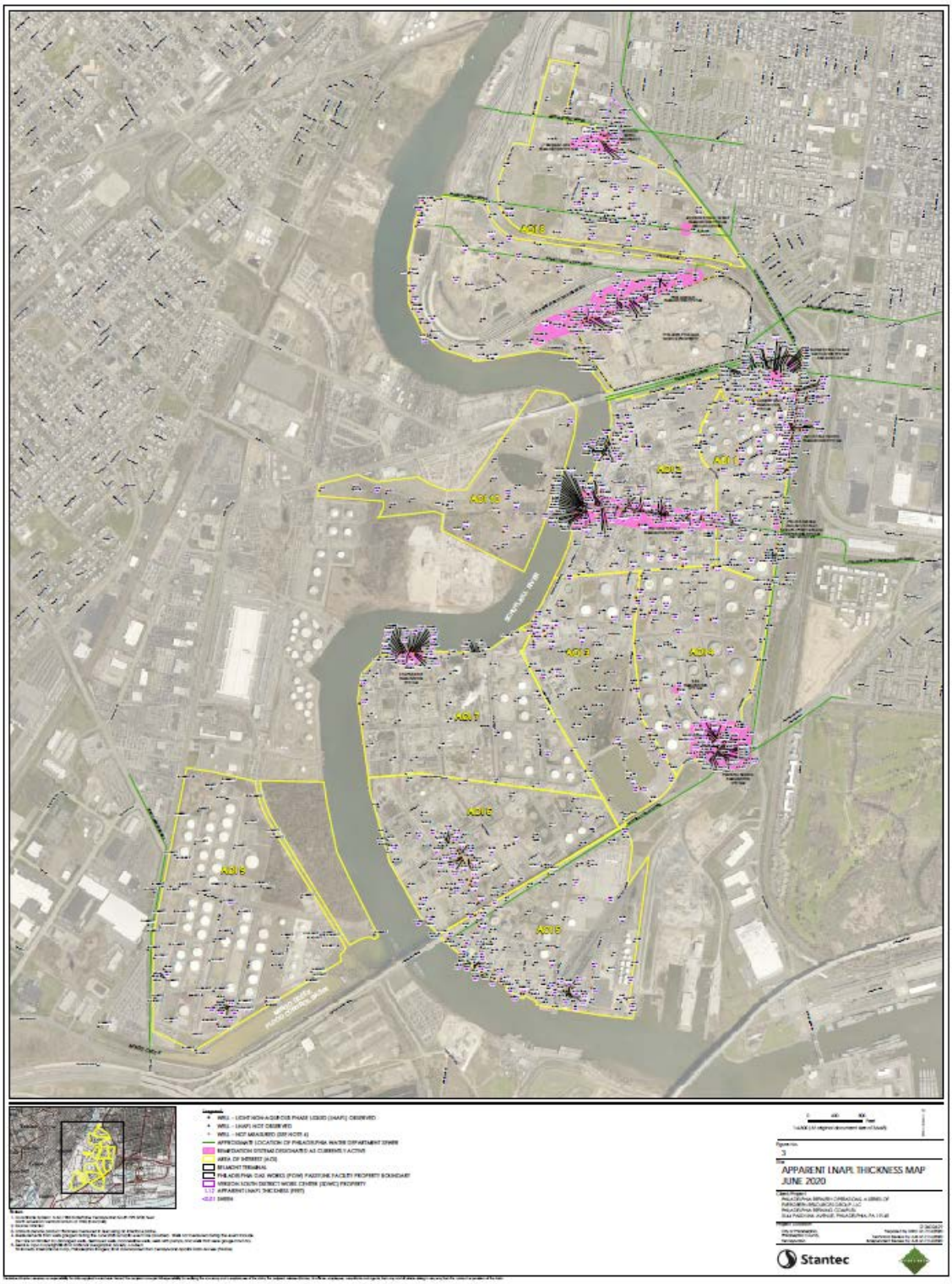
Because the last Evergreen report was submitted over three years ago, all the data underlying the reports are now considered "historical data," which should be used only if there is no reasonable expectation that the site conditions associated with the release being investigated have changed.

Presumably, Evergreen has the means to address this problem. Evergreen should synthesize the material from the groundwater remediation status reports prepared every six months since 2015. *See generally* Evergreen, Semi-Annual Remediation Status Reports. Those reports contain more recent data on groundwater. It would be a challenge for the public to undertake an analysis of those reports and synthesize them with the remedial investigation reports. This is something that Evergreen can and should do.

Those reports alone would not bring data and information up to date, as the ostensible purpose of them was different. But Evergreen will have gathered other information, data, and analyses relevant to the reports subject to this comment period. (In fact, we know that this is the case because Evergreen is attempting to divert a fate and transport analysis into another remedial investigation report later this year).

The groundwater remediation status reports identify wells that had not been installed when earlier reports were prepared. The 2013 report for AOI-11 does not reflect at least 15 additional deep wells that were apparently constructed since that time. *See* 2013 Report (AOI-11), Figures 5 and 6; *see also* Semi-Annual Remediation Status Report (Second Half 2019), Table 2 (Sitewide Fourth Quarter 2019 Gauging Data) (identifying 58 wells in the lower aquifer). They also provide more recent data on groundwater data in the deep aquifer.

In addition, those reports provide a more precise delineation of Light Non-Aqueous Phase Liquids in shallow wells. Figure 3 in a recent groundwater remediation status report not only shows the presence of additional wells installed since 2017, but also demonstrates the apparent thickness of Light Non-Aqueous Phase Liquids:



See Semi-Annual Remediation Status Report (First Half 2020), Figure 3 (Apparent LNAPL Thickness Map), pdf page 14 of 52. These liquids were present in shallow wells S-414 (thickness of 1.50 feet), S-382 (thickness of 0.92 feet) and S-283 (thickness of 0.54 feet). In

contrast, the remedial investigation report for AOI-3 shows no Light Non-Aqueous Phase Liquids in these shallow wells. *See* 2017 Report (AOI-3), Section 5.7 (LNAPL Characterization Results), pages 33-35, Figure 16 (Figure 16: Apparent LNAPL Thickness and Type), pdf page 173 of 760.

Evergreen should have synthesized and integrated material from those reports and done a similar analysis for all Areas of Interest.

Certainly, the data exist for doing this. In the tables in the groundwater remediation status reports there are columns setting forth the thickness of LNAPL. *See e.g.*, Semi-Annual Remediation Status Report (First Half 2020), Table 1 (First Quarter 2020 Gauging Data), Table 2 (Sitewide Annual 2020 Gauging Data), Table 3 (Comparison of Gauging Data for Select Wells). These data are not necessarily included in the remedial investigation reports.

Consistent with the Technical Guidance Manual, Evergreen should revise the reports so that the public is not commenting on reports containing historical data that are more than three years old. (It would not be a satisfactory response to this comment for Evergreen to simply assert that it has checked the groundwater remediation status reports and that it does not feel the need to revise the remedial investigation reports).

7. Evergreen Has Not Sufficiently Delineated the Nature and Extent of Contamination in the Deep Aquifer and the Unconfined Aquifer (Water Table).

There are fundamental flaws in Evergreen's analysis regarding the nature and extent of contamination in the deep aquifer and unconfined aquifer (water table), as well as in its analysis regarding the relationship between these aquifers.

A. Evergreen has not substantiated its assertion that significant contamination has not been observed in the lower aquifer.

In an answer to a question on its website, Evergreen makes the following statement:

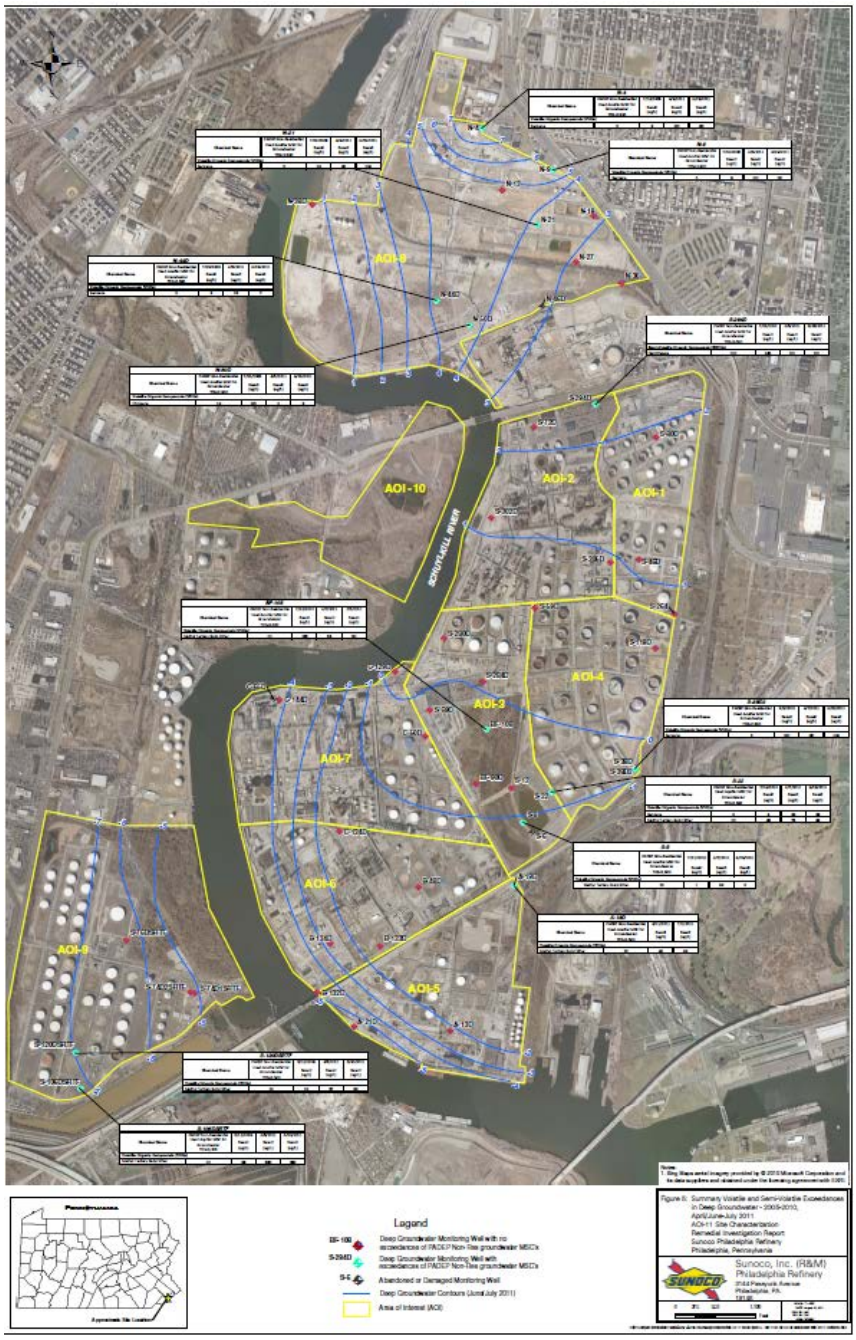
> Water quality in the lower aquifer is monitored through routine sampling of groundwater from approximately 80 wells, ***and to date significant contamination has not been observed in the lower aquifer beneath the Site.***

See Attachment 3 -- Q&A 19 (bold italics added for emphasis). It is not known what Evergreen means by this statement. Presumably, it means that there is contamination but that it is not significant. Reviewing the reports, it appears that the assertion is simply not correct.

In its comments on the first report for the deep aquifer, the Department noted exceedances of Medium-Specific Concentrations for a number of contaminants;

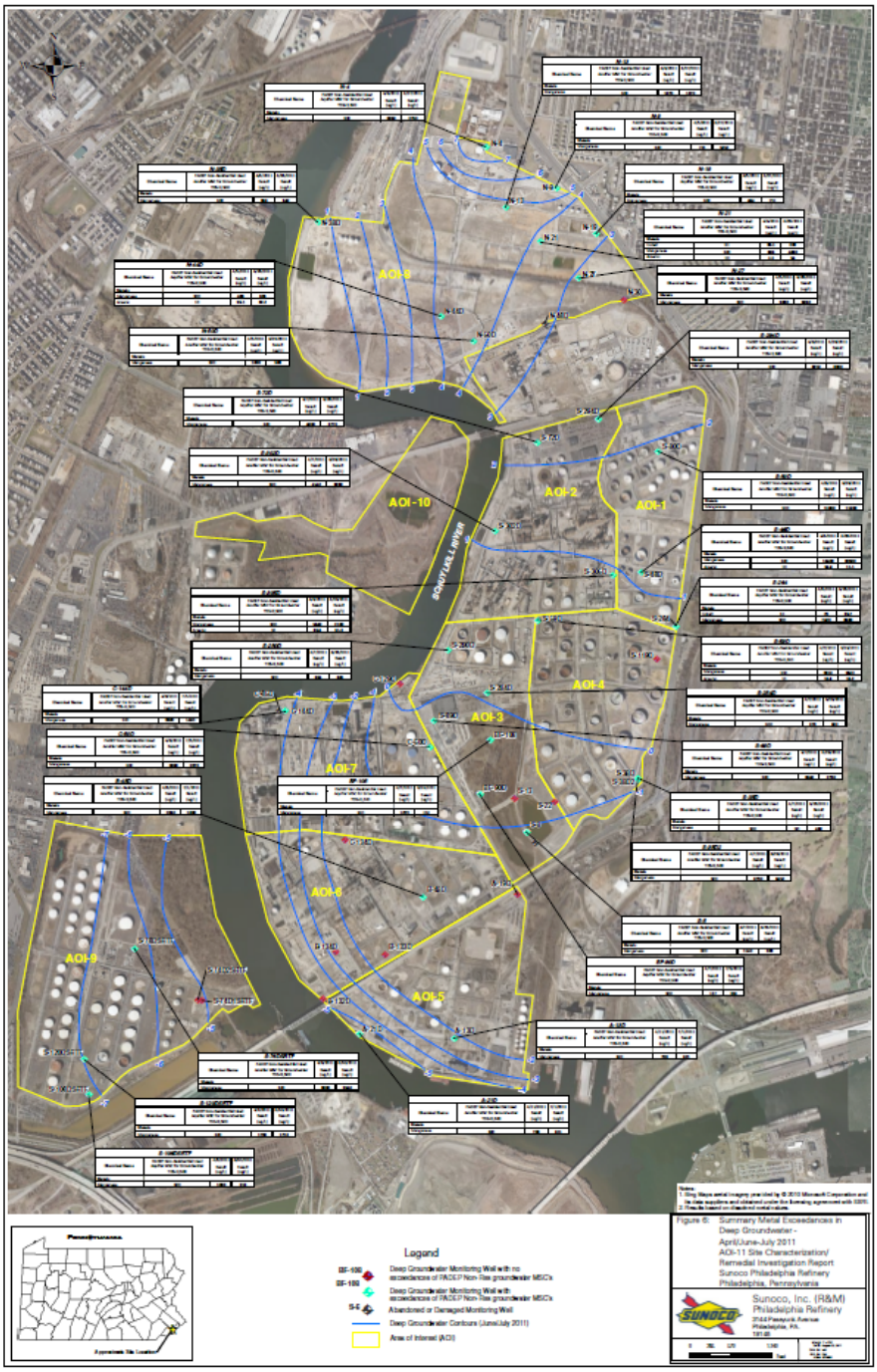
> ***Contaminants of concern (COC) that exceed the Department's non-residential statewide health standards*** (NRSWHS) in deep groundwater medium ***are***; ***chrysene, benzene, MTBE, naphthalene, cobalt, arsenic and manganese***. Iron exceeds the SMCL.

2011 Comments (AOI-11), paragraph 2 (bold italics added for emphasis). This was illustrated in the following Figures in the 2011 report. The figure for organic chemicals shows a large number of exceedances:



2011 Report (AOI-11), Figure 5 (Summary Volatile and Semi-Volatile Exceedances in Deep Groundwater - 2005-2010, April/June-July 2011); *see also id.,* Table 4 (2005-2010 Summary of Deep Groundwater Analytical Results); *see also id.,* Table 5 (April 2011 Summary of Deep Groundwater Analytical Results); *see also id.,* Table 6 (June-July 2011 Summary of Deep Groundwater Analytical Results), pdf pages 47-68, 75 of 76.

The figure for inorganic chemicals shows an even larger number of exceedances:

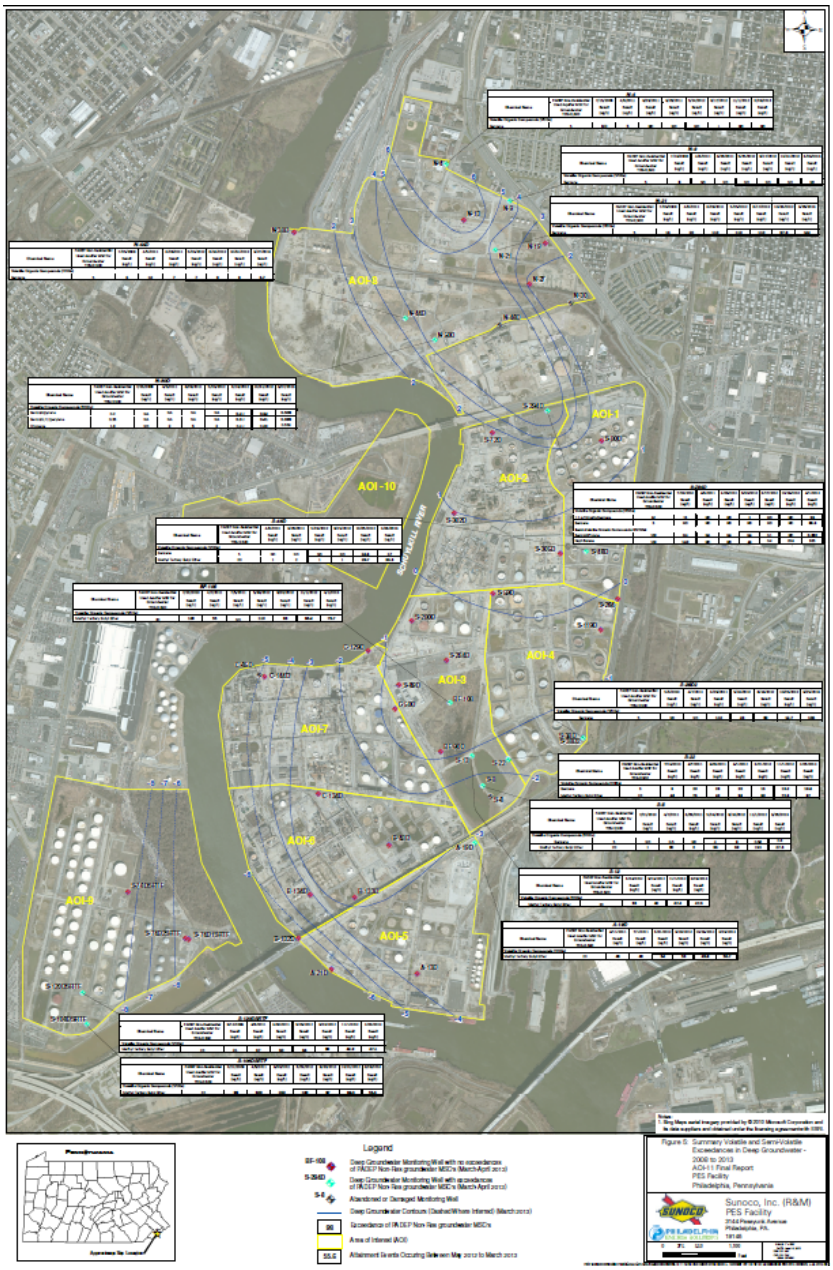


See id., Figure 6 (Summary Metal Exceedances in Deep Groundwater - April/June-July 2011); *see also id.*, Table 4 (2005-2010 Summary of Deep Groundwater Analytical Results); *see also id.*, Table 5 (April 2011 Summary of Deep Groundwater Analytical Results); *see also id.*, Table 6 (June-July 2011 Summary of Deep Groundwater Analytical Results), pdf pages 47-68, 76 of 76.

Evergreen also provides a textual narrative of the exceedances in its report. *See id.*, Section 5.1, pages 22-25.

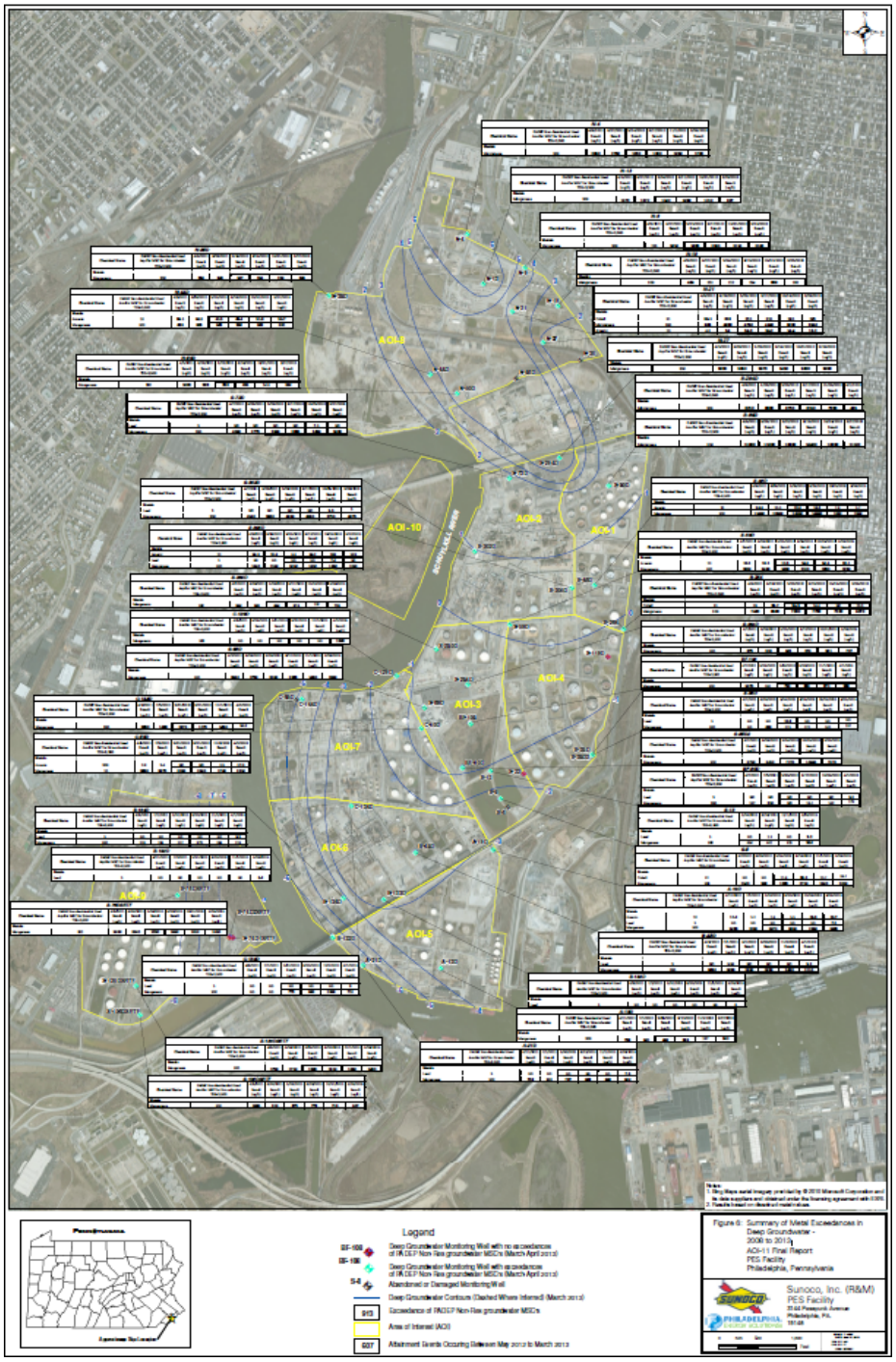
One would think that contamination is "significant" if the concentrations of contaminants are greater than a Medium-Specific Concentration for groundwater. That would make this contamination significant. If Evergreen is using another criterion to support its assertion regarding what is "significant," it should explain what it means.

The 2013 reports also demonstrate contamination of the deep aquifer above medium-specific concentrations. *See* 2013 Report (AOI-13), Section 5.2, pages 14-18. The figure for organic chemicals shows a large number of exceedances:



See id., Figure 5 (Summary Volatile and Semi-Volatile Exceedances in Deep Groundwater -- 2008 to 2013); *see also id.*, Table 4 (Summary of Deep Groundwater Analytical Results - 2005 to 2011), Table 5 (Summary of Attainment Sampling Deep Groundwater Analytical Results 2012-2013), pdf pages 45-77, 84 of 85.

The figure for in organic chemicals shows an even larger number of exceedances:



See id., Figure 6 (Summary of Metal Exceedances in Deep Groundwater - 2008 to 2013); *see also id.*, Table 4 (Summary of Deep Groundwater Analytical Results - 2005 to 2011), Table 5 (Summary of Attainment Sampling Deep Groundwater Analytical Results 2012-2013), pdf pages 45-77, 85 of 85.

In its comments at the time it disapproved the report in 2013, the Department noted elevated levels of Volatile Organic Compounds:

> The AOI 11 conceptual site model (§8.0) does not address the cause(s) for the occurrence of hydrocarbons in the Lower Sand aquifer. ***If the Middle Clay is a barrier to vertical migration of contaminants, then why are there elevated VOC levels in many areas? For example, at wells S-22 (AOI 3) and N-21 (AOI 8) benzene and/or MTBE are consistently elevated***, but the Middle Clay is ~20′ thick at these locations.

See 2013 Comments (AOI-11), paragraph 1 (bold italics added for emphasis). In addition, the Department noted the existence of plumes that were not properly characterized:

> 12. ***Keep in mind that deep aquifer "plumes" were characterized with single, isolated wells***. Sunoco did not delineate sources with peripheral wells, so we don't know if the concentrations at the presumed "source" wells are really reflective of the source area. ***They could be hundreds of feet downgradient or side-gradient of the greatest contamination***.

See id., paragraph 12 (bold italics added for emphasis).

In addition, subsequent remedial investigation reports demonstrate contamination of the deep aquifer in a number of Areas of Interest:

Area of Interest	**Title**	**Evergreen's References to Exceedances in the Deep Aquifer**
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report (approved)	Section 4.3, page 4.29 ("Concentrations of the following COCs were detected in lower aquifer groundwater above the SHS during the 2014 sampling events: benzene, MTBE, and lead. It is noted that the 2014 exceedances of the SHS for benzene were only observed in offsite wells ARCO-1D, S-399D, and S-394.")
AOI-2 Point Breeze Processing Area	2017 Report (approved)	Section 7.3, page 44 ("Prior to 2016, lead, 1,2,4-TMB, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and naphthalene were the COCs in the lower aquifer groundwater that were detected above their respective PADEP non-residential groundwater MSCs.

		There were no detections of COCs in the lower aquifer above the respective PADEP non-residential MSCs during both the August and October 2016 groundwater sampling events.")
AOI 3 Point Breeze Impoundment Area	2017 Report (approved)	Section 5.4, page 32 ("Historically, lead, benzene, and MTBE are the only COCs that have been detected in the lower aquifer groundwater within monitoring wells in AOI 3 at concentrations exceeding their respective PADEP non-residential groundwater MSCs. EDB (also known as 1,2-dibromoethane) exceeded the PADEP non-residential groundwater MSC of 0.05 micrograms per liter (ug/l) at four of the seven lower aquifer wells sampled during the June 2015 event, with the highest detected concentration of 0.086 ug/l at monitoring well S-8. However, EDB (also known as 1,2-dibromoethane) was not detected in any of the six lower aquifer wells sampled, including monitoring well S-8, during the most-recent AOI 3 lower aquifer groundwater sampling event in December 2015.")
AOI-4 No. 4 Tank Farm	2013 Report (disapproved) 2017 Report (disapproved)	Section 5.3, pages 19-20 (only discussing samples for shallow aquifer) Section 10.5.2, page 10.64 ("Concentrations of the following COCs were detected above the SHS in lower aquifer groundwater during 2016 characterization sampling events (see Table 4-3): benzene, MTBE, and lead. Available historical analytical data from previous groundwater sampling events was reviewed by Stantec. That data indicates that no additional Evergreen Comprehensive List COCs were identified at concentrations in excess of the current SHS during past AOI 4 lower aquifer groundwater sampling; however, historical arsenic exceedances were noted.")
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan (disapproved)	Section 5.3, page 25 ("A MTBE concentration of 34 ug/L was detected in deep monitoring well A-19D located in the northern portion of AOI 5. No other COC concentrations above the PADEP nonresidential used aquifer (TDS<2,500) groundwater MSCs were

		detected in groundwater from monitoring well A-19D or the other two Lower Sand wells in AOI 5.")
	2017 Report (approved)	Section 5.7, page 51 ("Lower aquifer groundwater in monitoring well A-19D historically exhibited concentrations of MTBE exceeding the respective PADEP non-residential groundwater MSC. No other COCs have historically been detected in the lower aquifer within AOI 5 above their respective PADEP non-residential groundwater MSCs.")
AOI-6 Girard Point Chemicals Area	2013 Report (disapproved) 2017 Report (approved)	Section 5.3, pages 21-22 (only discussing samples for shallow aquifer) Section 9.3.2, page 36 ("None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.")
AOI-7 Girard Point Fuels Area	2012 Report (disapproved) 2013 Addendum to Report (disapproved) 2017 Report (approved)	Section 5.3, page 27 ("There were no COCs detected in deep monitoring wells at concentrations above their respective PADEP non-residential groundwater MSCs.") (only discussing samples for soil) Section 9.3.2, page 38 ("None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.")
AOI-8 North Yard	2012 Report (approved)	Section 5.3, pages 25-26 ("Benzene was detected in three deep (Lower Sand) monitoring wells (N-9, N-21, N-44D) at concentrations slightly above its respective non-residential PADEP groundwater MSC. Toluene, MTBE, 1,2-dichoroethane, xylenes (total), cumene, ethylbenzene, ethylene dibromide, pyrene, phenanthrene, fluorene, naphthalene, and lead were not detected in deep

	2017 Report (approved)	groundwater in AOI 8 at concentrations above their respective PADEP non-residential groundwater MSCs." Section 9.4.2, page 9.63 ("Along with benzene, several SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, BEHP (also known as di(2-ethylhexyl) phthalate), phenanthrene, pyrene, and naphthalene), and metals (lead, manganese, arsenic, chromium, and cobalt) were detected above the respective SHS in certain lower aquifer wells (Table 4-3).")
AOI-9 Schuylkill River Tank Farm	2015 Report (disapproved) 2017 Report Addendum (approved)	Section 5.7, page 39 ("In 2009, MTBE was detected in the deep groundwater in monitoring wells at a concentration exceeding its respective PADEP non-residential groundwater MSC. …. During the baseline March 2015, August 2015, and November 2015 sampling events, benzene and MTBE were detected in deep groundwater and 1,2-dichloroethane was detected in newly installed well, S-110D SRTF, at concentrations exceeding their respective MSCs.") Section 4.3, page 18 ("In 2016, MTBE was the only site COC that was detected in the lower aquifer groundwater in two monitoring wells (S-118DSRTF and S-143SRTF) at concentrations exceeding its respective PADEP non-residential groundwater MSC.")
AOI-10 West Yard	2011 Report (approved)	Section 4.4, page 19 (only discussing results for shallow and intermediate wells)
AOI-11 Deep Aquifer Beneath Complex	2011 Report	Section 5.1, page 23 ("COCs at concentrations above their respective non-residential groundwater MSCs included: benzene, chrysene, methyl tertiary butyl ether (MTBE), naphthalene, arsenic, cobalt, and manganese.")

	2013 Report (disapproved)	Section 6.2, page 15 ("COCs detected at concentrations above their respective non-residential groundwater MSCs during the AOI 11 groundwater attainment sampling included: benzene, benzo(a)pyrene, benzo(G,H,I)perylene, methyl tertiary butyl ether (MTBE), 1,2,4 – trimethylbenzene, chrysene, naphthalene, lead, arsenic, cobalt, and manganese. Iron was detected over the SMCL.")

B. Evergreen does not sufficiently address the concern for contamination potentially migrating to New Jersey.

In its comments on the first report for AOI-11, the Department stated that Sunoco had not supported its assertion that the PRM aquifer system is not a pathway for exposure through a drinking water supply in New Jersey:

> 9. On Page 10 of the SCR/RIR, the following statement appears: "The PRM aquifer system no longer is used as a source of water supply in Philadelphia because of highly elevated concentrations of iron … etc." ***This statement is somewhat misleading since it is offered without any further information about water uses associated with this aquifer. DEP requests that the SCR/RIR also provide information to the effect that the PRM aquifer system is used as a source of water supply in New Jersey***. According to USGS's 2003 report, "Ground-water flow from areas of contamination in South Philadelphia to adjacent downgradient areas of New Jersey has the potential to affect supply wells drawing water from the lower aquifer of the PRM." (Sloto, 2003, page 35).

2011 Comments (AOI-11), paragraph 9 (bold italics added for emphasis).

The Department made a similar statement when it disapproved the report for AOI-11 in 2013:

> 21. ***The report did not address potential downgradient receptors of the Lower Sand aquifer contamination, particularly for inorganics.*** This was a concern in DEP's 9 Dec 2011 comments on the Sep 2011 RIR (item 9). The deep aquifer is a water supply for New Jersey. ***Sunoco proposes eliminating the groundwater exposure pathway in a 1-mile distance around the facility, but this would not include wells in New Jersey***.

2013 Comments (AOI-11), paragraph 21 (bold italics added for emphasis).

In fact, this was one of the deficiencies identified in disapproving the report;

> ***The evaluation of groundwater exposure pathways for potential human receptors was insufficient. Sunoco should examine an unidentified well downgradient of AOI 9 and water supply wells in New Jersey***. The receptor evaluation is required by Section 250.404(a).

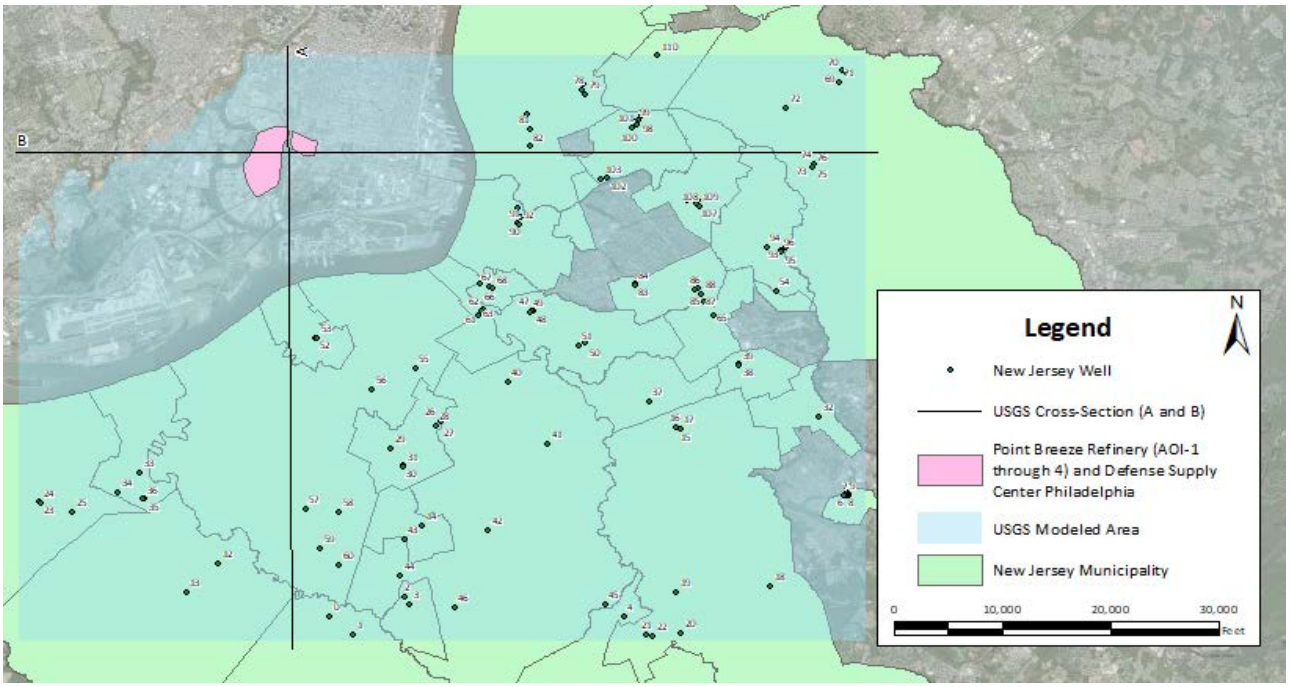
2013 Disapproval Letter (AOI-11), paragraph 2 (bold italics added for emphasis).

C. New Jersey's efforts to limit but not restrict withdrawals from the deep aquifer do not eliminate a pathway of contamination.

New Jersey continues to rely on the deep aquifer as a sole source supply. As of 2015, supply wells within the modeled study area in the 2001 USGS report were withdrawing approximately 4 billion gallons of water each year.

Created by the Council, the following Figure shows the New Jersey Potomac-Raritan-Magothy Aquifer supply wells used in the USGS model, in relation to the refinery site. The refinery site is colored in pink and is located to the west of the A cross-section and to the north and south of the B cross-section:

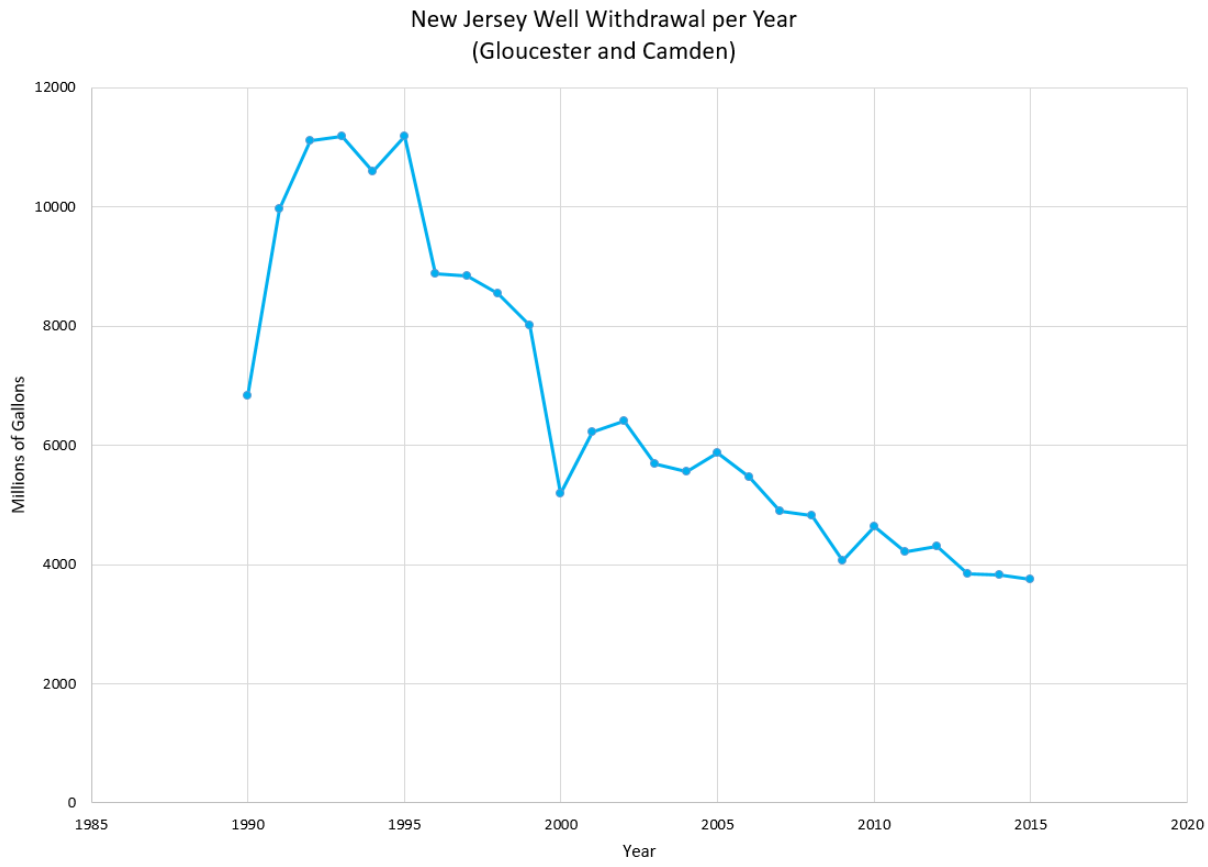
Modeled Wells in 2001 USGS Report
(prepared by Clean Air Council)



Source of data: USGS Report 2001-4218 (2001).

Created by the Council, the following Figure shows the amount of groundwater withdrawals from these supply wells, for the years 1990-2015:

Graph of Modeled Pumping Wells Withdrawal
In 2001 USGS Report
(prepared by Clean Air Council)



Source: USGS Report 2001-4218 (2001) and New Jersey Department of Environmental Protection Digital Geodata series DGS10-3, New Jersey Water Withdrawals.

The 2001 USGS report concluded that "the increased pumping in New Jersey maintained the downward vertical gradients." *See* USGS Report 2001-4218 (2001), page 22. This indicates a concern for the migration of contaminants to New Jersey.

There continues to be a risk of migration of contaminants by way of the deep aquifer to water supply wells in New Jersey, despite the fact that New Jersey has taken steps to decrease its reliance upon the deep aquifer for water supply. While the yearly withdrawal from Gloucester County and Camden County public supply wells declined from approximately 11,000 million gallons in 1995 to about 4,000 million gallons in 2015, that still is a significant level of withdrawal above the level of zero. *See* USGS 2001-4218 Report (2001), page 15; *see also* Graph of Modeled Pumping Wells Withdrawal In 2001 USGS Report (prepared by Clean Air Council, above).

The decrease appears to have resulted from the designation of Water Supply Critical Areas (N.J.A.C. 7:19-8) in two areas in the New Jersey Coastal Plain. The Department designated Water Supply Critical Area 2 to encompass all of Camden County and most of Gloucester County, as well as parts of other Counties. *See* N.J.A.C. 7:19-8.5(b), https://www.nj.gov/dep/rules/rules/njac7_19.pdf. It is the understanding of the Council that this program reduced groundwater withdrawals in areas of overdraft in conjunction with development of new surface water sources.

To support this initiative, the Tri-County Project is the primary water source to meet growing demands in the region. Major infrastructure improvements allowed the areas that previously solely relied upon the local PRM withdrawals to tap into this regional solution which is primarily a surface water source obtained from the Delaware River.

It is the understanding of the Council that Water Supply Critical Area 2 applies to the PRM aquifer system in parts of Ocean, Burlington, Camden, Gloucester and Atlantic Counties. Withdrawals are not prohibited from the PRM aquifer system in these counties, but are restricted. *See* N.J.A.C. 7:19-8.5, https://www.nj.gov/dep/rules/rules/njac7_19.pdf.

It is the Council's understanding that New Jersey has delineated well head protection areas for unconfined wells completed above the Potomac, but that this does not extend into Pennsylvania. *See* Spayd and Johnson, Guidelines for Delineation of Well Head Protection Areas in New Jersey (2003). To the extent that this report contemplates limiting wells tapping into the confined or deep aquifer, it only contemplates setting up a 50-foot wellhead protection area subject to a site-specific delineation based on the presence or absence and nature of intervening confining units. *See id.*, page 4. This does not suggest that the use of the confined aquifer in New Jersey is strictly prohibited.

While New Jersey maintains a database for water quality data, this is limited by the reporting by public supply wells in New Jersey, who are required to monitor and report water quality data quarterly. *See* NJ DEP, Drinking Water Watch. The presence or absence of an exceedance for a particular chemical in the raw water found in this database would not alone be dispositive of the question of a pathway between the refinery and the water supply in New Jersey.

D. The reports indicate the presence of a vertical pressure gradient, which Evergreen inappropriately attempts to avoid through the preparation of another remedial investigation report later in the year.

When Evergreen offers an analysis of "pressure gradients" in a future report, it admits that its analysis of the missing aquitard is deficient. *See* Comment 4 (relating to Evergreen's Q&A 19). It is not clear whether Evergreen's analysis of "pressure gradients" in a future report would involve new data or existing data. But at a minimum, Evergreen's analysis would be new because it is not located in the reports on which the public is now commenting.

In addition, available data in Evergreen's own reports indicates that there is a downward pressure gradient throughout most of the site:

Area of Interest	Title	Evergreen's References to Downward Gradients
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report	Section 5.4, page 5.39 ("Overall, hydraulic head potentials range from approximately 5.5 feet to -2.5 feet."
AOI-2 Point Breeze Processing Area	2017 Report (approved)	Section 2.2.3, page 15 ("The observed head differences correspond to downward vertical hydraulic gradients ranging between 0.015 ft/ft to 0.051 ft/ft."
AOI 3 Point Breeze Impoundment Area	2017 Report (approved)	Appendix I, page I-5 ("The observed head differences correspond to downward vertical hydraulic gradients ranging between 0.005 to 0.05 feet/feet (ft/ft).")
AOI-4 No. 4 Tank Farm	2013 Report (disapproved) 2017 Report (disapproved)	Appendix F, Section F.5.3, page F-8 ("For these wells the hydraulic gradient (0.0035) measured in the southern portion of AOI 4 during the 2005 Site Characterization Report (SCR) was used for their QD simulations.") Section 10.2, page 10.59 ("Across most of the study area (including all well pairs in AOI 4), the hydraulic head potential between observed aquifers was positive (downward) in May 2016 (Figure 5-8)."
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan (disapproved) 2017 Report (approved)	Section 2.3.2, page 11 ("Groundwater elevations in A-13D, A-19D, and A-21D were lower than elevations observed in nearby shallow wells indicating a downward vertical gradient exists between the shallow and the deep monitoring wells.") Section 2.2.3, page 15 ("The observed head differences correspond to downward vertical hydraulic

		gradients of 0.082 and 0.16 ft/ft at the A-13 and A-21 monitoring well pairs, respectively.")
AOI-6 Girard Point Chemicals Area	2013 Report (disapproved) 2017 Report (approved)	Section 2.2.1, page 8 ("Based on the December 2012 groundwater gauging event, the hydraulic gradient in the shallow/intermediate monitoring wells ranged from 0.003 near B-135 in the central portion of AOI 6 to 0.062 near B-169 in the western part of AOI 6 near the sheet pile wall"). Section 5.2.3, page 28 ("There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2013 RIR).")
AOI-7 Girard Point Fuels Area	2012 Report (disapproved) 2013 Addendum to Report (disapproved) 2017 Report (approved)	Section 2.3.2, page 13 ("Groundwater elevations in the deep zone are lower than the shallow/intermediate zone, exhibiting a downward vertical hydraulic gradient.") Section 9.2.3, page 37 ("There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 7 (2010 RIR and 2012 RIR).") Section 5.2, page 30 ("It is also noted that hydraulic head potentials between the unconfined and lower aquifers are downward across AOI 7.")
AOI-8 North Yard	2012 Report (approved) 2017 Report (approved)	Section 8.0 Site Conceptual Model, page 46 ("A downward vertical flow gradient exists between the shallow and deep zone as indicated by the groundwater elevations in the following monitoring well pairs: N-3/N-4, N-12/N-13, N-8/N-9, N-18/N-19, N-20/N-21, N-29/N-30, N-38/N-38D, N-43/N-44D, N-47/N-46D and N-51/N-50D. This is consistent with vertical gradients elsewhere in the refinery." Section 5.4.1, page 5.44 ("The positive potentials in AOI 8 ranged from approximately 3 feet to 11 feet. Near-equal hydraulic heads are assumed to be present in the lower aquifer subcrop area, as exemplified by wells N-137 and N-4; however, separation of geologic

		units in the area is difficult using existing lithologic logs.")
AOI-9 Schuylkill River Tank Farm	2015 Report (disapproved) 2017 Report Addendum (approved)	Section 2.2.3, page 14 ("As defined above, the deep aquifer is the Lower Sand which is a semi-confined to confined aquifer except where the clay aquitard is absent. Groundwater flow in the deep aquifer in the area where the Lower/Middle clay is absent is divergent due to gradual downward vertical groundwater migration through this area from the shallow aquifer. Following recharge from the shallow aquifer groundwater generally flows towards the southwest in the direction of regional flow patterns.") Appendix I, page I-5 ("The head differences measured in October 2016 between paired monitoring wells in the unconfined and lower aquifer (S-74D2SRTF/S-7D1SRTF, S-118SRTF/S-118DSRTF S-137SRTF/S-138SRTF, and S-142SRTF/S-143SRTF) ranged between zero (S-118SRTF/S-118DSRTF) to 4.28 (S-74D2SRTF/S-74D1SRTF). The observed head differences correspond to a downward vertical hydraulic gradient of 0.067 feet per feet (ft/ft) near the potentiometric high point of the unconfined aquifer (S-74D2SRTF/S-74D1SRTF) and transition to an upward vertical hydraulic gradient of 0.016 ft/ft (S-142SRTF/S-143SRTF) near Mingo Creek basin. The upward vertical hydraulic gradients observed are most likely attributable to the artificial lowering of the unconfined aquifer potentiometric surface due to the pumping in Mingo Creek basin.")
AOI-10 West Yard	2011 Report (approved)	Section 7.2, page 25 ("The vertical hydraulic gradient between the shallow and intermediate (Trenton Gravel) zones is downward at an average of 0.325 ft/ft"), but not addressing the gradient with respect to the deep aquifer)
AOI-11 Deep Aquifer Beneath Complex	2011 Report	Section 7.2, page 28 ("Downward vertical gradients exist between the shallow/intermediate and deep monitoring wells throughout the refinery with the exception of AOI 9 where deep groundwater flows vertically upward at the edges of the semi-confining clay.")

	2013 Report (disapproved)	Section 8.2, page 25 ("Downward vertical gradients exist between the shallow/intermediate and deep monitoring wells throughout the facility with the exception of AOI 9 where deep groundwater flows vertically upward at the edges of the semi-confining clay.")

According to a report regarding a hydrogeologic reconnaissance of the Swope Oil Superfund site and vicinity in Camden and Burlington counties in New Jersey, the downward leakage of water through confining units are the primary sources of recharge to the confined lower aquifer:

> Induced recharge into the Potomac-Raritan-Magothy aquifer system from the Delaware River ***and downward leakage of water through confining units*** toward pumping centers in Camden County ***are the primary sources of recharge to the confined lower aquifer***.

USGS Report 89-402 (1990), page 1. The pressure gradients described by Evergreen across the AOIs supports the downward leakage as a primary source of recharge through the clay at the refinery site.

Evergreen should quantify the range of pressure gradients in the AOIs where those data are not specified in the table above. The predominantly downward vertical gradient is influenced in part due to the pumping of the NJ deep aquifer wells, but this variable is fairly constant site-wide.

The unconfined and semi-confined to confined deeper aquifer interactions are complex. Evidence of this complexity is shown in the pressure gradient values listed above, which suggest variable, heterogeneous and anisotropic subsurface conditions. Thus the presence or absence of and nature of the clay (whether it is lensed with sand, is silty, soft, muddy, hard, etc.) likely has a significant impact on the pressure gradients. Larger gradients may have greater propensity for vertical leakage of shallow groundwater contamination into deeper aquifers. Smaller gradients may have the opposite effect.

Evergreen should prepare an analysis of the vertical gradients by quantifying those gradients in all Areas of Interest, understanding the significance of the values and drawing relationships between the gradients and the nature of and extent and thickness of the clays.

Specifically for AOI-9, Evergreen maps a perching clay layer within the unconfined aquifer. In its analysis of vertical gradients, Evergreen should explore the impact of this perching clay layer. In its characterization of the vertical gradients in the table above,

Evergreen does not reference or cite how the perching clay may impart influence on the gradients.

E. Evergreen fails to map the extent and thickness of the clay separating the unconfined and lower aquifer.

At the time of its disapproval of the report for AOI-11, the Department expressed a concern about the absence of the Middle Clay in AOI-9:

> 2. ***Why are there no downgradient property boundary wells at AOI 9 (i.e., along the western edge, see Fig. 5)?*** There are clearly potential storage tank and pipeline sources in the area between the existing deep monitoring wells and the property line. ***The Middle Clay is absent there***. Has Sunoco adequately determined conditions at the point of compliance?

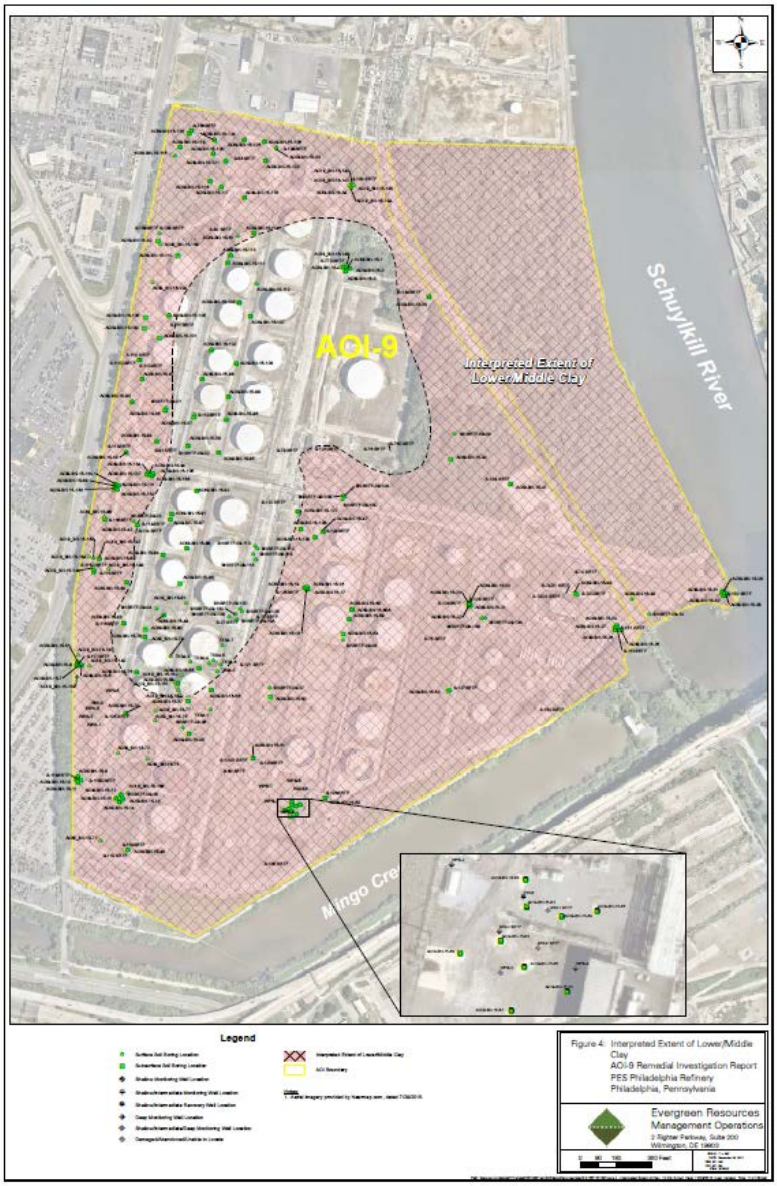
See 2013 Comments (AOI-11), paragraph 2 (bold italics added for emphasis).

As discussed above in the context of Evergreen's Q&A, Evergreen admits that its mapping of clay in the present reports is deficient, by offering to provide mapping of the middle clay unit aquitard in a future report. *See* Comment #4, above).

Evergreen fails to delineate the areal extent of the upper and middle/lower clay units. The unit is discontinuous across areas of the site. Where thick and present, this unit separates the unconfined shallow water table and deeper semi-confined and confined aquifer, and it may offer protection to the lower aquifer from shallow contaminants. The conceptual model does not map the continuity of this clay nor does it map areas of the site where it is thin to absent.

For example, for AOI-5 Evergreen asserts that the Lower/Middle Clay is believed to pinch out to the southeast in the direction of the confluence of the Schuylkill and Delaware Rivers. *See* 2017 Report, page 11. Cross sections provide more information. *See* 2017 Report, Figure 5a (Geologic Cross Section A-A') and Figure 5b (Geologic Cross Section B-B'). However, Evergreen fails to map the continuity of the clay and the areas where it is thin or absent.

Apparently in response to the Department's comment on the report for AOI-11, Evergreen has attempted to map the extent of a shallow (not deep) perching clay unit shown in AOI-9 reports:



See 2015 Report (AOI-9), Figure 4 (Interpreted Extent of Lower/Middle Clay); *see also id.*, Figures 4, 5, 7, 8, 9, 10.

Evergreen also did this in an addendum report for AOI-9:

2017 Report Addendum (AOI-9), Figure I-5 (Unconfined Aquifer MTBE Concentrations November 2016); *see also id.*, Figures I-2, I-3, I-4, I-5.

But Evergreen has not done this for the deep aquifer for AOI-9, and it has not done this for the other Areas of Interest. Evergreen should adopt a similar approach to mapping the extent of the clays for all Areas of Interest, for both shallow and deep units.

In its reports Evergreen fails to use isopach maps, which are a common technique for characterizing the nature of the geology at a site. Isopach maps can illustrate the extent of and thickness of intervening clay units. Where present and thick and uniformly clay, intervening clay units may protect the deeper aquifers from vertical leakage of shallow contaminated groundwater.

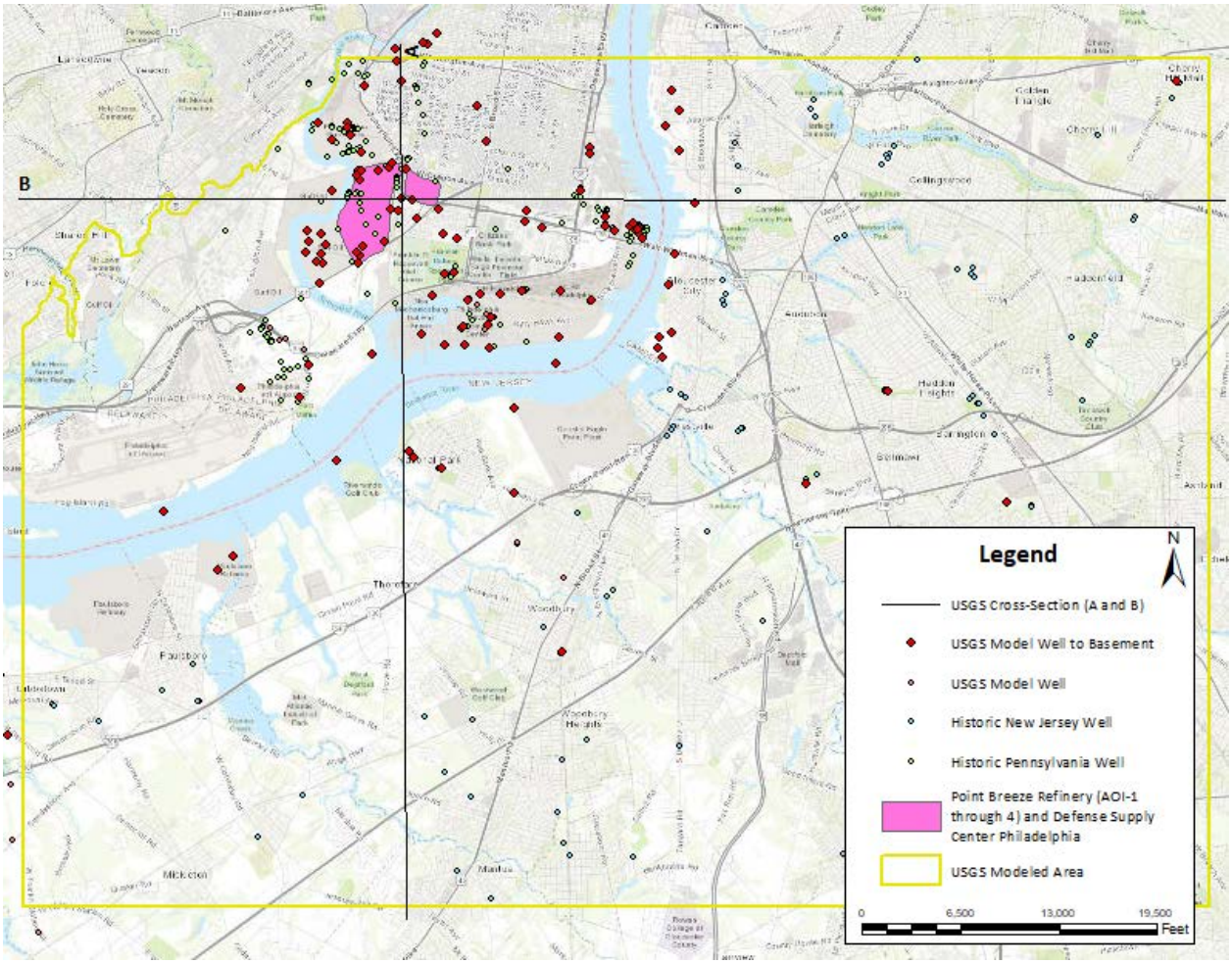
Conversely, in areas where the clay is absent, thin or non-uniform, the deeper aquifer may be less protected from vertical leakage of contaminated groundwater. Evergreen has included narrative and cross-section views to describe Areas of Interest where intervening clays may be present or absent.

Using the same example above, for AOI-5 Evergreen asserts that the Lower/Middle Clay is believed to pinch out to the southeast in the direction of the confluence of the Schuylkill and Delaware Rivers. *See e.g.* 2017 Report, Page 11. Cross section views provide more information *See e.g.* 2017 Report, Figure 5a (Geologic Cross Section A-A') and Figure 5b (Geologic Cross Section B-B'). However, Evergreen fails to present the information in planar or map view. The narrative and cross sections alone do not suffice or replace the need to characterize the clay spatially and vertically by also using isopach maps.

In contrast, the USGS has already developed a map of isopach clay thickness for the entire site, including AOI-1, AOI-2, AOI-3 and AOI-4. (In its own report, the USGS refers to these as the "Point Breeze Refinery"). The USGS actually uses some of the Evergreen wells in its analysis of geologic logs for borings extending to the basement rock. However, the USGS report pre-dates a number of the deep wells constructed at the refinery. Therefore, USGS has not integrated the whole of the refinery deep well logs and geologic data into its analysis.

Created by the Council, the following Figure shows a number of wells used by the USGS in its analysis, including many located on the refinery site:

Modeled Wells and
Cross-Sections A and B in 2001 USGS Report
(prepared by Clean Air Council)



Source of data: USGS Report 2001-4218 (2001), 10/22/2020 USGS email sharing the model archive summary for ancillary data used for this model.

From these data, the USGS has developed isopach thicknesses for the deeper clay units. Its isopach maps are an essential element of its conceptual model. The USGS sets them forth in the following three Figures:

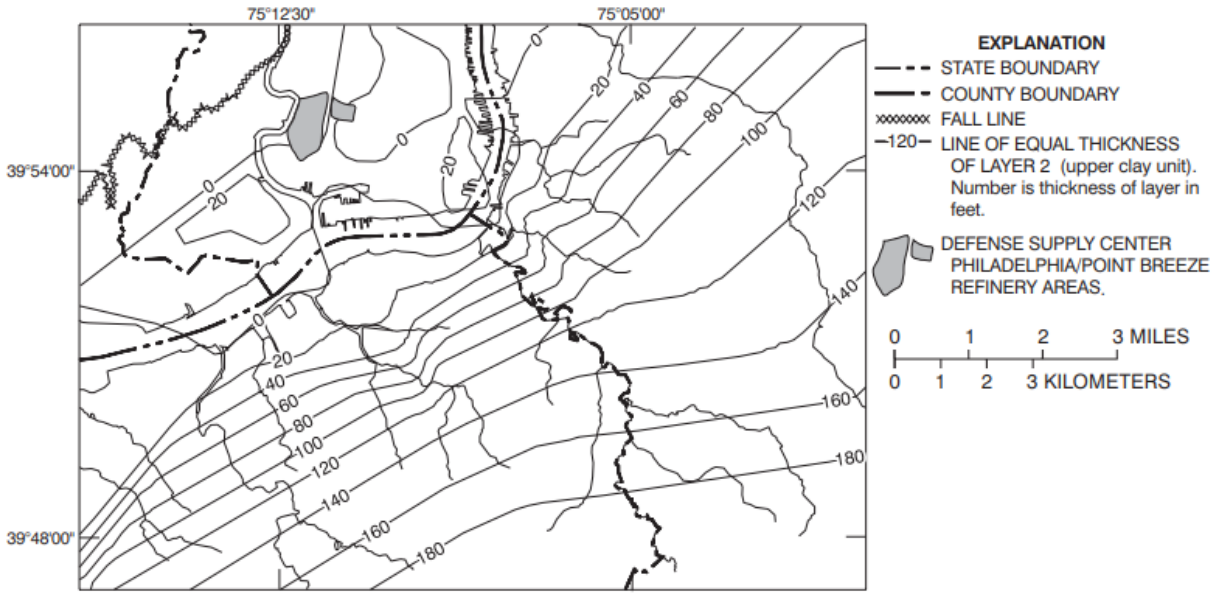


Figure 5. Thickness of the upper clay unit (model layer 2) of the Potomac-Raritan-Magothy aquifer system in the south Philadelphia area.

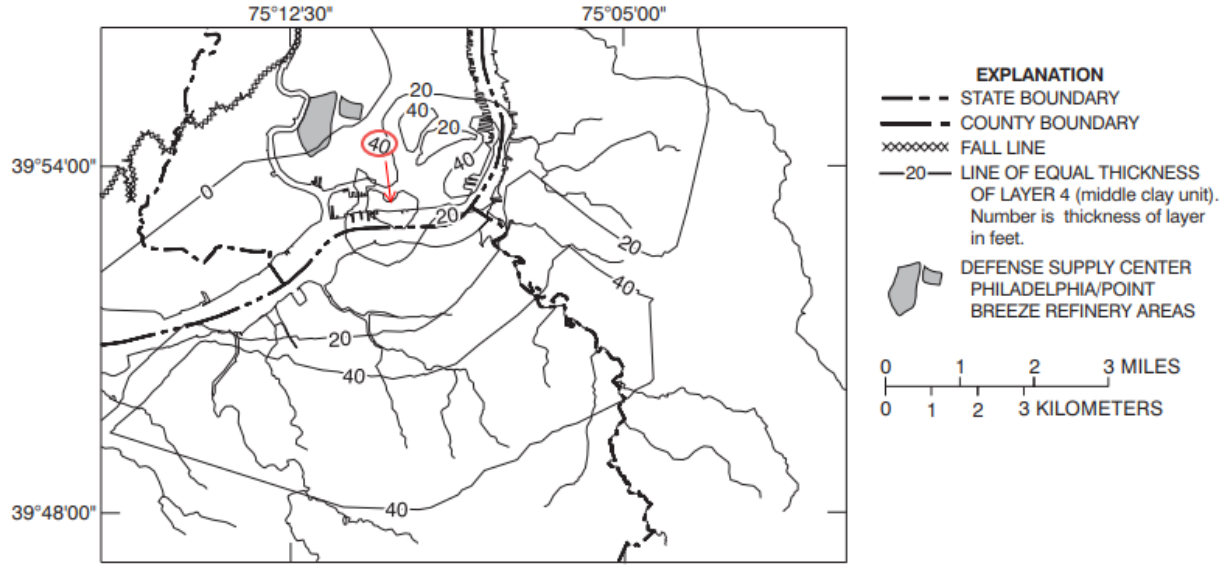


Figure 8. Thickness of the middle clay unit (model layer 4) of the Potomac-Raritan-Magothy aquifer system in the south Philadelphia area.

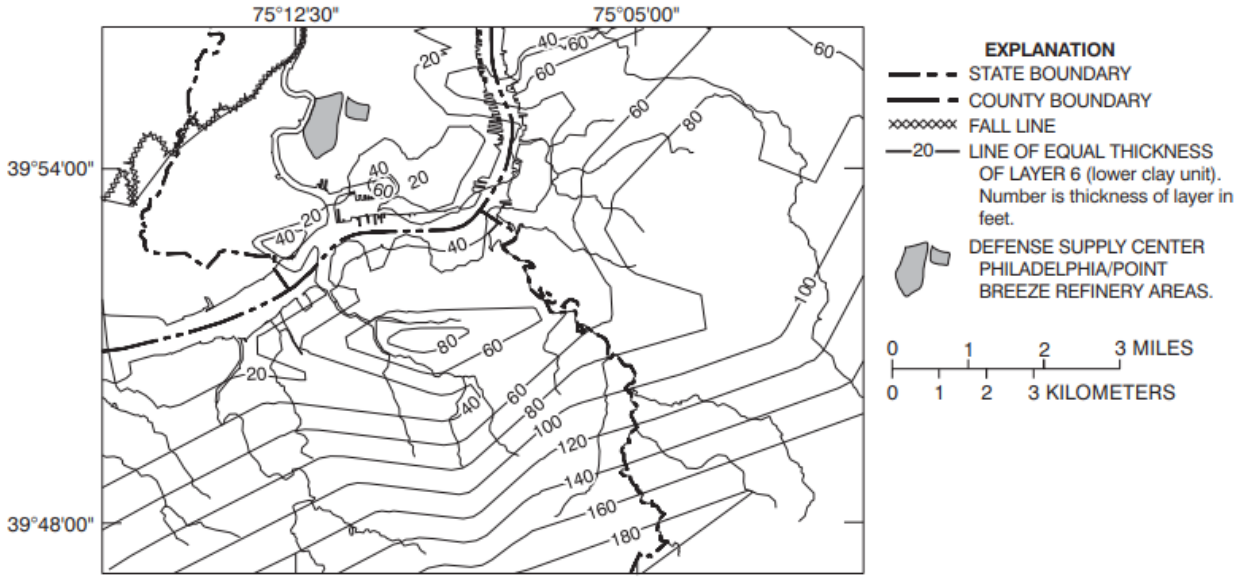


Figure 11. Thickness of the lower clay unit (model layer 6) of the Potomac-Raritan-Magothy aquifer system in the south Philadelphia area.

USGS Report 2001-4218 (2001), pages 8, 9, 11.

Evergreen did not prepare similar isopach maps for its reports. It should prepare similar maps to improve its conceptual model at the refinery site.

F. Evergreen has not established that the deep aquifer wells are properly located to sufficiently characterize the nature and extent of contamination.

While there are a number of deep wells throughout the site, it is not clear that they are all properly located and that the well network is reliable for delineating the nature and extent of contamination in the deep aquifer. The following comment addresses deep aquifer wells considered for the AOI-11 reports, subsequent remedial investigation reports for the different Areas of Interest, and the groundwater remediation status reports prepared up to 2020.

The Technical Guidance Manual underscores the importance of locating monitoring wells in areas of the property most likely to be impacted by contamination:

> B. Monitoring Well Types and Construction
>
> 3. Choice of Monitoring System
>
> Once ***the target zones, or areal locations and depths that are most likely to be impacted by the release are defined***, monitoring is often adequately accomplished by using ….wells that monitor the entire saturated thickness or a large portion of the target zone.

See Technical Guidance Manual, page A-7 (bold italics added for emphasis).

Locating wells in the deep aquifer is more challenging than locating wells in the unconfined aquifer:

> C. Locations and Depths of Monitoring Wells
>
> 5. Well Depths, Screen Lengths and Open Intervals
>
> Impacts to the aquifer under unconfined conditions are ***more easily evaluated than under confined or semi-confined conditions***…

See id., Technical Guidance Manual, page A-24 (bold italics added for emphasis).

The Technical Guidance Manual also underscores the importance of considering groundwater movement and the spatial distribution of contamination when establishing target zones for placement of monitoring wells:

> C. Locations and Depths of Monitoring Wells
>
> 4. Areal Placement of Wells
>
> For establishing the target zones, ***the remediator should consider the topics of groundwater movement and contaminant distribution….***
>
> Even well-defined groundwater flow direction maps should be evaluated carefully ***when choosing the target zones for upgradient and downgradient wells.***

See id., Technical Guidance Manual, pages A-23 to A-24 (bold italics added for emphasis).

Moreover, it is important to evaluate a confined aquifer in combination with an unconfined aquifer:

> ***...Sites with confined aquifers that have potential to be impacted will need to be evaluated in combination with the unconfined aquifer***. Such a situation would require more detailed vertical and discrete zone monitoring

See id., Technical Guidance Manual, page A-25 (bold italics added for emphasis).

The existence of groundwater remediation status reports may help to evaluate the appropriateness of the deep well network, because they define target zones or areal locations most likely to be impacted by releases. *See* Groundwater Remediation Status Report (First Half 2020), Figure 3 (Apparent LNAPL Thickness Map).

As discussed above in Comment #7(A), the detection of contaminants of concern in the deep aquifer demonstrates that it not only has the potential to be impacted, but that it has been impacted. *See* 2013 Report, Figure 5 (Summary Volatile and Semi-Volatile Exceedances in Deep Groundwater 2008 to 2013). The presence of volatile or semi-volatile organic compounds that exceed the Medium-Specific Concentrations is apparent in approximately 30% or 13 of the 43 sampled wells across AOI-11. Because of the identified contamination in the deep aquifer, Evergreen should evaluate the deep aquifer in combination with the shallow unconfined aquifer.

In its comments on the report for AOI-11, the Department was critical of Evergreen's characterization of the deep aquifer:

> Keep in mind that deep aquifer "plumes" were characterized with single, isolated wells. ***Sunoco did not delineate sources with peripheral wells, so we don't know if the concentrations at the presumed "source" wells are really reflective of the source area***. They could be hundreds of feet downgradient or side-gradient of the greatest contamination.

See 2013 Comments (AOI-11), Comment 12, page 2. This underscores the importance of evaluating the existing well network.

Past site characterization has led to the implementation of remediation at ten currently active systems in AOI-1, AOI-2, AOI-4, AOI-7, and AOI-8. Based on a recent groundwater remediation status report, the ten remediation systems designated as "currently active" are listed in the table below, prepared by the Council. *See* Groundwater Remediation Status Report (First Half 2020, Figure 2 (Site Plan), page 13. The table summarizes the position of deep aquifer well(s) respective to these system boundaries, setting forth the separation distance (distance from remediation system boundary to well location), monitoring well system type (well clustered or not), and estimated percent of deep aquifer screened (the portion of the well through which water from the aquifer may flow). Fields left blank indicate that well information was either not available or not located.

Currently Active Remediation Systems and Deep Well Position

(Prepared by Clean Air Council)

Remediation System	**Deep Wells Under System**	**Well Cluster (Y/N)**	**Percent of Deep Aquifer Screened (Estimate)**	**Nearest Deep Wells Outside System (Estimate)**	**Well Cluster (Y/N)[4]**	**Percent of Deep Aquifer Screened (Estimate[5]**
AOI-1 (Belmont Terminal / Loading Rack Remediation System)[6]	None			S-80D (700ft S) S-294D (1100ft W) S-393D (150ft E)	N N Y	55% 30% 30%
AOI-1 (Shunk Street Sewer Ventilation System and Biofilter)	None			S-393D (<50ft W)	Y	30%
AOI-1 (26th Street North Remediation System)	None			S-871 (<100ft S) S-389D (100ft SW) S-388D (700ft S) S-390D (800ft SW) S-391D (1400ft W)	Y Y Y Y Y	 40% 30% 30% 25%

[4] A well cluster refers to at least one well screened in the unconfined aquifer and one well screened in the deep aquifer, that are in close proximity. This is based on Figures in the remedial investigation reports and the groundwater remediation status reports.

[5] Clean Air Council made these estimates based on a review of cross sections and geologic well logs provided in the appendixes to the reports. The Estimated Deep Aquifer Screen refers to the section of the well where groundwater flows from the aquifer into the well through perforations.

[6] This represents the Loading Rack System (the Frontage Road System is offline). *See* Groundwater Remediation Status Report (First Half 2020), page 2.

AOI-1 (26th Street and Packer Avenue Sewers Biofilter Remediation System)	None			S-388D (300ft N) S-46D (500ft W) S-264D (900ft S) ARCO-1D (800ft SE) S-392D (900ft SW) S-399 (900ft SW)	Y N Y Y Y Y	30% 70% 40% 30% 45% 0%
AOI-2 (Pollock Street Horizontal Well Remediation System)[7]	None			S-302D (100ft N) S-305D (100ft S) S-46D (300ft E) S-390D (700ft N) S-391D (1000ft N)	Y Y N Y Y	60% 55% 70% 30% 25%
AOI-4 (Penrose Avenue Remediation System)	S-38D S-38D2	Y Y	100%	S-22 (500ft W) S-218D (1000ft N) S-39D (1100ft N)	Y Y N	40% 40% 20%
AOI-4 (S-30 Remediation System)[8]	None			S-218D (400ft N) S-22 (500ft N) BF-108 (1100ft N)	Y Y N	40% 40% 5%
AOI-7 (Separator Remediation System)[9]	C-144D C-65D	N Y	90% 80%	C-129D (1400ft NW)	Y	50%
AOI-8 (PGW Border Remediation System)	N-46D N-50D N-148D	Y Y N	5%	N-149D (700ft W) N-33 (700ft N) N-27 (300ft N) N-44D (400ft NW) N-30 (300ft E)	Y N N Y Y	

[7] The Pollock Street West End Remediation System has been turned off since 2016. *See id.*, page 3.
[8] The August presentation characterizes it as the "S-30 LNAPL Recovery System and the S-36 remediation system." *See* Evergreen, Act 2 Program Information Session (August 27 2020), page 47.
[9] The August presentation characterizes it as the "No. 3 Separator/Bulkhead Area." *See id.*

AOI-8 (Jackson Street Sewer Remediation System (Water Curtain)[10]	None			N-19 (200ft N) N-27 (300ft S) N-30 (300ft E) N-21 (600ft W)	Y N Y Y	
AOI-8 (Maiden Lane Remediation System)[11]	N-157 N-155	Y Y		N-9 (700ft E) N-4 (50ft N) N-13 (500ft S) N-21 (1100ft S)	Y Y Y Y	

Source: Groundwater Remediation Status Report (First Half 2020), 2013 Report (AOI-1), 2013 Report (part 2).

As indicated in the second column, there are no deep wells located under the area of the following active remediation systems: the four systems for AOI-1, the one system for AOI-2, one system for AOI-4, and one system for AOI-8. *See* Groundwater Remediation Status Report (June 2020), Figure 2 (Site Plan).

Moreover, at least 15 new deep wells have been installed since the time of the 2013 report for AOI-11. The data that are present in the groundwater remediation status reports do not establish that the deep aquifer well locations are sufficient to evaluate the nature and extent of the contamination in combination with the shallow aquifer. Those reports do not present a meaningful analysis regarding the appropriate location of the wells for purposes of the remedial investigation.

The movement of groundwater below the active remediation system boundaries should have been considered, but Evergreen has not explained or addressed it. While deep wells that are in or on the periphery of an active remediation system may help to characterize the nature and extent of contamination, the position (upgradient and downgradient) and presence or absence of clay layers separating the unconfined aquifer from the deep aquifer should be considered. Evergreen has not provided an explanation how it considered these groundwater movement details in placing deep monitoring wells.

[10] The Jackson Street Sewer Remediation System is offline, and therefore inactive. *See* Groundwater Remediation Status Report (First Half 2020), page 2. But Figure 2 characterizes the water curtain as an active remediation system. *See id.*, Figure 2. *See id.*

[11] A new total fluids groundwater remediation system has been installed (Maiden Lane Remediation System) and is expected to be operational in the second half of 2020. *See* Groundwater Remediation Status Report (First Half 2020), page 7. *See id.*

If Evergreen had been limited in where it could access locations for installing deep wells when the site was operated as a refinery in the past, that concern is no longer prevalent following the shutdown of refinery operations.

Based on this analysis, Evergreen should develop a thorough analysis of the adequacy of the deep well network to delineate the nature and extent of contamination.

G. Evergreen does not explain why only some deep wells located inside the active remediation systems are sampled in the groundwater remediation status reports.

Another problem is that Evergreen is not sampling all the deep wells that it has installed, even in the course of the active remediation. Prepared by the Council, the table below summarizes the status of water quality sampling at the deep wells inside the currently active remediation systems discussed above. Although they are within the remediation system boundaries, the majority of them are not sampled or not available to be sampled. *See* Groundwater Remediation Status Report (Second Half 2019).

Water Quality Sampling Performed
For Deep Wells in Active Remediation Systems
(Prepared by Clean Air Council)

Remediation System	**Deep Wells Under System**	**2016-2019 Groundwater Remediation Status Reports** **Water Quality Sampling Performed**
AOI-1 (Belmont Terminal Remediation System)	None	N/A - No Deep Wells
AOI-1 (Shunk Street Sewer Ventilation System and Biofilter)	None	N/A - No Deep Wells
AOI-1 (26th Street North Remediation System)	None	N/A - No Deep Wells

AOI-1 (26th Street and Packer Avenue Sewers Biofilter Remediation System)	None	N/A - No Deep Wells
AOI-2 (Pollock Street Horizontal Well Remediation System)	None	N/A - No Deep Wells
AOI-4 (Penrose Avenue Remediation System)	S-38D S-38D2	Not Sampled Sampled
AOI-4 (S-30 Remediation System)	None	N/A - No Deep Wells
AOI-7 (Separator Remediation System)	C-65D	Not Sampled, well abandoned or damaged
AOI-8 (PGW Border Remediation System)	N-46D N-50D N-148D	Not Sampled, well abandoned or damaged Not Sampled Not Sampled
AOI-8 (Jackson Street Sewer Remediation System (Water Curtain)	None	N/A - No Deep Wells
AOI-8 (Maiden Lane Remediation System)	N-157 N-155	Sampled Not Sampled

Source: Groundwater Remediation Status Report (First Half 2020), Figure 3 (Apparent LNAPL Thickness Map), Groundwater Remediation Status Report (2nd Half 2019), Table 3 (October/November 2013 Groundwater Sampling Analytical Results), 2013 Report (AOI-11), Figure 5 (Summary Volatile and Semi-Volatile Exceedances in Deep Groundwater - 2008 to 2013), 2013 Report, Appendix C (Deep Soil Boring Logs and Monitoring Well Construction Summaries).

As demonstrated in the table above, the only deep wells under the active remediation systems that were sampled were the following wells: S-38D2 (AOI-4), N-157 (AOI-8). The other 6 wells under the active remediation systems were not sampled.

Evergreen does not provide an explanation why all these deep wells inside the remediation system are not sampled. For well N-46D in AOI-8 (PGW Border Remediation

System) Evergreen indicates that it is not sampled because it is abandoned or damaged. But there is no explanation why N-50D is not sampled. This is particularly important because there were exceedances for volatile organic compounds in this well in the 2013 report. *See* 2013 Report, Figure 5. In addition, N-148D was drilled and constructed sometime after the 2013 report was submitted, N-148D. But Evergreen has not sampled this well, and it has provided no explanation for this.

H. Evergreen has not constructed the deep aquifer wells to screen the entire saturated thickness to sufficiently characterize the nature and extent of contamination.

As noted in the table in Comment #7(F), the estimated deep aquifer screen is far less than 100% for most of the 23 deep aquifer levels for which we have actual construction information. (Clean Air Council made these estimates based on a review of cross sections and geologic well logs provided in the appendixes to the reports). The deep aquifer screen refers to the section of the well within the deep aquifer where groundwater flows into the well through perforations. This means that Evergreen is not necessarily characterizing the contamination for the full length of the well. Evergreen has not provided an explanation for this.

The Technical Guidance Manual underscores the importance of the depth and screen length of monitoring wells:

> C. Locations and Depths of Monitoring Wells
>
> 5. Well Depths, Screen Lengths and Open Interval
>
> Groundwater monitoring networks should ***monitor the entire saturated thickness of the target zone***, or a very large percentage of it. ***If large vertical intervals of the target zone are unmonitored, chances are dramatically increased that groundwater contamination may go undetected or be underestimated if detected.***

Technical Guidance Manual, page A-25 (Appendix A, Groundwater Monitoring Guidance) (bold italics added for emphasis).

Relying on deep wells with partially penetrating screen intervals (that is, where the deep aquifer screen is less than 100%) dramatically increases the risk of inadequate site characterization.

Evergreen has not offered an explanation as to why deep aquifer wells are partially penetrating, and it has not provided an analysis as to how the partially screened construction of deep wells impacts its characterization of the nature and extent of contamination.

I. Evergreen should provide an explanation for its failure to use well clustering for all deep wells under or near the active remediation systems.

As noted in connection with the Council's table in Comment #7(F), a well cluster refers to at least one well screened in the unconfined aquifer and one well screened in the deep aquifer, that are in close proximity. (Clean Air Council made determinations based on Figures in the remedial investigation reports and the groundwater remediation status reports). Approximately 25% of the wells identified in the table where construction information is available in Comment #7(F) are not clustered wells. This means that Evergreen is not necessarily characterizing the vertical stratification of contamination across the unconfined and deep aquifer. Evergreen has not provided an explanation for this.

The Technical Guidance Manual underscores the importance of the design of the monitoring wells using well clusters.

> Monitoring Well Types and Construction
>
> 3. Choice of Monitoring System
>
> Monitoring is often adequately accomplished by using….single-screened wells that monitor the entire saturated thickness or a large portion of the target zone.
>
> ***When contamination has been detected and definition of vertical contaminant stratification is desired, wells that monitor more discrete intervals of the target zone, or individual aquifers, usually need to be constructed***. In this case, ***well clusters*** such as shown in Figure A-3 ***will often be the construction design of choice***.

Technical Guidance Manual, page A-7 (Appendix A, Groundwater Monitoring Guidance) (bold italics added for emphasis).

An objective of the monitoring system is to define the vertical contaminant stratification. The Technical Guidance Manual cites well cluster monitoring as a construction design of choice. Evergreen has not established that the non-clustered deep aquifer wells are of a sufficient design to characterize the nature and extent of contamination. Evergreen should provide an explanation as to why all the deep wells are not clustered.

J. Evergreen should provide a critical analysis of the reliability of its deep aquifer network and unconfined well network.

With respect to a deep well network, quality may be as important as quantity. While Evergreen reports the installation of 80 deep wells which have been installed and sampled over the years, there does not appear to be any analysis in the reports regarding whether the number and location of the wells is sufficient.

This is important because groundwater monitoring is a dynamic process. Data generated from successive sampling events provide an opportunity for evaluating the reliability of the

network. Repeat sampling of the existing deep well network only provides additional data from the same perspective, but does not address whether that perspective is appropriate. Evergreen should provide a more complete analysis of the reliability of the network.

The Technical Guidance Manual underscores the importance of a reliable deep aquifer network, based on locations and depths of wells:

> C. Locations and Depths of Monitoring Wells
>
> 1. Importance
>
> ***The locations and depths of monitoring wells are the most important aspects of a groundwater monitoring network. A monitoring point that is misplaced***, or not constructed properly to monitor constituents with unique physical characteristics, ***is of little use and may misrepresent the quality of the groundwater migrating to or from a site***. On the other hand, a properly positioned and constructed monitoring well that detects the earliest occurrence of contamination could save both time and money spent on cleanup of a site. It is important to note that the placement and construction of a groundwater monitoring network at an Act 2 site shall be conducted by a professional geologist licensed in Pennsylvania (25 Pa. Code §§ 250.204(a), 250.312(a), and 250.408(a)).

See id., *See id.*, Technical Guidance Manual, page A-15 (Appendix A, Groundwater Monitoring Guidance) (bold italics added for emphasis).

In the report for AOI-11, the analytical data for the deep aquifer are over seven years old. *See* 2013 Report (AOI-11), Tables 4 and 5. While data from subsequent sampling events were apparently included in reports for individual Areas of Interest (as well as in the groundwater remediation status reports), those reports do not provide a meaningful analysis whether the number and location of deep aquifer wells is sufficient for the remedial investigation. *See* Evergreen, Semiannual Remediation Status Reports; *see also* Evergreen, Act 2 Documents.

The lack of approved reports for AOI-4 and AOI-9 contributes to the concern for deep aquifer network. *See* 2014 Disapproval Letter (AOI-4), 2016 Disapproval Letter (AOI-9). In order to characterize deep aquifer contaminants of concern, it is important to have a reliable understanding and characterization of shallow aquifer contaminant sources, which may be linked to the deep aquifer.

Evergreen should provide a critical analysis of the reliability of its deep aquifer network. It should also do the same thing for its unconfined well network.

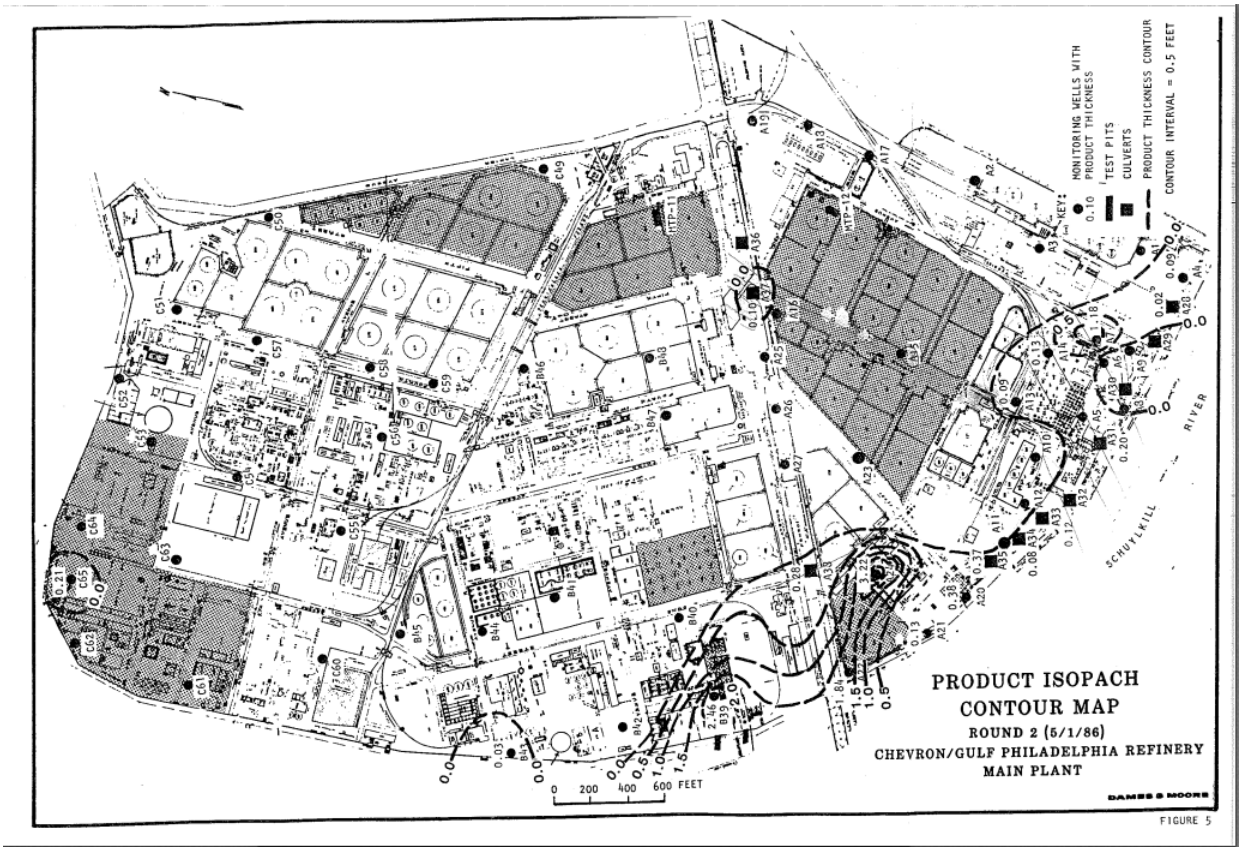
K. Evergreen should prepare isopach contour maps and synthesize the LNAPL analysis with deep aquifer monitoring data.

Evergreen presents the shallow aquifer free product thickness data separately from the deep aquifer groundwater monitoring data. *See e.g.*, 2016 Report (AOI-1), Figure 6-1 (Summary of Available LNAPL Sample Data – AOI 1 and Belmont Terminal), Figure 6-2 (May and Vicinity), Figure 10-6 (Historic Groundwater Analytical Results -- Deep Aquifer), Appendix E (LNAPL Conceptual Site Model), pdf pages 114, 115, 123 of 261. This makes it difficult to characterize the nature and extent of the contamination. Evergreen has not synthesized these data to evaluate whether contaminants are migrating from the LNAPL vertically into the deeper aquifer.

In the reports, Evergreen attempts to delineate the extent of Light Non-Aqueous Phase Liquids (also known as free products) floating on the surface of the shallow water table. As discussed above in Comment #6, the groundwater remediation status reports also map the apparent thicknesses of these liquids for a given shallow well location. But these reports do not analyze the extent of the free product in combination with the deep aquifer groundwater.

Also, Evergreen does not use isopach thickness maps. Isopach thickness maps are an important tool to characterize the extent of free product or LNAPL. Maps representing the thickness of liquids can provide important information regarding the nature and extent of the contamination. It is from these liquids that contaminants dissolve into groundwater and then spread laterally and/or vertically into the shallow and deep aquifers.

To illustrate, there is an isopach map in a historic report characterizing AOI-5, AOI-6 and AOI-7 from 1986, that the Council found deep in the documents:



See Phase I Final Progress Report, Figure 5 (Product Isopach Contour Map) (May 23, 1986), pdf page 19 of 39. The three sections in the Figure above correspond to AOI-7, AOI-6, and AOI-5 today.

This isopach map from 1986 is different from Evergreen's thickness maps because the latter only show distinct well points and identify the measured depth of the LNAPL. In contrast, the 1986 map delineates contour lines of equal thickness, characterizing an area of LNAPL.

Evergreen should expand upon the information and analysis set forth in its LNAPL thickness maps by adopting a similar approach. *See* Groundwater Remediation Status Report (First Half 2020), Figure 3.

In addition, Evergreen should update the data and map on water quality exceedances in the deep aquifer (*See* 2013 Report (AOI-11), Figure 5 (Summary of Volatile and Semi-Volatile Exceedances in Deep Groundwater – 2008 to 2013), and present and map those data along with the isopach contours and groundwater flow.

This exercise can help to evaluate the adequacy of the deep monitoring well network. Absent this analysis and mapping, the public cannot tell whether the deep aquifer wells are appropriately placed and adequate to characterize the nature and extent of the contamination.

L. Evergreen has inappropriately used detection limits that exceed relevant Medium-Specific Concentrations.

In a number of instances, the laboratory instrumentation used by Evergreen was not sufficient to gather reliable data on contaminants at concentrations necessary for making comparisons with Act 2 numeric values. The regulations require adherence to data quality standards set by EPA:

> Attainment of a standard shall be demonstrated with adherence to Data Quality Objective (DQO) and Data Quality Assessment (DQA) processes as specified by EPA.

See 25 Pa. Code § 250.702 (Attainment requirements).

In a guidance document, EPA states that a more sensitive method should be used if a method detection limit exceeds an action level:

> ***If the detection limit for a measurement method exceeds or is very close to the Action Level, then a more sensitive method should be specified*** or a different analytical approach should be used.

See EPA Guidance on Systematic Planning Using DQO (February 2006), page 41 (bold italics added for emphasis).

Where laboratory detection limits (which determine the ability of a laboratory to detect contaminants at threshold levels) are greater than a cleanup standard, one cannot reliably tell whether a cleanup level is met or not. To adequately characterize contaminants in groundwater, the laboratory detection limits appropriately need to be equal to or less than Medium-Specific Concentrations. Evergreen should address the data gaps arising from this problem.

To illustrate, for chrysene in the AOI-11, laboratory detection limits for chrysene were sometimes 5 ug/L or 10 ug/L, which are two to five times higher than the Medium-Specific Concentration of 1.9 ug/L. *See* 2013 Report (AOI-11), pdf pages 45-59, Table 4 (Summary of Deep Groundwater Analytical Results 2005-2011). In addition, laboratory detection limits exceeded the Medium-Specific Concentration for Benzo(A)Pyrene, Benzo(B)Fluoranthene, and Benzo(G,H,I)Perylene. *See id.*, pages 61- 77, Table 5 (Summary of Attainment Sampling Deep Groundwater Analytical Results 2012-2013).

In the case of the unconfined aquifer for AOI-5, a similar thing apparently happened for 1,2-dibromoethane (EDB). *See* 2017 Report (AOI-5), Table 7 (Summary of Groundwater Analytical Results), pdf pages 170-220 (setting forth laboratory detection limits as high as 0.5 mg/L, one order of magnitude higher than the Medium-Specific Concentration of 0.05 mg/L.

Similar anomalies may have occurred for other chemicals and other reports. Why certain sampling events and wells were subject to unreliable detection limits is unclear.

Evergreen should have used instrumentation with detection limits sufficient to allow the sampling to be meaningful.

Evergreen should address this explicitly in the narrative text of the reports, and it should conduct additional sampling to cure any unreliable data that have resulted from these anomalies.

8. Evergreen Fails to Properly Delineate the Contamination of Arsenic, Manganese, and Other Inorganics (Metals) in the Unconfined Aquifer and the Deep Aquifer.

Earlier in the course of this investigation, Evergreen was sampling for a wider array of inorganic chemicals (metals) than at present. There does not appear to be any explanation for why these chemicals were once sampled but are no longer sampled. Arsenic and manganese are two of the more notable metals, but there are others as well. Evergreen should provide a detailed explanation for why and how it has adopted this approach.

A. Evergreen's Q&A regarding the failure to sample for multiple metals is flawed.

In response to a recent question why Evergreen is focusing on lead to the exclusion of other metals, Evergreen asserts that this was decided by a 1992 RCRA Facility Investigation report, which is posted on its website:

> [New Q&A posted after December 30, 2020]
>
> ***Why is lead the only metals COC? Aren't there other contaminants such as copper, cadmium, arsenic that come from refining processes?***
>
> ***The site was tested for a complete list of metals as part of the 1992 RCRA Facility Investigation and none of these metals, except lead, were found to be a contaminant of concern and therefore were not identified as a contaminant of concern going forward. The 1992 Report is posted on the Evergreen website for reference.***
>
> However, both soil and groundwater samples from various areas of the facility with history of crude storage and processing have been sampled for a more comprehensive analyte list which included other metals as part of the remedial investigation activities. These data have all been included in the RIRs.
>
> Note: this response addresses other similar questions:
>
> The refinery was historically coal-fired. Where and how has the site been tested for Arsenic?
>
> Should other heavy metals be expected to be found given the history of heavy industrial use?
> .

See Evergreen, Q & A (bold italics added for emphasis). Presumably, Evergreen is referring to this report from 1992 in the historical reports section of its website: 1992 Results of a RCRA

Facility Investigation (ENSR, September 1992). Whether Sunoco considered something a contaminant of concern in 1992 is not dispositive as to the present remedial investigation, which is governed by a consent order executed in 2012 -- two decades later. That consent order does not exclude metals other than lead as Constituents of Concern .

In fact, the legal agreements do not identify Constituents of Concern. *See* 2003 Consent Order and Agreement (DEP Agreement); *see also* 2012 Consent Order and Agreement (DEP Agreement); *see also* 2012 Settlement Agreement and Covenant Not to Sue (EPA Agreement); *see also* 2020 First Amendment to Consent Order and Agreement (DEP Agreement). Rather, Evergreen proposed Constituents of Concern by including them in tables attached to reports that it submitted to the Department.

In addition, Evergreen's answer is contradicted by the fact that Sunoco did conduct sampling arsenic and manganese (and other metals), long after the 1992 report.

B. Over the course of time, Sunoco and Evergreen have pared down the focus of the remedial investigation for inorganics (metals) in groundwater.

When Evergreen prepared the reports for AOI-11, it identified arsenic and manganese (as well as several other metals) as Constituents of Concern with respect to the investigation of the deep aquifer. *See* 2011 Report (AOI-11), Table 1 (identifying arsenic, cobalt, iron, lead, and manganese), pdf pages 43-44 of 76; *see also* 2013 Report (AOI-11), Table 1 (identifying arsenic, cobalt, iron, lead, manganese, and mercury), pdf page 42 of 85. For arsenic and manganese, the form was "Total & Dissolved." *See id.*

But arsenic and manganese disappear as Constituents of Concern for the deep aquifer in subsequent reports, despite the fact that it was Evergreen's intent to shift its evaluation of the deep aquifer from the AOI-11 reports to the other reports:

Area of Interest	**Report**	**Comment:** **Metals As Constituents of Concern**
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report (AOI-1), Table 1-1	(only metal identified is lead)
AOI-2 Point Breeze Processing Area	2017 Report (AOI-2), Table 1	(only metal identified is lead)
AOI 3	2017 Report (AOI-3), Table 2	(only metal identified is lead)

Point Breeze Impoundment Area		
AOI-4 No. 4 Tank Farm	2013 Report (AOI-4), Table 2 2017 Report (AOI-4), Table 1-1 Table 1-2	(only metal identified is lead) (only metal identified on Petroleum Short List is lead) (identifying cobalt, lead, nickel, vanadium, and zinc on Comprehensive List)
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan (AOI-5), Table 1 2017 Report (AOI-5), Table 1	(only metal identified is lead, for tables for soil and groundwater) (only metal identified is lead)
AOI-6 Girard Point Chemicals Area	2013 Report (AOI-6), Table 1 2017 Report (AOI-6), Table 1	(only metal identified is lead) (only metal identified is lead)
AOI-7 Girard Point Fuels Area	2012 Report (AOI-7), Table 1 2013 Addendum to Report 2017 Report (AOI-7), Table 1	(only metal identified is lead, for tables for both soil and groundwater) (not providing a table) (only metal identified is lead)
AOI-8 North Yard	2012 Report (AOI-8), Table 1 2017 Report (AOI-8), Table 1-2 Table 1-2	(only metal identified is lead, for both soil and groundwater) (only metal identified on Petroleum Short List is lead) (identifying cobalt, lead, nickel, vanadium, and zinc on Comprehensive List)
AOI-9	2015 Report (AOI-9), Table 1	(only metal identified is lead)

Schuylkill River Tank Farm	2017 Report Addendum (AOI-9), Table 1	(only metal identified is lead)
AOI-10 West Yard	2011 Report (AOI-10), Table 1a and 1b	(only metal identified is lead, for tables for both soil and groundwater)[12]

In addition, the table above shows an inconsistency in Evergreen's inclusion of some metals as Constituents of Concern for some Areas of Interest (AOI-4 and AOI-8), but not for others (cobalt, nickel, vanadium, and zinc). Evergreen should substantiate this inconsistency.

Evergreen should provide a detailed explanation for why and how it has arrived at its approach for identifying Constituents of Concern for sampling for metals in the deep aquifer.

C. Evergreen should revise the reports to include arsenic as a Constituent of Concern for all Areas of Interest, because this metal is associated with contamination at former refineries.

There are several reasons why Evergreen should be including arsenic as a Constituent of Concern during this remedial investigation. Arsenic can be a problem for refineries even if it is naturally occurring in the environment (if its "background") and not caused by a release of hazardous substances. The "natural attenuation" of hydrocarbon releases at a refinery may have the undesirable effect of mobilizing arsenic and causing it to disperse in groundwater. USGS, Natural Breakdown of Petroleum Results in Arsenic Mobilization in Groundwater, USGS GeoHealth Newsletter, Vol. 12, No. 1 (2015).

Of course, if there has been a direct release of arsenic from refinery operations, that would present another concern for the migration of arsenic in groundwater. In the case of the refinery, there appears to be such a concern, based on a report identifying a number of exceedances for arsenic in soils in AOI-10. *See* 2011 Report (AOI-10), 17, 18, 20, 25, 26, 27, 31, 32, 36, 37, Table 5 (Summary of Shallow Soil Sample Analytical Results for CAMU Delineation Samples), Table 6 (Summary of Shallow Soil Sample Analytical Results: CAMU Area Soil Samples), Table 7 (Summary of Analytical Results for Waste in CAMU Areas), Table 8 (Summary of Soil Sample Analytical Results for Vertical Delineation Soil Samples Beneath Waste in CAMU), pdf pages 63-89 of 762. From the report, it is not clear what was the source of the arsenic.

Evergreen should provide a complete explanation regarding the source of the arsenic -- whether it relates to an anthropogenic source or a background source. Evergreen should explain why it did not conduct similar sampling for all Areas of Interest.

[12] In contrast to the approach to the deep aquifer, Evergreen does identify arsenic and manganese (as well as other metals) as Constituents of Concern for surface water and sediments. *See id.*, Table 1c, 1d.

D. Evergreen should revise the reports to address whether the widespread manganese contamination in the deep aquifer is truly attributable to "background levels" and not the legal responsibility of Sunoco.

In 2011, Evergreen identified manganese as a Constituent of Concern for the investigation of the deep aquifer:

> For AOI 11, four additional metals (arsenic, cobalt, iron and ***manganese***) and wet chemistry parameters including ammonia, chloride, fluoride, nitrate, nitrite, sulfate, alkalinity, total organic carbon (TOC), and total dissolved solids (TDS) ***were added to the COC list to further characterize deep groundwater at the site in accordance with the CO&A***.

See 2011 Report (AOI-11), Section 1.2, page 2 (bold italics added for emphasis). It also made the following observation about the highly elevated levels of manganese in the aquifer:

> ***The PRM aquifer system no longer is used as a source of water supply in Philadelphia because of highly elevated concentrations of*** iron (as high as 429,000 ug/L), ***manganese (as high as 4,000 ug/L),*** and sulfate (as high as 1,720,000 ug/L) ***that have contaminated the aquifer in south Philadelphia*** and have made the ground water unusable for most purposes (Sloto, 2003).

See id., Section 2.3, page 10 (bold italics added for emphasis). The problem was also local to the refinery:

> ***The 1994 ENSR investigation of the shallow and deep groundwater quality of the refinery noted that there were elevated levels of iron and manganese in the Farrington Sand Aquifer*** and that the results were consistent with those found by the USGS's regional report released in 1991.

See id., Section 2.3, page 13 (bold italics added for emphasis).

Evergreen found concentrations above the Medium-Specific Concentrations for manganese. *See id.*, Section 5.1, page 23; see also id., Table 5 (April 2011 Summary of Deep Groundwater Analytical Results), Table 6 (June-July 2011 Summary of Deep Groundwater Analytical Results), Figure 6 (Summary Metal Exceedances in Deep Groundwater, April/June-July 2011), pdf pages 51-68, 71 of 75.

In fact, there were exceedances in 33 of the 45 deep aquifer wells:

> ***A total of 33 deep monitoring wells exhibited concentrations of groundwater COCs above their respective MSCs for manganese***.

> The highest manganese detections were observed along the central and eastern portions of AOI 1.

See id., Section 5.1, page 24 (bold italics added for emphasis).

The 2013 report tells a similar story. *See* 2013 Report (AOI-11), Section 2.0, page 3, Section 3.4, page 7, Section 3.4.1, page 8, Section 4.0, page 11, Section 5.2, page 15, Section 5.2, page 16, 17, 18, Section 8.3, page 25, Section 8.4, page 26, Section 9.1, page 29, Section 12.0, page 30, Table 4 (Summary of Deep Groundwater Analytical Results 2005 to 2011), Table 5 (Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013), Table 6 (Regional Wide Groundwater Chemistry), Figure 6 (Summary of Metal Exceedances in Deep Groundwater 2008 to 2013), pdf pages 45-78, 85 of 75.

Evergreen should bring sampling in 2011 and 2013 up to date, and it should delineate Sunoco's contribution to the problem of manganese in the deep aquifer.

9. Evergreen Fails to Demonstrate that the Sheet Pile Wall and Bulkhead Provide Sufficient Protection Against the Migration of Contamination to the Schuylkill River.

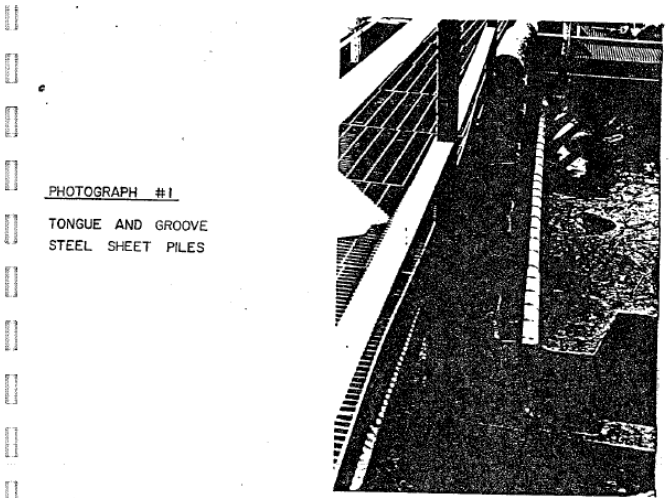
A. Evergreen has not fully characterized contamination in comparison with the sheet pile wall and bulkhead.

Along the perimeter of AOI-5, AOI-6, AOI-7, and AOI-2, a sheet pile wall was constructed in the 1950s -- presumably to protect the property from the influx of water from the Schuylkill River and to prevent the migration of contaminants into the river. In the reports, Evergreen assumes that it provides sufficient protection against migration of contamination to the river. But it offers no supporting evidence concerning the engineering specifications for this structure, its physical integrity, or any ongoing system of leak detection, maintenance, or repair. During this remedial investigation this failure is material because this means that Evergreen has not provided a sufficient delineation of the nature and extent of the contamination.

The most specific information we have about this structure is a 1985 memorandum identifying a tongue-and-groove steel sheet pile that is 8400 feet long:

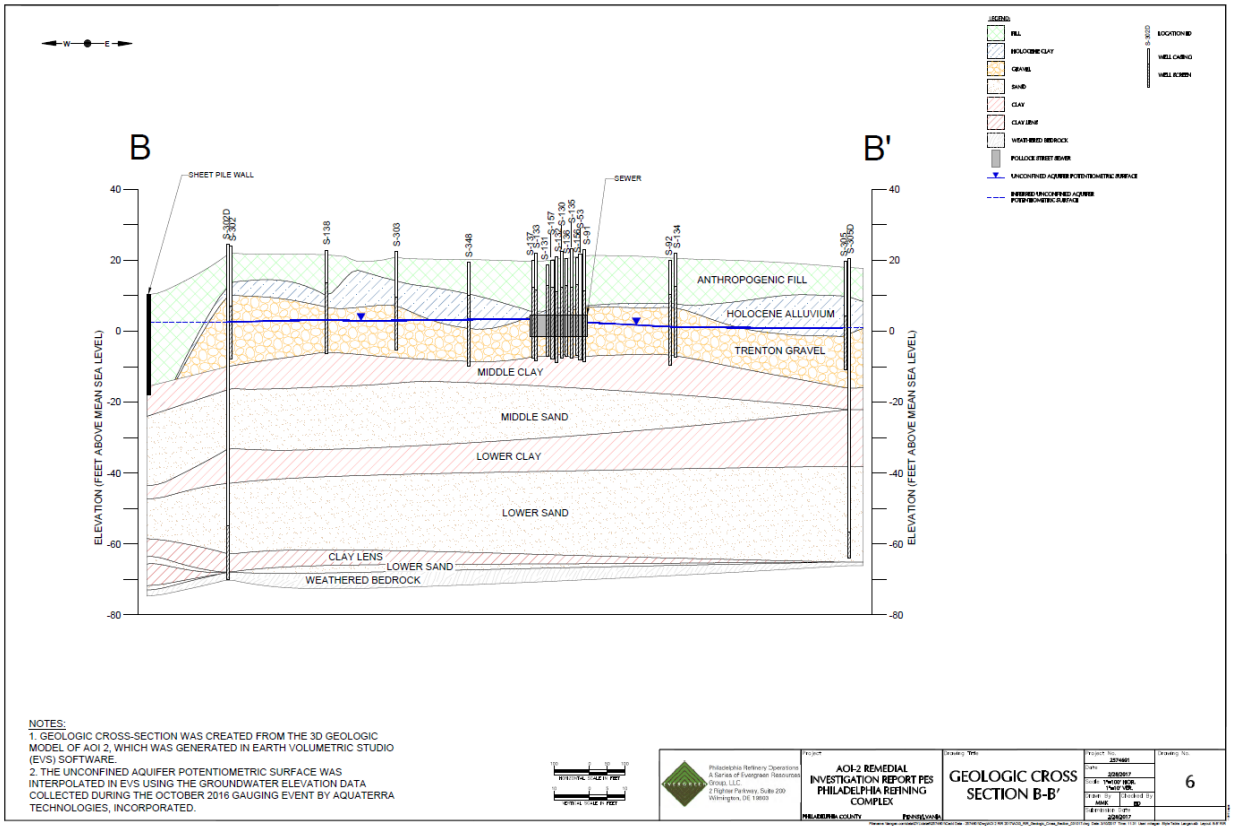
> Initially, the fill materials were placed behind a wooden seawall constructed in the early 1920's. ***This was replaced in the 1950's by 1400 feet of concrete seawall near the oil and grease plant and by 8400 feet of tongue-and-groove steel sheet pile along the remaining waterfront (Photograph #1).*** This fill-and-bulkhead system has led to the development of a shallow water table which is perched on the underlying marsh deposits. This water table is encountered at depths of 5 to 7 feet and is recharged by rainfall. Discharge of these groundwaters is to the Schuylkill River. The configuration of the water table cannot be determined without a sufficient number of monitor wells but flow directions are expected to be generally towards the river.

See 2017 Report, Appendix J (AOI-5), Appendix A (Historical Reports Combined), Memorandum dated May 8, 1985, page 5 (bold italics added for emphasis). The photograph is located here:



Id., pdf page 18. But this does not provide much detail regarding this structure, and it does not demonstrate that the sheet pile wall is effective.

A geologic cross section for AOI-2 provides some information regarding the relative position of the sheet pile wall:



See 2017 Report (AOI-2), Figure 6 (Cross Section B-B'), pdf page 206 of 215; *see also id.*,

Figure 4 (Geologic Cross Section Location Plan), Figure 5 (Cross Section A-A'), According to the Figure above, the sheet pile appears to be lie even with the surface of the ground, and appears to have a depth of about 28 feet, extending into the clay by one or two feet. *See id.* Because the sheet pile wall appears to lie right on the Schuylkill River, Evergreen has an obligation to delineate whether contaminated groundwater is migrating into the river.

Other cross sections do not appear to provide more information. One would expect the sheet pile wall to be picked up near the end of the cross section B-B' for AOI-6, but it does not appear to be located there. *See* 2017 Report (AOI-5), Figure 2 (Site Plan), Figure 4 (Geologic Cross Section Location Plan), Figure 5A (Geologic Cross Section A-A'), Figure 5B (Geologic Cross Section B-B'), pdf pages 227, 229-231 of 238. It should be located at the end of cross section E-E' for AOI-6, but it does not appear to be there. *See* 2017 Report (AOI-6), Figure 2 (AOI 6 Site Plan), Figure 8 (Stratigraphic Profile), pdf pages 53, 59 of 155. It should also be picked up for AOI-7, but it is not there, either. *See* 2017 Report (AOI-7), Figure 2 (AOI 7 Site Plan), Figure 8 (Stratigraphic Profile), pdf pages 56, 62 of 281.

In the reports, Evergreen provides no other meaningful information about the nature of this sheet pile wall. Rather, it simply makes repeated assertions that it is "keyed" into the Middle Clay Layer. *See* 2011 Report (AOI-5), page 6 ("A sheet pile bulkhead, keyed into the Middle Clay Unit, extends along the entire southern boundary of AOI 5 along the Schuylkill River."); *see also* 2013 Report (AOI-6), page 2 ("A sheet pile bulkhead, which is keyed into the Middle Clay Unit, extends along the entire western boundary of the AOI, between the AOI and the Schuylkill River."); *see also* 2012 Report (AOI-7), page 2 ("The entire western and northern boundary of AOI 7 along the Schuylkill River is bound by a sheet pile wall which is keyed into the Middle Clay Unit."); *see also* 2017 Report (AOI-2) ("A sheet pile bulkhead, which is keyed into the Middle Clay layer, extends along a portion of the western boundary of the AOI, between the AOI and the Schuylkill River."). Again, this does not demonstrate that the sheet pile wall is effective.

On the question of effectiveness, Evergreen's language is guarded. It asserts that the sheet pile "limits" the flow of groundwater to the Schuylkill River -- and thereby acknowledges the possibility of flow into the river. *See* 2011 Report (AOI-5), page 11 ("[s]hallow groundwater interaction with the Schuylkill River is limited by the sheet pile wall"); *see also* 2013 Report (AOI-6), page 9 ("[s]hallow groundwater interaction with the Schuylkill River is limited by the presence of the sheet pile wall"); *see also* 2012 Report (AOI-7), page 14 ("[s]hallow/intermediate groundwater interaction with surface water is limited by the sheet pile wall"); *see also* 2017 Report (AOI-2), page 35 ("[t]he presence of the sheet pile wall and the vertical wall in this area limits the discharge of dissolved phase COCs in the unconfined aquifer groundwater to the Schuylkill River"). Again, this does not demonstrate that the sheet pile wall is effective. Evergreen offers no meaningful evidence about this sheet pile wall in support of the proposition that it is an effective barrier to the migration of groundwater.

In the absence of such evidence, Evergreen offers circular reasoning to advance its proposition. Begging the question, it asserts that the movement of groundwater toward the river is limited because the groundwater can discharge no faster than the sheet pile wall permits:

> Along the sheet pile wall, ***the movement of groundwater and contamination*** through the alluvium/fill towards the Schuylkill River (the POC) ***is limited by the hydraulic conductivity of the sheet pile wall. This is because groundwater behind the sheet pile wall can discharge no faster to the Schuylkill River than the sheet pile wall permits***. The lower hydraulic conductivity of the sheet pile wall also causes groundwater to mound up behind it.

See 2011 Report (AOI-5), Appendix H, Section H.5.6, page H-6 (Hydraulic Conductivity (K)). *See also* 2013 Report (AOI-6), part 2, Appendix H, Section H.5.6, page 7 of 12. This begs the question whether the sheet pile wall is effective.

When Evergreen refers to the "lower hydraulic conductivity of the sheet pile" in the last sentence quoted above, Evergreen is simply implying that the hydraulic conductivity of the sheet pile wall is less than that of regular fill. *See* 2013 Report (AOI-6), part 2, Appendix F, Section F.4, page 3 of 12 ("For assessment purposes it was assumed that groundwater flow through sediments near the sheet pile wall are affected more by the lower sheet pile permeability relative to the higher hydraulic conductivity of the sediments."). It is not remarkable to assume that a sheet pile wall would tend to have a lower permeability than sediments, assuming it is functioning properly. But again, Evergreen assumes that the sheet pile wall is effective, without offering meaningful evidence.

Evergreen attempts to bolster its assertion by appealing to a coefficient of hydraulic conductivity, but that information is not specific to this sheet pile wall. Rather, Evergreen offers a putative number for hydraulic conductivity for unsealed sheet pile walls, obtained from a manufacturer of sheet pile walls (Waterloo Barrier):

> To account for the presence of the sheet pile wall in the QD and SWLOAD models ***the effective hydraulic conductivity used for simulating Zones 1 through 5 was 0.283 ft/d*** (10^{-5} cm/sec) ***which represents unsealed sheet piling (Waterloo Barrier, Inc.).***

See 2011 Report (AOI-5), Appendix H, Section H.5.6, page H-6; *see also id.*, Figures H.4 through H.8. Evergreen does not provide any foundation for how Waterloo Barrier arrived at this coefficient, and Evergreen does not cite any written report of Waterloo Barrier as a source of authority for this coefficient.

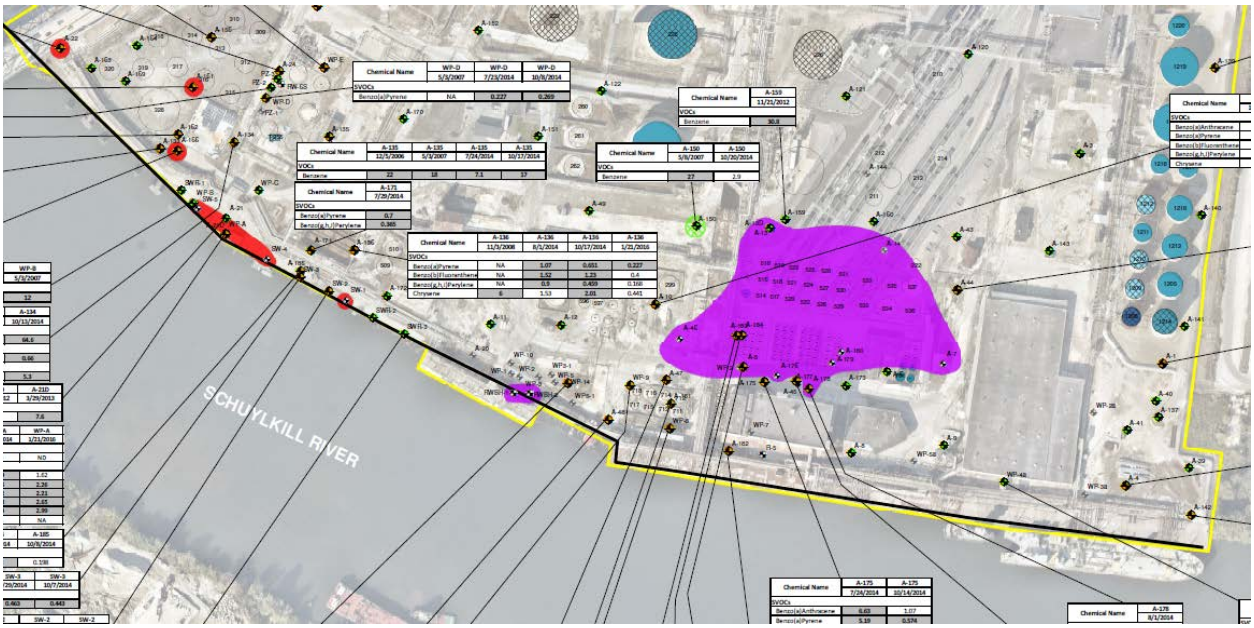
Presumably, the coefficient provided by Waterloo was based on unsealed sheet pile walls marketed at that time this report was prepared (around 2011). Apparently, that company has a proprietary sheet pile wall product developed in 1989. *See* Waterloo Barrier Inc., Waterloo Barrier® Groundwater Containment Wall. But there is no reason to suggest that Waterloo manufactured the sheet pile wall at the oil refinery (it was installed in the 1950s), or that the coefficient that Waterloo provided is a reliable one when applied to a sheet pile wall

constructed in the 1950s. It says nothing about the effectiveness of a sheet pile wall that has been subject to all the forces of nature and humankind for over sixty years.

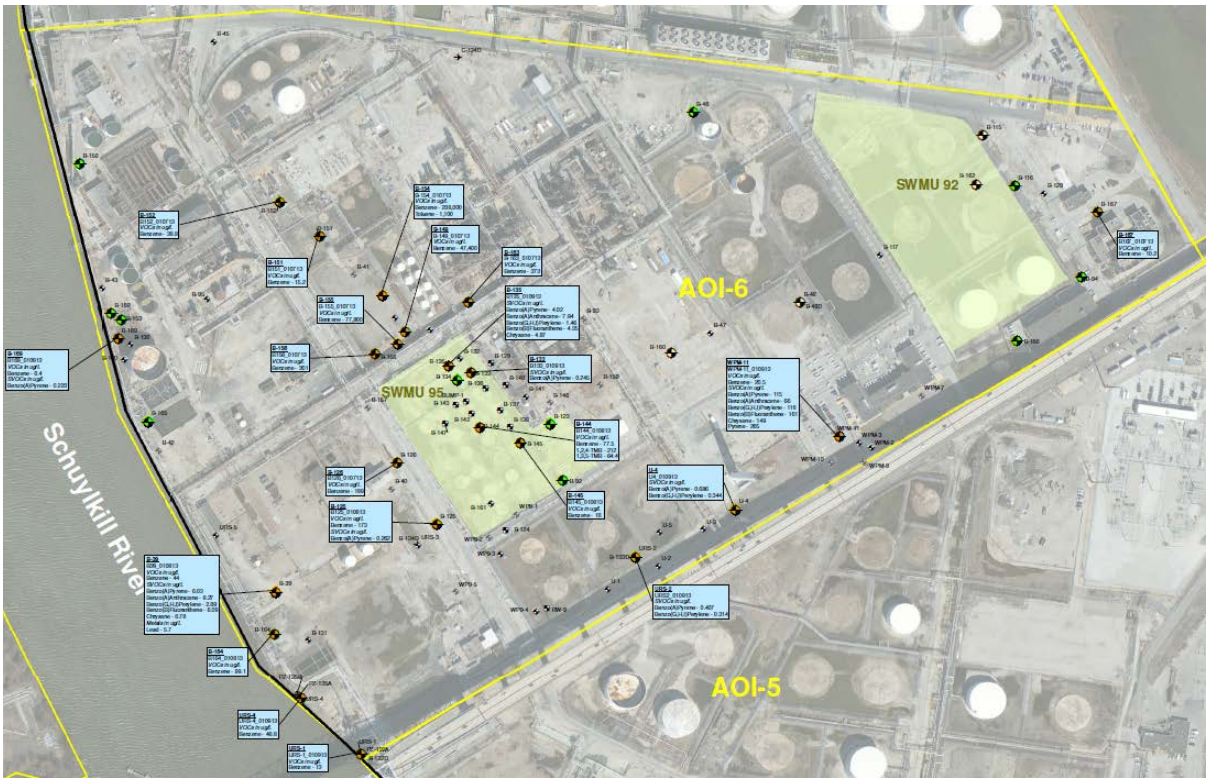
B. <u>There are compelling concerns about the protectiveness of the sheet pile</u>.

These forces include the migration of contaminants in groundwater that could contribute to corrosion of the sheet pile wall. Evergreen does not address this. This is important because Evergreen has gathered data demonstrating contaminants in monitoring wells in the shallow aquifer near the sheet pile wall, based on the reports for AOI-5, AOI-6, AOI-7, and AOI-2. (As discussed above, in AOI-2, the sheet pile appears to extend to a depth of approximately 28 feet, implicating the shallow aquifer).

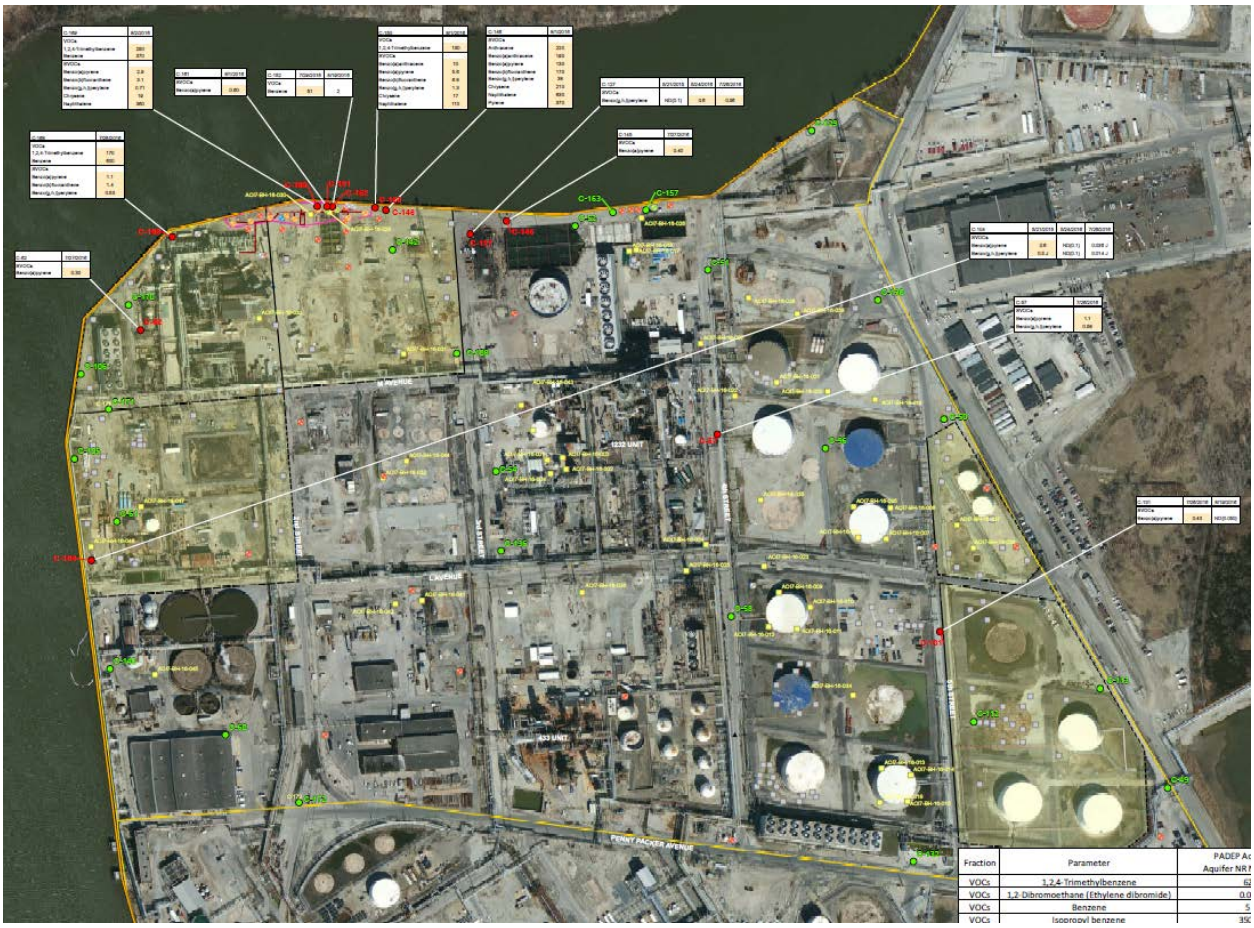
The following screenshots illustrate some of this contamination:



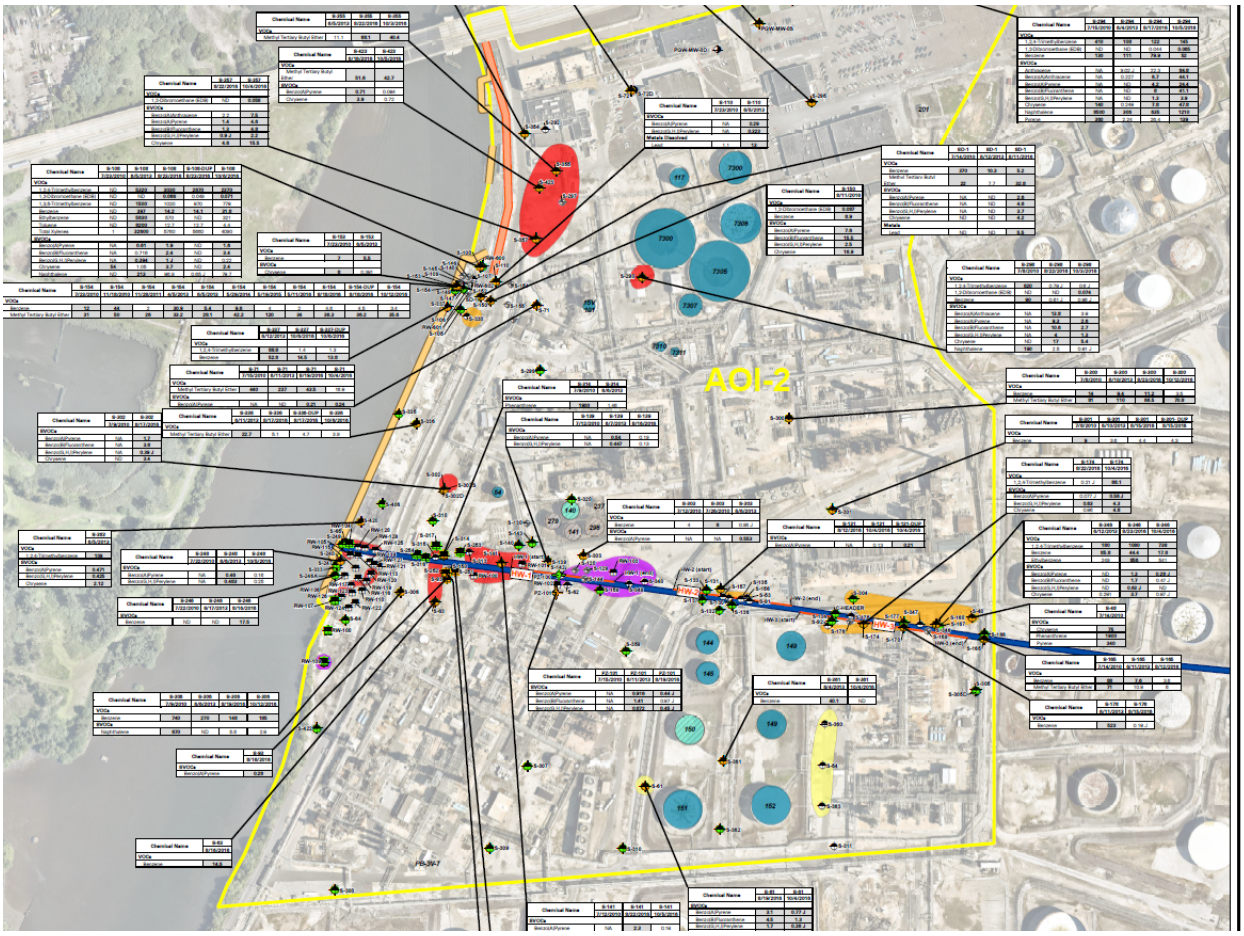
See 2017 Report (AOI-5), Figure 10 (Summary of Groundwater Sample Exceedances), pdf page 236 of 238.



See 2013 Report (AOI-6), Figure 11 (Summary of Groundwater Sample Exceedances), pdf page 100 of 101.



See 2017 Report (AOI-7), Figure 19 (Water Table Groundwater Results), pdf page 74 of 281.



See 2017 Report (AOI-2), Figure 12A (Summary of Unconfined Aquifer Groundwater Sample Exceedances), pdf page 212 of 215.

These forces include seismic events. Just four months ago, a magnitude 3.1 earthquake struck in East Freehold, New Jersey, causing impacts that were felt in Philadelphia. CBS Philly, *3.1 Magnitude Earthquake Strikes New Jersey, Shaking Reported Across State Including Philadelphia-Area* (September 9, 2020). This is important because seismic events could cause pressure and stress on the sheet pile wall, weakening its structure and making it more susceptible to wear and tear.

These concerns are not simply academic. Evergreen has already identified at least one instance of a breach of the sheet pile wall that required repair. *See* 2012 Report (AOI-7), page 29 (noting that as an interim remedial measure, Sunoco "[s]ealed a penetration in the sheet pile wall adjacent to the junction box, eliminating groundwater flow to the Schuylkill River"). This statement implies that there was groundwater flow into the Schuylkill River through the breach.

C. With respect to prevailing engineering standards, Evergreen should consider resources such as the U.S. Army Corps of Engineers' engineering manual.

As Evergreen considers the sheet pile wall in this remedial investigation, it should review modern engineering standards for sheet pile walls. For example, the U.S. Army Corps of Engineers has prepared a section on the design of sheet pile walls in its engineering manual. *See* U.S. Army Corps of Engineers, *Design of Sheet Pile Walls*, March 31, 1994 (EM 1110-2-2504 31) (75 pages), available on the Army Corps of Engineers' webpage on Engineer Manuals.

According to that engineering manual, the problem of corrosion is an electrochemical question. *See id.*, page 9-1, Section 9.2.b(3) ("The corrosion process is electrochemical in nature and occurs wherever there is a difference in electric potential on the piles surface."). The engineering manual states that "[p]ermanent installations should allow for subsequent installation of cathodic protection should excessive corrosion occur." *Id.*, page 2-2, Section 2.4.b. Evergreen should provide an analysis of what systems are in place for cathodic protection.

D. Evergreen has not responded to the Department's Comment relating to the sheet pile wall in the report for AOI-11 (deep aquifer).

It does not appear that Evergreen has addressed a question from the Department regarding the use of the coefficient of hydraulic conductivity obtained from Waterloo. *See* 2013 Comments (AOI-6). Among other things, the Department questioned Evergreen's use of this coefficient not only for the migration of contaminants within the short distance between the sheet pile wall and the river, but also for an additional distance of 150 feet to the east of the sheet pile wall. *See id.*, Comments 28-31. Evergreen's response did not address these comments. *See* 2018 Response to Comments (AOI-6). Evergreen should respond to these comments now, as well as the comments of the Council.

10. The Remedial Investigation Reports are Deficient Because They Fail to Address the Impacts of Climate Change -- Including Sea Level Rise and Storm Surges.

For years, it has been known that emissions of greenhouse gases have caused changes in climate, including sea level rise and changes in precipitation patterns. Despite the existence of state and regional climate change plans to address these impacts, Evergreen has not incorporated any analysis of these impacts into its remedial investigation. The former refinery is located on the banks of the Schuylkill River, which is projected to rise by two feet in 2050, which would cause flooding over a number of areas of the facility. Because of the failure to consider these impacts, the delineation of the nature and extent of contamination is deficient.

Climate change implicates at least two concerns for this remedial investigation. First, climate change could potentially affect remediation systems through sea level rise and increased storm events. This is not merely a hypothetical future concern. Although the present public comment period concerns remedial investigation reports, there is an overlapping remediation aspect that is a part of these reports. *See* Evergreen, Act 2 Program Information Session (August 27, 2020), Remediation Timeline, slide 47 (bar graph displaying active and inactive remediations since 1995, and identifying 11 active remediations as of August 2020).

In addition, the remedial investigation reports themselves cover sewer remediation systems. *See e.g.*, 2016 Report (AOI-1), Section 10.43, page 10.65-10.66, 2017 Report (AOI-2), Section 8.0, pages 49-51, 2017 Report (AOI-4), Section 10.43, page 10.63, 2017 Report (AOI-7), Section 10.42, page 42, 2017 Report (AOI-8), Section 9.2.5, page 9.60.

Second, because climate change could potentially affect the flow of surface water and groundwater, Evergreen should have considered it when evaluating the fate and transport of contaminants in the reports.

A. State and local agencies have adopted plans to address the impacts of sea level rise, which is projected to amount to two feet for Philadelphia in 2050.

Under the Pennsylvania Climate Change Act of 2008, the Department of Environmental Protection must prepare a Climate Change Plan every three years. *See* Act 70 of 2008, Section 7(a). The most recent climate change action plan recognizes the impacts of flooding in the City of Philadelphia:

> Climate impacts in Pennsylvania are happening now and will continue to put Pennsylvanians and local industries at risk. ***Key impacts in Pennsylvania (Shortle et al. 2015) include***:
> ….
> ***More frequent flooding and associated disruptions due to sea level rise in communities and cities in the Delaware River Basin, including the city of Philadelphia***
> ….

See DEP, Pennsylvania Climate Change Plan (2018), pages 25-26.

At a regional level, the City of Philadelphia has projected an increase in sea level rise of two feet by 2050 and four feet by 2100:

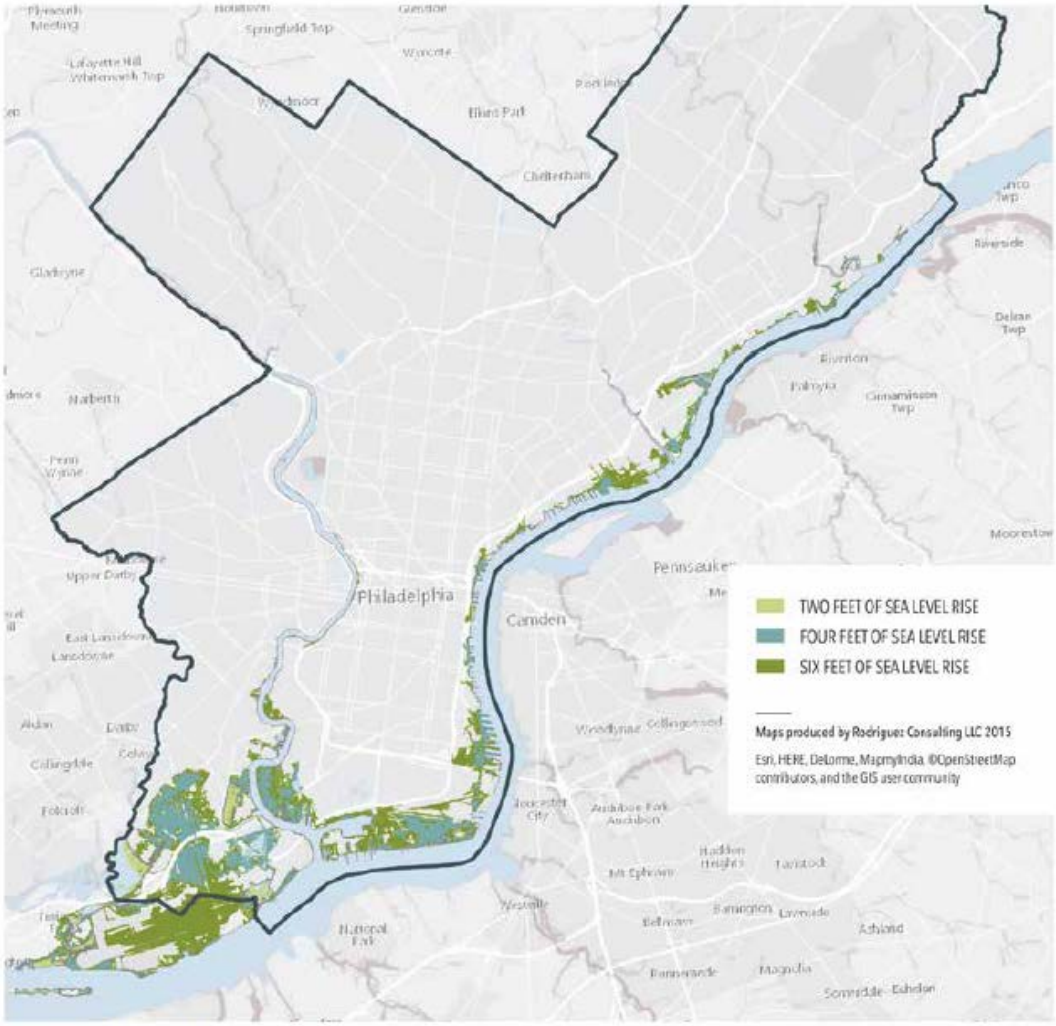
> SEA LEVEL RISE (SLR): Two scenarios consider just the impacts of sea level rise: ***two feet*** (***the local projection for 2050 assuming moderate carbon emissions worldwide***) and ***four feet*** (***the projection for 2100 given the same emissions assumptions***). [citing NOAA, the Digital Coast].

See City of Philadelphia, Mayor's Office of Sustainability and ICF International, *Growing Stronger: Toward a Climate-Ready Philadelphia* (November 2015) (bold italics added for emphasis).

This report includes a map of Philadelphia highlighting areas at risk of inundation from a sea level rise of two feet. Among them are a number of Areas of Interest at the former oil refinery (AOI-5, AOI-6, AOI-7, AOI-8, AOI-9, and AOI-10):

FIGURE 8

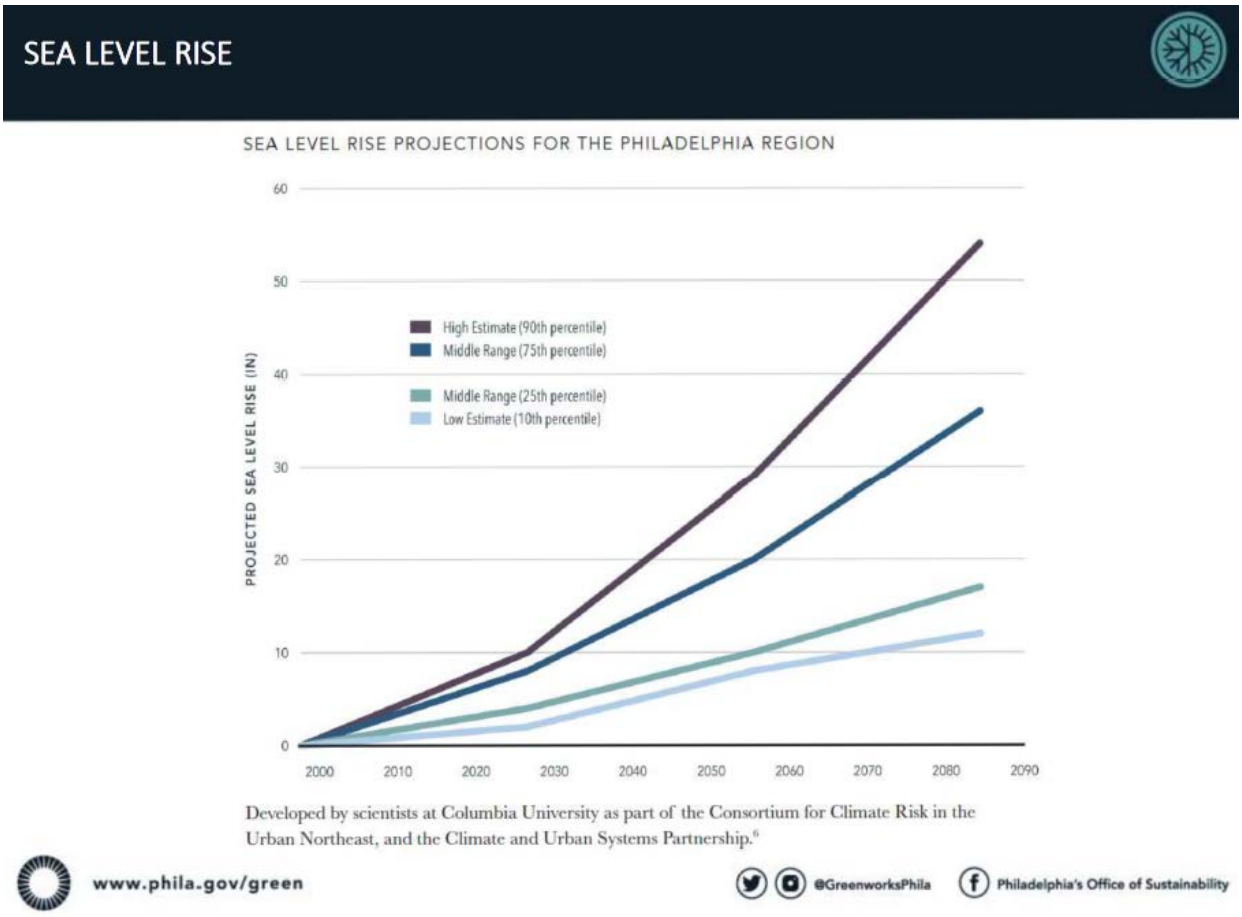
POTENTIAL INUNDATION FROM SEA LEVEL RISE



Areas in Philadelphia at risk of inundation under two feet of sea level rise, which is the expected sea level rise in 2050 under a scenario of moderate greenhouse gas emissions; four feet of sea level rise, which is the expected sea level rise in 2100; and six feet of sea level rise, which is the expected level in 2100 under a high-greenhouse-gas emissions scenario.

Id., page 16.

A more recent report of the city's Office of Sustainability projects an increase of sea level rise of two to seven inches during the period 2000-2020, with further increases thereafter:



City of Philadelphia, Office of Sustainability, *Greenworks: A Vision for a Sustainable Philadelphia* (May 31, 2018), page 13.

B. <u>The projected sea level rise of 2 feet by 2050 will place extensive areas of the former refinery underwater.</u>

The Sea Rise Viewer of the National Oceanic and Atmospheric Administration provides a vivid description of what this will mean for the former refinery. The following are a series of snipped figures showing the implications of sea level rise on the refinery site, downloaded on January 4, 2021.

In the following figures, the blue areas are areas of sea level rise because they are hydrologically connected to the ocean:

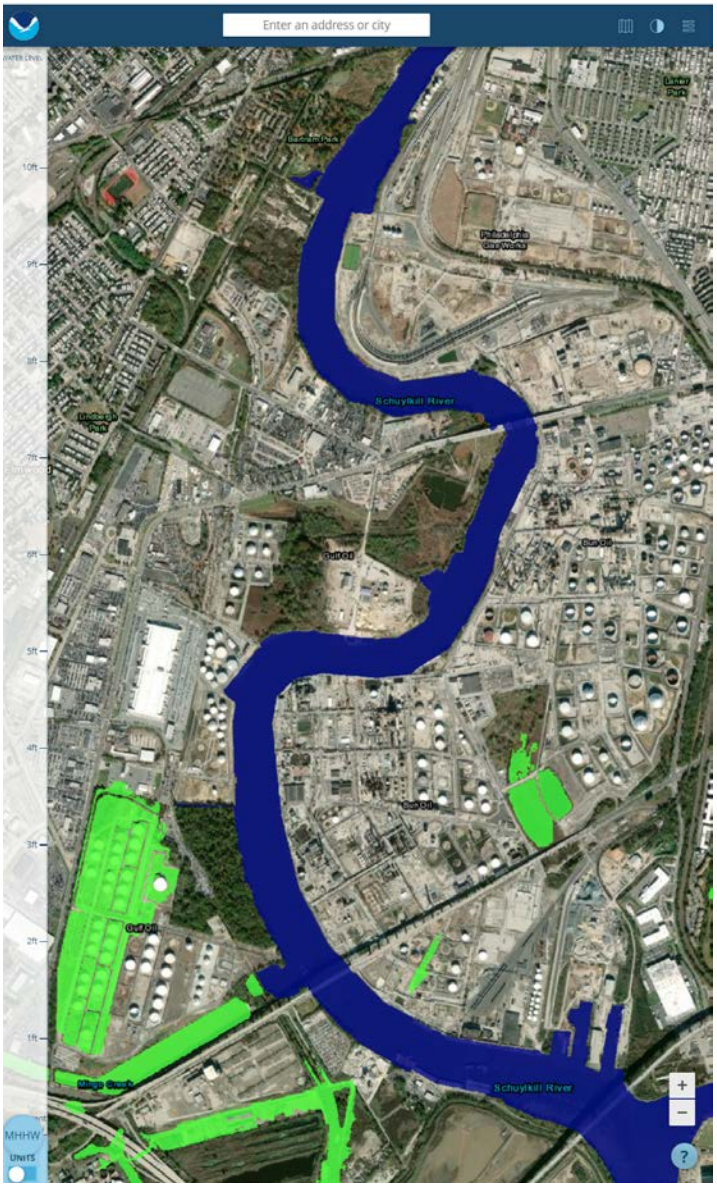
> Water levels are relative to local Mean Higher High Water Datum. ***Areas that are hydrologically connected to the ocean are shown in shades of blue (darker blue = greater depth***).

See NOAA, Sea Level Rise Viewer (click on the circular icon with the letter “i” in the lower left hand corner) (bold italics added for emphasis). The green areas are areas that may also flood even though they are hydrologically "unconnected" to the ocean:

> Low-lying areas, displayed in green, ***are hydrologically "unconnected" areas that may also flood***.

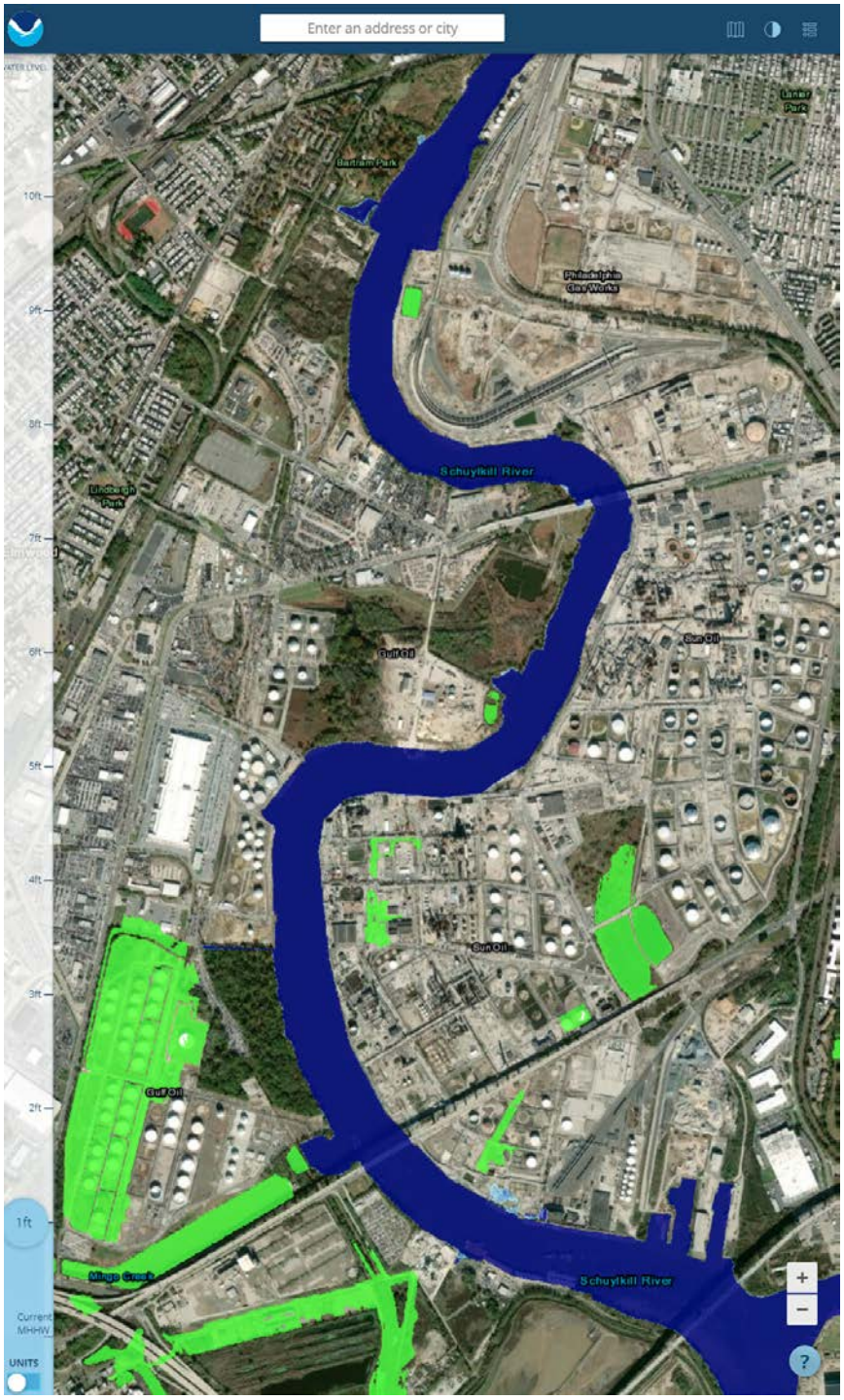
See id.

This first map shows current conditions:



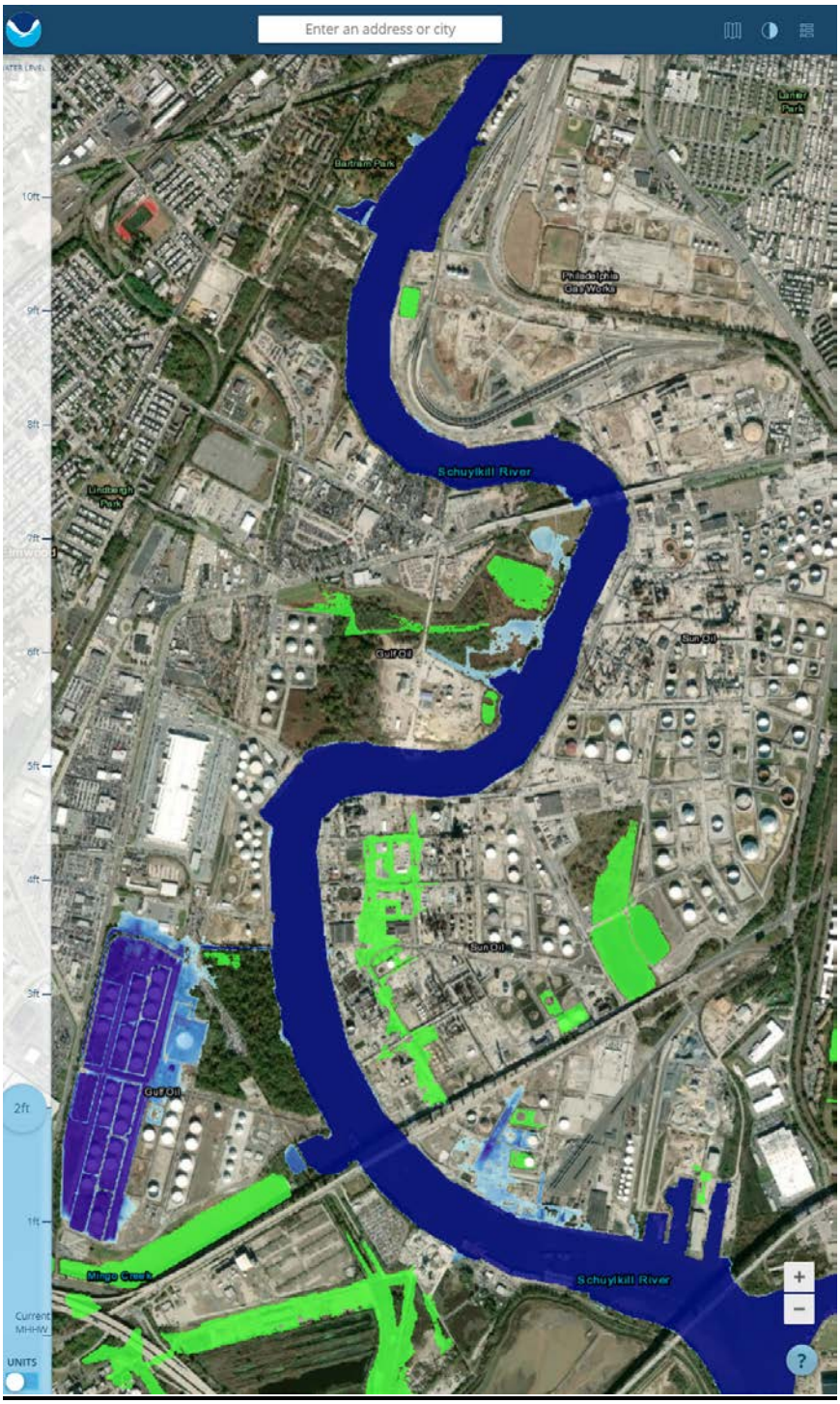
Source: NOAA Sea Level Rise Viewer (set for Mean Higher High Water (MHHW).

This second map shows that sea level rise of one foot will cover parts of AOI-5 and AOI-10:



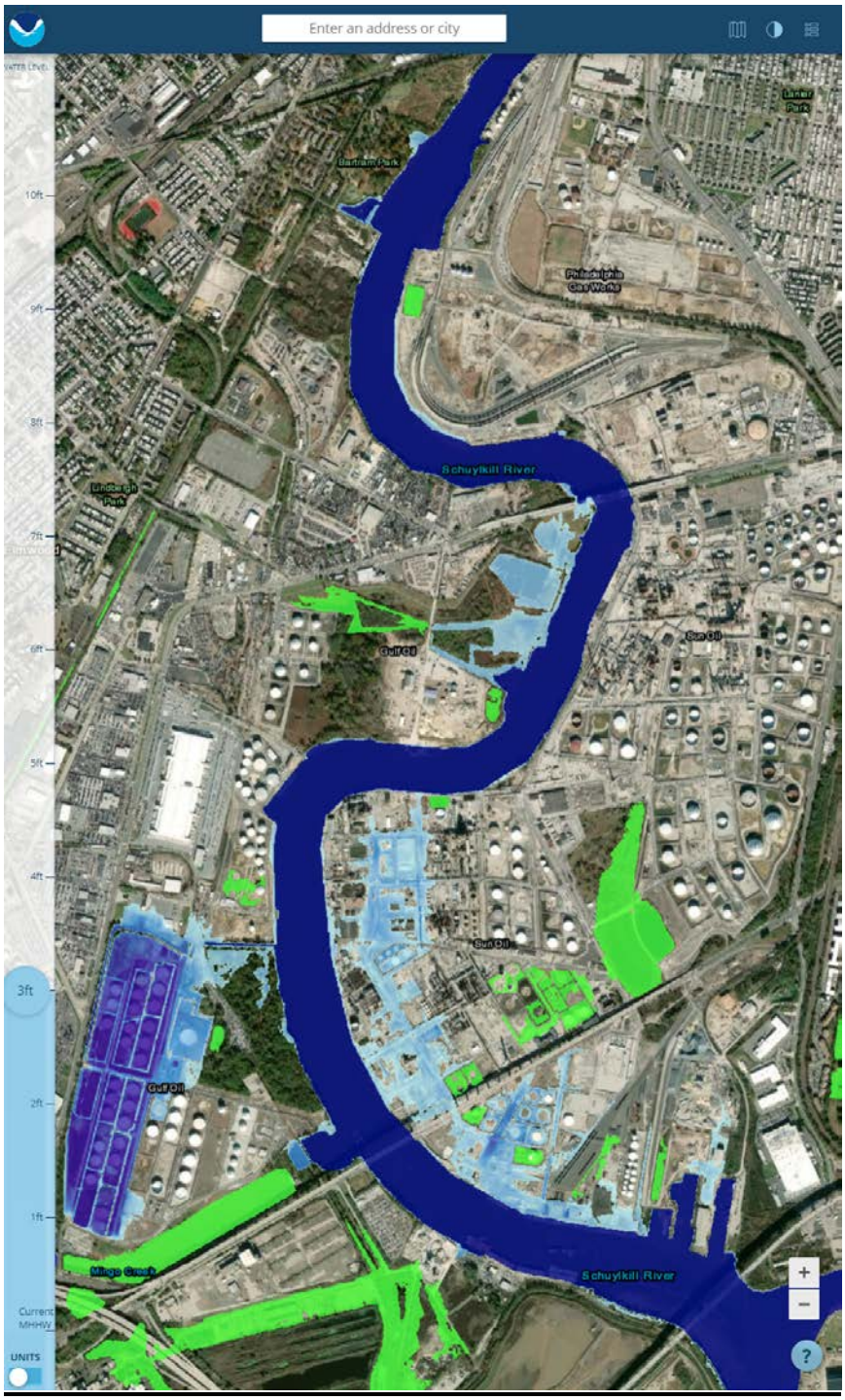
Source: [NOAA Sea Level Rise Viewer] (set for one foot)

The third map shows that sea level rise of two feet will cover extensive parts of AOI-5, AOI-9 and AOI-10, and small parts of AOI-6 and AOI-8:



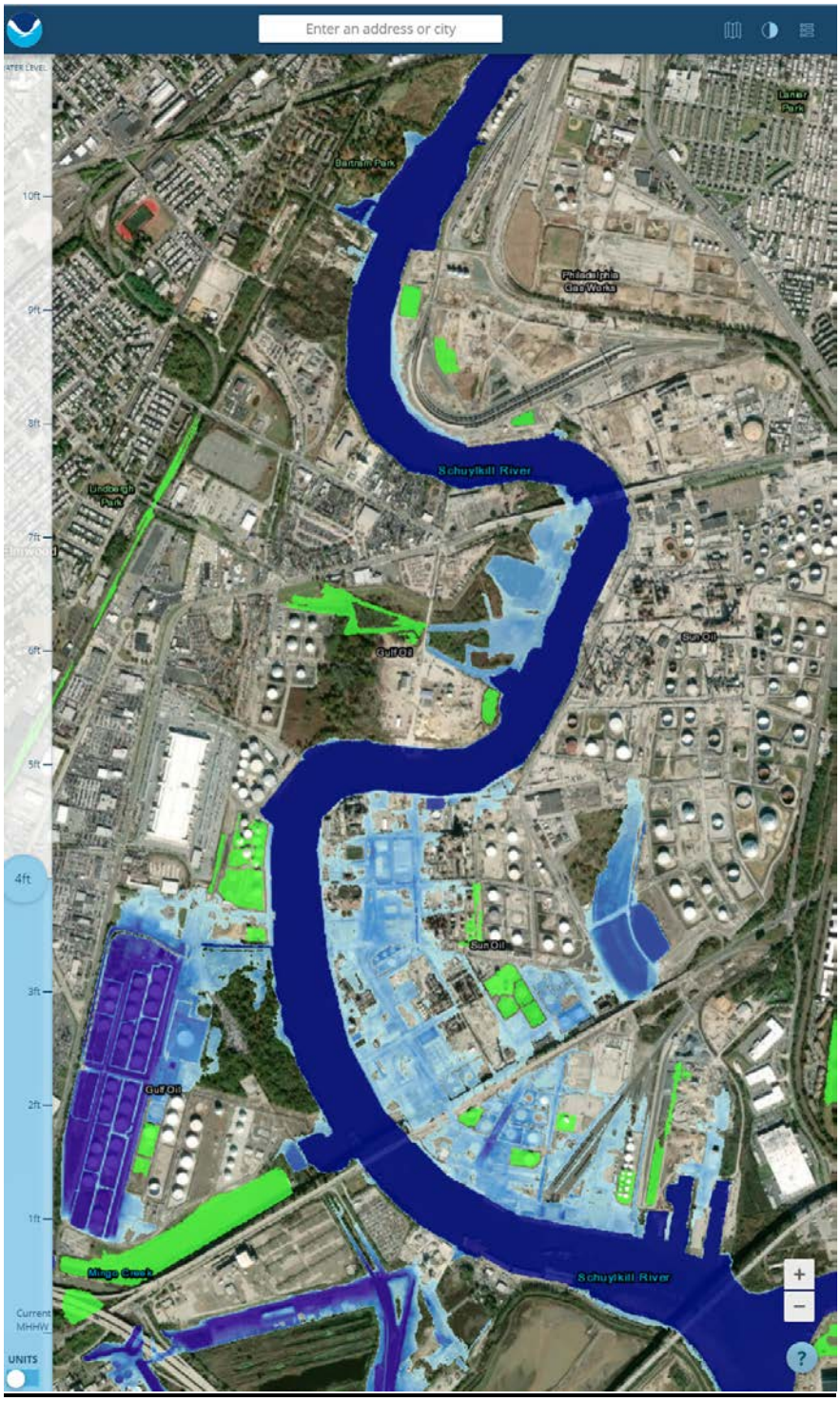
Source: [NOAA Sea Level Rise Viewer] (two feet)

The fourth map shows that sea level rise of three feet will cover extensive areas in AOI-5, AOI-6, AOI-7, AOI-9, and AOI-10, and parts of AOI-8:



Source: [NOAA Sea Level Rise Viewer](#) (three feet)

The fifth map shows that sea level rise of four feet will cover extensive areas in AOI-3, AOI-5, AOI-6, AOI-7, AOI-9, and AOI-10, and parts of AOI-8:



Source: [NOAA Sea Level Rise Viewer] (four feet)

C. <u>According to EPA Region III, a responsible party should consider the impacts of climate change during a remedial investigation</u>.

EPA Region III has jurisdiction over the remedial investigation at the oil refinery. It is the policy of EPA Region III to consider sea level rise at the remedial investigation stage, and it encourages state agencies to do the same. Region III makes this clear in its Climate Change Adaptation Implementation Plan:

> Priority Actions, Goal 3 Cleaning Up America's Communities & Advancing Sustainable Development:
>
> ….
>
> ***Perform vulnerability analyses during site investigation***, cleanup design, operations and maintenance, five year reviews, etc. ***Encourage states to consider doing the same for state-led states***.

See EPA Mid-Atlantic Region III, Climate Change Adaptation Implementation Plan (May 30, 2014), page 25.

For example, Region III notes that shallow groundwater aquifers are likely to be the most sensitive part of the groundwater system to climate change:

> D. Water Quality impacts from climate changes
>
> ***Shallow groundwater aquifers that exchange water with streams are likely to be the most sensitive part of the groundwater system to climate change***. ***Small reductions in groundwater levels can lead to large reductions in stream flow and increases in groundwater levels can increase stream flow***. Further, the interface between streams and groundwater is an important site for pollution removal by microorganisms. Their activity may change in response to increased temperature and increased or decreased streamflow as climate changes, this may affect water quality and affect Clean Water Act goals related to water bodies in non-attainment and affect TMDL development.
>
> A specific mid-Atlantic water quality concern[] is the Delaware River Basin, which includes portions of New York, Pennsylvania, New Jersey, and Delaware that drain to the 330-mile long Delaware River and Bay...."

Id., page 14 (bold italics for emphasis). We know that the water table is high in areas of the site. *See* Comment #12, below.

In addition, Region III acknowledges the potential for impacts of sea level rise on aquifers and groundwater:

> E. Severe flooding from sea-level rise and extreme precipitation is likely to increase
>
> ***Sea-level rise is expected to increase saltwater intrusion into coastal freshwater aquifers***, making some unusable without desalination. Increased evaporation or reduced recharge (drought) into coastal aquifers exacerbates saltwater intrusion. Like water quality, ***research on the impacts of climate change on groundwater,*** ecosystems, and infrastructure ***has been minimal and remedies may be difficult***.

Id., page 15 (bold italics for emphasis).

Finally, Region III acknowledges that flooding could affect the migration and management of contaminants:

> A. Restoring and Preserving Land
>
> Increased flooding and sea-level rise may increase the risk of contaminant releases from vulnerable RCRA Corrective Action sites, Superfund sites, Brownfield sites, LUST sites, other contaminated sites, and landfills. ***Flooding from more intense and frequent storms and extreme storm events could affect the migration and management of contaminants***. Sea-level rise can lead to inundation and salt water intrusion which may impact the performance of the remedies ***and cause the transport of contaminants at sites in coastal areas***. Contaminant migration could also occur after prolonged power loss at cleanup sites with pump and treat systems dependent on grid electricity.
>
> Impacts may be most severe for cleanup sites that are not yet completed; however sites with waste in place following a cleanup and permitted facilities that manage hazardous materials may also be vulnerable. ***Sites with on-site containment or treatment remedies within the 100 or 500 year flood plain of a surface water body and/or within the sea-level rise zone 1.5 meters above high tide are of particular concern in Region III***. Sediment sites with in situ capping remedies are vulnerable to flood regime changes and re-suspension and deposition of contaminated sediment. Flooding from storms and inundation due to sea level rise could jeopardize land revitalization efforts

> including renewable energy generation, greener cleanups, and ecological revitalization projects, as well as other site reuse or redevelopment plans at Brownfield sites and completed Superfund Sites.
>
> Increased ambient temperatures and extreme heat may impact the design and operation of remediation systems. Cleanup sites with waste in place phytoremediation, or a vegetative cap may be vulnerable in areas that experience drought or changing plant hardiness zones. Slowed growth rates during heat waves could impact the success of the remedy or revitalization effort, and excessive vegetation loss could lead to erosion. Coastal, stream, and mountain ridge top habitats are examples of ecosystems in Region 3 that are vulnerable to increases in ambient temperature.

Id., page 17 (bold italics for emphasis).

Last year, the Government Accountability Office published a report recommending that EPA take additional actions to manage risks from climate change. U.S. Government Accountability Office, *Superfund: EPA Should Take Additional Actions to Manage Risks from Climate Change*, GAO-20-73 (2019). The GAO report described Region III's adoption of a policy considering climate change in cleanups of contaminated sites.

To illustrate, the Region III plan notes that increased flooding and sea level rise may increase risks of releases of contaminants:

> Each of the 10 EPA regional offices identified relevant regional climate change effects in their 2014 climate change adaptation implementation plans. [footnote 70]. For example, ***the Region 3 plan states that increased flooding and sea level rise may increase risks of releases of contaminants, salt water intrusion may impact the performance of remedies, and increased temperatures may impact vegetation that prevents erosion***.

Id., pages 36-37.

In addition, the plan notes that "Region 3 has developed a mapping tool on climate change vulnerability that provides site-level assessments of sea level rise, among other potential impacts." *Id.*, page 39.

The GAO report also noted that "[o]fficials from Region 3 told us that they take into account a number of factors, including climate change impacts, if any, when they design and select site remedies."). *Id.*, page 43.

Applying these principles, Region III has considered sea level rise and climate change in the context of the Publicker Industries site on the Delaware River, in southeast Philadelphia. The GAO Report noted that "Region 3 considered newly available information on projected sea level rise in the region to determine if those projections called into question the protectiveness of the existing remedies at the site." *Id.*, page 44.

It is notable that sea level rise was not a concern for the Publicker Industries site only because it is located at a high elevation above sea level (15-19 feet):

> Question C: Has any other information come to light that could call into question the protectiveness of the remedy?
>
> Answer: No other information has come to light that calls into question the protectiveness of the remedy. However, ***due to the proximity of the Publicker site and the Delaware River, EPA looked at the potential impacts from the effects of climate change for this Five-Year Review.*** In a joint report from the EPA and the Delaware River Basin Commission, ***an estimated 21-inch rise in global sea level by 2050 would imply a rise of 2.4 feet in the Delaware estuary***. Also, an estimated 7-foot global rise by 2100 would imply an 8.2-foot rise in the Delaware estuary. [footnote omitted]. ***The Publicker property is located at an elevation of approximately 15-19 feet above sea level***."

See 2014 Five-Year Report for Publicker Industries, page 10 (bold italics for emphasis).

But the oil refinery is closer to sea level, making sea level rise more of a concern. The Publicker Industries site is located at 3223 South Delaware Avenue, Philadelphia, near the Walt Whitman Bridge. *See* EPA, Superfund Site: Publicker Industries Inc. This is about three miles from the oil refinery, and it is located in the same watershed. Just as EPA considered sea level rise in the context of that matter, Evergreen should have considered sea level rise in these reports.

D. <u>The reports do not address climate change when delineating the nature and extent of contamination</u>.

But none of the reports contains any meaningful discussion of the impact of climate change and sea level rise on the remedial investigation.

It would not be a satisfactory response for Evergreen to assert that this is a remediation question to be addressed in the future, rather than a remedial investigation question to be addressed now. That would be a false distinction. In fact, Evergreen has made it a remedial investigation question in its reports wherever it has asserted that pathways of exposure through soil and groundwater are not complete because of on-site permit personal protective equipment (PPE) procedures:

7.6 Potential Migration Pathways and Site Receptors

The following summarizes potential migration pathways and site receptors for AOI 5. AOI 5 is situated within a fenced and secured area to prevent unauthorized Access.

- The potential direct contact pathway to soil greater than two feet is ***deemed incomplete based on PES's on-site permit and PPE procedures which limit exposure to soil encountered in excavations***.

- The potential direct contact pathway to groundwater is ***deemed incomplete based on PES's on-site permit and PPE procedures which limit exposure to groundwater that may be encountered in excavations***.

See 2017 Report (AOI-5), Section 7.6, pages 60-61. Evergreen makes similar assertions in other reports. *See e.g.*, 2016 Report (AOI-1), Section 9.6, pages 9.57-9.58, 2017 Report (AOI-2), Section 7.6, pages 48-49, 2017 Report (AOI-3), Section 7.6, pages 42-43, 2017 Report (AOI-4), Section 9.7, pages 9.55-9.56, Section 7.6, page 42, 2017 Report (AOI-6), Section 9.6, page 37, 2017 Report (AOI-7), Section 9.6, pages 39-40, 2017 Report (AOI-8), Section 10.6, pages 10.75-10.77, 2017 Report Addendum (AOI-9), Section 6.5, page 27, 2011 Report (AOI-10), Section 7.6, pages 28-29. Because the impacts of sea level rise and climate change may affect pathways of exposure, those assertions are flawed.

Evergreen has not explained how on-site permit and PPE procedures will guard against the impacts of climate change -- including sea level rise and storm surge events. The reports are deficient and they need to be revised.

11. Evergreen May Not Fragment the Remedial Investigation Reports by Diverting its Deficiencies Into a Future Fate and Transport Remedial Investigation Report.

Evergreen unfairly attempts to respond to numerous flaws in the reports (including its insufficient characterization of the unconfined aquifer and lower aquifer), by simply promising a future remedial investigation report later this year. *See* 2020 First Amendment to Consent Order and Agreement, page 5 of 77 (setting forth a deadline of December 31, 2021 for a "Fate and Transport Remedial Investigation Report"). This would allow Evergreen to fragment the remedial investigation reports into different pieces, minimizing public scrutiny and delaying its responses to public concerns. It would be fundamentally unfair.

Under Evergreen's approach, the current reports would be approved individually and considered closed, preventing any further comments on them. But later on, the public would be commenting on material that was carved out of these reports and moved into a new report. The objection would then be made that the public may not comment on matters that were previously approved, even though the material is interrelated.

This is flawed for several reasons. The public cannot meaningfully comment on soil and groundwater sampling in the current reports without having a complete analysis of the relationship between the unconfined aquifer and the deep aquifer. Also, it cannot comment on a future fate and transport analysis without considering the underlying soil and groundwater data organized by Evergreen in the current reports.

It is worth noting that the Fate and Transport Remedial Investigation Report promised by Evergreen simply appears to be nothing more than a revised report for AOI-11 that was disapproved in 2013. Nothing in the Department's review of that report compels the conclusion that the remedial investigation reports should be fragmented in the manner proposed by Evergreen. *See* 2011 Comments (AOI-11), Comment 8, 2013 Comments (AOI-11), Comments 11-19, 2013 Memorandum (AOI-11), pages 3-4, 2013 Disapproval Letter (AOI-11). The implication of the Department's disapproval was merely that Sunoco had to submit another remedial investigation report that included an approvable fate and transport analysis. The implication was not that Sunoco should fragment the remedial investigation reports for AOI-11.

In its discussion of site characterization activities in Section II of the Technical Guidance Manual, the Department emphatically recognizes that a fate and transport analysis is a part of a site characterization, and not separate from it:

> The site characterization activities conducted must result in a thorough investigation which meets the requirements of Pa. Code § 250.204. **A complete and accurate site characterization, including fate and transport analysis, and its documentation in the final report is very important, as it is the basis for making remediation decisions and is used later in identifying the appropriate area for demonstrating attainment. Except for sites involving the excavation option for petroleum-**

> **contaminated soil (see 25 Pa. Code § 250.707(b)(1)(iii)), without a proper site characterization, attainment requirements cannot be met and the final report will be disapproved by the Department.**

See DEP, Technical Guidance Manual, Section II.A.4.a, page II-11 (bold in original).

The Department reiterates this point in Section III of the Technical Guidance Manual when it discusses the purpose of a fate and transport analysis:

> **Fate and transport analysis or modeling is a necessary part of site characterization and demonstrating attainment of an Act 2 standard**. However, the Chapter 250 regulations governing Act 2 use the term "fate and transport analysis" as opposed to "fate and transport model." This particular distinction was made because it will not always be necessary to run an analytical or numerical quantitative "fate and transport model" to achieve a standard.
>
> Whether simple or complex, any fate and transport analysis must rely on having and/or obtaining valid data. Reliable field data will be critical in supporting the professional conclusions regarding any predictions of contaminant fate and transport and needs to be considered during the site characterization.
>
> Fate and transport analysis will be used in the Act 2 process to predict contaminant concentrations migrating through the unsaturated zone and the saturated zone, including the impact of soil contamination on groundwater. It will also include an analysis of diffuse groundwater flow into surface water (e.g., a stream) for purposes of determining compliance with surface water quality standards.

See DEP, Technical Guidance Manual, Section III.A, page III-1 (bold in original, underlining added for emphasis). Because "[f]ate and transport analysis or modeling is a necessary part of site characterization," Evergreen may not break out parts of the current remedial investigation reports to address later in a Fate and Transport Remedial Investigation Report.

The proper way to do this is all at once as Sunoco originally attempted to do in 2013 (although it did this unsuccessfully because the report for AOI-11 was deficient).

When Evergreen revises the current reports to address the multiple flaws identified throughout these comments, it should include whatever fate and transport analysis it has been preparing since it submitted its last report over three years ago. Everything should be republished for another public comment period before submission to the Department.

12. <u>Evergreen Fails to Sufficiently Delineate Exceedances of the Soil-to-Groundwater Numeric Value and the Direct Contact Numeric Value for All Constituents of Concern</u>.

Throughout the reports, Evergreen looked for contamination at a distance with a telescope, rather than close-up with a magnifying glass. It conformed its discussion of exceedances to an expectation that it would have to meet less stringent cleanup levels, rather than more stringent cleanup levels. To illustrate, it focused its efforts on delineating lead contamination in surface soils with respect to a direct contact numeric value (1000 mg/kg) and a proposed site-specific standard (initially 1708 mg/kg, and later 2240 mg/kg), while marginalizing and at times even obliterating a discussion of the soil-to-groundwater numeric value (450 mg/kg).

To the extent that data regarding exceedances of the more stringent soil-to-groundwater numeric value are included in the reports, they are buried in dense tables and highlighted as many as three times to reflect three different numeric values being exceeded at the same time. This does not provide a clear delineation of the contamination for the public. The public is entitled to a picture of what the contamination looks like from the perspective of different numeric values.

There is no discussion of whether the soil-to-groundwater numeric value prevails over the direct contact numeric value in setting the Medium-Specific Concentration, which is particularly problematic because the water table is less than ten feet from the surface of the ground in areas of the site, necessitating the use of the soil-to-groundwater numeric value.

Evergreen does not provide an adequate explanation as to why it believes the contamination has been delineated. Often its summary conclusion is based on the assertion that it found a certain number of exceedances of the proposed site-specific standard, which is insufficient.

A statement of policy in Act 2 recognizes the importance of the public understanding how remediation standards are applied at a site:

> ***The public is entitled to understand how remediation standards are applied to a site*** through a plain language description of contamination present on a site, the risk it poses to public health and the environment and any proposed cleanup measure.

See Act 2, §102(9) (bold italics added for emphasis), 35 P.S. §6026.102(9) (same, in unofficial statute). In the case, Evergreen does not sufficiently explain the interplay between the soil-to-groundwater numeric value and the direct contact numeric value.

A. Under the regulations, a Medium-Specific Concentration is defined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value, unless the responsible party makes a soil-to-groundwater pathway equivalency determination.

For surface soils (0-2 feet), the MSC is determined by the lowest of three numbers, one of which is the soil-to-groundwater pathway numeric value:

> (d) ***For the nonresidential standard***, the MSC for regulated substances contained ***in soil throughout the soil column to a depth of 2 feet from the existing ground surface*** is one of the following:
>
> (1) ***The lowest of the following***:
>
> (i) ***The ingestion numeric value as determined by the methodology in § 250.306***, using the appropriate default nonresidential exposure assumptions contained in § 250.306(e).
>
> (ii) ***The inhalation numeric value*** which is the lower of the values for volatilization into the outdoor air and the inhalation of particulates, ***as determined by the methodology in § 250.307***, using the appropriate default nonresidential exposure assumptions contained in § 250.307(d).
>
> (iii) ***The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308***.

See 25 Pa. Code §250.308(d)(1) (bold italics added for emphasis). The other two numbers are the ingestion numeric value under §250.306 and the inhalation numeric value under 250.307. *See id.* Tables 3A (organics) and 4A (inorganics) in Appendix A list the other values (in the form of the direct contact numeric value) for each contaminant). *See id.*

A responsible party can avoid the soil-to-groundwater numeric value under paragraph (1)(iii), but only if it provides either a demonstration of a soil buffer or an equivalency demonstration:

> (2) ***The lowest of paragraph (1)(i) or (ii) and***, in addition, ***one of the following***:
>
> (i) ***A demonstration of the soil-to-groundwater pathway soil buffer*** as identified in § 250.308(b), if applicable.

> (ii) ***A soil-to-groundwater pathway equivalency demonstration*** as identified in § 250.308(d).

See id., 25 Pa. Code §250.308(d)(2) (bold italics added for emphasis).

The first cross-referenced section requires the identification of a soil buffer that meets a vertical distance value set forth in a Table in the regulations, as well as other requirements:

> (b) ***The soil-to-groundwater pathway soil buffer is the entire area between the bottom of the area of contamination and the groundwater or bedrock*** and ***shall meet the following criteria***:
>
> (1***) The soil depths established in Appendix A, Tables 3B and 4B*** for each regulated substance.
>
> (2) The ***concentration*** of the regulated substance ***cannot exceed the limit related to the PQL or background*** throughout the soil buffer.
>
> (3) No Karst carbonate formation underlies or is within 100 feet of the perimeter of the contaminated soil area.

See id., 25 Pa. Code §250.308(b) (bold italics added for emphasis). This means that the responsible party must look at Table 3B (setting forth soil buffer distances for organics) and Table 4B (setting forth soil buffer distances for inorganics), to compare with the depth of the soil sample.

In other words, assuming the soil-to-groundwater numeric value is the lowest of the three numbers in Section 306(d)(1), a responsible party must guide its soil samples according to the soil-to-groundwater numeric value or according to the PQL or background.

The second cross-referenced section allows the substitution of an equivalency demonstration if the groundwater is below the Medium-Specific Concentration or the background standard prior to remediation:

> (d) For any regulated substance, ***an equivalency demonstration may be substituted*** for the soil-to-groundwater numeric value throughout the site and the soil-to-groundwater pathway soil buffer ***if the groundwater is below the MSC value or the background standard prior to remediation***. This equivalency demonstration shall include the following:
>
> (1) ***Fate and transport analysis*** of the regulated substance from the deepest point of contamination in the soil through unsaturated zone soil ***and shall include the use of soil-to-water partition***

> ***coefficients***. The analysis ***shall demonstrate that the regulated substances will not migrate to bedrock or the groundwater within 30 years at concentrations exceeding the greater of the groundwater MSC or background groundwater*** as the endpoint in soil pore water directly under the site.
>
> (2) In addition to sampling required for attainment of the inhalation or ingestion numeric values for soils up to 15 feet, as applicable, **reporting and monitoring for eight quarters that shows no exceedances of the greater of the groundwater MSCs or of the background standard f**or groundwater beneath the contaminated soil and no indications of an increasing trend of concentration over time that may exceed the standard.

See id., 25 Pa. Code §250.308(d) (bold italics added for emphasis). To do this substitution, the responsible party would have to conduct groundwater modeling (a fate and transport analysis). In the present case, Evergreen has not performed an approvable fate and transport analysis. Therefore, this substitution is not available to Evergreen.

For subsurface soils (2-15 feet), the Medium-Specific Concentration is determined by the lowest of two numbers, one of which is the soil-to-groundwater pathway numeric value:

> (e) ***For the nonresidential standard***, the MSC for regulated substances contained ***in soils at depths greater than 2 feet through 15 feet from the existing ground surface***, is ***one of the following***:
>
> (1) ***The lowest of the following***:
>
> (i) ***The inhalation numeric value which considers volatilization to the outdoor air, as determined by the methodology in § 250.307***, using the appropriate default nonresidential exposure assumptions contained in § 250.307(d), and using a transfer factor (TF) based upon the calculated emission rate from subsurface soil as specified in the method of Jury, et al. 1990. Water Resources Research, Vol. 26, No. 1, pp. 13—20.
>
> (ii) ***The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308***.

25 Pa. Code §250.308(e)(1) (bold italics added for emphasis). (The analysis is the same as for surface soils, except for the fact that the ingestion numeric value is not considered).

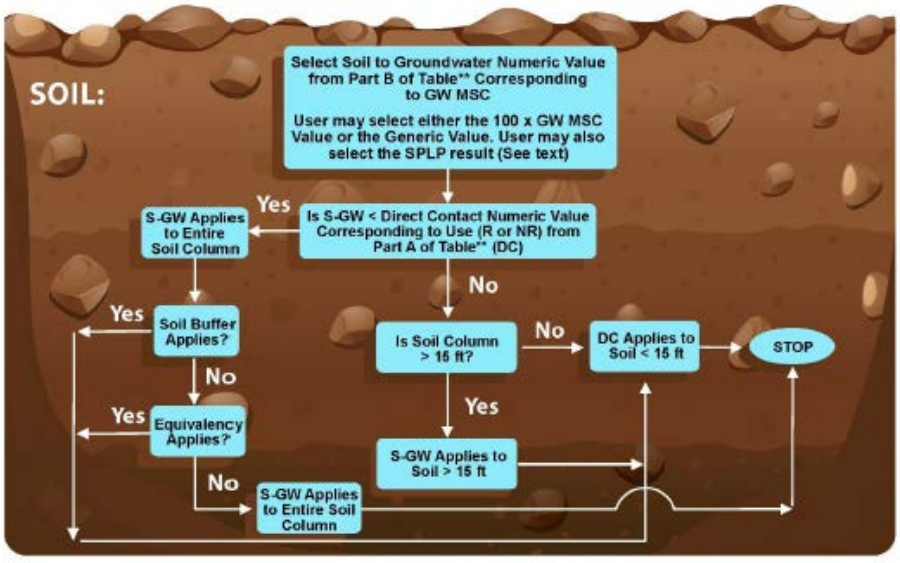
As in the case with surface soils, a responsible party can avoid the soil-to-groundwater numeric value under paragraph (e)(1)(ii), but only if it provides the same demonstrations as discussed above for surface soils:

> (2) ***The value identified in paragraph (1)(i)*** and ***one of the following***:
>
> (i) ***A demonstration of the soil-to-groundwater pathway soil buffer*** as identified in § 250.308(b), if applicable.
>
> (ii) ***A soil-to-groundwater pathway equivalency demonstration*** as identified in § 250.308(d).

25 Pa. Code §250.308(e)(2) (bold italics added for emphasis).

The Technical Guidance Manual confirms this analysis:

Figure II-11: Decision Tree for Selecting Statewide Health Standard MSCs for Groundwater and Soil



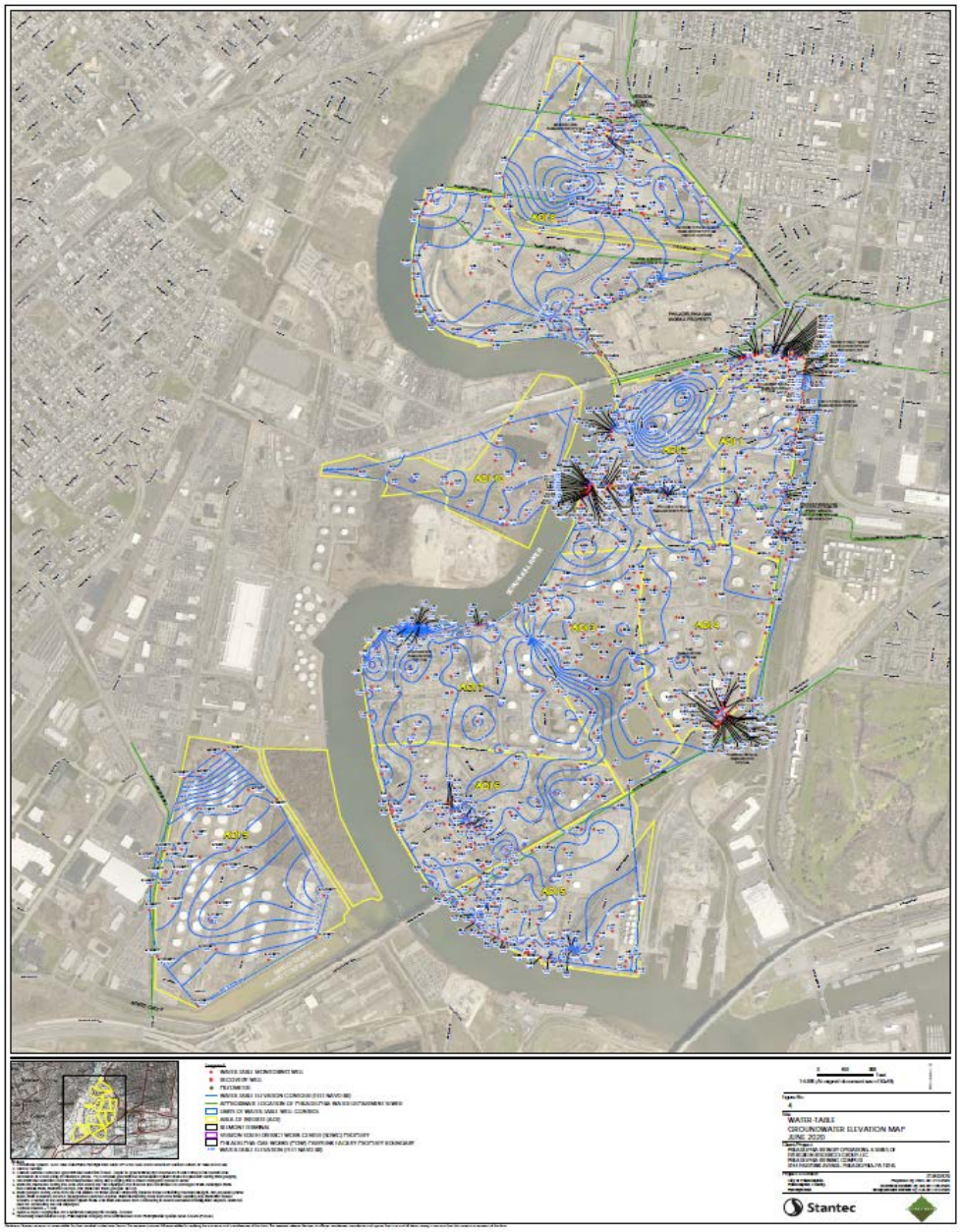
* For Organic Regulated Substances, use Table 1; Use Table 2 for Inorganic Regulated Substances
** For Organic Regulated Substances, use Table 3; Use Table 4 for Inorganic Regulated Substances

Note: Figure must be used in conjunction with the text. Reference Section II.B.2.c)

Technical Guidance Manual, page II-52.

B. Because areas of the refinery site have a high water table, Evergreen must compare the soil buffer distance for each Constituent of Concern with the depth of each soil sample, to determine whether the soil-to-groundwater numeric value or the direct contact numeric value defines the Medium-Specific Concentration.

According to a recent groundwater remediation status report, much of the site appears to have a high water table:



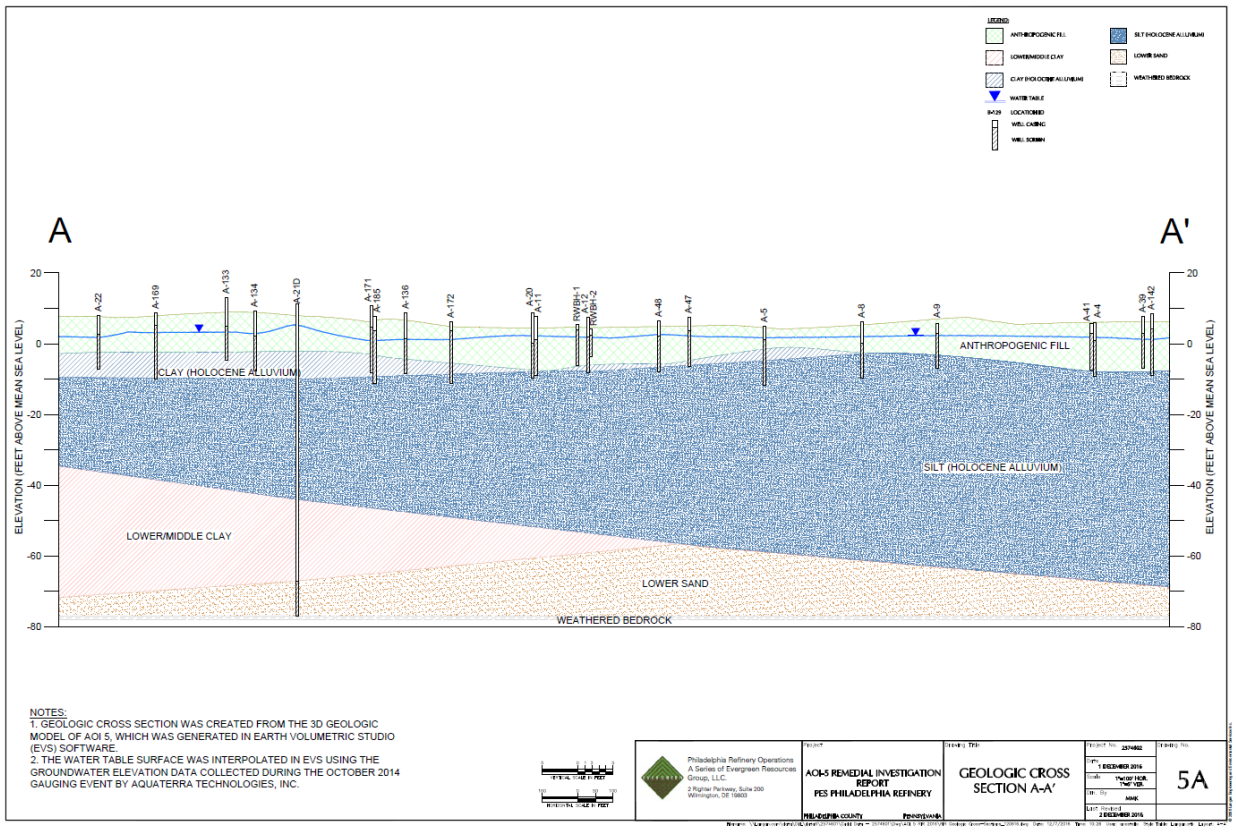
See Semi-Annual Remediation Status Report (June 2020), Figure 4 (Water-Table Groundwater Elevation Map). But the groundwater elevations on this contour map do not literally display the

depth to groundwater from the surface, for two reasons. First, the map is defined by reference to sea level, and not all of the site is located exactly at sea level. Second, not all of the site is exactly flat.

Instead, one must look to other evidence to ascertain the depth to the water table from the surface. Evergreen has provided geologic cross sections for all Areas of Interest. To illustrate with respect to AOI-5, the following Figure from the 2017 report identifies two cross sections -- an A-A' cross section generally running from west to east (in pink), and a B-B' cross section generally running from north to south (in green):

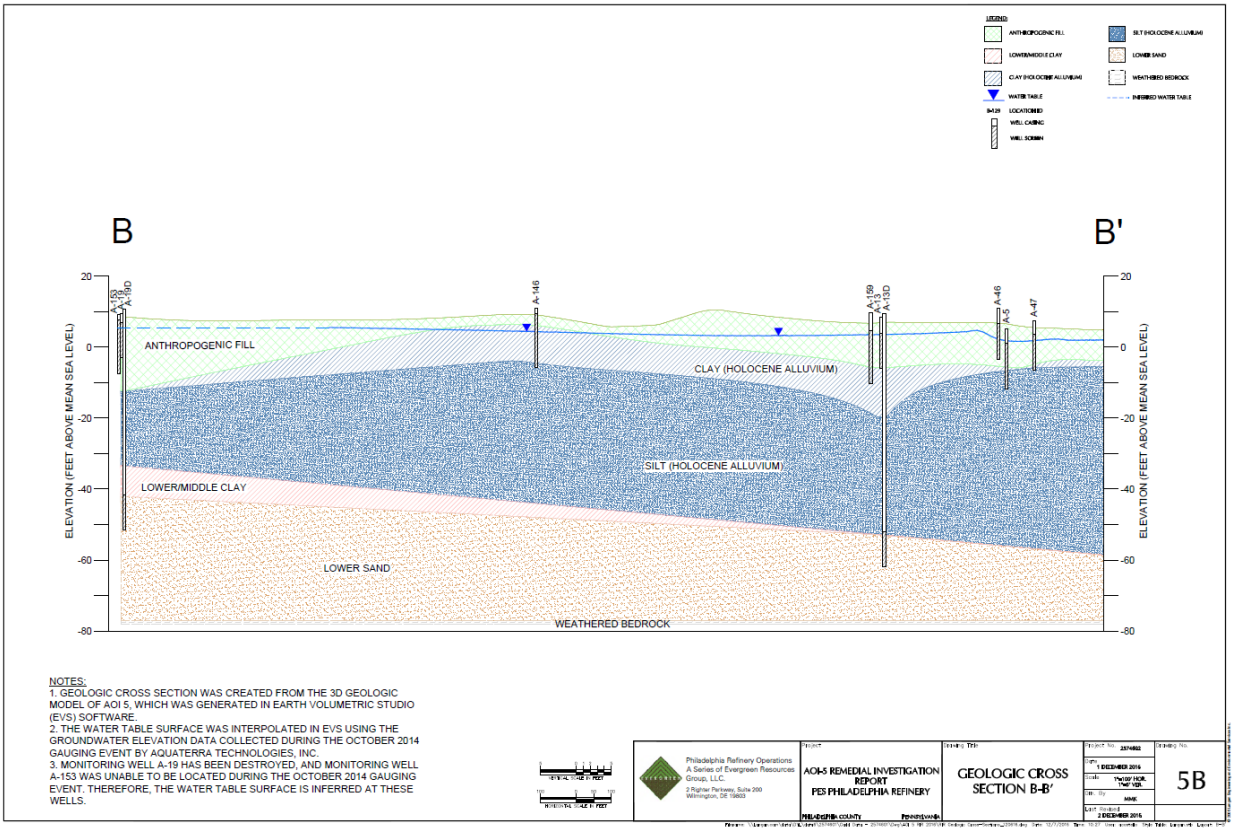
2017 Report (AOI-5), Figure 4 (Geologic Cross Section Location Plan).

The following Figure displays a side view of cross section A-A', looking from the south toward the north. Throughout all of this cross section, the distance between the yellow line at the top (the surface) and the blue line below (the water table) is less than ten feet:



See id., Figure 5A: Geologic Cross Section A-A'.

The other cross section B-B' tells a similar story. The following Figure displays a side view of this cross section, looking from the west toward the east. Throughout all the cross section, the distance between the yellow line at the top (the surface) and the blue line below (the water table) is less than ten feet:



See id., Figure 5B: Geologic Cross Section B-B'.

Despite this graphical evidence, Evergreen did not delineate the contamination in the 2017 report for AOI-5 according to the soil-to-groundwater numeric value. Rather, it delineated it according to the direct contact numeric value and the proposed site-specific value. (See discussion below). Evergreen does not provide a justification for this, and there does not appear to be one.

While Evergreen did use the soil-to-groundwater numeric value as a guide for some soil sampling for AOI-5, it did this for the limited purpose of making a hazardous waste determination under the Toxicity Characteristic Leaching Procedure (TCLP) for the management of hazardous waste under the Resource Conservation and Recovery Act (RCRA). (Once contamination is removed, it becomes waste if it is intended to be disposed). The purpose appears to have been simply to establish some criterion for limiting the amount of waste for consideration as hazardous waste. But Evergreen did not do this for all soil samples. This is insufficient to delineate contamination for these reports under Act 2.

A similar analysis may be performed for the other Areas of Interest. The following chart summarizes the geologic cross sections in the reports, and shows there are certain points where the depth to the water table is less than ten feet from the surface:

Area of Interest	Title	Clean Air Council's Analysis of Evergreen's Geologic Cross Sections
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report (part 1)	Figure 5-1, 5-2 (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-2 Point Breeze Processing Area	2017 Report (part 1) (approved)	Figure 5, 6 (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI 3 Point Breeze Impoundment Area	2017 Report (approved)	Figure 5, 6 (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-4 No. 4 Tank Farm	2013 Report (disapproved) 2017 Report (Figures) (disapproved)	Figure 5 (failing to show water table depth in cross section) Figures 2.6, 2.7. 2.8 (failing to show water table depth in cross sections)
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan (disapproved) 2017 Report (approved)	Figure 5 (failing to show water table depth in cross section) Figure 5A, 5B (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-6 Girard Point Chemicals Area	2013 Report (disapproved) 2017 Report (approved)	Figures 5, 6 (failing to show water table depth in cross section) Figure 8 (failing to show water table depth in cross section, apart from Schuylkill River)
AOI-7 Girard Point Fuels Area	2012 Report (disapproved) 2013 Addendum to Report (disapproved)	Figure 5A, 5B, 5C (suggesting water table is less than 10 feet below surface at certain points along cross sections) (not providing a geologic cross-section)

	2017 Report (approved)	Figure 8 (failing to show water table depth in cross section, apart from Schuylkill River)
AOI-8 North Yard	2012 Report 2012 Report (part 2) (approved) 2017 Report 2017 Report (part 2) (approved)	Figures 5a, 5b, 5C (failing to show water table depth in cross sections) Figures 2-6, 2-7, 2-8, 2-9, 2-10 (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-9 Schuylkill River Tank Farm	2015 Report (disapproved) 2017 Report Addendum (approved)	Figure 6A, 6B (suggesting water table is less than 10 feet below surface at certain points along cross sections) Figure 6a, 6b (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-10 West Yard	2011 Report (approved)	Figure 4A, 4B (suggesting water table is less than 10 feet below surface at certain points along cross sections)
AOI-11 Deep Aquifer Beneath Complex	2011 Report (part 1) 2011 Report (part 2) 2013 Report (part 1) 2013 Report (part 2) (disapproved)	Appendix D (Site Wide Geologic Cross Sections) (attaching 20 cross-sections for different Areas of Interest) Appendix C (Geologic Cross Sections) (attaching 23 cross-sections from historical reports) Appendix D (Site Wide Geologic Cross Sections) (attaching 20 cross-sections for different Areas of Interest) Appendix C (Geologic Cross Sections) (attaching 23 cross-sections from historical reports)

The regulations set forth a different buffer depth for a number of contaminants. To illustrate in the case of organics, the soil buffer distance for 1,2,4-trimethylbenzene is 15 feet and the soil buffer distance for 1,3,5-trimethylbenzene is 30 feet:

Table 3—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values[1]

REGULATED SUBSTANCE	CASRN	Used Aquifers								Nonuse Aquifers				Soil Buffer Distance (feet)
		TDS ≤ 2500				TDS > 2500								
		Residential		Nonresidential		Residential		Nonresidential		Residential		Nonresidential		
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	
TRICHLOROPROPANE, 1,2,3-	96-18-4	4	3.2 E	4	3.2 E	400	320 E	400	320 E	400	320 E	400	320 E	NA
TRICHLOROPROPENE, 1,2,3-	96-19-5	0.063	0.037 E	0.26	0.15 E	6.3	3.7 E	26	15 E	0.063	0.037 E	0.26	0.15 E	NA
TRIETHYLAMINE	121-44-8	1.5	0.36 E	6.2	1.5 E	150	36 E	620	150 E	1.5	0.36 E	6.2	1.5 E	NA
TRIETHYLENE GLYCOL	112-27-6	8,300	1,000 E	10,000	2,900 E	10,000	10,000 C	10,000	10,000 C	8,300	1,000 E	10,000	2,900 E	NA
TRIFLURALIN	1582-09-8	1	1.9 E	1	1.9 E	100	190 E	100	190 E	1	1.9 E	1	1.9 E	30
TRIMETHYLBENZENE, 1,3,4- (TRIMETHYLBENZENE, 1,2,4-)	95-63-6	1.5	8.4 E	6.2	35 E	150	840 E	620	3,500 E	150	840 E	620	3,500 E	15
TRIMETHYLBENZENE, 1,3,5-	108-67-8	42	74 E	120	210 E	4,200	7,400 E	4,900	8,600 E	42	74 E	120	210 E	30
TRINITROGLYCEROL (NITROGLYCERIN)	55-63-0	0.5	0.2 E	0.5	0.2 E	50	20 E	50	20 E	50	20 E	50	20 E	NA
TRINITROTOLUENE, 2,4,6-	118-96-7	0.2	0.023 E	0.2	0.023 E	20	2.3 E	20	2.3 E	0.2	0.023 E	0.2	0.023 E	NA
VINYL ACETATE	108-05-4	42	5 E	180	21 E	4,200	500 E	10,000	2,100 E	42	5 E	180	21 E	NA
VINYL BROMIDE (BROMOETHENE)	593-60-2	0.15	0.073 E	0.78	0.38 E	15	7.3 E	78	38 E	1.5	0.73 E	7.8	3.8 E	NA
VINYL CHLORIDE	75-01-4	0.2	0.027 E	0.2	0.027 E	20	2.7 E	20	2.7 E	2	0.27 E	2	0.27 E	NA
WARFARIN	81-81-2	1.3	3.1 E	3.5	8.4 E	130	310 E	350	840 E	1,300	3,100 E	1,700	4,100 E	30
XYLENES (TOTAL)	1330-20-7	1,000	990 E	1,000	990 E	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	10,000	10,000 C	NA
ZINEB	12122-67-7	210	33 E	580	92 E	1,000	160 E	1,000	160 E	210	33 E	580	92 E	NA

[1] For other options see Section 250.308
All concentrations in mg/kg
E—Number calculated by the soil to groundwater equation is section 250.308
C—Cap
NA—The soil buffer distance option is not available for this substance
THMs—The values listed for trihalomethanes (THMs) are the total for all THMs combined.
HAAs—The values listed for haloacetic acids (HAAs) are the total for all HAAs combined.

See 25 Pa. Code 250, Appendix A, Table 3B (organic regulated substances).

To illustrate in the case of inorganics (metals), the soil buffer distance for lead is 10 feet:

Table 4—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
B. Soil to Groundwater Numeric Values[1]

REGULATED SUBSTANCE	CASRN	Used Aquifers								Nonuse Aquifers				Soil Buffer Distance (feet)
		TDS <= 2500				TDS > 2500								
		R		NR		R		NR		R		NR		
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	
ALUMINUM	7429-90-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	7440-36-0	0.6	27	0.6	27	60	2,700	60	2,700	600	27,000	600	27,000	15
ARSENIC	7440-38-2	1	29	1	29	100	2,900	100	2,900	1,000	29,000	1,000	29,000	15
BARIUM AND COMPOUNDS	7440-39-3	200	8,200	200	8,200	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15
BERYLLIUM	7440-41-7	0.4	320	0.4	320	40	32,000	40	32,000	400	190,000	400	190,000	10
BORON AND COMPOUNDS	7440-42-8	600	1,900	600	1,900	60,000	190,000	60,000	190,000	190,000	190,000	190,000	190,000	30
CADMIUM	7440-43-9	0.5	38	0.5	38	50	3,800	50	3,800	500	38,000	500	38,000	15
CHROMIUM (III)	16065-83-1	10	190,000	10	190,000	1,000	190,000	1,000	190,000	10,000	190,000	10,000	190,000	5
CHROMIUM (VI)	18540-29-9	10	190	10	190	1,000	19,000	1,000	19,000	10,000	190,000	10,000	190,000	15
COBALT	7440-48-4	1	59	4	160	130	5,900	350	16,000	1,300	59,000	3,500	160,000	15
COPPER	7440-50-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE, FREE	57-12-5	20	200	20	200	2,000	20,000	2,000	20,000	20,000	190,000	20,000	190,000	20
FLUORIDE	16984-48-8	400	44	400	44	40,000	4,400	40,000	4,400	190,000	44,000	190,000	44,000	NA
IRON	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	7439-92-1	0.5	450	0.5	450	50	45,000	50	45,000	500	190,000	500	190,000	10
LITHIUM	7439-93-2	8	2,500	23	6,900	830	190,000	2,300	190,000	8,300	190,000	23,000	190,000	10
MANGANESE	7439-96-5	30	2,000	30	2,000	3,000	190,000	3,000	190,000	30,000	190,000	30,000	190,000	15
MERCURY	7439-97-6	0.2	10	0.2	10	20	1,000	20	1,000	200	10,000	200	10,000	15
MOLYBDENUM	7439-98-7	4	650	4	650	400	65,000	400	65,000	4,000	190,000	4,000	190,000	15
NICKEL	7440-02-0	10	650	10	650	1,000	65,000	1,000	65,000	10,000	190,000	10,000	190,000	15
PERCHLORATE	7790-98-9	1.5	0.17	1.5	0.17	150	17	150	17	1,500	170	1,500	170	NA
SELENIUM	7782-49-2	5	26	5	26	500	2,600	500	2,600	5,000	26,000	5,000	26,000	20
SILVER	7440-22-4	10	84	10	84	1,000	8,400	1,000	8,400	10,000	84,000	10,000	84,000	20
STRONTIUM	7440-24-6	400	44	400	44	40,000	4,400	40,000	4,400	190,000	44,000	190,000	44,000	NA
THALLIUM	7440-28-0	0.2	14	0.2	14	20	1,400	20	1,400	200	14,000	200	14,000	15
TIN	7440-31-5	2,500	190,000	7,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	10
VANADIUM	7440-62-2	0.29	290	0.82	820	29	29,000	82	82,000	290	190,000	820	190,000	5
ZINC	440-66-6	200	12,000	200	12,000	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15

[1]For other options see Section 250.308
All concentrations in mg/kg
R—Residential
NR—Non-Residential
NA—Not Applicable

See id., Table 4B (inorganic regulated substances).

Because the geologic cross sections indicate a water table less than ten feet from the surface in areas of the refinery site, Evergreen should have identified the soil buffer distance listed in Table 3B and Table 4B for each contaminant and compared it with the depth of groundwater (namely, the number of feet below the surface at which groundwater is present). Only if Evergreen can satisfy the soil buffer distance test or provide a sufficient equivalency demonstration, can it use the direct contact numeric value to determine the Medium-Specific Concentration.

But Evergreen did not incorporate this analysis into the reports. It should revise the reports to correct this deficiency.

C. <u>Constituents of Concern have soil buffer distances of 5 feet, 10 feet, 15 feet, and 30 feet, potentially causing the soil-to-groundwater numeric value to determine the Medium-Specific Concentration</u>.

In the reports, Evergreen identifies Constituents of Concern for soil sampling and groundwater sampling. *See e.g.*, 2017 Report (AOI-7) (Table 1, "Constituents of Concern"). The following Table (prepared by the Council, not Evergreen) identifies the soil-to-groundwater numeric values and direct contact numeric values referenced by Evergreen.

There are two values that may be used to establish the soil-to-groundwater numeric value. One is based on 100 times the MSC for groundwater. Another is based on generic value

calculations. The one used by Evergreen is highlighted in green. For each Constituent of Concern, the soil-to-groundwater numeric value used by Evergreen is lower than the direct contact numeric value.

In addition, the Table identifies the soil buffer distances corresponding to the Constituents of Concern, and they range from 5 feet (for chrysene) to 30 feet (for naphthalene).

All values in these tables are listed in the regulations as of January 14, 2021, and do not include proposed values in the Department's pending Act 2 rulemaking.

Volatile Organic Compounds (VOCs)
(Prepared by Clean Air Council)

Constituent of Concern	**Nonresidential Surface (0-2ft) soil MSC (mg/kg)**	**Buffer depth (ft)**	**Soil to groundwater 100*GW MSC (mg/kg)**	**Soil to groundwater generic value (mg/kg)**
1,2-Dichloroethane (CAS 107-06-2)	**86 (85)**	NA	**0.5**	0.1
1,2,4-Trimethylbenzene (CAS 95-63-6)	**560 (4700)**	15	6.2(53)	**35 (300)**
1,3,5-Trimethylbenzene (CAS 108-67-8)	**10,000 (4700)**	30	120(53)	**210 (93)**
Benzene (CAS 71-43-2)	**290 (280)**	NA	**0.5**	0.13
Cumene (CAS 98-82-8)	**7700 (7600)**	15	350	**2500**
Ethylbenzene (CAS 100-41-4)	**890 (880)**	NA	**70**	46
Ethylene Dibromide (EDB) (CAS 106-93-4)	**3.7**	NA	**0.005**	0.0012

Methyl Tertiary Butyl Ether (CAS 1634-04-4)	**8600/(8500)**	NA	**2**	0.28
Toluene (CAS 108-88-3)	**10,000**	NA	**100**	44
Xylene (Total) (CAS 1330-20-7)	**8000 (7900)**	NA	**1000**	990

Semivolatile Organic Compounds (VOCs)
(Prepared by Clean Air Council)

Constituent of Concern	Nonresidential Surface soil MSC (mg/kg)	Buffer depth (ft)	Soil to groundwater 100*GW MSC (mg/kg)	Soil to groundwater generic value (mg/kg)
Anthracene (CAS 120-12-7)	**190,000**	10	6.6	**350**
Benzo(a)anthracene (CAS 56-55-3)	**130**	5	0.49(0.39)	**430 (340)**
Benzo(a)pyrene (CAS 50-32-8)	**12 (91)**	5	0.02	**46**
Benzo(b)fluoranthene (CAS 205-99-2)	**76**	5	0.12	**170**
Benzo(g,h,i)perylene (CAS 191-24-2)	**190,000**	5	0.026	**180**
Chrysene (CAS 218-01-9)	**760**	5	0.19	**230**
Fluorene (CAS 86-73-7)	**130,000**	15	190	**3800**
Naphthalene (CAS 91-20-3)	**760/(66)**	30	10	**25**
Phenanthrene (CAS 85-01-8)	**190,000**	10	110	**10,000**
Pyrene (CAS 129-00-0)	**96,000**	10	13	**2200**

For areas where the water table is less than thirty feet from the surface, the Medium-Specific Concentration for the following Constituents of Concern may have to be set by the soil-to-groundwater numeric value:

1. 1,3,5-Trimethylbenzene (soil buffer distance of 30 feet).

For any areas where the water table is less than fifteen feet from the surface, the Medium-Specific Concentration for the following Constituents of Concern may have to be set by the soil-to-groundwater numeric value:

1. 1,2,4-Trimethylbenzene (soil buffer distance of 15 feet),
2. 1,3,5-Trimethylbenzene (soil buffer distance of 30 feet),
3. Cumene (soil buffer distance of 15 feet),
4. Fluorene (soil buffer distance of 15 feet), and
5. Naphthalene (soil buffer distance of 15 feet).

For any areas where the water table is less than ten feet from the surface, the Medium-Specific Concentration for the following Constituents of Concern may have to be set by the soil-to-groundwater numeric value:

1. Anthracene (soil buffer distance of 10 feet),
2. Phenanthrene (soil buffer distance of 10 feet), and
3. Pyrene (soil buffer distance of 10 feet).

For any areas where the water table is less than five feet from the surface, Evergreen should have used the soil-to-groundwater numeric value to determine the Medium-Specific Concentration for the following contaminants:

1. Benzo(a)anthracene (soil buffer distance of 5 feet),
2. Benzo(a)pyrene (soil buffer distance of 5 feet),
3. Benzo(b)fluoranthene (soil buffer distance of 5 feet),
4. Benzo(g,h,i)perylene (soil buffer distance of 5 feet), and
5. Chrysene (soil buffer distance of 5 feet).

But the reports do not include an analysis of soil buffer distances and their role in determining the Medium-Specific Concentration. When it revises the reports, Evergreen should be including a sufficient analysis.

D. Although Evergreen appears to have used the soil-to-groundwater numeric value to determine the Medium-Specific Concentration in some instances, it did not do this as a matter of course.

In the narrative text of the reports, when Evergreen identifies exceedances of the soil-to-groundwater numeric value, it is merely pointed to data tables. Evergreen does not provide an analysis of exceedances of this value or even identify the number of these exceedances in the

narrative text. Rather, it shifts to the direct contact numeric value and the site-specific standard to delineate the contamination.

The following tables illustrate how Evergreen did this:

AOI-1: Point Breeze No. 1 Tank Farm

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2016 Report (part 1) 2016 Report (part 2) (approved)	Table 3-2 (historical, statewide health standards) (identifies only the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances in orange) Table 3-3 (historical, characterization soil screening levels) (identifies only the direct contact numeric values for surface soils and subsurface soils (although the proposed site-specific standard for lead is substituted), and highlights exceedances in orange)	Section 3.5, page 3.25-3.26 (delineating only with respect to the direct contact numeric value and the proposed site-specific standard) Section 9.3.1, page 9.52 (vague summary does discuss exceedances of the soil-to-groundwater numeric value)

AOI-2: Point Breeze Processing Area

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 4 (identifies both the soil-to-groundwater numeric value and the direct contact numeric value (although it substitutes the proposed site-specific standard for the direct contact numeric value for lead), and highlights exceedances of each in different ways in the Table)	Section 5.1, page 31 (delineating only exceedances of the direct contact numeric value and the proposed site-specific standard, and not delineating exceedances of the soil-to-groundwater numeric value) Section 11.1, page 53 (asserting in a circular fashion that "[a]ny soils that exhibited exceedances of the soil-to-groundwater MSCs the corresponding soil-to-groundwater pathway will be

		evaluated through analysis and characterization of the groundwater pathway")

AOI 3: Point Breeze Impoundment Area

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 4 (identifies only the direct contact numeric value (although it substitutes the proposed site-specific standard for the direct contact numeric value for lead), and highlights exceedances of this value in the Table).	Section 3.1, pages 18-19 (delineating only exceedances of the direct contact numeric value and the proposed site-specific standard, and not delineating exceedances of the soil-to-groundwater numeric value) Section 11.0, page 46 (dismissing the soil-to-groundwater pathway and using the confusing term "direct-contact pathway," asserts that "[w]ith regard to the potential direct-contact pathway to subsurface soil within AOI 3 (i.e., greater than 2 feet deep) and the soil-to-groundwater pathway, the direct contact pathway to soil greater than 2 feet beneath the ground surface at the Complex is considered incomplete because of on-site procedures and PPE requirements that protect onsite workers from exposure.")

Table 4 of the 2017 report obliterates any consideration of the soil-to-groundwater numeric value**.**

AOI-4: No. 4 Tank Farm

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2013 Report (disapproved)	Table 4 (identifies both the soil-to-groundwater numeric value and the direct contact numeric value, and	Section 5.2, page 18 (asserting that "1,2,4-TMB, 1,3,5-TMB, benzene, and lead exceeded their respective

	also identifies the MSC (determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of all three in Table).	non-residential MSCs," but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value) Section 12.0, page 35 (asserting that "[c]oncentrations of benzene, 1,2,4-TMB, 1,3,5-TMB, and lead detected in soil samples collected in AOI 4 were above their respective PADEP non-residential soil MSCs"), but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value)
2017 Report (part 1) 2017 Report (part 2) (disapproved)	Table 3-2 (statewide health standards) identifies only the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances in orange). Table 3-3 (direct contact MSCs) (identifies only the direct contact numeric value for surface soil and subsurface soil (although it substitutes the proposed site-specific standard for lead), and highlights exceedances in orange).	Section 3.6, pages 22-23 (delineating only exceedances of the direct contact numeric value and the proposed site-specific standard, but in passing it mentions several exceedances of the soil-to-groundwater numeric value, while apparently neglecting the exceedance of 494 mg/kg for BH-13-101) Section 13.1, page 13.72 (delineating only exceedances of the direct contact numeric value and the proposed site-specific standard, by asserting that "[c]oncentrations of COCs in all other collected soil samples (including subsurface soil) were below the highest of the SHS, the non-residential direct contact MSC, or the numeric lead SSS.").

The 2013 report is extremely confusing because the same listed concentration may be highlighted in bold (with reference to one value), underlining (with reference to another value), or gray (with reference to yet another value) -- or a combination of several methods of highlighting.

The approach of the 2017 report is like the approach for the AOI-1 report.

Spot-checking data reveals the omission of an exceedance in the narrative for the exceedance of 494 mg/kg for BH-13-101.

In addition to checking the data in these reports again, Evergreen should prepare separate maps showing the locations of exceedances -- one for the soil-to-groundwater numeric value, one for the direct contact numeric value, and one for the proposed site-specific standard. This way, the public will have a better context for visualizing and understanding the data and its implications for delineating the extent of the contamination.

AOI-5: Girard Point South Tank Field

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2011 Report/Cleanup Plan (disapproved)	Table 4 (outside Solid Waste Management Unit (SWMU) areas) (identifies both the soil-to-groundwater numeric value and the direct contact numeric value, and highlights exceedances of each) Table 5 (SWMU areas) (identifies both the soil-to-groundwater numeric value and the direct contact numeric value, and highlights exceedances of each)	Section 5.0, pages 20-24, Figure 8 (attempts to delineate for both the soil-to-groundwater numeric value and the direct contact numeric value, for both non-SWMU areas and SWMU areas) Section 13.0, pages 36, 47-48 (attempts to delineate only for a calculated site-specific standard for lead of 1708 mg/kg)
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 4 (identifies only the direct contact numeric value (although it substitutes the proposed site-specific standard for the direct contact numeric value for lead), and highlights exceedances of this value.	Section 5.1, 5.3, pages 19, 38-45, Figure 8 (legend) (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard, and using the soil-to-groundwater numeric value only as a benchmark for limiting soil samples a hazardous waste determination

		through the use of the Toxic Characteristic Leaching Procedure) Section 10.0, pages 64-65 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard)

Table 4 of the 2011 report is very confusing because the same listed concentration may be highlighted in bold (with reference to the direct contact value), and gray (with reference to both). This buries the significance of the soil-to-groundwater numeric value, which is a concern where the water table is less than ten feet from the surface (the soil buffer distance for lead in Table 4B is 10 feet).

Table 5 of the 2011 report is extremely confusing because the highlighting because the same listed concentration may be highlighted bold (with reference to the direct contact value), or dark gray (with reference to both), and there is also an unrelated light gray shading of the entire rows immediately above and below the row displaying these data. (There is a fourth kind of highlighting where the sides of the rectangular cell are highlighted to denote exceedances of the Toxic Characteristic Leaching Procedure for purposes of determining whether the material constitutes hazardous waste under the Resource Conservation and Recovery Act). The public deserves a clearer presentation of the data regarding exceedances of the soil-to-groundwater numeric value.

In Table 4 of the 2017 report, Evergreen completely obliterated a reference to exceedances of the soil-to-groundwater numeric value. This is a problem because the proposed site-specific value is inappropriate and Evergreen has stated that it would follow any future changes by the Department with respect to the target blood lead level.

Given the concerns about the high water table, Evergreen should revise the report to include a discussion about the number and location of soil samples with exceedances of the soil-to-groundwater numeric value.

AOI-6: Girard Point Chemicals Area

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2013 Report (part 1) 2013 Report	Table 4 (identifies the soil-to-groundwater numeric value and the direct contact numeric	Section 5.1, 5.2, pages 19-22, Figure 10 (legend) (attempting to delineate for both the soil-to-groundwater numeric value and

(part 2) (disapproved)	values, as well as the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of all three).	the direct contact numeric value, for both non-SWMU areas and SWMU areas, but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value, forcing the reader to pick them off Figure 10) Section 12.0, page 41 (asserting that "[c]oncentrations of benzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, benzo(a)pyrene, ethylbenzene, ethylene dibromide, cumene, and lead detected in soil samples collected in AOI 6 were above their respective PADEP non-residential soil MSCs"), but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value)
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 3a (current data) (identifies the soil-to-groundwater numeric value and the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of all three). Table 4a (historical data) (identifies the direct contact numeric value and the SHS (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of each with multiple superscripts, in addition to bold, underlining, and orange).	Section 3.5, page 22 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard) Section 3.6, pages 22-23 (referencing some exceedances of the soil-to-groundwater numeric value in additional soil sampling, but not discussing the implications of the exceedances and whether additional sampling should have been performed) Section 13.1, page 42 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard)

Table 4 of the 2013 report is extremely confusing because the same listed concentration may be highlighted in bold (with respect to one value), underlining (with respect to another value), and gray (with respect to yet another value). This is like the 2014 report for AOI-4

Table 4a of the 2017 report is very confusing because one has to read the superscript notes at the bottom of the spreadsheet to find out which value is being exceeded. The data relating to exceedances of the soil-to-groundwater numeric value should be broken out so that they may be understood.

AOI-7: Girard Point Fuels Area

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2012 Report (disapproved)	Table 4 (identifies only the soil-to-groundwater numeric value, and highlights exceedances)	Section 5.1, 5.2, pages 23-26, Figure 8 (legend) (attempting to delineate for the soil-to-groundwater numeric value, for both non-SWMU areas and SWMU areas) Section 12.0, page 45 (stating that "[c]oncentrations of benzene, naphthalene, 1,2,4-TMB, and lead detected in surface soil samples collected in AOI 7 were above their respective PADEP non-residential soil MSCs, but does not ___, and dismisses this under the rationale that "all but one location (BH-10-26 for lead) were below the calculated site-specific standards")
2013 Addendum to Report (disapproved)	Table 3 (identifies the soil-to-groundwater numeric value, the direct contact numeric value, and the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of all three).	Section 4.1, 4.2, pages 6-10, Figure 3 (legend) (attempting to identify exceedances of the soil-to-groundwater numeric value, for both non-SWMU areas and SWMU areas) Section 7.0, page 13 (stating that "[c]oncentrations of lead were detected in shallow soil samples above the non-residential soil MSC, and concentrations of 1,3,5-TMB, lead and

		benzene were detected in deep soils above the non-residential soil MSC," but not explaining why this is sufficient to delineate the contamination)
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 3a (current data) (identifies the direct contact numeric value and the MSC (apparently determined by the lower of the soil-to-groundwater numeric value or the direct contact numeric value, but substitutes the proposed site-specific standard for the MSC for lead), and highlights exceedances of each). Table 4a (historical data) (identifies the direct contact numeric value and the SHS (apparently defining it as the lower of the soil-to-groundwater numeric value or the direct contact numeric value, but substituting the proposed site-specific standard for the direct contact numeric value for lead), and highlighting exceedances of each in orange, bold, and italics in the Table).	Section 3.6, page 25 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard) Section 3.7, page 26 (referencing some exceedances of the soil-to-groundwater numeric value in additional soil sampling, but not discussing the implications of the exceedances and whether additional sampling should have been performed) Section 13.1, page 45 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard)

Table 3 of the 2013 Addendum is extremely confusing because a listed concentration may be highlighted in bold (with respect to one value), underlining (with respect to another value), and gray (with respect to yet another value). This is like the 2014 report for AOI-4

Table 3a of the 2017 report is misleading because the proposed site-specific standard is the only value for lead that is listed, meaning that one reviewing this would know nothing about exceedances of the soil-to-groundwater numeric value or the direct contact numeric value for lead.

Table 4a of the 2017 report is confusing; while it identifies exceedances of the soil-to-groundwater numeric value, it suffers from too much highlighting by reference to multiple values, making it very difficult to evaluate the exceedances in terms of the multiple values.

AOI-8: North Yard

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2012 Report (part 1) 2012 Report (part 2) (approved)	Table 4 (non-SWMU) (identifies only the MSC (apparently defining it as the soil-to-groundwater numeric value) and highlights exceedances in gray) Table 5 (SWMU 2) (identifies only the MSC (apparently defining it solely by the soil-to-groundwater numeric value) and highlights exceedances in gray)	Section 5.1, 5.2, pages 24-25, Figure 8 (legend) (attempting to delineate for the soil-to-groundwater numeric value, for both non-SWMU areas and SWMU areas), but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value, forcing the reader to pick them off Figure 8) Section 12.0, page 55 (stating that "[c]oncentrations of benzene, naphthalene, benzo(a)pyrene and lead detected in shallow soil samples collected in AOI 8 were above their respective non-residential soil MSCs; however they were below the calculated site-specific standards," but not explaining why this is sufficient to delineate the contamination)
2017 Report (part 1) 2017 Report (part 2) (approved)	Table 3-2 (identifies only the SHS (apparently defining it as the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlighting exceedances are highlighted in orange and bold and underlining) Table 3-3 (same data) (identifies only the direct contract numeric value for surface soils and subsurface soils (but characterizes the proposed site-specific standard as the direct contract	Section 3.5, pages 3.27-3.28 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard) Section 13.1, page 13.80 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard)

	numeric value for lead), and highlights exceedances in orange.	

Table 3-3 of the 2017 obliterates any characterization of exceedances of the direct contact numeric value where those exceedances are less than the proposed site-specific standard.

AOI-9: Schuylkill River Tank Farm

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2015 Report (part 1) 2015 Report (part 2) (disapproved)	Table 4a (PA inspection) (identifies only the MSC (apparently defining it as the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances in purple) Table 5 (identifies the Surface Soil MSC (apparently defining it as the lower of the soil-to-groundwater numeric value) and the Direct Contact MSC (another term for the direct contact numeric value), and highlights one in bold and underlining and the other in gray.	Section 5.2, pages 31-32, Section 5.4, pages 34-35, Figure 11 (legend) (implying an attempt to delineate for the soil-to-groundwater numeric value, but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value, forcing the reader to pick them off Figure 11, which actually only identifies exceedances of the direct contact numeric value and the proposed site-specific standard, and not exceedances of the soil-to-groundwater numeric value) Section 11.0, page 49 (stating that "[t]hirteen surface soil locations exhibited lead concentrations above the SSS or benzo(a)pyrene concentrations above the non-residential soil direct contact MSC," but not explaining why this is sufficient to delineate the contamination)
2017 Report Addendum (part 1)	Table 4 (identifies only the direct contact numeric value (substituting the proposed site-specific standard for the direct contact numeric value	Section 4.1, pages 16-17, Figure 16 (legend) (attempting to delineate contamination only with respect to the direct contact numeric value and the

2017 Report Addendum (part 2) (approved)	for lead), and highlights exceedances of this value).	proposed site-specific standard) Section 7.0, page 28 (attempting to delineate contamination only with respect to the direct contact numeric value and the proposed site-specific standard) Section 7.0, page 28 (stating that "[o]ne surface soil location exhibited a lead concentration above the SSS for lead. This exceedance has been delineated." Section 7.0, page 28 (stating that [o]ne surface soil location exhibited a benzo(b)flouranthene concentration above the PADEP non-residential surface soil direct contact MSC. This exceedance has been delineated.")

Evergreen's failure to identify exceedances on Figure 11 demonstrates why it should revise all these reports. What guided the entire investigation was a concern for establishing a less stringent standard (the direct contact numeric value or the proposed site-specific standard), rather than the more stringent soil-to-groundwater numeric value. If the latter numeric value had been used, Evergreen would have been able to characterize the contamination more precisely.

Instead, it established an approach that biased the investigation toward higher exceedances of the direct contact numeric value or the proposed site-specific standard, to the neglect of lower exceedances of the soil-to-groundwater numeric value. That latter approach would have presented a more detailed picture. We cannot see that picture because Figure 11 is flawed and missing data.

Table 5 of the 2015 report is extremely confusing, as it blurs terms (the MSC and the site-specific standard), its uses terms that have legal distinctions without making that distinction clear (Surface Soil MSC and Direct Contact MSC) and obliterating characterization of the soil-to-groundwater numeric value, at least with respect to lead. A site-specific standard is not an MSC. *Cf.* 25 Pa. Code 250, subchapter C (Statewide Health Standards) with 25 Pa. Code 250, subchapter D (Site-Specific Standard).

Table 4 of the 2017 report addendum obliterates any characterization of exceedances of the soil-to-groundwater numeric value where the exceedances are less than the proposed site-specific standard.

The 2017 Addendum does not even attempt to delineate exceedances of the soil-to-groundwater numeric value or the direct contact numeric value -- and there are 55 exceedances of the direct contact numeric value.

AOI-10: West Yard

Title	Analysis of Evergreen's Tables	Analysis of Evergreen's Textual Narrative
2011 Report (approved)	Table 4 (areas outside SWMU) (identifies the direct contact numeric value and the MSC (apparently defining it as the lower of the soil-to-groundwater numeric value or the direct contact numeric value), and highlights exceedances of both of each in gray) Tables 5-9 (similar)	Section 4.1, 4.2, pages 17-18, Figure 7 (legend), Figure 8 (legend) (attempting to delineate for the soil-to-groundwater numeric value, for both Corrective Action Management Unit (CAMU) areas and non-CAMU areas, but not identifying how many soil samples had exceedances, which soil samples had exceedances, what was the numeric value used to determine the exceedances, or what was the extent of the exceedance of the numeric value, forcing the reader to pick them off Figure 7 and Figure 8) Section 11.0, pages 36-37 (attempting to delineate contamination only with respect to proposed site-specific standards)

E. Evergreen fails to establish a soil buffer equivalency determination as required by the regulations, instead offering a "qualitative assessment" that defers its work to a future Fate and Transport Remedial Investigation Report, underscoring the interdependence of these reports and fragmenting the public comment process.

For all Areas of Interest, Evergreen uses the direct contact numeric value to delineate soil exceedances (for both surface soil and subsurface soil), rather than the soil-to groundwater numeric value. Evergreen offers no alternative equivalency determination to meet the requirements for an "an equivalency demonstration" in Section 250.308(d) of the regulations:

> (d) For any regulated substance, ***an equivalency demonstration may be substituted*** for the soil-to-groundwater numeric value throughout the site and the soil-to-groundwater pathway soil

> buffer ***if the groundwater is below the MSC value or the background standard prior to remediation***. This equivalency demonstration shall include the following:
>
> (1) ***Fate and transport analysis*** of the regulated substance ***from the deepest point of contamination in the soil through unsaturated zone soil*** and shall include the ***use of soil-to-water partition coefficients***. The analysis shall demonstrate that ***the regulated substances will not migrate to bedrock or the groundwater within 30 years*** at ***concentrations exceeding the greater of the groundwater MSC or background in groundwater*** as the ***endpoint in soil pore water directly under the site***.
>
> (2) In addition to sampling required for attainment of the inhalation or ingestion numeric values for soils up to 15 feet, as applicable, reporting and monitoring for eight quarters that shows no exceedances of the greater of the groundwater MSCs or of the background standard for groundwater beneath the contaminated soil and no indications of an increasing trend of concentration over time that may exceed the standard.

Section 250.308(d) (bold italics added for emphasis).

By its own admission, Evergreen avoids these quantitative requirements and instead offers its own "qualitative assessment." Evergreen does not even ask the Department to accept a qualitative assessment in place of the quantitative assessment required by the regulations. Evergreen may not avoid the requirements of the regulations in this manner.

Any vague assertions by Evergreen about aboveground activities cited to support a "pathway elimination" argument are insufficient to meet the requirements of Section 250.308(d) with contamination underneath the surface of the ground.

AOI-1: Point Breeze No. 1 Tank Farm

The report uses the direct contact numeric value for soil to screen exceedances, and asserts that:

> ***The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this RIR (Section 4) and through subsequent remedial measures which will be further described in future Act 2 deliverables. In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step in the screening process is to compare all of the soil analytical***

> ***results to the nonresidential direct contact MSCs***. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

See 2016 Report (part 1), Section 1.6.1, page 1.7 (bold italics added for emphasis). But there is no discussion of "equivalency" as required by the Section 250.308(d) of the regulations. *See id*.

Contrary to the suggestion in the quotation, Section 4 does not contain a discussion of the "soil-to-groundwater pathway." *See id.*, Section 4.0, pages 4.27-4.29. Moreover, the fate and transport section of the report concerns groundwater only, and does not include a discussion of the soil-to-groundwater pathway. *See id.*, Section 10.0, pages 10.59-10.71 ("Qualitative Fate and Transport Assessment").

AOI-2: Point Breeze Processing Area

The report uses the direct contact numeric value and the proposed site-specific standard for lead to screen exceedances in surface soil. *See* 2017 Report (part 1), page 6. It uses the direct contact numeric value to screen exceedances in subsurface soil. *See id.*

It does not delineate exceedances of the soil-to-groundwater numeric value under the rationale that they will be evaluated through analysis and characterization of the groundwater pathway:

> Soil sample exceedances of the PADEP non-residential soil-to-groundwater MSCs are ***not displayed in Figure 11 as these exceedances will be evaluated through analysis and characterization of the groundwater pathway***.

See id., page 30 (bold italics added for emphasis).

However, Sunoco does not provide a discussion of this analysis and characterization. Rather, it simply assumed that its evaluation of groundwater data would suffice:

> No fate and transport modeling was completed for the soil analytical results ***since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 2 are discussed in more detail in Section 9.

See id., Section 6.1, page 40 (bold italics added for emphasis). That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9, pages 51-52 ("Exposure Assessment"). The fate and transport evaluation for groundwater does not provide this analysis. *See id.*, Section 6.2, page 40-41.

AOI 3: Point Breeze Impoundment Area

The report uses the direct contact numeric value and the proposed site-specific standard for lead to screen exceedances in surface soil. *See* 2017 Report (part 1), Section 1.4, page 6. It uses the direct contact numeric value to screen exceedances in subsurface soil. *See id.*

In addition, it stated

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 3 are discussed in more detail in Section 9.

See id., Section 6.1, page 35 (bold italics added for emphasis). *Accord*, Section 7.5, page 40. That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9, pages 44-45 ("Exposure Assessment"). The fate and transport evaluation for groundwater does not provide this analysis, either. *See id.*, Section 6.2, page 35-36.

AOI-4: No. 4 Tank Farm

The report states that non-residential direct contact MSC were used to screen exceedances for both surface and subsurface soil. *See* 2013 Report (part 1) (disapproved), page 5. Using circular reasoning, Sunoco stated that it did not have to perform a fate and transport analysis for the soil-to-groundwater pathway because it assumed there was no pathway of exposure other than direct contact:

> No fate and transport modeling was completed for the soil analytical results ***since the only potential exposure pathway to shallow soil is by direct contact***. PES's permit procedures and personal protective equipment (PPE) requirements eliminate the potential direct contact exposure pathway to subsurface soil. Potential exposure pathways for AOI 4 are discussed in detail in Section 9.0.

See id., Section 7.1, page 23 (bold italics added for emphasis). That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9, page 30 ("Human Health Exposure Assessment/Risk Assessment"). The fate and transport evaluation for groundwater does not provide this analysis, either. *See id.*, Section 7.2, page 23-24.

In the 2017 report, Evergreen again avoids the quantitative requirements of Section 250.308(d), Evergreen instead offers its own "qualitative assessment":

> ***A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport assessment presented in this RIR***. Rather, a qualitative-level assessment of groundwater data has been completed (Section 10).

See 2017 Report, Section 9.5, page 9.52 (bold italics added for emphasis). That is insufficient because Section 10 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 10, pages 10.57-10.69 ("Fate and Transport Assessment").

AOI-5: Girard Point South Tank Field

The report uses the direct contact numeric value and the proposed site-specific standard for lead to screen exceedances in surface soil. *See* 2011 Report/Cleanup Plan (part 1) (disapproved), page 6. It uses the direct contact numeric value to screen exceedances in subsurface soil. *See id.*

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 5 are discussed in more detail in Section 9.

See id., Section 6.1, page 55 (bold italics added for emphasis). That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9, page 30 ("'Exposure Assessment' "). The fate and transport evaluation for groundwater does not provide this analysis, either. *See id.*, Section 6.2, page 55-56.

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers t simply use its groundwater data:

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 5 are discussed in more detail in Section 9.

2017 Report, Section 6.1, page 55 (bold italics added for emphasis). That is insufficient because Section 9 does not provide an analysis of how this meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9.0, pages 62-63.

AOI-6: Girard Point Chemicals Area

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers t simply use its groundwater data:

> ***No fate and transport modeling was completed for the soil analytical results since the only potential exposure pathway to shallow soil is by direct contact***. PES's permit procedures and personal protective equipment (PPE) requirements eliminate the potential direct contact exposure pathway to subsurface soil. Potential exposure pathways for AOI 6 are discussed in detail in Section 9.0.

2013 Report, Section 7.1, page 25 (bold italics added for emphasis). That is insufficient because Section 9.0 does not provide an analysis of how this meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9.0, pages 35-40.

As in AOI-1, the report states that:

> ***The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this report***. In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

See 2017 Report (part 1), Section 1.5.1, page 6 (bold italics added for emphasis). It did not perform a delineation to the lowest value (the soil-to-groundwater numeric value," but to the highest of the several values:

> Delineation was performed to the highest of the Act 2 non-residential SHS, the non-residential direct contact MSC, and the numeric SSS (for lead).

See id., page 17.

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers its own "qualitative assessment":

> ***A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport***

> ***assessment presented in this RIR.*** Rather, a qualitative-level assessment of groundwater data was warranted at this stage of the investigation.

See id., Section 9.5, page 36 (bold italics added for emphasis). That is insufficient because Section 10 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 10, pages 37-41 ("Qualitative Fate and Transport Assessment").

AOI-7: Girard Point Fuels Area

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers t simply use its groundwater data:

> ***No fate and transport modeling was completed for the soil analytical results since the only potential exposure pathway to shallow soil is by direct contact***. The soil-to- groundwater pathway is evaluated through evaluation of groundwater data. Potential exposure pathways for AOI 7 are discussed in detail in Section 9.0.

2012 Report, Section 7.1, page 28 (bold italics added for emphasis). That is insufficient because Section 9.0 does not provide an analysis of how this meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9.0, pages 39-44.

As in AOI-1 and AOI-6, the report states that;

> ***The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this report.*** In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

See 2017 Report (part 1), Section 1.5.1, page 6 (bold italics added for emphasis). It also stated that "Delineation was completed to the non-residential direct contact MSC and the numeric SSS (for lead)." *See id.*, Section 3, page 16.

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers its own "qualitative assessment":

> ***A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport***

> ***assessment presented in this RIR.*** Rather, a qualitative-level assessment of groundwater data was warranted at this stage of the investigation.

See id., Section 9.5, page 38 (bold italics added for emphasis). That is insufficient because Section 10 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 10, pages 40-44 ("Qualitative Fate and Transport Assessment").

AOI-8: North Yard

Avoiding the quantitative requirements of Section 250.308(d), Evergreen instead offers t simply use its groundwater data:

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 8 are discussed in more detail in Sections 9.0 and 10.0 below.

2012 Report, Section 7.1, page 32 (bold italics added for emphasis). That is insufficient because Section 9.0 and 10.0 provide no analysis of how this meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9.0 and Section 10.0, pages 49-54.

Similar to AOI 1, it is stated:

> ***The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this RIR (Section 4) and through subsequent remedial measures which will be further described in future Act 2 deliverables***. To further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step in the screening process is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

See 2017 Report (part 1), Section 1.6.1, page 1.9 (bold italics added for emphasis). Accordingly, exceedances in soil samples were determined by the direct contact MSC.

Contrary to the suggestion in the quotation above, Section 4 does not contain any discussion of a "soil-to-groundwater pathway." *See id.*, Section 4, pages 4.29-4.32.

The report states that

> ***A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport assessment presented in this RIR***. Rather, a qualitative-level assessment of groundwater data has been completed (Section 9).

See id., Section 10.5, page 10.73 (bold italics added for emphasis). That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 9, pages 9.55-9.67 ("Fate and Transport Assessment").

AOI-9: Schuylkill River Tank Farm

Evergreen makes the following statement:

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 9 are discussed in more detail in Section 9 below.

2015 Report, Section 6.1, page 42. That is insufficient because Section 9 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section Section 9.0, page 48.

The report uses the direct contact numeric value and the proposed site-specific standard for lead to screen exceedances in surface soil. *See* 2017 Report Addendum (part 1), Section 1.1, page 2. It uses the direct contact numeric value to screen exceedances in subsurface soil. *See id.*

Again, Evergreen simply assumed that its evaluation of groundwater data would suffice to meet the requirements of Section 250.308(d) of the regulations:

> ***No fate and transport modeling was completed for the soil analytical results since the soil-to-groundwater pathway is evaluated through groundwater data***. Potential exposure pathways for AOI 9 are discussed in more detail in Section 6 below.

See id., Section 5.1 page 21 (bold italics added for emphasis). *Accord*, Section 6.4, page 25. However, no analysis related to 250.308(d) is provided.

Contrary to the suggestion in the quotation above, Section 6 does not contain any discussion of a "soil-to-groundwater pathway." *See id.*, Section 6.0, pages 22-27 ("Conceptual

Site Model"). Evergreen simply repeats the circular assertion above. *See id.*, Section 6.4, page 25 ("No fate and transport modeling was completed for the soil analytical results. The soil-to-groundwater pathway is evaluated through groundwater data.").

AOI-10: West Yard

Using circular reasoning, Sunoco stated that it did not have to perform a fate and transport analysis for the soil-to-groundwater pathway because it assumed there was no pathway of exposure other than direct contact:

> ***No fate and transport modeling was completed for the soil analytical results since the only potential exposure pathway to soil is by direct contact to shallow soil***. The soil-to-groundwater pathway is evaluated through groundwater data. Potential exposure pathways for AOI 10 are discussed in more detail in Section 8.0.

See 2011 Report, Section 6.1 page 21 (bold italics added for emphasis). *Accord*, Section 7.5, pages 27-28 (Fate and Transport of COCs). That is insufficient because Section 8.0 provides no analysis of how it meets the requirements of Section 250.308(d) of the regulations. *See id.*, Section 8.0, pages 29-33 ("Human Health Exposure Assessment/Risk Assessment").

13. The Department Should Disapprove Evergreen's Proposed Site-Specific Standard of 2240 mg/kg for Lead in Surface Soils.

Evergreen's proposed site-specific standard of 2240 mg/kg for lead in surface soil is flawed for several reasons. First, in its use of the Adult Lead Model, Evergreen inappropriately assumed a target blood lead level of 10 ug/dL in a fetus, rather than the target blood lead level of 5 ug/dL that the Centers for Disease Control and Prevention have been using since 2012 for case management for children exposed to lead. Changing this value alone would result in a standard of no more than 1050 mg/kg, rather than 2240 mg/kg.

In addition, the high water table in areas of the site complicates the notion that Evergreen could even develop a site-specific standard greater than the soil-to-groundwater numeric value. *See* Comment #7, above. Because the Adult Lead Model merely involves the multiplication of variables relating to exposure to lead in surface soils, it is insufficient as a risk assessment for the soil-to-groundwater pathway of exposure.

The Department should disapprove the proposal.

A. Evergreen inappropriately assumed a target blood lead level of 10 ug/dL in a fetus, rather than the target blood lead level of 5 ug/dL used by the Centers for Disease Control and Prevention for case management for children since 2012.

In 2015, Evergreen proposed a site-specific standard of 2240 mg/kg for lead in surface soil. 2015 Human Health Risk Assessment (Lead). The Department approved this proposal. 2015 Memo (lead), 2015 Approval Letter (lead). In its report, Evergreen assumed a target blood lead level of 10 ug/dL in a fetus:

Table 1
Calculation of a Site-Specific Standard for Lead
Philadelphia Refinery, Belmont Terminal and Marcus Hook Industrial Complex
U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 6/21/09

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 1999-2004
$PbB_{fetal,\ 0.95}$	95th percentile PbB in fetus	ug/dL	10
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	–	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	–	1.8
PbB_0	Baseline PbB	ug/dL	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S,\ D}$	Absorption fraction (same for soil and dust)	–	0.12
$EF_{S,\ D}$	Exposure frequency (same for soil and dust)	days/yr	219
$AT_{S,\ D}$	Averaging time (same for soil and dust)	days/yr	365
	Site Specific Standard (SSS) for Lead	**ppm**	**2,240**

Notes:
ug/dL = micrograms per deciliter
ug/day = micrograms per day
g/day = grams per day
days/yr = days per year

2015 Human Health Risk Assessment (Lead), Table 1.

Last year, the Council submitted comments on a proposed Act 2 rulemaking that would have increased the direct contact numeric value from 1000 ppm to 2500 ppm. *See* Attachments 4-8 -- Clean Air Council Comments on Proposed Act 2 Rulemaking dated April 30, 2020. Just like Evergreen's proposal, that proposal was based on a target blood lead level of 10 µg/dL for a fetus. *See* Attachment 4 -- Clean Air Council Comments, pages 4-6. The value of 10 ug/dL was based on a "level of concern" value set by the Centers for Disease Control in 1991 -- nearly thirty years ago. *See id.*, pages 2, 8, 23.

In 2012, the Centers for Disease Control lowered the number to 5 µg/dL, and since then it has used this number as a "reference value" for case management for pregnant women and children up to 5 years old. *Id.*, pages 8-9. The Pennsylvania Department of Public Health, the Allegheny County Health Department, and the City of Philadelphia have also been using 5 µg/dL for case management. *Id.*, pages 10-13.

At its presentation to the Clean Standards Scientific Advisory Board (CSSAB) last month, the Department stated that it now intends to use the 5 ug/dL target blood lead level in the calculation of a direct contact numeric value, rather than the 10 ug/dL target blood lead level. Rounding to two significant figures, the Department intends to finalize a direct contact numeric value of 1100 mg/kg, rather than the proposed value of 2500 mg/kg. *See* DEP, Overview of Chapter 250 Draft-Final Rulemaking (December 16, 2020), pages 6-9; *see also* DEP, Draft Appendix A, Table 4A (December 16, 2020).

The fact that the Department has now embraced a target blood lead level of 5 ug/dL (rather than 10 ug/dL) underscores the error made in Evergreen's proposed site-specific standard.

The lowering of target blood lead level to 5 ug/dL would result in a proposed site-specific standard of no more than 1050 mg/kg. (While the Department intends to round up this figure to 1100 mg/kg for the proposed direct contact numeric value, rounding up would be inappropriate for a proposed site-specific standard. Evergreen did not round down its proposed standard of 2240 mg/kg to 2200 mg/kg).

B. Because the Adult Lead Model is a soil ingestion model, it is insufficient as a risk assessment for the soil-to-groundwater pathway of exposure.

Given the limitations of the Adult Lead Model, the failure of Evergreen to delineate soil contamination according to the soil-to-groundwater pathway, and the failure of Evergreen to characterize the relationship between the unconfined aquifer (water table) and the deep aquifer, it is questionable whether a site-specific standard higher than the soil-to-groundwater pathway would even be appropriate. *See* Comments #7, 12, above.

The inputs into the Adult Lead Model do not take into consideration the pathway of exposure through groundwater. It is a model based on the soil ingestion pathway. *See* Attachment 4 -- Clean Air Council Comments on Proposed Act 2 Rulemaking, page 16.

Under state law, a responsible party may propose a site-specific standard in place of a soil-to-groundwater numeric value or a direct contact numeric value. *See* Section 301(a)(3) of Act 2 of 1995. But any proposed standard must comply with the Act 2 regulations.

The regulations require a site-specific risk assessment. For a toxic chemical such as lead, they require a reduction of risk to a quantitative range of risk:

> (b) The site-specific standard ***shall be a protective level that eliminates or reduces any risk to human health*** in accordance with the following:
>
> (1) ***For known or suspected carcinogens***, soil and groundwater cleanup standards ***shall be established at exposures which represent an excess upperbound lifetime risk of between 1 in 10,000 and 1 in 1 million***. The cumulative excess risk to exposed populations, including sensitive subgroups, may not be greater than 1 in 10,000.

….

25 Pa. Code 250.402(b) (bold italics added for emphasis).

It is premature for Evergreen to propose a site-specific standard for lead in surface soil for a number of reasons. The Adult Lead Model does not address exposure through the soil-to-groundwater pathway. Evergreen has not properly delineated contamination according to the soil-to-groundwater numeric value. There is a high water table in areas of the site. Evergreen has failed to sufficiently characterize the relationship between the unconfined aquifer (water table) and the deep aquifer.

14. Evergreen's Flawed Site-Specific Standard Results in an Insufficient Delineation of Lead Contamination in Surface Soils.

In its reports, Evergreen has provided a distorted delineation of lead contamination in surface soils. It framed its discussion in terms of a proposed site-specific standard of 2240 mg/kg that is artificially lenient and erroneous. In terms of quantitative data, the reports would have been very different if the delineation had been based on the soil-to-groundwater numeric value (450 mg/kg) or even the direct contact numeric value (1000 mg/kg).

The anticipation of a lenient standard of 2240 mg/kg would naturally have affected decisions in the field regarding the number and locations of soil samples to be taken. The Department's guidance document underscores what common sense would suggest -- that with a less stringent standard in mind, fewer samples would be necessary:

> ***Soils must be characterized horizontally and vertically to concentrations below the selected numeric standards***, or to where it can be demonstrated that the pathway elimination measure is adequate to protect human health and the environment. This ensures that all soils containing regulated substances at or above the selected numeric standards have been adequately characterized to support a fate and transport analysis which shows where the contamination is currently located and those areas to which it is moving. ***The remediator determines the concentration level for characterization beyond the minimal level stated above***. The remediator must state what factors were used in determining the level used to define the site boundaries.

See Technical Guidance Manual, Section II.A.4.b.i, page II-12 (bold italics added for emphasis).

With respect to the quantitative data, the following table identifies the increase in the number of exceedances that would result if the soil-to-groundwater numeric value (450 mg/kg) or the direct contact numeric value (1000 mg/kg) were to be used to delineate the contamination, instead of the proposed site-specific standard (2240 mg/kg):

Area of Interest	Title	Exceedances Under Different Numeric Values
AOI-1 Point Breeze No. 1 Tank Farm	2016 Report, Table 3-2	16 exceedances of soil-to-groundwater numeric value (450 mg/kg) 7 exceedances of direct contact numeric value (1000 mg/kg) 4 exceedances of proposed site-specific standard

		(2240 mg/kg)
AOI-2 Point Breeze Processing Area	2017 Report, Table 4 (approved)	18 exceedances of soil-to-groundwater numeric value (450 mg/kg) 9 exceedances of direct contact numeric value (1000 mg/kg) 4 exceedances of proposed site-specific standard (2240 mg/kg)
AOI 3 Point Breeze Impoundment Area	2017 Report, Table 4 (approved)	15 exceedances of soil-to-groundwater numeric value (450 mg/kg) 6 exceedances of direct contact numeric value (1000 mg/kg) 5 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-4 No. 4 Tank Farm	2013 Report, Table 3-2 (disapproved) 2017 Report (disapproved)	13 exceedances of soil-to-groundwater numeric value (450 mg/kg) 10 exceedances of direct contact numeric value (1000 mg/kg) 6 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-5 Girard Point South Tank Field	2011 Report/Cleanup Plan, Table 4 (outside SWMU areas) Table 5 (SWMU areas) (disapproved)	3 exceedances of soil-to-groundwater numeric value (450 mg/kg) 1 exceedance of direct contact numeric value (1000 mg/kg) 1 exceedance of proposed site-specific standard (2240 mg/kg) 25 exceedances of soil-to-groundwater numeric value (450 mg/kg) (3 outside SWMU areas) 14 exceedances of direct contact numeric value (1000 mg/kg) (1 outside SWMU areas) 4 exceedances of proposed site-specific standard

		(2240 mg/kg) (1 outside SWMU areas)
	2017 Report, Table 4 (approved)	80 exceedances of soil-to-groundwater numeric value (450 mg/kg) 57 exceedances of direct contact numeric value (1000 mg/kg) 11 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-6 Girard Point Chemicals Area	2013 Report, Table 4 (disapproved)	21 exceedances of soil-to-groundwater numeric value (450 mg/kg) 8 exceedances of direct contact numeric value (1000 mg/kg) 2 exceedances of proposed site-specific standard (2240 mg/kg)
	2017 Report, Table 3a (Recent Data) (approved)	12 exceedances of soil-to-groundwater numeric value (450 mg/kg) 5 exceedances of direct contact numeric value (1000 mg/kg) 4 exceedances of proposed site-specific standard (2240 mg/kg)
	Table 4a (Historical Data)	50 exceedances of soil-to-groundwater numeric value (450 mg/kg) 23 exceedances of direct contact numeric value (1000 mg/kg) 6 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-7 Girard Point Fuels Area	2012 Report , Table 4 (disapproved)	11 exceedances of soil-to-groundwater numeric value (450 mg/kg) 3 exceedances of direct contact numeric value (1000 mg/kg)

		0 exceedances of proposed site-specific standard (2240 mg/kg)
	2013 Addendum to Report, Table 1 (disapproved)	21 exceedances of soil-to-groundwater numeric value (450 mg/kg) 5 exceedances of direct contact numeric value (1000 mg/kg) 0 exceedances of proposed site-specific standard (2240 mg/kg)
	2017 Report, Table 3a (approved)	6 exceedances of soil-to-groundwater numeric value (450 mg/kg) 0 exceedances of direct contact numeric value (1000 mg/kg) 0 exceedances of proposed site-specific standard (2240 mg/kg)
	Table 4a (Historical Data)	29 exceedances of soil-to-groundwater numeric value (450 mg/kg) 6 exceedances of direct contact numeric value (1000 mg/kg) 0 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-8 North Yard	2012 Report, Table 4 (approved)	11 exceedances of soil-to-groundwater numeric value (450 mg/kg) 4 exceedances of direct contact numeric value (1000 mg/kg) 0 exceedances of proposed site-specific standard (2240 mg/kg)
	2017 Report, Table 3-2 (approved)	36 exceedances of soil-to-groundwater numeric value (450 mg/kg) 19 exceedances of direct contact numeric value (1000 mg/kg)

		7 exceedances of proposed site-specific standard (2240 mg/kg)
AOI-9 Schuylkill River Tank Farm	2015 Report, Table 5 (disapproved)	87 exceedances of soil-to-groundwater numeric value (450 mg/kg) 55 exceedances of direct contact numeric value (1000 mg/kg) 11 exceedances of proposed site-specific standard (2240 mg/kg)
	2017 Report Addendum (approved)	6 exceedances of soil-to-groundwater numeric value (450 mg/kg) 3 exceedances of direct contact numeric value (1000 mg/kg) 1 exceedance of proposed site-specific standard (2240 mg/kg)
AOI-10 West Yard	2011 Report, Table 4 (outside CAMU) (approved)	12 exceedances of soil-to-groundwater numeric value (450 mg/kg) 6 exceedances of direct contact numeric value (1000 mg/kg) 3 exceedances of proposed site-specific standard (2240 mg/kg)
	Table 5 (CAMU delineation samples)	5 exceedances of soil-to-groundwater numeric value (450 mg/kg) 2 exceedances of direct contact numeric value (1000 mg/kg) 0 exceedances of proposed site-specific standard (2240 mg/kg)
	Table 6 (CAMU area)	1 exceedance of soil-to-groundwater numeric value (450 mg/kg) 0 exceedances of direct contact numeric value (1000 mg/kg)

		0 exceedances of proposed site-specific standard (2240 mg/kg)

The disparity in the number of exceedances is most striking for the two Areas of Interest with the most lead contamination (AOI-5 and AOI-9). Therefore, it is a concern that Evergreen did not even attempt to compare the soil sample results with the soil-to-groundwater numeric value (450 mg/kg) or the direct contact numeric value (1000 mg/kg) in some reports for these areas. In a report for AOI-5, it simply lists 2240 mg/kg as the "PADEP Non-Residential Surface Soil Direct Contact MSC." *See* 2017 Report (AOI-5), Table 4, pdf pages 86-127. In a report for AOI-9, it lists 2240 mg/kg as both the "PADEP Non-residential Surface Soil MSC" and the "PADEP Non-residential Soil Direct Contact MSC." 2015 Report, Table 5, pdf pages 70-106.

As a matter of law, it is an error to identify 2240 mg/kg as the "PADEP Non-residential Surface Soil MSC" and the "PADEP Non-residential Soil Direct Contact MSC." An MSC is not a site-specific standard and a site-specific standard is not an MSC. *Cf.* 25 Pa. Code Subchapter D (Site-Specific Standard) with 25 Pa. Code § 250.305 (MSCs for soil).

Evergreen should have shown the work, but it did not. The Council had to identify these exceedances itself.

Evergreen's errors are also important on a qualitative level. By ruling out certain samples under the assumption that an artificially lenient standard would apply, Evergreen would have blocked off lines of investigation. Data on exceedances helps to inform one's judgment regarding additional sampling.

Finally, Evergreen does not provide an analysis that synthesizes the data in a meaningful and helpful way. There is no discussion in the conclusions of the reports about why it took the samples in the locations it did and stopped where it did. Rather, it points to data in tables and asserts in a conclusory fashion that it has delineated the contamination. This is not sufficient.

15. <u>Evergreen Fails to Include Per- and Polyfluoroalkyl Substances (PFAS) as a Constituent of Concern, Despite a History of Catastrophic Fires at the Refinery</u>.

Per- and Polyfluoroalkyl Substances (PFAS) are persistent, bioaccumulative, and harmful chemicals. Historically, some of them have been used in foam for firefighting at refineries. Evergreen does not identify PFAS as a Constituent of Concern in any of its reports. Given a history of catastrophic fires at the facility prior to the sale in 2012, Evergreen should prepare a work plan and revise its remedial investigation to include PFAS contaminants in the soil and groundwater.

A. <u>The Department has acknowledged the harmful health effects of PFAS by proposing to establish Medium-Specific Concentrations for Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS) and Perfluorobutane Sulfonate (PFBS)</u>.

PFAS are a group of man-made chemicals that includes PFOA, PFOS, PFBS, and many other chemicals. EPA, Basic Information on PFAS ("What is the difference between PFOA, PFOS and GenX and other replacement PFAS?"). According to EPA, "[s]tudies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals." *Id.* ("Are there health effects from PFAS?"). In 2016, EPA issued drinking water health advisories for PFOA and PFOS. *See* EPA, Fact Sheet: PFOA & PFOS Drinking Water Health Advisories (November 2016).

EPA notes that PFAS is associated with firefighting at refineries:

> Drinking water can be a source of exposure in communities where these chemicals have contaminated water supplies. ***Such contamination is typically localized and associated with a specific facility, for example***,
>
> - an industrial facility where PFAS were produced or used to manufacture other products, or
> - ***an oil refinery, airfield or other location at which PFAS were used for firefighting***.

EPA, Basic Information on PFAS ("How are people exposed to PFAS?") (bold italics added for emphasis). Historically, PFAS are associated with fire-fighting foams. *Id.* ("What is the difference between PFOA, PFOS and GenX and other replacement PFAS?").

Last year, the Department proposed to add Medium-Specific Concentrations for PFOA, PFOS, and PFBS. *See* 50 Pa. B. 1011 (February 15, 2020), paragraph 1. It is anticipated that the Department will finalize this proposal. *See* DEP, Overview of Chapter 250 Proposed Rulemaking (July 30, 2020), pages 22-24 (summarizing public comments in presentation to Cleanup Standards Scientific Advisory Board); *see also* DEP, Draft Appendix A, Table 1 (December 16, 2020) (including MSCs for PFOs, PFOA, and PFBS in latest proposed draft).

B. Given the provision of foam for firefighting at the refinery before 2012, there is a concern for the presence of PFAS in the soil and groundwater.

There is a history of explosions and fires at the Philadelphia refinery. The following table summarizes this history:

Year	Incident	Facility
1931	explosion	Atlantic Refining plant at Point Breeze
1960	fire	Girard Point Refinery, then owned by Gulf
1970	explosion	Arco plant
1975	fire	Gulf refinery
1975	fire	Arco refinery
1977	explosion and fire	Arco plant
1988	explosion	Point Breeze, then operated by John Deuss' Atlantic Refining & Marketing Corp
1998	small fire	Girard Point

Source: Mariah Rush, Philadelphia Inquirer, *In Philly, a history of oil refinery fires going back decades* (Updated: June 21, 2019).

The 1975 fire was the worst. It was an 11-alarm fire that overwhelmed the facility and resulted in the deaths of eight firefighters. A video of the massive fire is available at 6ABC Action News, *Looking back at 1975 Philly refinery fire that killed 8 firefighters* (00:35-1:07). The owner of the refinery was fined $37,000. New York Times, *Gulf Fined $37,000 for Violations At South Philadelphia Refinery* (July 7, 1977).

PFAS is a concern at the refinery site because foam was provided to the firefighters to fight that fire:

> But more than 500 firemen fought all night to avert a catastrophe.
> ***They spread a blanket of foam to smother the flames***.

See Elmer Smith, Philadelphia Inquirer, *30 Yrs. Later, Memories of a Refinery Inferno* (August 17, 2005) (republication) (bold italics added for emphasis). The oil foam overwhelmed the sewer system, resulting in the flashing of the material and contributing to the death of several firefighters:

> During this catastrophe, firefighters successfully suppressed flames emanating from tank 231, roughly where the current stack is now visible north of the Platt Bridge. During the course of their operations, ***a massive quantity of oily foam began to overwhelm the refinery's sewage system and accumulate in tank dikes and along the major thoroughfares where most of the fire apparatuses were assembled***. Just before 5PM, ***this material flashed, capturing men and machines amid white hot sheets of flame***. Four entire firetrucks and their crews melted before the department's officers.

Christopher R. Dougherty, *A Petaled Rose Of Hell: Refineries, Fire Risk, And The New Geography Of Oil In Philadelphia's Tidewater* (December 10, 2013) (bold italics added for emphasis).

This is one example of foam being provided to firefighters to fight fires at the refinery. There may be others. Because foam was used in firefighting, there is a concern that it contained PFAS, and that these chemicals are now contaminants in the soil and groundwater.

C. Evergreen should revise the reports to include PFAS as Constituents of Concern in the soil and groundwater, and it should prepare a work plan for submission to the Department.

In its reports prior to the sale in 2012, Evergreen did not identify PFAS as a Constituent of Concern. *See e.g.*, 2004 Current Conditions Report, Table 5a and Table 5b (Constituents of Concern for Soil and Groundwater), pdf pages 120-121; *see also* Interim Activities Work Plan (2011), Table 2 (Constituents of Concern for Soil and Groundwater), pdf pages 16-17. Nor did Evergreen do this in reports after 2012. *See e.g.*, 2017 Report (AOI-7), Table 1 (Constituents of Concern), pdf page 76.

Evergreen should amend its list of Constituents of Concern to include the PFAS group, including PFOA, PFOS, and PFBS.

In addition, Evergreen should develop a work plan for a remedial investigation of PFAS in the soil and groundwater. In doing so, Evergreen should work with the City of Philadelphia fire department to gather records regarding historical fires, to identify the locations of the property where PFAS contamination is more likely to be located.

Thank you for your consideration of the Council's comments.

Sincerely,

_____

Joseph Otis Minott, Esq.
Executive Director and Chief Counsel

Christopher D. Ahlers, Esq.
Staff Attorney

Nily Dan, Ph.D (Chemical Engineering)
Engineering Volunteer
Consultant

Clean Air Council
135 S. 19th St., Suite 300
Philadelphia, PA 19103
215-567-4004 ext. 116
joe_minott@cleanair.org
cahlers@cleanair.org

Attachment 1

(Letter from Evergreen dated February 11, 2014)

February 11, 2014

Mr. Stephen Sinding
Environmental Cleanup and Brownfields Program Manager
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401

Re: Notice of Assumption of Liabilities – former Sunoco Philadelphia Refinery at 3144 West Passyunk Ave., Philadelphia, PA

Dear Mr. Sinding:

As set forth in the Buyer-Seller Consent Order and Agreement dated August 14, 2012 ("Buyer-Seller Agreement"), Sunoco, Inc. (R&M) previously operated the refinery located at 3144 Passyunk Avenue, Philadelphia, PA (the "Philadelphia Refinery"). A portion of the Philadelphia Refinery designated as "Point Breeze" was acquired as part of a transaction with Atlantic Richfield Company in approximately September of 1989, thereafter owned by Atlantic Refining & Marketing Corp. (an affiliate of Sunoco, Inc. (R&M)), and leased to and operated by Sunoco, Inc. (R&M). A portion of the Philadelphia Refinery designated as "Girard Point" was acquired in approximately August of 1994 and was thereafter owned and operated by Sunoco, Inc. (R&M). The Philadelphia Refinery (both Point Breeze and Girard Point) is currently owned and operated by Philadelphia Energy Solutions LLC ("PES"), with Sunoco, Inc. holding a minority equity interest in PES and an independent party holding the remainder of the equity interest.

In response to the Department's request during our meeting at your office on January 27, 2014, we are providing formal notice that on November 15, 2013, "Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC, a Delaware limited liability company," ("Evergreen") was formed under the laws of the State of Delaware, assigned EIN #46-4184955, and funded with a capital contribution of estimated future investigatory and/or remedial costs as determined by a third party independent consulting firm. In return, on December 17, 2013, Evergreen agreed to assume any liabilities of Sunoco, Inc. (R&M) and Atlantic Refining & Marketing Corp. related to the time periods specified above and arising from, or relating to, any environmental condition at, on, in, under or migrating to or from the Philadelphia Refinery and existing or occurring on, or prior to December 30, 2013, except any losses related to product liability, asbestos, private party environmental or silica.

Evergreen also agreed to manage the investigation, assessment and remediation activities relating to the presence or release of hazardous substances at the Philadelphia Refinery attributable to Sunoco, Inc. (R&M) and/or Atlantic Refining & Marketing Corp. for the time periods specified above. Evergreen's approach to managing these activities will be consistent with Sunoco's past practices as described in further detail in the Act 2 Notice of Intent to Remediate ("NIR") dated October 12, 2006, the Work Plan for Site Wide Approach Under the One Cleanup Program ("Site Wide Approach Work Plan") dated September 16, 2011, and the Buyer-Seller Agreement. Additionally, Evergreen's technical team managing the activities will remain the same and, as such, Jim Oppenheim will continue as the primary contact from Evergreen for the activities described in this letter. However, please direct all future correspondence and notices, to the extent that they relate to the activities described in this letter and such correspondence and/or notices previously would have been sent to Sunoco, to Evergreen at:

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
2 Righter Parkway, Suite 200
Wilmington, Delaware 19803
Attn: Jim Oppenheim
Office: 302-477-0192
E-mail: jroppenheim@evergreenresmgt.com

Thank you for your attention to this matter.

Sincerely,

Scott T. Cullinan, PE
President, Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC

cc: Paul Gotthold (EPA Region III)
C. David Brown (PADEP) (via e-mail)
Wm. Stanley Sneath (PADEP) (via e-mail)
Walter Payne (PADEP) (via e-mail)
David Burke (PADEP) (via e-mail)
Kathy Nagle (PADEP) (via e-mail)
Steve O'Neil (PADEP) (via e-mail)
Jim Oppenheim (Evergreen) (via e-mail)
Arnnie Dodderer (Sunoco) (via e-mail)
Kevin Dunleavy (Sunoco) (via e-mail)
Joseph Roberts (Sunoco) (via e-mail)
Chuck Barksdale (PES) (via e-mail)

Attachment 2

(Letter from Department of Environmental Protection and Environmental Protection Agency,

dated November 8, 2011)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, PA 19103-2029

RECEIVED
NOV 08 2011

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
LAND RECYCLING PROGRAM
400 Market Street
Harrisburg, PA 17105-8471

Mr. James Oppenheim
Sunoco, Inc. (R&M)
10 Industrial Hwy MS4
Lester, PA 19029

Dear Mr. Oppenheim:

The United States Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (DEP) acknowledge your interest in completing the environmental cleanup at the Sunoco Inc. (R&M) Philadelphia Refinery facility located at 3144 Passyunk Avenue, Philadelphia, PA 19145-5229 as identified by your Notice of Intent to Remediate (NIR) submitted October 12, 2006. DEP and EPA have developed an approach to conducting such work at RCRA facilities which we refer to as the One Cleanup Program.

EPA and DEP signed a ***One Cleanup Program Memorandum of Agreement*** (MOA) on April 21, 2004. The MOA provides a streamlined approach for Pennsylvania facilities with corrective action obligations under the Resource Conservation and Recovery Act (RCRA) to complete federal corrective action and, concurrently, receive a liability release from Pennsylvania. The EPA agrees to your participation in the One Cleanup Program per your wish to select this option within the NIR.

The project managers for your facility are Walter Payne, DEP and Hon Lee, EPA. Their job is to work with you to coordinate the review and approval process to make certain that the requirements of both programs are met. The DEP project manager will have the overall lead, while EPA will be responsible for addressing RCRA issues, including a determination of the environmental indicators for human health and groundwater control.

Upon completion and submittal of the Site Wide Approach Work Plan, all parties will discuss the appropriate next steps and schedules. Where possible, we will rely on Act 2's Statewide Health or site specific options to develop a remedy. We also plan to follow Act 2 time frames as much as possible. If these options do not fully satisfy RCRA requirements, we expect the parties to develop an acceptable alternative.

Once agreement is reached on any necessary cleanup, EPA will publish a draft Final Decision for public input and proceed to a final Decision using EPA's ***Final Guidance on Completion of Corrective Action Activities at RCRA Facilities,*** which can be found in the

February 23, 2003 ***Federal Register***. DEP will proceed with a review and an approval decision on the Act 2 reports as provided in Act 2, Sections 302(e), 303(h) and 304(n). Responsibility for any post-remedial measures or institutional controls will be determined by the joint work team on a facility-specific basis in order to ensure the needs of both programs are met.

For your convenience, the full text of the MOA can be found at the following link: http://www.epa.gov/region03/revitalization/pennsylvania.htm

EPA and DEP thank you for participating in this program. For more information please contact Walter Payne, DEP at (484) 250-5792 or Hon Lee, EPA at (215) 814-3419.

Sincerely,

Paul Gotthold, Associate Director
Land & Chemicals Division
Region III
US Environmental Protection Agency

Troy Conrad, Director
Land Recycling Program
Department of Environmental Protection

cc: Walter Payne, PADEP
David Burke, PADEP
Ayman Ghabrial, PADEP
Hon Lee, EPA
Colleen Costello, Langan Engineering & Environmental
file

Attachment 3

(Evergreen's Q&A, downloaded December 30, 2020)

Evergreen's Q&A: https://phillyrefinerycleanup.info/q-a/
(downloaded on Wednesday, December 30, 2020)

Air Quality

1. There is a benzene pool that extends toward residential neighborhoods of South Philadelphia. In June 2019, PES reported fence line measurements of benzene above regulatory limits. What's the situation? What corrective actions have been taken?

Dissolved benzene in groundwater (otherwise known as a benzene groundwater plume) is present at the former Philadelphia Refinery. The Remedial Investigation Reports summarize the benzene in groundwater that Evergreen has characterized as part of the Act 2 investigations. For example, the AOI 1 RIR presents details concerning benzene in groundwater along the eastern boundary of the former Philadelphia Refinery. These reports also summarize the interim remedial activities to address environmental impacts including groundwater and vapor remediation systems that exist along the property boundary on 26th Street. Part of the Act 2 processes include evaluating potential impact to offsite properties, including residences. These evaluations show that the dissolved benzene impacted groundwater beneath AOI 1 is not likely to migrate under nearby residential areas, and that there are no air impacts from the benzene groundwater plume to offsite properties. Evergreen prepared an overall summary slide of benzene in groundwater beneath the whole facility due to on-site and off-site sources for presentation during the November 2019 public meeting. The presentation is posted to this website. PES, as owner and operator of the facility, is required to report fence line measurements of benzene based on air emissions from PES' operations. This is unrelated to the benzene groundwater plume and Evergreen does not have the information to be able to address the portion of your question related to the 2019 PES reported fence line monitoring.

2. Right now there is a very strange smell outside. I am inclined to believe it may be emissions from your site. If so, what could it be?

The operation of the site has been under the direction of Philadelphia Energy Solutions (PES) since the sale of the site in 2012 from Sunoco to PES, so Evergreen/Sunoco has not been involved in site operations since that time. In addition, operations at the former Philadelphia Refinery by PES were shut down in 2019, so we are unsure of what smell you are referring to. The City of Philadelphia does maintain air monitoring in the vicinity of the site, which is summarized in its 2020-2021 Air Monitoring Network Plan.

(https://www.phila.gov/media/20200504115105/2020-2021_AMNP_DRAFT_FINAL__20200424.pdf)

3. I read that Benzene levels were 30 times higher than permitted, putting them on par with levels you would see in 3rd world countries like India. Also watchdog websites went black in the weeks leading up to the explosion. There was no data available to the public in the weeks leading up to the explosion.

Evergreen is responsible for managing the environmental investigation and cleanup of soil and groundwater from impacts that occurred before PES purchased the site in 2012. PES operated the site and would have the information pertaining to air emission data. In addition, the City of Philadelphia Department of Public Health's Air Management Services may also be able to provide additional air quality data from that time period ((215) 685-7584 or dphams_service_requests@phila.gov).

4. Now I'm smelling and feeling the toxic pollution from the refinery again.

The environmental impacts to soil and groundwater that Evergreen is investigating and cleaning up have not shown to cause air impacts. Additional information concerning air quality from either the EPA or the City of Philadelphia may be helpful to identify the source of any smells.

5. I currently reside in Siena Place near the borderline of the refinery. I just want to know is it safe to live there in terms of Air quality and in regards to the plume status. Recently, I have smelled Gas outside approximately on A few occasions near the end of July and don't know if that is from the refinery or cleanup process as the refinery is not currently operating.

The refining operations were shut down in 2019; however, Evergreen is unaware of other site activities that have taken place at the facility since that time, so we are unsure of the source of any odors. PES operated the site and would have the information pertaining to air emission data. In addition, the City of Philadelphia Department of Public Health's Air Management Services may also be able to provide additional air quality data from that time period ((215) 685-7584 or dphams_service_requests@phila.gov). The City of Philadelphia does maintain air monitoring in the vicinity of the site, which is summarized in its 2020-2021 Air Monitoring Network Plan. (https://www.phila.gov/media/20200504115105/2020-2021_AMNP_DRAFT_FINAL 20200424.pdf).

Evergreen is responsible for investigation and cleanup of subsurface conditions present at the property before the sale to PES in 2012. Part of Evergreen's investigation involves defining the extent of contamination in groundwater (the plume as you noted) and determine if the impacts present a risk to people onsite and those located near to the site. Evergreen operates remediation systems at the facility to control groundwater contamination as well as control vapors in sewers near and through the facility. Based on the completed investigations, the environmental impacts to soil and groundwater have not shown to cause impact to indoor or outdoor air in residential areas offsite.

6. Hi, I live in Siena place. I noticed that Benzene concentration is a light green and close to the dark green shaded areas in the same spot as my current house (very close to pha housing and refinery) (Evergreen note: this question refers to slide #38 "Groundwater Investigation Results – Benzene" in the August 27, 2020 presentation which is available for view or download on www.phillyrefinerycleanup.info). I think it was in the lower aquifer and water table aquifer. Because it is right below my house it seems from the map, can this present a danger to me or the house? Like can my water and be affected? And gas vapors be present? Or is it totally safe to live in this area even though it is below ground?

Information from the remedial investigation activities do not indicate that there is any risk to indoor or outside air in offsite properties from benzene in groundwater originating from the former Philadelphia Refinery. Evaluation of vapors to indoor and outdoor air from a dissolved plume beneath the subsurface is part of the evaluation required by Act 2. That evaluation will be included in future Act 2 reports to be submitted upon completion of all Remedial Investigation Reports. Please note that the slide being referenced shows refinery data as well as data collected from other nearby Act 2 sites. Plumes originating from other Act 2 sites are evaluated by the appropriate responsible parties who are remediating those Sites.

7. Air monitoring has been done on site to see if vapors were present in refinery buildings or the surrounding air. When will this investigation of air quality be extended to surrounding areas, slash neighborhoods?"

Even though we do already have enough data, this is a risk assessment activity (that gets reported in future Act 2 submittals). However, we already looked at potential vapor issues off site using the existing data. In general, you use the known extent of a plume and also look at the potential groundwater impacts (after modeling the future extent of groundwater impacts). So while we don't have an approved fate and transport model that shows this, to be conservative, we looked at the concentrations at the property

boundary (which would generally be higher than concentrations further away). In other words, you assume that you would have residences right on the fence line, and use those groundwater concentrations at that higher level to compare. This initial assessment did not find any potential impacts to off-site residences from the on-site conditions in shallow groundwater or known extent of plumes emanating from the facility.

8. When were the outdoor air samples taken?

The outdoor (ambient) air samples that Evergreen has collected across the site have been collected over many years. Some samples were collected during individual AOI investigations and some were collected as part of a site-wide vapor investigation. Individual sample dates are included in the air data tables within the Remedial Investigation Reports.

9. Are chemicals you are presently using putting additional toxins in the air?

Evergreen does not use chemicals in their current remediation systems.

10. Air quality measurements were made within existing buildings, but no air quality data was collected in surrounding neighborhoods or onsite at contaminated locations.

Evergreen must investigate air quality stemming from subsurface contamination only, not from refinery operations above ground. As documented in the Remedial Investigation Reports, air samples were collected from inside site buildings, and from outdoor air locations both as background and above areas of known LNAPL plumes. There are no known residential areas where the contaminated groundwater has migrated from the facility to beneath those areas, which would possibly warrant sampling. Also, future movement of contaminant plumes over time will be part of future site activities, including fate and transport modeling and evaluation of any potential risk associated with the migration of offsite plumes as part of a vapor intrusion assessment.

Climate Change

11. What sea level rise, if any, was the tide gate built to accommodate?

Tide gates are a common flood prevention structure for areas in a tidal zone. Tide gates close during incoming tides to prevent inundation from downstream water propagating inland and open during outgoing tides to drain upland areas. The tide gates at the Site were not specifically designed to address sea level rise; however, the Site will continue to be regulated under the stormwater management requirements of the City of Philadelphia and the PADEP which includes provisions for sea level rise.

12. 1)We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk.
    2) Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifer.
    3) The work done so far does not consider the impacts of climate change, rising sea level and worsening storms. Note: for the purpose of response, this comment was split into three topics by Evergreen.

1)The site-specific standard for lead was approved by both PADEP and EPA and utilized the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. As part of the remedial investigations, the lead data was compared to the Act 2 SHS MSC, which is 450 ppm, based on the soil to groundwater pathway. This comparison is shown on the figures/tables in the RI Reports and in the 8/27/20 presentation. The approach that was used to calculate the SSS for direct contact was to use the Adult Lead Model recommended by the EPA. The PADEP used the same model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead.

2)DEP did not approve two of the RIRs – AOI-4 and AOI-9 – based on the need for additional offsite characterization, not a level of contamination over other AOIs. The characterization portion of the AOI-11 report was sufficient for approval; however, the fate and transport portion of the AOI-11 reports was not, which is why the report was not approved. Data has been collected from the lower aquifer wells as part of the other AOI remedial investigations since 2013 and reported in the Remedial Investigation Report submitted since 2013.
3)Characterization and delineation of contaminants of concern does not generally require consideration of climate change, sea level rise or worsening storms. Climate

change will be considered in future fate and transport efforts and cleanup plans where that type of variable warrants consideration.

13. Why is there no mention of climate change in discussion of the Water-table aquifer? These levels could change by multiple feet in the next few decades.

One of Evergreen's primary objectives through the remedial investigations under Act 2 was to characterize the facility's geologic framework and the water-bearing units it supports. Potential flow pathways for contaminant transport could be evaluated in this manner using recent groundwater observations from hundreds of wells at the facility. Evergreen's groundwater model is calibrated and validated to these recent groundwater data to provide defensible fate and transport simulations that are based on current conditions. A sensitivity analysis was performed on the groundwater model to evaluate the impact of changes to inputs on performance and increase confidence in its ability to make predictions.

Evergreen recognizes that climate changes are predicted that could alter local hydrologic conditions near the facility, such as higher water levels in the water-table aquifer or higher tides in the Schuylkill River. An assessment of climate change from available, published resources and the potential implications to Evergreen's groundwater model will be included in the upcoming Fate and Transport RIR.

14. Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling states, "the boundary condition data variability must be quantifiable and based on accepted models or observations." What in plain language does this response mean? You have not directly answered the question. What efforts are being made to quantify the boundary condition data? Are accepted models available or not? If not, why not?

Evergreen plans to evaluate climate change data in support of groundwater modeling for contaminant fate and transport. The effort will include a review of available literature on climate change predictions for the Philadelphia region. Accepted climate models would be those that are published, peer-reviewed, and/or otherwise viewed as reliable and relevant to future conditions at the facility. Quantifiable refers to the need for climate change data to be numeric in nature so that the values can be incorporated into Evergreen's modeling.

15. The hydrological situation is changing. Are you considering remediation strategies with respect to sea-level rise, which could affect groundwater on the site?

Evergreen's approach to remediation of the facility will be detailed in future Cleanup Plans, and climate changes predicted to occur within the anticipated timeframe to completion will be considered.

16. Climate change-generated sea-level rise (Schuylkill, Delaware) is a given. There are already models out there. What range of values in feet are Evergreen assuming for 2050, and 2100?

Evergreen has yet to complete the contaminant fate and transport assessment for the facility and currently has a working groundwater flow model that is calibrated to recent, average sea level in the Schuylkill River estimated from a local tide gauge. The magnitude of sea-level rise has not yet been selected for evaluation in the modeling and is pending a literature review of available resources and initial modeling results to understand the time constraints on contaminant fate under Act 2 (i.e., how many years are predicted for Evergreen to meet Cleanup goals under Act 2 compared to the magnitude of climate change predictions within that general time period).

Fate & Transport

17. What is the status of your groundwater and aquifer modeling for all pollutants?

The groundwater flow model has been completed but cannot be finalized and submitted until all Remedial Investigation Reports are approved as data collected for these reports are used as the basis for the groundwater flow model. Groundwater contaminant fate and transport model efforts will be conducted subsequent to approval of the Remedial Investigation Reports since the fate and transport modeling is dependent upon the information in the Remedial Investigation Reports and the groundwater flow model.

18. Will Evergreen be incorporating climate resilience into its groundwater modeling?

Evergreen's groundwater flow model for the former Philadelphia Refinery has been calibrated and validated to recent environmental conditions and measured observations. As a part of the remedial investigation's contaminant fate and transport assessment, Evergreen will review available information related to climate change in the Philadelphia area and, if warranted, the groundwater model could be adjusted to adapt to predicted climate conditions and could provide a range of potential outcomes for consideration (e.g., a higher average Schuylkill River stage due to sea-level rise or an increased recharge rate due to an increase in annual precipitation). For a defensible model and reliable predictions, the boundary condition data variability must be quantifiable and based on accepted models or observations.

19. When will Evergreen conduct the fate and transport analysis for the lower aquifer? There is no aquitard between upper and lower aquifer across most of the site. Won't the heavily contaminated shallow aquifer gradually leach contaminants into the lower aquifer? (a critical drinking water source for New Jersey)

The fate and transport analysis for the lower aquifer will be performed once the Remedial Investigation Reports for AOI 4 and AOI 9 have been approved. There are areas beneath the Site where connections exist between the lower aquifer and water table aquifer are less extensive than the areas where we have that important clay layer present. The cross section shown during the August 27th Public Information Session was just one example from the site model that straddles the Schuylkill River where the aquitard is interpreted to be missing. Other cross sections show the continuity of that clay layer. Even where the aquitard is missing, it does not necessarily mean that water and contaminants will move down into the deeper aquifer. That potential has to do with

pressure gradients that the model can simulate. The fate and transport model will simulate future scenarios based upon current conditions.

It is noted that the fate and transport analysis will include mapping of the middle clay unit aquitard. Water quality in the lower aquifer is monitored through routine sampling of groundwater from approximately 80 wells, and to date significant contamination has not been observed in the lower aquifer beneath the Site. Considering the aging and degrading petroleum sources in the water table from historic Sunoco sources, we do not expect groundwater hydrocarbon plumes to expand under current groundwater conditions.

20. In today's presentation, the presenter described that water flows within the upper groundwater can only mix with water in the lower groundwater if there is a "hole" in the 'shelf' layer between. Even from a layman's perspective, the airplane-view images provided for comparing the two zones and the "shelf-like' separation, that pathway appeared quite large–and that it could be a pathway of contaminates. Is this being studied? What is the status of such a report and when would its findings be presented and addressed?

Characterization of the refinery geology, hydrogeology, and extent of contamination, including study of the pathways that could exist, has been ongoing and is included in the RIRs. A fate and transport analysis will be prepared once all the RIRs have been approved, and the analysis will include model simulations of contaminant transport. This report is expected to be submitted by the end of 2021.

21. Why is there no mention of climate change in discussion of the Water-table aquifer? These levels could change by multiple feet in the next few decades.

One of Evergreen's primary objectives through the remedial investigations under Act 2 was to characterize the facility's geologic framework and the water-bearing units it supports. Potential flow pathways for contaminant transport could be evaluated in this manner using recent groundwater observations from hundreds of wells at the facility. Evergreen's groundwater model is calibrated and validated to these recent groundwater data to provide defensible fate and transport simulations that are based on current conditions. A sensitivity analysis was performed on the groundwater model to evaluate the impact of changes to inputs on performance and increase confidence in its ability to make predictions.

Evergreen recognizes that climate changes are predicted that could alter local hydrologic conditions near the facility, such as higher water levels in the water-table

aquifer or higher tides in the Schuylkill River. An assessment of climate change from available, published resources and the potential implications to Evergreen's groundwater model will be included in the upcoming Fate and Transport RIR.

22. Evergreen's answer on the website to the question of whether climate change will be incorporated in the groundwater modeling states, "the boundary condition data variability must be quantifiable and based on accepted models or observations." What in plain language does this response mean? You have not directly answered the question. What efforts are being made to quantify the boundary condition data? Are accepted models available or not? If not, why not?

Evergreen plans to evaluate climate change data in support of groundwater modeling for contaminant fate and transport. The effort will include a review of available literature on climate change predictions for the Philadelphia region. Accepted climate models would be those that are published, peer-reviewed, and/or otherwise viewed as reliable and relevant to future conditions at the facility. Quantifiable refers to the need for climate change data to be numeric in nature so that the values can be incorporated into Evergreen's modeling.

23. How much more information do you need to complete the fate and transport model?

We believe we have sufficient information to complete the model. However, we need to have agreeance on that from DEP prior to submittal. In other words, all of the Remedial Investigation Reports must be approved first (meaning, that DEP feels we have sufficiently defined the contamination so that a model can be accurate and complete). Once the RIR Addendums for AOI's 4 and 9 are submitted and approved, the fate and transport model will be finalized and submitted to PADEP for approval.

Groundwater

24. What investigation has been done to identify contamination to soil or groundwater beyond the property boundary (offsite)?

Evaluation of conditions at the property boundaries and offsite, where appropriate, are addressed in each Remedial Investigation Report with respect to the property boundary area nearest each defined Area of Interest. Investigation generally includes offsite monitoring wells installed by Evergreen (or previous entities) and data sharing efforts with multiple adjacent or nearby properties also in Act 2 or other environmental programs.

25. There is a benzene pool that extends toward residential neighborhoods of South Philadelphia. In June 2019, PES reported fence line measurements of benzene above regulatory limits. What's the situation? What corrective actions have been taken?

Dissolved benzene in groundwater (otherwise known as a benzene groundwater plume) is present at the former Philadelphia Refinery. The Remedial Investigation Reports summarize the benzene in groundwater that Evergreen has characterized as part of the Act 2 investigations. For example, the AOI 1 RIR presents details concerning benzene in groundwater along the eastern boundary of the former Philadelphia Refinery. These reports also summarize the interim remedial activities to address environmental impacts including groundwater and vapor remediation systems that exist along the property boundary on 26th Street. Part of the Act 2 processes include evaluating potential impact to offsite properties, including residences. These evaluations show that the dissolved benzene impacted groundwater beneath AOI 1 is not likely to migrate under nearby residential areas, and that there are no air impacts from the benzene groundwater plume to offsite properties. Evergreen prepared an overall summary slide of benzene in groundwater beneath the whole facility due to on-site and off-site sources for presentation during the November 2019 public meeting. The presentation is posted to this website. PES, as owner and operator of the facility, is required to report fence line measurements of benzene based on air emissions from PES' operations. This is unrelated to the benzene groundwater plume and Evergreen does not have the information to be able to address the portion of your question related to the 2019 PES reported fence line monitoring.

26. There has been some concern that because of the aquifer under the water, pollutants from the refinery may impact drinking water in downstream New

Jersey. Do you think this was ever a concern? If yes, will it continue to be one even as the refinery shuts down?

Evergreen's role is to evaluate and remediate groundwater conditions created based on use of the facility up through 2013. Based on extensive data collected over the last 20+ years, and groundwater modeling performed to date, it is highly unlikely that those groundwater impacts affect drinking water quality in New Jersey. As part of the Act 2 process, Sunoco and Evergreen have performed several preliminary risk assessments, including accounting for the projection of dissolved contaminant migration in groundwater. All assessments to date have shown that conditions with respect to groundwater beneath the facility are protective of human health both onsite and offsite. Evergreen is working on a complete groundwater fate and transport analysis, which projects where and how far contaminants will travel and at what concentrations, as well as other reports that will provide additional and more detailed analysis.

27. Has AOI 11 cleanup been started? What is the plan for the cleanup for AOI 11?

Additional investigation has been completed for AOI 11 since the time of the last report submitted solely for AOI 11 in 2013. In fact, the latest Remedial Investigation Reports (RIRs) for each of the AOIs include information about AOI 11, or the lower groundwater unit, within that AOI. We chose to incorporate AOI 11 into the other AOI RIRs in order to give a full description of groundwater within each AOI in these reports. After the RIRs are all submitted and approved, Risk Assessment and Cleanup Plans will be submitted for different areas of the site. The proposed cleanup for AOI 11 will be included in the Cleanup Plans, which are yet to be submitted for the site. Note that active ongoing remediation efforts in shallow groundwater to remove petroleum products and contaminated groundwater have likely had a positive effect on AOI 11 groundwater quality through source removal. In addition, natural processes work to break down petroleum in the subsurface.

28. When will the public hearings for AOI 11 under Act 2 take place?

Evergreen held a Public Information Session on August 27, 2020 during which the environmental data collected for the AOI's was reviewed with the public. Additional meetings are planned to be held for future Act 2 submittals, some of which will include information about AOI 11. The public is encouraged to ask questions and provide comments to any report submitted during the Act 2 process. Notices will be sent to the public via newspapers as well as an email to interested parties for all future report submittals and meetings.

29. What effect has pollution been in the last 7 years since the last reports on AOI 11 were issued on 6/21/2013?

New groundwater data for AOI 11 has been collected since 2013 and it is presented in the RIRs for each of the other AOIs. Overall, most groundwater conditions in the lower groundwater unit (AOI 11) have been demonstrated to be stable to improving since the 2013 reporting for petroleum-related compounds.

30. Have there been any studies on the effect of the pollution of the PRM in the water supply in NJ, as public and private water companies draw water from it and Phila stopped using it in the 1990's because it was too polluted?

Evergreen is not aware of any available studies that evaluate the fate and transport of petroleum hydrocarbon chemicals in groundwater from the site into New Jersey groundwater. Evergreen plans to complete fate and transport modeling with a numerical groundwater model, which will evaluate the potential migration of petroleum-related chemicals from both the water-table aquifer (AOIs 1-10) and lower aquifer (AOI 11). Based on data collected to date, there is no indication that petroleum-related chemicals in groundwater from site operations will migrate to New Jersey.

There have been several studies of the PRM groundwater unit focusing on groundwater flow and naturally occurring metals, including:

Historical Ground-Water-Flow Patterns and Trends in Iron Concentrations in the PotomacRaritan-Magothy Aquifer System in parts of Philadelphia, Pennsylvania, and Camden and Gloucester Counties, New Jersey, U.S. Geological Survey, Water-Resources Investigations Report 03-4255,
Schreffler, Curtis, L., 2001. Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia Pennsylvania, U.S. Geological Survey, Water-Resources Investigations Report 01-4218, Sloto, R. A., 2003.

31. Has NJ DEP been involved with any issues on the NJ side of the Delaware River? Have public and municipal water companies in NJ been notified about pollution in the PRM Aquifer water supply? Have they been notified about AOI 11 efforts by PA DEP and EPA?

The NJDEP is routinely involved with groundwater investigations of the PRM due to source areas located in New Jersey that are not related to impacts in AOI 11. There

has been no demonstrated connection between groundwater impacts in AOI 11 due to past refinery operations and the PRM groundwater quality in New Jersey. As such, the NJDEP has not been involved with cleanup of the former Philadelphia Refinery. Evergreen's understanding of AOI 11 groundwater conditions beneath and adjacent to the refinery has not warranted notification of the public or municipal water companies in New Jersey, nor has the Pennsylvania Department of Environmental Protection or U.S. Environmental Protection Agency notified these water purveyors that there is a perceived risk to New Jersey groundwater quality stemming from operation of the former Philadelphia Refinery.

32. What are the biggest environmental concerns with the water moving forward as this space is transitioned to a mixed-use industrial site?

In general, water concerns remain the same between use of the site as a refinery and the proposed use. As part of the Act 2 process, groundwater quality must be investigated as well as migration of and risks associated with the contaminants identified. The groundwater beneath the site is not allowed to be used for any potable (human consumption) or industrial use; therefore, the direct exposure to groundwater through these pathways is not identified as a concern. Potential vapor intrusion, or vapors migrating from the groundwater into indoor structures, is being evaluated as part of the investigation process. The proposed redevelopment may increase site elevation, due to the need for added grade for construction, which may help address potential concerns about floodwaters interacting with impacted soils. The remaining pathway to be evaluated is the interaction of groundwater with surface water in the Schuylkill River. The results of the evaluation of this pathway will be presented in a Site-Wide Fate and Transport Remedial Investigation Report. The findings in this report, along with the completion of the Human Health and Ecological Risk Assessment, will determine if additional cleanup measures for groundwater are needed, which will be presented in the Act 2 Clean-up Plan.

33. Hi, I live in Siena place. I noticed that Benzene concentration is a light green and close to the dark green shaded areas in the same spot as my current house (very close to pha housing and refinery) (Evergreen note: this question refers to slide #38 "Groundwater Investigation Results – Benzene" in the August 27, 2020 presentation which is available for view or download on www.phillyrefinerycleanup.info). I think it was in the lower aquifer and water table aquifer. Because it is right below my house it seems from the map, can this present a danger to me or the house? Like can my water and be affected? And gas vapors be present? Or is it totally safe to live in this area even though it is below ground?

Information from the remedial investigation activities do not indicate that there is any risk to indoor or outside air in offsite properties from benzene in groundwater originating from the former Philadelphia Refinery. Evaluation of vapors to indoor and outdoor air from a dissolved plume beneath the subsurface is part of the evaluation required by Act 2. That evaluation will be included in future Act 2 reports to be submitted upon completion of all Remedial Investigation Reports. Please note that the slide being referenced shows refinery data as well as data collected from other nearby Act 2 sites. Plumes originating from other Act 2 sites are evaluated by the appropriate responsible parties who are remediating those Sites.

Hilco / Redevelopment

34. Philly Inquirer (8/3/2020) says Hilco is calling for an “exposure barrier,” instead of removal. How extensive is contamination beyond the site? Concerned this does not address the health and environmental rights of the local community, nor account for sea-level rise and climate change flooding.

The off-site impacts are described in the Remedial Investigation Reports and two Areas of Investigation (AOIs), AOI 4 and AOI 9, have completed additional investigation activities to delineate off-site impacts. As part of developing future Cleanup Plans for the site, several remedial options will be evaluated, including exposure barriers which may be necessary on-site. Exposure barriers are a general term and may include remedial options such as capping (to eliminate any direct contact exposure to soil) and vapor barriers (to eliminate any exposure to vapors in a building). Although Evergreen has not developed any Cleanup Plans yet, it is anticipated that exposure barriers will be one of the remedial options that will be considered in accordance with the PADEP’s capping guidance. The effects of sea-level rise and/or flooding will be evaluated as part of the Cleanup Plans.

35. If Hilco is going to help Evergreen throughout the cleanup, then why aren’t they on this call and subsequent PIP meetings? (Evergreen note: question referring to the 8/27/20 public information session)

Hilco Redevelopment Partners (HRP) will be part of the remediation process. HRP/PES is responsible for former PES releases/liabilities (after 2012) and Evergreen is responsible for former Sunoco releases/liabilities (pre-2012). Although HRP and Evergreen have separate responsibility for remediation, HRP and Evergreen are working together during the site development to ensure that Evergreen’s remediation activities continue without disruption, and to coordinate where the development activities need to be considered in developing the remedial plan (for example, placement of vapor barriers in future buildings to address potential vapor migration/exposure). Unfortunately, HRP was unable to attend the August 27th meeting due to prior commitments but will be part of future public sessions.

36. Hilco has indicated in the Soil Management Report it filed with the City that the site-specific standard for lead required for the HRP intended uses for the site is 1,000 PPM. Will Evergreen remediate to this 1,000 PPM standard rather than the 2,240 PPM previously approved by PADEP?

The Soil Management Plan generated by Hilco outlines how they will deal with soils during development activities and outlines conditions by which soils can be moved within the facility and where they can be placed. They noted using the existing direct contact statewide health standard of 1,000 ppm as one of the matrices in that plan. This does not affect the site-specific standard that Evergreen calculated and referenced in Remedial Investigations. The future cleanup plans will still compare all new soil data to both the statewide health and site-specific values to determine appropriate remedy selection.

37. When clean-up will the community be notified in south and southwest Philly?

Any cleaning or demolition of tanks or above-ground structures are the responsibility of the property owners, Hilco Redevelopment Partners (HRP)/PES. Evergreen is not involved in these activities, but HRP has indicated that they will also communicate to the public about their activities.

Evergreen is in the process of finishing the investigation activities at the former Philadelphia Refinery to identify the extent of the chemicals in soil and groundwater, in order to ultimately develop a remediation (cleanup) plan for the site. Before a Cleanup Plan can be written, Evergreen will also complete a risk assessment to determine the potential impact from the chemicals in the subsurface at the site and to help develop the cleanup approach. During this process, reports will be written, public meetings will be held and information will be posted to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Additional notifications will be made before any final cleanup activities are started at the site.

38. Is there any involvement of Hilco, the new owner?

Hilco is not involved in Evergreen's Act 2 program at the site. Hilco will have their own remediation program to manage separate issues; however, the two programs are separate. Evergreen and Hilco will work together to limit disruptions of Evergreen's remediation program during the development activities.

Other / Misc.

39. Who is GHD? And what is their relationship to Evergreen and Sunoco and ET?

GHD is one of several environmental consulting firms contracted by Evergreen to work on Sunoco's legacy remediation at the Philadelphia refinery.

40. I was wondering what your plans are now that Hilco has purchased the land PES and Sunoco both left in shambles.

Evergreen is in the process of finishing the investigation activities at the former Philadelphia Refinery to identify the extent of the chemicals in soil and groundwater, in order to develop a remediation (cleanup) plan for the site. Before a cleanup plan can be prepared, Evergreen will also complete a risk assessment to determine the potential impact from the chemicals in soil and groundwater. At various steps in the process, reports will be written, public meetings will be held on Act 2 reports and information will be posted to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Additional notifications will be made before any final cleanup activities start at the site.

41. Have you reached out to Hilco about their clean-up efforts? Will you be monitoring them for accountability over severe toxic chemical spills in the water and soil?

Evergreen has been in communication with Hilco Redevelopment Partners (HRP) as the company finalized the purchase of the site from Philadelphia Energy Solutions (PES). Evergreen will continue to communicate and work jointly with HRP for the cleanup of the site during their redevelopment so that our investigation and remediation (cleanup of the historic contamination) can continue during their redevelopment activities. Evergreen's cleanup plan, which will address contamination in soil and groundwater existing up to the date of the sale of the facility to PES in 2012, is being completed under the Pennsylvania Department of Environmental Protection's (PADEP's) Act 2 program and tank program, as well as the U.S. Environmental Protection Agency's (EPA's) Resource Conservation and Recovery Act program.

42. I would also like to know your plan for holding Sunoco responsible for the decades of destructive pollution they caused in our city. This pollution has had direct impacts on community health in the surrounding neighborhood and has fueled the devastating climate crisis now impacting us all.

Sunoco is responsible for cleaning up soil and water contamination generated prior to the sale of the facility in September 2012. Evergreen, as a wholly owned subsidiary of Sunoco, is managing the cleanup that Sunoco is responsibility.

43. Why does the former refinery get special treatment compared to other nonresidential sites? In terms of the lead site specific standards in soils 0 to 2 feet

The ability to calculate a site-specific standard (for any media) is a provision in the Act 2 regulations and is not the only one allowed, but is common practice and one of the three options for standards that can be applied to a site: Statewide Health, Background, or Site-Specific. Other non-residential sites can also calculate a Site Specific Standard if they choose to do so for their Act 2 projects.

This question was also provided to PADEP, to which the following response was provided: "Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2 of 1995) allows the remediator to select the type of cleanup standard they wish to use for the site. One option is the site-specific standard, and risk assessments are a means available to any remediator to attain that standard. Evergreen chose to use a risk assessment to determine a site-specific standard for direct contact exposures of people with lead in surface soil (upper 2 feet). With this approach they were able to use a more current scientific methodology from U.S. EPA to calculate a risk-based value. Remediators who do not perform a site-specific analysis will generally use the published Statewide health standard default cleanup values, but the site-specific standard option may be used by any remediator and it is not unique to this site."

44. So, you are acknowledging that the DEP is attempting to increase the nonresidential surface soil lead standard to 2,500 from 1000 to accommodate the refinery site?

The PADEP calculated a new proposed direct contact standard based on the updated Adult Lead Model and updated exposure assumptions recommended by the USEPA, not to accommodate any specific site.

45. How can you tell whose benzene is whose?

In general, where there are potentially offsite sources and/or onsite sources which may explain the presence of benzene, factors such as the respective products used at a site, release history and/or environmental conditions such as geology and hydrogeology which govern how those products behave in the subsurface, etc. may assist in

identifying a source. Where different releases onsite may explain the presence of benzene, factors such as time of release may assist.

46. Who pays evergreen to do this work?

Evergreen is an Energy Transfer company. So, the funding for the remediation ultimately comes from Energy Transfer.

47. What was your process for hiring the local consultants. Was there any review of consultants by residents/public?

When we hire consultants, we look for similar experience; for example, have they worked at refineries before, have they worked on petroleum sites before. We have peers in the industry who have opinions on a lot of consultants. There are a lot of factors that go into it, but we do not typically ask the residents or the public for their involvement on hiring consultants.

Ownership / History / Infrastructure

48. Please explain the formal, legal, and/or organization ties that Evergreen has to Sunoco and/or Energy Transfer.

Evergreen is a wholly-owned subsidiary of ETC Sunoco Holdings LLC f/k/a Sunoco, Inc. (there was a corporate name change in December 2018), and both companies are indirect subsidiaries of Energy Transfer L.P. In November 2013, Evergreen was registered in the State of Delaware to manage Sunoco's legacy environmental cleanup at the Philadelphia Refinery.

49. The logistical infrastructure moves petrochemicals across the site. Where are the pipelines, pumps, storage tanks, and intakes/offtakes located (on a map)? What dangers do each pose?

The features related to petroleum operations that were included in Evergreen's Act 2 or Chapter 245 (Tank Act) investigations are included in the figures in the RIRs, and the associated environmental impacts are summarized in these reports. Also note that operations have been shut down and we expect that most infrastructure will likely be removed as part of the redevelopment.

50. The site contains two refineries (at Point Breeze and Girard Point). What is the story for each refinery?

While the question is a bit open-ended and capable of multiple interpretations, we interpret this question to be generally inquiring about the ownership history of the two refineries. As specified on the website, Point Breeze (which includes AOI 1, 2, 3 4, and 8) was formerly owned by Atlantic Richfield Company (ARCO) and purchased by Atlantic in 1985 and subsequently by Sunoco. Girard Point (which includes AOI 5, 6 and 7) was formerly owned by Chevron and purchased by Sunoco in 1994. After that time, the facility operated as one refinery. In 2012, the complex was transferred from Atlantic (as to Point Breeze) and Sunoco (as to Girard Point) to Philadelphia Energy Solutions (PES).

51. The site contains multiple tank farms (Schuylkill, etc.). What is the story for each tank farm?

While the question is a bit open-ended, we interpret this question to be generally inquiring about Sunoco's regulatory compliance with respect to tanks at the property. The environmental impacts at the tank farms have been evaluated two different ways as

part of Evergreen's activities. If there was a release or tank closure from a tank operated by Sunoco, an investigation was completed and reported following the Pennsylvania Tank Act regulations. The general areas of the tank farms were also evaluated following the Act 2 process. Many tank investigations are also included in the RIR documents. Tank closures and releases occurring after 2012 were dealt with by the current owner/operator.

52. Could you explain Evergreen's exact relationship with the refinery?

Evergreen is a wholly owned subsidiary of ETC Sunoco Holdings LLC (formally known as Sunoco, Inc.), and both companies are indirect subsidiaries of Energy Transfer L.P. In November 2013, Evergreen was registered in the State of Delaware to manage Sunoco's legacy environmental cleanup at the Philadelphia Refinery. By legacy, we mean that Sunoco retained responsibility for remediating the subsurface conditions at the refinery that existed on Sept. 8, 2012, on the date the property was transferred to Philadelphia Energy Solutions.

53. I thought the refinery was to be permanently shut down following the explosion in June of 2019? Will the refinery be permanently shut down?

Evergreen is responsible only for the historic (pre-2012) contamination that exists below the surface in soil and groundwater at the Site. Because of that, our work includes investigating and cleanup of the extent of contamination in the subsurface that existed before the sale of the facility from Sunoco to Philadelphia Energy Solutions (PES) in 2012. It is our understanding that the refinery was permanently shut down after the explosion; however because Evergreen is not the owner/operator of the facility, operations conducted at the site after the explosion are not known to Evergreen.

As of June 26, 2020, Hilco Redevelopment Partners (HRP) completed its purchase of the site. HRP plans to redevelop the site and the company has no plans to operate the site as a refinery.

54. Do you have any idea what is going to be done with the site, and is there any way to encourage using it as a site for renewable energy for the city?

Evergreen is responsible only for the historic contamination that exists below the surface in soil and groundwater at the Site. We are in the process of finishing the investigation activities at the site to identify the extent of the chemicals in soil and groundwater, so we can develop a remediation (cleanup) plan for the site. Before a cleanup plan can be prepared, Evergreen will also complete a risk assessment to

determine the potential impact from the chemicals in soil and groundwater. At various steps in the process, reports will be written, public meetings will be held for the Act 2 reports and information will be posted to the website created for the Act 2 process (https://phillyrefinerycleanup.info). Additional notifications will be made before any final cleanup activities start at the site.

As of June 26, 2020, Hilco Redevelopment Partners (HRP) completed its purchase of the site. HRP plans to redevelop the site into a multi-modal logistics hub and does not plan to operate the site as a refinery. As part of their outreach activities, more information will be provided by HRP for specific future site uses as their redevelopment process continues. Evergreen will continue to communicate and work jointly with HRP so that our investigation and cleanup activities can continue during their redevelopment. Evergreen's cleanup is being completed under PADEP's Act 2 program and tank program, as well as the U.S. EPA's Resource Conservation and Recovery Act.

55. What other companies are involved in the cleanup, besides Evergreen?

Evergreen is responsible to cleanup legacy contamination, generated prior to September 2012. Hilco Redevelopment Partners (HRP) is responsible to cleanup recent contamination, generated after September 2012.

56. How is it determined what ground pollution is from 2012 and before…and what is from 2012 to the present?

When the facility was sold to PES in 2012, Sunoco had a good understanding of the nature and extent of contamination at the facility. It was assumed that any known contamination at the time of the sale was Sunoco's responsibility to cleanup. After the sale of the property, if changes in the contaminant profile on-site occurred, or known spills happened, the resulting cleanup became PES' responsibility. In some instances, new contamination co-exists with old contamination, and the responsibility is shared.

57. In today's presentation (August 27th Public Information Session), a summary of the content within RI reports was provided. If source, extent and pathway of contaminants is discovered to have conveyed contaminants beyond the beyond the property boundary which legal entity is currently responsible for impact study costs and remediation costs?"

Act 2 requires that the Remedial Investigation Report defines the extent of contamination, including beyond the property boundaries. Two of the RIRs were not

approved for that reason, which is why they required additional offsite work to further define the full extent of contamination in those areas.

Public Participation

58. Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?

Since Atlantic/Sunoco purchased the refinery, there have been 21 Act 2 reports submitted and, at the time of each submission (as well as at the time of each of three Notices of Intent to Remediate (NIR) submitted for the property), a letter was sent to the City of Philadelphia and notices appeared in a local newspaper informing the public of each submittal and their opportunity to comment on the submittals. In August 2018, DEP requested that Evergreen revisit the previous public involvement plan with the City of Philadelphia. After a meeting with DEP, EPA and City officials in November 2018, Evergreen began developing the www.phillyrefinerycleanup.info website in preparation for a public meeting. The fire at PES' facility occurred after this effort was underway, in June of 2019. At that time, Evergreen suggested opening the website prior to announcing a date for a legacy remediation public meeting to allow the agencies to share the website in order to aid in answering questions that were being posed about Sunoco's legacy remediation program. The June 2019 fire at the PES facility does not relate to Evergreen's Act 2 submittals or public involvement plan.

59. Public Participation that begins after the all the information is gathered, everything decided and recommendations are ready to be presented to the public is not adequate public participation. Public participation must begin at the beginning, not the end or near the end.

Evergreen agrees that public participation should not be done once everything is decided. As stated previously, public notice was completed when a Notice of Intent to Remediate (NIR) was submitted at the start of the Act 2 process and when the NIR was updated two times afterwards. In addition, public notice has been completed when each of the 21 Act 2 reports have been submitted to the PADEP. In addition, a public meeting was held in 2006 during the early stages of the Act 2 activities at the Site and Evergreen is committed to continuing public participation as part of the public participation plan, including additional public meetings.

60. Does Evergreen consider the 11/7 "event" a formal meeting, and if so, does this start the timeline for them? If it does not, when will the next meeting be held?

Evergreen remains disappointed that entrances were blocked at the planned meeting preventing members of the community and agency officials from engaging in a discussion about the environmental condition of the refinery property. Evergreen views

the public engagement process as ongoing due to the acceptance of comments from the public, but a specific end date is still being discussed as the process continues. Evergreen is working with stakeholders to schedule another meeting in the future. Information on the scheduled meeting will be posted to the website and public notices will be submitted as was done with the original meeting.

61. Why was there no meeting 11/7/20. Why was Evergreen “blocked” from the meeting? Was there a meeting at all?

Evergreen is unaware of the exact reason the meeting was blocked by certain members of the public. The purpose of that meeting was to initiate public involvement by introducing who Evergreen is, provide a summary of the work that has been completed at the site to date, and discuss Evergreen’s future activities. Evergreen held a virtual meeting on August 27, 2020 for the same purpose.

62. The information on your website seems to be outdated but i recently received a letter in the mail asking us to submit comments. I worry about our community over the river in South Philly who have dealt with countless decades of health problems due to this harmful refinery. Please keep me updated on this matter.

We appreciate that you have taken the time to look at the Evergreen website. The intent of the website is to be a central location that contains all of the most recent reports for the site, a summary of frequently asked questions, and news about upcoming events. We are currently updating the website with information on an upcoming public information session. The postcard was part of Evergreen’s overall outreach plan to the community and we welcome any comments you have on the site and the proposed cleanup process.

63. Thank you for doing your best to use plain language and take the measures you have to try to include the public, as is required by Act 2. Will you hold more regular small group sessions, as a necessary precursor to the public being able to submit educated comments? Information only presented in a one-way format does not enable true public engagement.

Evergreen has offered to community groups, such as Philly Thrive, to meet in a smaller group settings to answer questions concerning the Site. Evergreen will work with the community to develop the best format to engage in smaller group settings as part of the Act 2 process.

64. Please support Philly Thrive's demands: Equal partnership with the public needs to be achieved by: (1) creating a series of public meetings in a small-group format to allow for meaningful public engagement throughout the Act 2 process and (2) creating a community-based advisory group to solicit questions and comments, and evaluate the effectiveness of the PIP on an ongoing basis.

Evergreen is committed to engaging with the local community throughout the Act 2 process. Since Act 2 does not have an established process to create a community advisory board, Evergreen is currently evaluating how they can work with the current Site owner and the City as part of a community advisory group.

Evergreen has offered to community groups, such as Philly Thrive, to meet in a smaller group settings to answer questions concerning the Site. Evergreen will work with the community to develop the best format to engage in smaller group settings as part of the Act 2 process.

65. As a community resident I think this media forum is not consumer friendly in allowing community members to have an opportunity to participate fully in this report out process.

Evergreen is evaluating how the future virtual public information session can be structured to allow for live Q&A that will allow for as many people as possible to have their questions answers.

66. If residents are going to invest time & energy in providing our comments, we need to know that there will be responsiveness to the comments- and they won't just sit on a website (thank u for the website btw!). Specifically: can "approved" reports that didn't have public input until now be reopened and revised based on public comments that find any inadequacies in the reports? Otherwise what is the point of us commenting?

Evergreen will revise the approved Remedial Investigation Reports if new information is identified through the public comment process concerning the conclusions of the Remedial Investigation Reports. The comments received to the Remedial Investigation Reports will also inform the fate and transport evaluation, risk assessment, selection of remedial approach and monitoring, all which are still yet to occur at the Site.

67. Many of the finalized online reports reflect reviews done between 2011 to 2016 with no updates. How can I learn what happened next? Is there a person to

contact with specific, referenced questions, which would be onerous for a Zoom conference?

RIR reports do not get updated once approved. Once RIRs are completed and approved, other report types are submitted with additional information, activities, and updates in the Act 2 process. Evergreen has multiple reports planned for 2021 and will provide a draft schedule on the website of upcoming reports. We have also provided copies of the semi-annual update reports on the website, which are not Act 2 submittals, but provide a routine update on remediation activities at the facility. You can ask questions in writing via email or live during the next Zoom meeting. In addition, Evergreen is currently planning smaller group meetings in the future which may make communication easier.

Regulations

68. Have you submitted draft cleanup plans to DEP? Can we receive a copy of the Cleanup Plan?

A draft Cleanup Plan has not been submitted to the PADEP. Remedial Investigations must be completed prior to submitting Cleanup Plans and other Act 2 reports that follow Remedial Investigations in the Act 2 process. Upon completion of Remedial Investigation Reports (RIRs) for each of the Areas of Interest, the subsequent Act 2 reports can then be submitted. The Cleanup Plan(s) will be prepared and submitted following the Sitewide Fate & Transport RIR, Sitewide Ecological Risk Assessment Report and Sitewide Human Health Risk Assessment Report (or some combination of these reports). However, remediation (cleanup) activities which were conducted prior to entering the Act 2 program and interim remediation activities currently being conducted are summarized in the RIRs posted to the website.

69. I understand that the cleanup is happening under a voluntary act 2 opt in? What were the benefits to opting into this program?

The information provided below was largely obtained from the PA Department of Environmental Protection (DEP) Overview of the Land Recycling Program Fact Sheet, which can be accessed through this link: DEP Fact Sheet.

The Land Recycling Program (which actually includes Acts 2, 3, 4, 6 and 68, but is commonly referred to as “Act 2”) encourages the recycling and redevelopment of old industrial sites, such as the PES Refinery. It sets standards, by law, that are protective of human health and the environment and that consider future use. It provides potential developers with clear cleanup standards based on risk, not a moving target in a negotiated agreement, and provides an end to liability when that cleanup standard is met. This makes old industrial sites more attractive to potential developers, as we have seen with Hilco’s purchase of the PES Refinery. As a result, many sites have been and will be redeveloped with Act 2, helping many of the commonwealth’s urban and rural municipalities to provide jobs and economic growth while remediating environmental impacts, ensuring protection of human health and the environment.

Some additional advantages of using Act 2 for the cleanup of the site include:

Uniform cleanup standards – Act 2 establishes environmental remediation standards to provide a uniform framework for cleanups. The standards established under Act 2 are used for most voluntary and mandatory cleanups conducted in Pennsylvania.

Standardized review procedures – Act 2 describes the submission and review procedures used at sites, thus providing a uniform process for all sites statewide. Uniformity makes it easier to prepare submissions and follow through the steps necessary to remediate a site, which also provides more transparency to the public in the process. It also establishes timeframes in which regulators must complete review of submissions.

State releases from liability – Act 2 provides owners or developers with releases from state liability for a site that has been remediated, according to the standards and procedures in the Act. Act 3 extends liability protection to financiers, such as economic development agencies, lenders, and fiduciaries (fiduciaries are those who act as a trustee, executor, or administrator for the benefit of another person). These provisions are intended to reduce the liability concerns that may inhibit involvement with/cleanup of contaminated sites.

Memorandum of Agreement (MOA) with EPA – In April 2004, DEP and the U.S. Environmental Protection Agency (EPA) entered into a Memorandum of Agreement (MOA) that clarifies how sites remediated under Pennsylvania's brownfields program also may satisfy requirements for three key federal laws: the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation Liability Act (CERCLA), and the Toxic Substances Control Act (TSCA). The framework outlined in the MOA provides procedures for coordinating cleanups under Act 2 with federal cleanup requirements under RCRA, CERCLA, and TSCA, where applicable. Specifically, the MOA allows for Act 2 to address the cleanup of the PES Refinery not

70. But the state of PA actually uses a blood lead level double what the federal CDC updated in 2012.https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm

This question was sent to PADEP who provided the following response:

DEP's published Statewide health standard nonresidential direct contact numeric value for lead in soil, 1000 mg/kg (milligrams lead per kilogram soil), was based on a target blood lead level in adults of 20 mg/dL (micrograms lead per deciliter of blood). Evergreen derived a site-specific direct contact numeric value in their 2015 risk assessment based on a target blood lead level of 10 mg/dL. This is U.S. EPA's default value in the Adult Lead Methodology, which was the method used by Evergreen in their risk assessment calculation.

71. How do DEP and Evergreen determine what is safe?

This question was sent to PADEP who provided the following response:

DEP establishes Act 2 Statewide health standard cleanup values for soil and groundwater, known as Medium-Specific Concentrations (MSCs), using a variety of risk- and health-based methods. For instance, many groundwater MSCs are adopted from U.S. EPA's drinking water standards. Other MSCs are calculated by DEP to protect human health at acceptable risk levels (e.g., a cancer risk of no more than 1 in 100,000).

For site-specific standard cleanups, remediators may develop a risk assessment that uses data specific to the site, and therefore it may differ from attainment of the Statewide health standard MSCs. Risk assessments must demonstrate acceptable cumulative risks, meaning that health effects of all contaminants from both soil and groundwater and through all exposure pathways must be examined. Risk assessments must also consider all potential human receptors (e.g., workers and contractors, as well as nearby residents if contamination has migrated to homes, parks, etc.).

An alternative approach with the site-specific standard is known as "pathway elimination," meaning that the remediator implements measures to prevent people from being exposed to contamination. These measures commonly include constructing a cap at the surface so people won't touch or ingest contaminated soil and dust, prohibiting groundwater use, and sometimes installing systems to mitigate vapor intrusion in buildings. The determination that pathway elimination remedies are "safe" relies in part on the remediator following best practices and standard guidance. DEP reviews plans and specifications for the work (submitted in an Act 2 cleanup plan), DEP reviews documentation for the remedy completion (submitted in an Act 2 final report), and DEP inspects the installation work and subsequent maintenance of the remedy. In addition, DEP oversees the execution of an environmental covenant recorded on the property deed to ensure future maintenance of the remedies. In some cases, testing is also performed to verify that the remedy is effective.

Lastly, while the focus of Act 2 cleanups is on the protection of human health, they must also address potential ecological exposures. Contamination that affects certain sensitive ecological receptors, such as threatened and endangered species, must be addressed in the cleanup. This can also be accomplished through a risk assessment or remedial measures.

72. In today's presentation (Evergreen note: question refers to the August 27, 2020 Public Information Session), related to lead, the presenter described that 'it is a complex process' for 'choosing the standard' associated with lead contamination levels and its subsequent categorization. Why does the entity responsible for contamination clean-up (and their supporting team) have the option to choose their standard for clean-up? Who is the authority having jurisdiction who reviews the selected standard? Are other standards more stringent? If so, why were those standards not used for these contaminants in this case?

There are three choices for clean-up standards that can be applied to any Act 2 site: Statewide Health, Background, or Site-Specific. The choice between the three standards is up to the remediator, but each one has strict guidelines and processes that must be followed to demonstrate to the PADEP (who has jurisdiction and responsibility to review the selected standard) that the standard is appropriate and has been met. DEP has also provided some information that is helpful in answering this question – please see the PADEP response to the question "How do DEP and Evergreen determine what is safe?"

Remedial Investigation Reports (RIR-specific Questions)

73. When will the revised RIRs for AOIs 4, 9 and 11 be submitted?

The Remedial Investigation Addendums for AOI 4 and 9 will be submitted once the public comment period for the approved Remedial Investigation Reports is completed and a summary document is submitted and approved by the PADEP. The investigation of the deep groundwater unit (AOI 11) has been incorporated into the other Remedial Investigation Reports since 2013 based on discussed with the PADEP, so a separate AOI 11 Remedial Investigation Report will not be submitted since it has been more appropriately incorporated into the submitted Remedial Investigation Reports.

74. Gulf operated a refinery where the Schuylkill Tank Farm is currently located before building the refinery at Gerard Point. What contamination is left at the former refinery site? What are the implications for people living or working in Eastwick?

The site characterization and history for the Schuylkill River Tank Farm (SRTF), which is also known as AOI 9, can be found in the Remedial Investigation Reports for AOI 9. Some contaminants are present in soil and groundwater related to the former operations. Light non-aqueous phase liquid (LNAPL) or oil is also present in limited areas and has been observed in monitoring wells. Evergreen completed additional off-site delineation of the dissolved contaminants since the submittal of the last RIR and is planning to submit these results to PADEP in a forthcoming addendum to the AOI 9 RIR, which can occur once the public comment process on previously submitted reports is complete. However, data collected since the last RIRs will be presented at the upcoming public meeting. The results of the site characterization demonstrate that the contamination from AOI 9 does not extend to any residential areas. Additional evaluation of risk within AOI 9 will be completed in the risk assessment report, which will be submitted after the AOI 9 RIR addendum. The final remedial approach will then be presented in a Cleanup Plan dedicated to the SRTF.

75. Can you comment on why AOI11 deep groundwater report has not yet been approved?”

There were both an AOI 11 Remedial Investigation Report and a Final Report that were submitted. Both were disapproved solely for the fate and transport analysis that was included in the reports. The remedial investigation portion of those reports were good. Note that before we started a site wide model concept, each of the AOI reports had separate individual models completed, but we have since updated that approach

because the only disapproval points for those reports were based on the fate and transport, In subsequent talks with PADEP, we decided that the next phase of reporting for AOI 11 would be in the site-wide Fate and Transport RI report. Also note that AOI 11 has been monitored continually and data reported in other AOI RIRs.

76. It seems like many of the RIRs are still pending despite Hilco's plans to start construction in 2021. 1) What AOIs are planned to be clear to build in 2021 and 2) what are the states of their RIR and Remedial Action Reports such that building can occur so soon. 3)If they are starting in the North, AOI 8 has an identified benzene plume that exceeds the site boundary to the north. There is a sample point in the lower aquifer on the boundary that is outside of the active and inactive remediation boundaries. What are the remediation activities that need to be done prior to construction to address these needs?

There are two RIR Addendums pending: AOI-4 and AOI-9. Both required additional offsite information on groundwater only prior to approval. 1) We are not sure if Hilco has presented a development schedule to the public. However, they have held pubic meetings and plan additional ones where this question can be posed. 2) All RIRs with regard to soil delineation are complete for all areas. Cleanup Plans will be submitted consistent with the area of Hilco's planned development, with AOI 8 being first. Cleanup Plans are submitted after all RIR actives are complete. 3) Exposure pathway assessment identifies indoor air (onsite) as a potential pathway of concern with regard to the groundwater contaminant plumes. Therefore, indoor air assessments will be completed at all future building locations to determine if vapor mitigation measures will be necessary to protect workers from potential indoor air exposure. With the exception of potential vapor mitigation at building locations, no other remediation activities will need to occur prior to construction. However, operation of the existing remediation systems in the north yard will continue during and after construction (including a system that operates in the area you noted where a plume extends beyond the property boundary to the north).

77. Is soil tested to a depth greater than 2 feet deep?

Yes, soil is tested at many depths. We showed the soil data results in two different slides: 0-2 feet below the surface and anything else collected from greater than 2 feet below the surface. That's because the standard concentrations that we compare our data to are different for surface soil (0-2 feet) and subsurface soil (2-15 feet, or greater).

Remediation

78. What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?

Groundwater/light non-aqueous phase liquid (LNAPL) are being recovered via remediation system recovery wells along the property boundary in an area along 26th Street. Groundwater and LNAPL are also recovered via horizontal recovery wells along the Pollack Street sewer through the facility. Sewer conditions are to be evaluated as part of the future modeling efforts.

79. Have you submitted draft cleanup plans to DEP? Can we receive a copy of the Cleanup Plan?

A draft Cleanup Plan has not been submitted to the PADEP. Remedial Investigations must be completed prior to submitting Cleanup Plans and other Act 2 reports that follow Remedial Investigations in the Act 2 process. Upon completion of Remedial Investigation Reports (RIRs) for each of the Areas of Interest, the subsequent Act 2 reports can then be submitted. The Cleanup Plan(s) will be prepared and submitted following the Sitewide Fate & Transport RIR, Sitewide Ecological Risk Assessment Report and Sitewide Human Health Risk Assessment Report (or some combination of these reports). However, remediation (cleanup) activities which were conducted prior to entering the Act 2 program and interim remediation activities currently being conducted are summarized in the RIRs posted to the website.

80. Two water filtration plants (at Girard Point and Point Breeze) treat groundwater before returning water to the Schuylkill River. How effective are these systems? What happens during heavy rains and floods?

The water treatment plants are run and operated by PES under a NPDES permit issued by the PADEP. Operation of the water treatment plant will be conducted by the new property owner. PES or the PADEP would be better able to respond to the question of how effective these systems are and what happens during heavy rains and floods.

81. Should the groundwater remediation systems that were discontinued be restarted? If not, why not? If so, when will that happen?

Various remediation systems historically have been discontinued generally when the remedial goals are complete or where the technology is no longer the most appropriate. Each remediation system is discussed in its associated Remedial Investigation Report.

Any proposed additional systems, remedial goals and associated monitoring will be included in future Act 2 reports such as the Risk Assessment and the Cleanup Plan.

82. What is the quality of the water discharged from the Pollock St well system into the Schuylkill?

Groundwater collected from the Pollack St well system is not discharged directly to the Schuylkill River. Groundwater discharged from any remediation system is either processed through the facility's wastewater treatment plant which operates under a National Pollutant Discharge Elimination System (NPDES) permit held by PES or discharged to the Philadelphia Water Department (PWD) sewer system via a Groundwater Discharge Permit held by Evergreen. Evergreen samples groundwater discharge to the PWD sewer per the permit requirements and the discharge from the facility's wastewater treatment plant is sampled by PES in accordance with their NPDES permit.

83. Have you considered remediating with bacteria? Or mycelium? We understand they're both more affordable options.

Evergreen has considered and will continue to consider various remedial options at each area of proposed remediation. Remedial options must consider a number of factors, including but not limited to logistics, utilities, subsurface flow conditions, chemistry, nature and extent of the contamination, nutrient availability, etc. Bioremediation technologies, not specifically mycoremediation, have been/are utilized in AOI-4 and AOI-1 and will continued to be considered for the Site.

84. What specific steps are being taken to clean the water from potential contaminants?

Since the original Consent Order & Agreement between Sunoco and DEP in 1993, Sunoco and Evergreen have implemented several interim remedial actions at the refinery. Various remediation systems were installed in the facility in 1995 to prevent the migration of impacted groundwater offsite. Additional remediation systems have been installed since that time to either address source removal (removing petroleum product and contaminated groundwater at the source of the release on-site) and/or control the migration of impacted groundwater beyond the property boundary. Between 1993 and present, 25 remediation systems have been operated at the refinery by Sunoco/Evergreen.

Remediation activities have included, but are not limited to:

Groundwater and/or product recovery via both vertical and horizontal wells, where product and/or groundwater impacted with hydrocarbons are removed from the subsurface;
Oxygen injection into groundwater ,to aid in removal and/or breakdown of petroleum products in the subsurface;
Sewer ventilation systems, or the removal of petroleum vapors from air in subsurface utilities; and
Soil vapor extraction, or removing petroleum vapors from the subsurface.
Many of the remediation systems have been decommissioned over the years when they have achieved their intended purpose and/or other remedial alternatives have been selected. Evergreen currently operates nine remediation systems operating at the facility. In addition to remediation systems, areas of soil have been remediated at the facility via excavation and/or capping.

As discussed above, after the Fate and Transport RIR, Human Health Risk Assessment and Ecological Risk Assessments are completed, these interim remedies – along with potential additional remedies – will be evaluated and included in the Act 2 Cleanup Plan.

85. Is there a permit for the discharge of water from the wastewater treatment system to the PWD, who is the permit holder, and have the permit requirements been met?

Evergreen has a permit for any contaminated water that we discharge to PWD, and Evergreen is the permittee. The permit has monthly discharge monitoring requirements that need to be achieved to meet the requirements of the permit. Some of the discharge from Evergreen's systems go directly to the PES wastewater treatment plant. PES had a NPDES permit to operate their wastewater treatment plant, which is permitted through the PADEP, which is different from a PWD permit. Hilco Redevelopment Partners (HRP) will now be running the waste water treatment plant and will be permittee for the NPDES permit.

86. What other companies are involved in the cleanup, besides Evergreen?

Evergreen is responsible to cleanup legacy contamination, generated prior to September 2012. Hilco Redevelopment Partners (HRP) is responsible to cleanup recent contamination, generated after September 2012.

87. How is it determined what ground pollution is from 2012 and before…and what is from 2012 to the present?

When the facility was sold to PES in 2012, Sunoco had a good understanding of the nature and extent of contamination at the facility. It was assumed that any known contamination at the time of the sale was Sunoco's responsibility to cleanup. After the sale of the property, if changes in the contaminant profile on-site occurred, or known spills happened, the resulting cleanup became PES' responsibility. In some instances, new contamination co-exists with old contamination, and the responsibility is shared.

Risk Assessment / Communication

88. I am wondering if you are able to send out updates about what plans are being carried out when. For instance, if you are cleaning a particular thing, I'd like to know ahead of time when that cleaning will take place and what the risks to the surrounding environment/people are.

Evergreen is responsible only for the historic contamination that exists below the surface in soil and groundwater at the Site, not current operations or development of the site. Any cleaning or demolition of tanks or above-ground structures are the responsibility of the property owner, Hilco Redevelopment Partners (HRP) and/or PES. Evergreen is not involved in these activities, but HRP has indicated that they will also communicate to the public about their activities.

Evergreen is in the process of finishing the investigation activities at the former Philadelphia Refinery to identify the extent of the chemicals in soil and groundwater, in order to ultimately develop a remediation (cleanup) plan for the site. Before a cleanup plan can be written, Evergreen will also complete a risk assessment to determine the potential impact from the chemicals in the subsurface at the site and to help develop the cleanup approach. During this process, Act 2 reports will be written, public meetings will be held on such reports and information will be posted to the website which was created and funded by for the Act 2 process (https://phillyrefinerycleanup.info). Additional notifications will be made before any final cleanup activities related to such cleanup plans begin at the site.

89. If there are risks to people I would like to be provided with information which will allow me to identify if something in your process has gone poorly and if I need to take further precaution to keep myself and my family safe.

Evergreen's risk assessment will identify potential risks from chemicals in groundwater and soil, and the cleanup plan will include the activities planned to mitigate those risks. We will also provide additional communication to the public prior to starting the final cleanup to inform the public about the proposed cleanup process.

90. The speaker (during the August 27th Public Information Session) said that the remedial investigation reports have to be approved before Evergreen does risk assessments. Since this hasn't happened yet, why did Evergreen already complete the risk assessment for lead in soil?

In order to determine risk to human or ecological receptors associated with contamination in soil or groundwater, the extent of the contamination must be known/defined for accurate calculation of risk. The calculation of the lead Site Specific Standard for shallow soil used risk-based calculations utilizing the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. This approach was appropriate since the extent of lead in soil had been defined. The two RIRs that were not approved were due to need for additional wells to better define off-site migration of groundwater plumes, not lead in soil.

91. Why isn't the site-specific standard for lead being reevaluated based on the anticipated site use (commercial warehouse)?

The site-specific standard for lead was calculated based on non-residential (not industrial) site use, which is consistent with the planned future use.

92. Will this affect our drinking water?

The refinery contamination sources discussed during the public information session are not expected to impact local drinking water supplies obtained by the City from the Delaware and Schuylkill Rivers.

93. It seems like many of the RIRs are still pending despite Hilco's plans to start construction in 2021. 1) What AOIs are planned to be clear to build in 2021 and 2) what are the states of their RIR and Remedial Action Reports such that building can occur so soon. 3)If they are starting in the North, AOI 8 has an identified benzene plume that exceeds the site boundary to the north. There is a sample point in the lower aquifer on the boundary that is outside of the active and inactive remediation boundaries. What are the remediation activities that need to be done prior to construction to address these needs?

There are two RIR Addendums pending: AOI-4 and AOI-9. Both required additional offsite information on groundwater only prior to approval. 1) We are not sure if Hilco has presented a development schedule to the public. However, they have held pubic meetings and plan additional ones where this question can be posed. 2) All RIRs with regard to soil delineation are complete for all areas. Cleanup Plans will be submitted consistent with the area of Hilco's planned development, with AOI 8 being first. Cleanup Plans are submitted after all RIR actives are complete. 3) Exposure pathway assessment identifies indoor air (onsite) as a potential pathway of concern with regard to the groundwater contaminant plumes. Therefore, indoor air assessments will be completed at all future building locations to determine if vapor mitigation measures will

be necessary to protect workers from potential indoor air exposure. With the exception of potential vapor mitigation at building locations, no other remediation activities will need to occur prior to construction. However, operation of the existing remediation systems in the north yard will continue during and after construction (including a system that operates in the area you noted where a plume extends beyond the property boundary to the north).

94. It may have been more effective if this presentation was made available a week ago and we could have spent these two hours asking pertinent questions, such as: 1. what are the critical paths for considering the risks of lead and benzene to the adjacent communities; 2. how are increased climate-change risks being assessed; 3. how is ground and surface water run off being considered in the plans; 4. how is Hilco assessing the additional risks of (what looks like will be) hard scape pavement of 85-90% of the site?

1-Pathways and routes of exposure are discussed in the RIRs and they will be presented in more detail in the Risk Assessment Report. The Risk Assessment Report will be submitted after the public comments on the Remedial Investigation Reports, and after completion of the Public Comment RIR and the Fate and Transport RIR.

2-Climate change will be considered during the Fate and Transport modeling which will be presented in the Fate and Transport Remedial Investigation Report as well as in the selection of the remedial approach of the Site, which will be presented in the Cleanup Plan.

3&4-Ground and surface water run off will be evaluated as part of the remedial approach, presented in the Cleanup Plans. Stormwater runoff due to increased hard scaping will be permitted in accordance with local and state regulation as part of the redevelopment process by Hilco.

Soil

95. Why is Evergreen's site-specific Lead standard (2240 ppm) so much higher than the state standard (1000 ppm)?

The PADEP's Non-Residential Medium Specific Concentration (MSC) was derived using the Society for Environmental Geochemistry and Health (SEGH) model (Wixson, 1991). Since that time, the PADEP has endorsed the use of alternative uptake biokinetic models for the evaluation of lead toxicity including the Bower model (Bowers et al., 1994) for non-residential site uses. The USEPA adapted the Bowers et al. model to develop the Adult Lead Model (ALM). The ALM is a widely.accepted approach to risk characterization for non-residential exposure scenarios and recommended by the USEPA (EPA, 2001). Evergreen used the EPA's default assumptions for assessing non-residential risks from lead exposure in the ALM model to develop the site specific standard for lead.

96. The site contains several rail facilities (North Yard, West Yard, etc.). What are the conditions at rail terminals and along rail tracks?

The rail facilities are located in AOI 5 and AOI 8. Installation of these rail facilities occurred after the property transfer to PES. Therefore, conditions near these lines resulting from their operation would not be part of Evergreen's investigations. However, the environmental conditions characterized as part of the Act 2 investigations, which included the areas below and around the current rail areas, are included in the Remedial Investigation Reports for AOI 5 and AOI 8. Contaminants associated with past petroleum operations in those areas are summarized in those reports. Evergreen is unable to provide information about the operational conditions related to recent (since 2012) operations of the rails. PES would be better able to respond to those inquiries.

97. Various docks have handled ships since 1866. Multiple fires have occurred on ships over the years. What is the condition of the land along the waterfront?

The environmental impacts that have been characterized during Evergreen's Act 2 investigations along the waterfront are presented in the RIRs, specifically in the AOI 2, 3, 5, 6, 7, 8, 9 and 10.

98. The speaker (during the August 27th Public Information Session) said that the remedial investigation reports have to be approved before Evergreen does risk assessments. Since this hasn't happened yet, why did Evergreen already complete the risk assessment for lead in soil?

In order to determine risk to human or ecological receptors associated with contamination in soil or groundwater, the extent of the contamination must be known/defined for accurate calculation of risk. The calculation of the lead Site Specific Standard for shallow soil used risk-based calculations utilizing the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. This approach was appropriate since the extent of lead in soil had been defined. The two RIRs that were not approved were due to need for additional wells to better define off-site migration of groundwater plumes, not lead in soil.

99. 1)We are concerned about lead in surface soil. The standard Evergreen has proposed does not address the risk. 2) Evergreen has not obtained approval from DEP for remedial investigation reports for several of the more contaminated areas of interest. Including the aquifer. 3) The work done so far does not consider the impacts of climate change, rising sea level and worsening storms. Note: for the purpose of response, this comment was split into three topics by Evergreen.

1)The site-specific standard for lead was approved by both PADEP and EPA and utilized the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. As part of the remedial investigations, the lead data was compared to the Act 2 SHS MSC, which is 450 ppm, based on the soil to groundwater pathway. This comparison is shown on the figures/tables in the RI Reports and in the 8/27/20 presentation. The approach that was used to calculate the SSS for direct contact was to use the Adult Lead Model recommended by the EPA. The PADEP used the same model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead.

2)DEP did not approve two of the RIRs – AOI-4 and AOI-9 – based on the need for additional offsite characterization, not a level of contamination over other AOIs. The characterization portion of the AOI-11 report was sufficient for approval; however, the fate and transport portion of the AOI-11 reports was not, which is why the report was not approved. Data has been collected from the lower aquifer wells as part of the other AOI remedial investigations since 2013 and reported in the Remedial Investigation Report submitted since 2013.

3)Characterization and delineation of contaminants of concern does not generally require consideration of climate change, sea level rise or worsening storms. Climate change will be considered in future fate and transport efforts and cleanup plans where that type of variable warrants consideration.

100. Why did you choose such a high site-specific standard, and do you plan to keep it that high?

The approach used to calculate the SSS for direct contact was to use the Adult Lead Model recommended by the EPA. The PADEP used the same model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead. If the PADEP changes PADEP's assumptions related to lead, such as permissible blood lead levels, Evergreen will update the SSS accordingly. The SSS for lead utilized the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. If the PADEP changes their assumptions related to lead, such as permissible blood lead levels, Evergreen will update the SSS accordingly.

101. Why does the former refinery get special treatment compared to other nonresidential sites? In terms of the lead site specific standards in soils 0 to 2 feet

The ability to calculate a site-specific standard (for any media) is a provision in the Act 2 regulations and is not the only one allowed, but is common practice and one of the three options for standards that can be applied to a site: Statewide Health, Background, or Site-Specific. Other non-residential sites can also calculate a Site Specific Standard if they choose to do so for their Act 2 projects.

This question was also provided to PADEP, to which the following response was provided: "Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2 of 1995) allows the remediator to select the type of cleanup standard they wish to use for the site. One option is the site-specific standard, and risk assessments are a means available to any remediator to attain that standard. Evergreen chose to use a risk assessment to determine a site-specific standard for direct contact exposures of people with lead in surface soil (upper 2 feet). With this approach they were able to use a more current scientific methodology from U.S. EPA to calculate a risk-based value. Remediators who do not perform a site-specific analysis will generally use the published Statewide health standard default cleanup values, but the site-specific standard option may be used by any remediator and it is not unique to this site."

102. The lead standard should be revised to be protective of public health. The standard that was approved (2240 parts per million (ppm) in surface soil) is much weaker than the default standard of 1000 ppm. The assumptions Evergreen used in calculating the standard are inaccurate and outdated.

The SSS was calculated using the updated Adult Lead Model and exposure assumptions recommended by the USEPA and the PADEP. The previous calculations used by the PADEP were outdated; therefore, the PADEP recently used the same updated Adult Lead model to develop an updated non-residential lead direct contact MSC that reflects the current state of the science for lead. The new calculated proposed direct contact statewide health standard for lead is in line with the site-specific standard that was calculated in 2015 for the site. If the PADEP changes their assumptions related to lead, such as permissible blood lead levels, Evergreen will update the SSS accordingly.

103. Since Evergreen used an inappropriate standard as a basis for its remedial investigation reports, how does it justify that it has correctly defined the extent of lead contamination?

As noted in response to other questions concerning the lead, the calculation of the site-specific standard was appropriate in accordance with the Act 2 regulations and recommendations from the USEPA and the PADEP. As part of the remedial investigations, the lead data was compared to the Act 2 SHS MSC, which is 450 ppm, based on the soil to groundwater pathway, to define the extent of lead contamination. This comparison is shown on the figures/tables in the RI Reports and in the 8/27/20 Public Information Session, so the extend of lead has been delineated to 450 ppm at the Site. Data was also compared to the site-specific standard.

104. These graphics (Evergreen note: assumption is reference to graphics from the August 27th Public Information Session relating to remediation) all show problems relating to gasses and water…not contaminated soil. Will soil be removed and replaced with clean soil?

The remediation systems operated at the site historically and currently were installed to address groundwater or vapors since those represented potential risk pathways, which is why they were shown during the August 27th Public Information Session. There are a few areas where soil conditions indicated a risk based on previous site conditions and use. For example, some areas where lead had been reported above the site-specific standards have been excavated and properly disposed of offsite. Hilco has developed a Soil Management Plan which will address soils to be excavated and/or placed around the facility to be determined by extensive sampling of soils prior to removal.

Attachment 4

(Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

CLEAN AIR COUNCIL

Environmental Quality Board
(Department of Environmental Conservation)

Proposed Rulemaking
Administration of the Land Recycling Program
25 Pa. Code Chapter 250

50 Pa.B. 1011-1097 (February 15, 2020)

Written Comments by Clean Air Council

April 30, 2020

Via email -- RegComments@pa.gov

The Council appreciates the opportunity to provide these written comments on the proposed rulemaking of the Environmental Quality Board and the Department of Environmental Protection ("the Department") relating to Act 2, the state law regarding cleanup standards for voluntary and involuntary cleanups.

The Council is a non-profit environmental health organization headquartered at 135 South 19th Street, Suite 300, Philadelphia, Pennsylvania, 19103. The Council also maintains an office in Pittsburgh. The Council has been working to protect everyone's right to a clean environment for over 50 years. The Council has members throughout the Commonwealth who support its mission.

While the Environmental Quality Board is the government entity proposing the rulemaking, the Council will refer to the Department as the source of the proposed rulemaking, in the interest of clarity.

On Saturday, February 15, 2020 the Department published a notice of proposed rulemaking, setting a deadline of April 14, 2020 for the public comment period. 50 Pa.B. 1011-1097 (February 15, 2020). The deadline was extended to April 30, 2020 due to the ongoing COVID-19 pandemic. 50 Pa.B. 1650 (March 21, 2020).

Summary of Comments

The Council's comments are directed to the Department's proposed increase in the direct contact numeric value for lead in nonresidential soil from 1000 ppm to 2500 ppm. The proposal would not be protective of public health.

The proposal is erroneously based on a target blood concentration of 10 µg/dL for a fetus, which is based on a "level of concern" value set by the Centers for Disease Control in 1991 -- nearly thirty years ago. In 2012, the Centers for Disease Control lowered the number to 5 µg/dL, and since then it has used this number as a "reference value" for case management for pregnant women and children up to 5 years old. The Pennsylvania Department of Public Health, the Allegheny County Health Department, and the City of Philadelphia have also been using 5 µg/dL for case management.

There is no adequate public health justification for the proposal. There was no credible attempt to set an appropriate target blood concentration or direct contact numeric value. Minutes of meetings of the Cleanup Standards Scientific Advisory Board (CSSAB) and related documents do not reflect any meaningful discussion of the choice between a target blood concentration of 10 µg/dL and 5 µg/dL.

The proposal would be far weaker than comparable cleanup levels in five of the six states neighboring Pennsylvania.

The direct contact numeric value for lead in nonresidential soil is important to the ongoing remedial investigation at the Philadelphia oil refinery. This site is two and a half miles from the Council's office, and it is located in the poorest large city in the nation. In December 2019, the Department informed people in the community that the proposed direct contact numeric value would affect the cleanup at this site.

In using a target blood concentration of 10 µg/dL as a basis for the proposal, the Department makes the same error that it made when it approved a site-specific standard of 2240 ppm for the Philadelphia oil refinery in 2015. The proposal would endorse this error and enable property owners at contaminated sites to benefit from even less stringent site-specific standards for lead -- in the neighborhood of 2500 ppm. This would be material to a cleanup of the Philadelphia oil refinery, as it would result in a much smaller number of lead exceedances that would have to be dealt with by way of corrective action. For example, for two Areas of Interest (AOI-5 and AOI-9), this would mean only 10 or 11 exceedances each, rather than 55 exceedances each under a value of 1000 ppm.

In a legal challenge, the proposed direct contact numeric value of 2500 ppm would be unreasonable as a matter of law and "not in accordance with law."

The Department should not finalize the proposal. It should retain the current value of 1000 ppm.

Factual Background

"Any remediation standards adopted by this Commonwealth must provide for the protection of public health and the environment." Act 2, § 102(3).

Under the regulations, the Department must review new scientific information that is used to calculate Medium-Specific Concentrations (MSCs) and propose appropriate changes at least 36 months after the most recently promulgated MSCs:

> ***The Department will review new scientific information that relates to the basis of the MSCs as it becomes available*** and will propose appropriate changes for the consideration of the EQB as necessary, but in no case more than 36 months after the effective date of the most recently promulgated MSCs.

25 Pa. Code §250.11 (page 250-9) (bold italics added for emphasis). *See also* Proposed Rule, 50 Pa.B. 1011 (Section D. Background and Purpose).

In preparing this rulemaking, the Department sought the input of the Cleanup Standards Scientific Advisory Board (CSSAB):

> The Department worked with the Cleanup Standards Scientific Advisory Board (CSSAB) during the development of this proposed rulemaking. The CSSAB, which was established by section 105 of Act 2 (35 P.S.§ 6026.105), consists of persons representing a cross section of experience, including engineering, biology, hydrogeology, statistics, medicine, chemistry, toxicology and other related fields. The purpose of the CSSAB is to assist the Department and the Board in developing Statewide health standards, determining the appropriate statistically and scientifically valid procedures and risk factors to be used, and providing other technical advice as needed to implement Act 2.

Proposed Rule, 50 Pa.B. 1012 (Section D. Background and Purpose).

Currently, the nonresidential direct contact numeric value for lead is calculated based on a method developed by the Society for Environmental Geochemistry and Health (SEGH model). 25 Pa. Code §250.306(e), page 250-29, Chapter 250 regulations (pdf). Based on that model, the current regulations set the nonresidential direct contact numeric value for lead at 1000 ppm. *Id.*, 25 Pa. Code chapter 250, Appendix A, Table 4A, page 250-104.

A. The Department proposes to substitute the Adult Lead Methodology for the SEGH Model.

In the proposed rulemaking, the Department proposes to discontinue use of the SEGH model and instead adopt EPA's Adult Lead Methodology (ALM) for calculating the nonresidential direct contact numeric value for lead in soil. *See* Proposed Rule, 50 Pa.B. 1019 (to be codified at 25 Pa. Code §250.306(e)). As defined by EPA, the "(ALM) estimate[s] the concentration of lead in the blood of children, pregnant women and their developing fetuses who might be exposed to lead-contaminated soils." U.S. Environmental Protection Agency, Lead at Superfund Sites (Attachment 1). Because the ALM involves a formula, the Department has also proposed input variables for that formula. *See id.*, 50 Pa.B. 1097 (Draft Chapter 250 rulemaking Table 7, Attachment 2).

While the Department accepted the Centers for Disease Control and Prevention's baseline blood concentration of 0.6 µg/dL (which has decreased since 2012), it did not accept the reference value of 5 µg/dL (which the Centers for Disease Control and Prevention has used since 2012) as the target blood concentration. The Department's choice results in an increase in the direct contact numeric value for lead from 1000 ppm to 2517 ppm, which rounds to 2500 ppm.

B. The Department proposes using a target blood concentration ($PbB_{fetal,0.95}$) of 10 µg/dL.

In the notice of the proposed rulemaking the Department does not identify the target blood concentration that it used. Rather, it lists "TBD" as the target blood concentration ($PbB_{fetal,0.95}$). *See* 50 Pa.B. 1097 (Draft Chapter 250 rulemaking Table 7, Attachment 2).

In April 2018, minutes from a CSSAB meeting show that the Department was aware of adverse health effects associated with a lead blood concentration of 10 µg/dL, and requested guidance from the CSSAB as to which blood lead level, 5 µg/dL or 10 µg/dL, should be used to calculate the lead direct contact numeric value:

> ***EPA and Centers for Disease Control and Prevention (CDC) have determined that childhood blood lead concentrations at or above 10 micrograms of lead per deciliter (µg/dL) present risks to children's health. However, CDC has a blood lead action level of 5 µg/dL***. Additionally, the input parameters used in calculating the residential ingestion numeric value for lead in soil are based on EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model from 1990. Guidance was requested regarding which level should be used and whether DEP should update the model used for the input parameters. ***Ms. Guiseppi-Elie stated that blood lead action levels are a top priority for EPA and it is possible that the action level could go as low as 3 µg/dL***.

Cleanup Standards Scientific Advisory Board, Meeting Minutes, page 4 (April 4, 2018, Attachment 3) (bold italics added for emphasis).

Although the EPA member offered to research the issue and report back, the minutes from the subsequent meetings do not indicate any further discussion. *See* Department of Environmental Protection, Agendas and Handouts.

In August 2018, the Department made a presentation to the CSSAB at its meeting, noting the adverse health effects associated with a blood lead concentration of 10 µg/dL and that EPA was updating its strategy to address them:

> EPA – ***Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below***. OSRTI [Office of Superfund Remediation and Technology Innovation] is developing a new soil lead policy to address this new information.

Department of Environmental Protection, PowerPoint Presentation (August 1, 2018, Attachment 4), page 9 (bold italics added for emphasis). The CSSAB made a recommendation to use a target blood concentration of 10 µg/dL:

> ***CSSAB recommended that 10 µg/dL be used*** in the equation to calculate medium-specific concentrations (MSCs) for residential and non-residential lead exposure.

Cleanup Standards Scientific Advisory Board, Meeting Minutes, page 4 (August 1, 2018, Attachment 5) (bold italics added for emphasis). But the minutes do not provide any discussion or justification for this recommendation. *See id.* Among "potential action items," the meeting minutes mention the formation of a workgroup to further discuss lead blood level concentrations. *See id.*, page 5. It is not clear whether such a workgroup was ever formed.

In February 2019, the CSSAB held its next meeting, apparently reviewing a lead model comparison sheet prepared by the Department. *See* Department of Environmental Protection, Lead Model Comparison Sheet (undated, Attachment 6).[1] This sheet compares the current direct contact numeric value (1000 ppm) with two other values calculated using the ALM. With a target blood concentration of 5 µg/dL, the direct contact numeric value would be 1050 ppm. With a target blood concentration of 10 µg/dL, the direct contact numeric value would be 2517 ppm. (Apparently, the Department rounded down the 2517 ppm figure to arrive at the proposed value of 2500 ppm).

But the minutes from the CSSAB meeting provide no discussion of the choice between the two target blood concentrations. *See* Cleanup Standards Scientific Advisory Board, Meeting Minutes (February 13, 2019, Attachment 7).

For the February 2019 meeting, the Department's presentation demonstrates that the choice of a target blood concentration had been made before that meeting:

[1] Although undated, the document was posted among the materials for the February 13, 2019 meeting. *See* Department of Environmental Protection, Agendas and Handouts.

> Residential and non-residential direct contact values [were] calculated for lead using updated models and target blood lead level of 10 µg/dL.

Department of Environmental Protection, PowerPoint Presentation, page 12 (February 13, 2019, Attachment 8). Accordingly, the Department prepared a draft Table 4A for cleanup levels, containing a nonresidential direct contact numeric value of 2517 ppm. *See* Draft Chapter 250 rulemaking Table 4A (February 13, 2019, Attachment 9). However, draft Table 7 did not identify the chosen blood lead concentration, instead listing it as "TBD." *See* Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (February 13, 2019, Attachment 2).

For subsequent meetings of the CSSAB on June 12, 2019 and October 29, 2019, the Department posted updated versions of these proposed tables. For the nonresidential direct contact numeric value, the Department rounded down the 2517 ppm number to 2500 ppm. *See* Draft Chapter 250 rulemaking Table 4A (June 12, 2019, Attachment 10), Draft Chapter 250 rulemaking Table 4A (October 29, 2019, Attachment 11).

However, the Department continued to list the target concentration as "TBD," even though it had clearly made a determination to use a target blood lead level of 10 µg/dL. *See* Draft Chapter 250 rulemaking Table 7 (June 12, 2019, Attachment 12), Draft Chapter 250 rulemaking Table 7 (October 29, 2019, Attachment 13). This is also how the Tables appear in the notice of the proposed rulemaking. *See* 50 Pa.B. 1072 (Table 4A), 1097 (Table 7).

Comments

1. **It is the Policy of Public Health Agencies and Medical Organizations to Monitor Pregnant Women With Blood Lead Levels Over 5 ug/dL.**

The Department used the Adult Lead Methodology (ALM) as a basis for proposing the direct contact numeric value for lead. This methodology is designed to be protective of the fetus of a pregnant worker at a contaminated site. U.S. Environmental Protection Agency, Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology ("We assume that cleanup goals (preliminary remediation goals, or PRGs) that are protective of a fetus will also afford protection for male or female adult workers," Attachment 14). Accordingly, it is important to keep in mind the medical literature relating to fetal blood levels. A sample of that literature demonstrates that there is no "safe" maternal lead blood level for fetuses.

Maternal blood lead levels below 10 µg/dL have been linked to adverse birth outcomes (*See*, e.g., The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016, Attachment 15)). The World Health Organization states that "[t]here is no known 'safe' blood lead concentration; even blood lead concentrations as low as 5 µg/dL, may be associated with decreased intelligence in children, behavioral difficulties and learning problems. As lead exposure increases, the range and severity of symptoms and effects also increases." The World Health Organization, Lead Poisoning and Health, (August 23, 2019, Attachment 16).

The Committee on Obstetric Practice of the American College of Obstetricians and Gynecologists identifies pregnant women with blood lead levels higher than 5 µg/dL as requiring "avoidance of further exposure," "specific nutritional recommendations regarding calcium and iron supplementation" (to reduce risk from lead), and may be asked to discontinue breastfeeding their infants if the infant's blood lead level is higher than 5 µg dL. The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016, Attachment 15).

The Centers for Disease Control and Prevention notes that "If a pregnant or lactating woman has blood lead levels (BLLs) ≥5 µg/dL, the health care provider should attempt to determine the source(s) of lead exposure, working with the local health department and occupational medicine specialists as needed for environmental assessment and case management." Centers for Disease Control and Prevention, Breastfeeding (Attachment 17).

The National Capital Poison Center and HealthyChildren.org (associated with the American Academy of Pediatrics) also use a value of 5 µg/dL as a threshold for additional health interventions. *See* The National Capital Poison Center, Lead and Pregnancy ("If the level is 5 or above, repeat testing is needed. How often a woman is re-tested depends on her blood lead level. Pregnant women with lead levels of 5 mcg/dL or above also need extra calcium and iron in their diets. These supplements help prevent higher blood lead levels.", Attachment 18); *see also* HealthyChildren.org, Blood Lead Levels in Pregnant & Breastfeeding Moms ("Although most people will have some lead in their blood, levels greater than 5 micrograms per deciliter (µg/dL) indicate that there is some exposure that needs to be addressed.", Attachment 19).

In using a target blood concentration of 10 µg/dL for lead as a basis for calculating a proposed direct contact numeric value of 2500 ppm, the Department disregards policies set by the Centers for Disease Control and Prevention, the American College of Obstetricians and Gynecologists, and other medical organizations, putting pregnant women and their fetuses at risk.

2. <u>Public Health Agencies Use a Blood Lead Level of 5 µg/dL as a Basis for Managing Lead Exposure in Children 0-6, a Particularly Sensitive Population</u>.

The dangers of children's exposure to lead are well-documented and have been known for centuries. U.S. Department of Health and Human Services, National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead, page xv (June 2012, Attachment 20). Blood lead concentrations under 10 µg/dL are associated with reduced postnatal growth, decreased hearing, increased hypersensitivity to allergens, increased incidence of essential tremor, increased blood pressure, increased risk of hypertension, increased incidence of ALS, and increased cardiovascular-related mortality. *Id.*, Executive Summary, page xix, Table 1.1. The NTP Report "concludes that there is *sufficient* evidence for adverse health effects in children and adults at blood [lead] levels" less than 10 µg/dL and less than 5 µg/dL. *Id.*, Executive Summary, page xviii.

Federal and state public health agencies have applied a reference level of 5 ug/dL to guide their case management for children exposed to lead, starting at birth. Of course, any target blood concentration for a fetus should be as stringent or more stringent than an "elevated blood lead level" set by a public health agency for the protection of children.

A. The Centers for Disease Control and Prevention uses a reference level of 5 µg/dL for case management for children exposed to lead.

As part of the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention implements a lead poisoning prevention program. Centers for Disease Control and Prevention, Lead Poisoning Prevention (Attachment 21). Over time, the Centers for Disease Control and Prevention have lowered the concentration of lead in blood that is considered "elevated" in children, from 30 µg/dL to 25 µg/dL (in 1985), to 10 µg/dL (in 1991), and to 5 µg/dL (in 2012). *See* National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead, page xv (Attachment 20); *see also* Centers for Disease Control and Prevention, Blood Lead Levels in Children (Attachment 22).

In 2012, an advisory committee recommended that the Centers for Disease Control and Prevention eliminate the use of the phrase "level of concern" and lower the number from 10 µg/dL to 5 µg/dL:

> KEY POINTS/RECOMMENDATIONS
>
> Based on the scientific evidence, ***the ACCLPP recommends that the term "level of concern" be eliminated from all future agency***

> ***policies, guidance documents, and other CDC publications***, and that current recommendations based on the "level of concern" be updated according to the recommendations contained in this report.
>
> ***CDC should use a childhood BLL reference value based on the 97.5th percentile of the population BLL in children ages 1-5 (currently 5 µg/dL) to identify children and environments associated with lead-exposure hazards***. The reference value should be updated by CDC every four years based on the most recent population based blood lead surveys among children.

Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention, page 3 (January 4, 2012, Attachment 23) (bold italics added for emphasis).

The Centers for Disease Control and Prevention concurred with this recommendation, discontinuing the use of the phrase "level of concern" and adopting the term "reference value." Centers for Disease Control and Prevention, CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention", page 5, Recommendation I (June 7, 2012, Attachment 24). In addition, it lowered the number from 10 µg/dL to 5 µg/dL, committing to use the lower number for case management and distribution of public health information:

> In FY12, CDC will:
>
> a. ***Use the reference value*** in recommendations that ***involve follow-up evaluation of children*** after BLL testing.
>
> b. ***Use the reference value*** as defined to ***identify high-risk childhood populations*** and geographic areas most in need of primary prevention.
>
> c. ***Provide this information***, including specific high-risk areas, ***to a wide variety of federal, state, and local government agencies*** and nongovernment organizations interested in lead-poisoning prevention.

Id., pages 6-7, Recommendation II.

To illustrate, the website of the Centers for Disease Control and Prevention sets forth a matrix tailoring case management activities to particular blood lead levels (less than 5 µg/dL, 5–9 µg/dL, 10–19 µg/dL, etc.). Centers for Disease Control and Prevention, Recommended Actions Based on Blood Lead Level (Attachment 25). At blood lead levels of 5-9 µg/dL, "case management" includes follow-up testing, an investigation of potential sources of lead exposure, and nutritional counseling. *See id.*

B. The Department of Housing and Urban Development uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

The Department of Housing and Urban Development has adopted the 5 µg/dL reference value of the Department of Health and Human Services (Centers for Disease Control and Prevention) in its regulatory approach to exposure to lead-based paint in public housing. In 2016 and 2017, it proposed and finalized a rule that defined an "[e]levated blood lead level" as "a confirmed concentration of lead in whole blood of a child under age 6 equal to or greater than the concentration in the most recent guidance published by the U.S. Department of Health and Human Services (HHS) on recommending that an environmental intervention be conducted…."). Proposed Rule, 81 Fed. Reg. 60,304, 60,324 col. 1 (September 1, 2016), Final Rule, 82 Fed. Reg. 4151, 4167 (January 13, 2017) (to be codified at 40 C.F.R. 35.110 (Definitions)).

At the time of the rulemaking, the Centers for Disease Control and Prevention had already adopted the reference value of 5 µg/dL. *See* Proposed Rule, 81 Fed. Reg. 60,306 col. 2 ("CDC's current reference range level is 5 mg/dL (5 micrograms of lead per deciliter).").

For the Department of Housing and Urban Development, an "elevated blood lead level" is the threshold for lead in blood in a child that triggers a number of regulatory requirements for investigation. *See id.*, 82 Fed. Reg. 4167-4172 (to be codified at 40 C.F.R. §§35.325(a), 35.730(a), 35.830(a), 35.1130(a), 35.1225(a)).

C. The Pennsylvania Department of Health defines a blood lead level of 5 µg/dL as "elevated," requiring monitoring and case management for children.

The Pennsylvania Department of Health follows the Centers for Disease Control and Prevention's reference value of 5 µg/dL as an "elevated lead blood level" for children:

> Exposure to lead, even at low levels, can cause intellectual, behavioral and academic deficits. [footnotes omitted]. For this reason, ***in 2012, the Centers for Disease Control and Prevention (CDC) defined an elevated blood lead level (EBLL) as a blood lead level (BLL) ≥ 5 micrograms per deciliter (µg/dL).*** [footnote omitted]. ***This value is also used to identify children who require case management*** because, even at low levels, lead has been known to affect IQ, the ability to pay attention and educational achievement.

See Pennsylvania Department of Public Health, Childhood Lead Poisoning Prevention Program, 2018 Childhood Lead Surveillance Annual Report (January 2020, Attachment 26), page 3 (Executive Summary) (bold italics added for emphasis). The Department of Health applies this level for its own purposes by defining an elevated blood level as a level equal to or greater than 5 µg/dL. *See id.*, page 12 (Definitions) ("Elevated blood lead level (EBLL): A BLL ≥ 5 µg/dL"). The Department of Health also uses the terms "confirmed EBLL ≥ 5 µg/dL" and "confirmed EBLL ≥ 5 µg/dL," but only to differentiate among effects of different ranges, both of which are considered "elevated." *See id.* Those ranges become important in differentiating impacts and

responses. *See id.*, pages 17-47, Tables 1-14). To illustrate, in 2018, among children aged 0-71 months, 2.99% had elevated levels between 5 and 9.9 µg/dL, and 1.10% had elevated levels equal to or greater than 10 µg/dL. *Id.*, page 16 (Table 3).

The Department of Health then uses the 5 µg/dL level for monitoring children throughout the state in areas not subject to the jurisdiction of the county and municipal health departments:

> ***The Department's community health nurses (CHNs) continue to monitor elevated lead levels (≥ 5 µg/dL) in children aged 6 and under living in Pennsylvania***. The Department's community health nurses cover the counties and areas of the state not covered by the 10 county and municipal health departments (CMHDs). ***The CMHDs include six county (Allegheny, Bucks, Chester, Erie, Montgomery, and Philadelphia) and four municipal (Allentown, Bethlehem, Wilkes-Barre, and York city) health departments and have their own specific case management protocols***.

Id., page 5 (bold italics added for emphasis).

D. The Allegheny County Health Department uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

The Allegheny County Health Department has jurisdiction over the metropolitan area of Pittsburgh and neighboring communities in Allegheny County. Its universal lead testing regulation went into effect on January 1, 2018. *See* Article XXIII, Universal Blood Lead Level Testing Regulations, Section 10 (effective July 5, 2017, Attachment 27). It requires all children to be tested for lead exposure at approximately 9-12 months old and then again at approximately 24 months old. *See* Allegheny County Health Department, Blood Lead Level Testing (Attachment 28).

If the blood level is below 5 µg/dL, a follow-up test is not needed:

> **If the result is below 5 µg/dL:**
>
> - Your child's blood level is not elevated at this time. It is below the CDC's reference value, which is 5 µg/dL.
> - Your child does not need a follow-up test now.
> - If your child is younger than 2 years old, s/he will need another test when s/he is approximately 24 months old.
> - Your child may need another test if s/he moves to a different home, daycare, school, etc. that was built before 1978.
> - Go to our Prevention page to see how to keep your child safe from lead exposure.

Id. ("What Do the Test Results Mean?"). If the blood level is above 5 µg/dL, the Health Department considers the blood level to be elevated, requiring a confirmatory test:

If the result is at or above 5 µg/dL:

- Your child's blood level is elevated.
- If the test was a capillary test (in which blood is drawn from a finger stick) it needs to be confirmed with a venous test, in which blood is drawn from the arm. Capillary samples are easier to contaminate and sometimes the result is not accurate.
- Confirmatory tests need to be prescribed by your child's doctor. If your child is under- or uninsured, please see ACHD's Guide for Under and Uninsured Residents for a list of pediatric healthcare resources in Allegheny County that can help.
- Check the table below to see when your child should get a confirmatory test:

Recommended Schedule for Obtaining a Confirmatory Venous Sample

BLL (µg/dL)	Time to confirmation testing
<5	No confirmation required
5-9	1 week - 1 month[a]
10-44	1 week - 1 month[a]
45-59	48 hours
60-69	24 hours
≥70	Urgently as emergency test

[a] The higher the BLL on the screening test, the more urgent the need for confirmatory testing.

If the venous test confirms result at or above 5ug/dl, get more information on next steps by visiting My Child Has an Elevated Blood Lead Level.

Id. Like the Centers for Disease Control and Prevention and the Pennsylvania Department of Health, the Allegheny County Health Department draws an important line at 5 µg/dL.

E. The Philadelphia Department of Public Health uses a blood lead level of 5 µg/dL for case management for children exposed to lead.

Like the state health department, the Philadelphia Department of Public Health defines an elevated blood level as a level equal to or greater than 5 µg/dL. *See* Philadelphia Department of Public Health, Childhood Lead Poisoning Surveillance Report (2017, Attachment 29), page 3 (Definitions) ("Elevated BLLs (EBLLs) in this report are classified as either 5-9 µg/dL or ≥10 µg/dL"). Like the state health department, it creates different categories of elevated blood levels (5-9 µg/dL and ≥10 µg/dL) for the purpose of gathering information and tailoring case management. To illustrate, in 2017, among children aged 0-71 months, 4.6% of newly identified blood lead levels were between 5 and 9 µg/dL, and 1.1% were equal to or greater than 10 µg/dL. *Id.*, page 10 (Table 4).

In using a target blood concentration of 10 µg/dL for lead as a basis for calculating a proposed direct contact numeric value of 2500 ppm, the Department disregards policies set by the Centers for Disease Control and Prevention, the Department of Housing and Urban Development, the Pennsylvania Department of Public Health, the Allegheny County Health Department, and the City of Philadelphia for children 0-6, and by extension the fetuses that are the target population of the ALM.

3. **The Proposed Direct Contact Numeric Value Would Have a Significant Negative Impact on Cleanups Throughout the Commonwealth.**

The Commonwealth of Pennsylvania recognizes the risks of exposure to lead and the prevalence of lead throughout the state. Joint State Government Commission, Advisory Committee and Task Force on Lead Exposure, Lead Exposure Risks and Responses in Pennsylvania (April 2019, Attachment 30). The conclusions of this state report are consistent with the conclusions about the detrimental health effects of lead outlined above. *See id.*, page 5 ("Children are at the greatest risk of lead poisoning, which can cause neurological damage, organ damage and death, but adults and the elderly can also suffer health concerns from lead exposure."), page 46 ("Intensive medical studies have found that young children are particularly vulnerable to the toxic effects of lead and can suffer profound and permanent adverse health effects, most notably affecting the development of a child's brain and nervous system.").

The state report noted that lead is a special concern in this Commonwealth due to "the age of Pennsylvania's infrastructure and history as an industrial center." *Id.*, page 5. The prevalence of elevated blood lead levels above 10 µg/dL in adults in Pennsylvania is among the highest in the nation:

> Of the 28 states reporting blood lead levels of greater than or equal to 10 µg/dL to the CDC under its Adult Blood Lead Epidemiology and Surveillance (ABLES) programs in 2013, ***Pennsylvania had the third highest prevalence rate at 49.1 per 100,000 employed adults aged 16 or older***. This is more than twice the average of 20.4. ***Pennsylvania had the highest prevalence rate for blood lead levels greater than or equal to 25 µg/dL at 25.7***. The average rate at this blood lead level was 5.2.

Id., page 46 (bold italics added for emphasis). But 10 µg/dL is not the goal. In the next sentence, the report notes that "[r]ecent studies have "found decreased renal function associated with BLLs at <5 µg/dL and increased risk of hypertension and essential tremor at BLLs <10 µg/dL." *Id.* (citing authority).

The proposed direct contact numeric value is not protective of human health because it is calculated using a target blood concentration for lead that is associated with significant negative health effects. Additionally, using this outdated target blood concentration enables remediators to develop site-specific standards that are not protective of public health. This is important because the flawed methodology would affect a broad range of sites.

A. The direct contact numeric value is not protective of human health.

In the notice of the proposed rulemaking, the Department erroneously asserts that the proposed direct contact numeric value for lead would protect public health:

> ***These proposed changes, based on new information, would protect public health and the environment*** and would provide the regulated community with clear information regarding the requirements of Act 2 and Chapter 250 related to the remediation of contaminated sites.

50 Pa.B. 1011, col. 1 (February 15, 2020) (bold italics added for emphasis). This statement is erroneous because the Department includes "new scientific information" that is favorable to a higher value (the baseline blood concentration), but does not include updated scientific information that is favorable to a lower value (the target blood concentration). *See* 25 Pa. Code §250.11 (requiring the Department to review "new scientific information" and propose "appropriate changes").

Numerically, the proposed direct contact numeric value is located in a table. 50 Pa.B. 1072 (proposing a direct contact numeric value of 2500 ppm, and deleting existing direct contact numeric value of 1000 ppm). The methodology for calculating the proposed standard is set forth in a subsection relating to ingestion numeric values. *See* 50 Pa.B. 1019-1020 (proposed regulatory text). The Department proposes to discontinue use of the existing model of the Society for Environmental Geochemistry (SEGH) and instead use the Adult Lead Methodology of EPA:

> (e) The residential ingestion numeric value for lead in soil was developed using the **[Uptake Biokinetic (UBK) Model for Lead (version 0.4)]** **Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children, Windows®® version (IEUBKwin v1.1 build 11) 32-bit version** developed by the EPA (U.S. Environmental Protection Agency. (**[1990]** **February 2010**) **[Uptake Biokinetic (UBK) Model for Lead (version 0.4). U.S. EPA/ECAO. August 1990,]** in lieu of the algorithms presented in subsections (a) and (b). Default input values are identified in Appendix A, Table 7. Because the **[UBK]** **IEUBK** model is applicable only to children, the nonresidential ingestion numeric value was calculated **[according to the method developed by the Society for Environmental Geochemistry and Health (Wixson, B. G. (1991)). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. *Trace Substances in Environmental Health*. (11-20), using the following equations:**

$$S = \frac{1000\left[\left(\frac{T}{G^n}\right) - B\right]}{\delta}$$

]

using EPA's Adult Lead Methodology (ALM) in accordance with the guidance, exposure factors, equations, and spreadsheets provided in EPA's *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil* (EPA-540-R-03-001, OSWER Dir # 9285.7-54, January 2003), *OLEM Directive 9285.6-56 "Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters"* (May 2017) and the associated June 14, 2017, version of the *Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee* spreadsheets. Table 7 identifies each of the variables **[in this equation] used to calculate the nonresidential ingestion numeric value for lead**.

Id. (proposed §250.306(e)) (emphasis in original; bold underlining in original represents new material; brackets in original represents deleted material).

The proposed rule states that the direct contact numeric value was calculated using the ALM and in accordance with the guidance, and spreadsheets, contained in three documents.

The first document is an EPA guidance document regarding the use of the ALM, published in 2003. U.S. EPA, Technical Review Workgroup for Lead, Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (EPA-540-R-03-001, January 2003, Attachment 31). At that time, EPA was recommending a target blood lead concentration of 10 µg/dL. *See id.*, page 6, Table 1. EPA published this document before the Centers for Disease Control lowered its threshold from 10 µg/dL to 5 µg/dL in 2012.

The second document is an update published by EPA in 2017 that addressed newer scientific information regarding blood levels. That document set forth a table of calculations for Preliminary Remediation Goals (essentially, cleanup levels), based on a "5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead target level":

Table 3. Current and previous PbB_0 and GSD_i parameter values shown in the ALM *PRG calculation* tab of the ALM spreadsheet. Calculations of PRGs 5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead target level.

Variable	Description of Variable	Units	Current GSDi and PbB_0 from Analysis of NHANES: 2009-2014	Previous GSDi and PbB_0 from Analysis of NHANES 1999-2004
$PbB_{fetal, 0.95}$	95th percentile PbB in fetus	µg/dL	5	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365
PRG	**Preliminary Remediation Goal Soil Lead Concentration where PbB_i = 5 µg/dL**	**ppm**	**1050**	**773**

U.S. EPA, OLEM Directive 9285.6-56, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable, page 6, Table 3 (May 2017, Attachment 32).

Attached to the two-page transmittal memorandum was a set of Frequently Asked Questions that stated that EPA was updating its soil lead strategy to incorporate new scientific information recognizing adverse health effects at blood lead concentrations below 10 µg/dL, and that the release date was pending:

> OLEM [Office of Land and Emergency Management] recognizes adverse health effects at blood lead concentrations below 10 µg/dL. ***Accordingly, OLEM is updating the soil lead strategy to incorporate this new information***. However, the release date for the updated strategy is pending.

Id., Transmittal Memorandum, page 3 (bold italics added for emphasis). In the meantime, the TRW Lead Committee recommended the following considerations for all non-residential risk assessments where lead is a contaminant of concern:

> 1. ***The updated NHANES values are appropriate for lead risk assessments for residential and non-residential exposures*** both in

> assessing risk and in developing preliminary remediation goals (PRGs) for your site.
>
> 2. ***Lead risk assessments should include a discussion of*** the most current toxicity information and ***Centers for Disease Control and Prevention Reference level***.
>
> 3. Consistent with risk management best practices, ***caution should be applied when implementing cleanup levels based on the updated NHANES values for non-residential scenarios (PRGs are greater than 2000 ppm using default values).*** Ineffective controls or incorrect land use assumptions could have potentially greater health consequences on children who are exposed (e.g., by visiting, trespassing, or tracking the material to the residence) to these high concentrations (especially given the new toxicity information).
>
> Users are encouraged to contact the technical support hotline, TRW Lead Committee, or regional risk assessor with any questions.

Id. (bold italics added for emphasis).

The third document represents an Excel spreadsheet prepared in 2017 by EPA for calculating Preliminary Remediation Goals for nonresidential soils based on the new scientific information, including the updated target blood concentration. U.S. EPA Technical Review Workgroup for Lead, Spreadsheet for Calculation of PRGs: Appendix B of ALM document(2 pp, 18 K) (June 14, 2017, Attachment 33).[2] In this document there are two sheets: (1) one sheet for Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas and (2) one sheet for Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas. *See id.* Rather than using 10 µg/dL, EPA used 5 µg/dL as the target blood concentration in both sheets. *See id.* Together with other inputs, this leads to a Preliminary Remediation Goal of 1050 ppm. *See id.*

The use of the 5 µg/dL target blood concentration in this spreadsheet is significant because this spreadsheet was based on a template attached to the 2003 guidance document, which had used 10 µg/dL as the target blood concentration. See Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (January 2003, Attachment 31), Appendix B ("Calculations of Preliminary Remediation Goals (PRGs)," page B-1.

The Department was aware that EPA recognized adverse health effects below 10 µg/dL, and even quoted cautionary language from EPA in its lead model comparison sheet:

[2] The link is on EPA's website: Lead at Superfund Sites: Software and Users' Manuals.

> EPA's lead guidance website states, ***'Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below***. OSRTI is developing a new soil lead policy to address this new information.
> ….
>
> ***EPA's guidance for the ALM cautions that the values calculated using this new model are high and may not be protective of all receptors, i.e. a school or playground that borders a non-residential property***. This is not necessarily in-line with the purpose of the statewide health standard which should be protective across the entire state.

See Department of Environmental Protection, Lead Model Comparison Sheet (undated, Attachment 6) (bold italics added for emphasis). Still, the Department used 10 µg/dL, rather than 5 µg/dL.

In fact, in the notice of the proposed rulemaking the Department suggests that new scientific information regarding lead exposure leads to the conclusion that the direct contact numeric value should be *weakened*, rather than strengthened:

> The soil numeric values represent a proposed decrease for approximately 83% of the values and an increase for 17% of the values. For groundwater, the proposed changes reflect a decrease for approximately 92% of the values and an increase in approximately 8% of the values. Lowering the values may indicate a more stringent cleanup is required at a site ***and increasing the values may indicate a less stringent cleanup is required at a site***. ***These proposed changes reflect updated information related to exposure limitations to these substances and recognize that a higher or lower standard is better representative of those substances' exposure thresholds***.

See 50 Pa.B. 1012 col. 1 (bold italics added for emphasis). But the Department is going in the *opposite* direction of the science. In the context of a lack of a safe level of exposure to lead, the public health agencies have been focusing on lower blood lead levels, not higher levels. *See* discussion in Comment #2, above.

In the calculation of the direct contact nonresidential soil standard of 2500 ppm, the Department used all the default parameters provided in the 2017 Adult Lead Methodology (Attachment 33), *except* for the target blood level (Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7, February 13, 2019, Attachment 2). In response to an inquiry regarding the development of the proposed direct contact numeric value, the Department stated that "DEP is using EPA's lead methodologies, generally with EPA's default values." *See* Attachment 34 -- Email from C. David Brown to Peter Winslow, dated January 3, 2020.

By asserting that it "generally" used EPA's default values, the Department demonstrated that it was ignoring a value that it considered to be a default value in EPA's 2017 spreadsheet.

In 2020, the Department may not cherry-pick new scientific information -- at least not reasonably. It cannot apply new scientific information that tends to make a standard less stringent (the baseline blood concentration) while ignoring other new scientific information that tends to make a standard more stringent (the target blood concentration). In proposing the direct contact numeric value, the Department adopted the 10 μg/dL target blood concentration in EPA's 2003 guidance document, ignoring the 5 μg/dL target blood concentration in EPA's 2017 guidance document, and ignoring the 5 μg/dL target blood concentration in EPA's 2017 spreadsheet.

Because the target blood concentration used by the Department is not protective of public health, the proposed direct contact numeric value is not protective of public health.

B. The proposed direct contact numeric value would make site-specific standards for lead not protective of public health.

In addition to causing a dramatic increase in the proposed direct contact numeric value, the Department's use of the 10 μg/dL target blood concentration would enable owners of contaminated sites to develop site-specific standards that are not protective of public health.

It does this in two ways. First, it increases the threshold at which a property owner will have an incentive to request a site-specific standard, where the direct contact numeric value prevails over the soil-to-groundwater numeric value. Under the regulations, sometimes the medium-specific concentration is set by the direct contact numeric value, and other times it is set by the soil-to-groundwater numeric value. *See* 25 Pa. Code §250.305(d)(1)-(2). Second, its use of the 10 μg/dL target blood concentration validates the development of a site-specific standard near 2500 ppm, superseding both the direct contact numeric value and the soil-to-groundwater numeric value.

The Department recognizes that the proposed amendments do not change the statutory right of a remediator to develop a site-specific standard for lead:

> ***The proposed amendments to Statewide health standard MSCs would not affect the cleanup options available to remediators under other cleanup standards***. Persons conducting remediation under Act 2 may choose from three different cleanup standards: background, Statewide health ***or site-specific***.

See 50 Pa.B. 1015 col. 1 (bold italics added for emphasis).

Under the statute, a property owner has the option of developing a site-specific standard rather than applying a statewide health standard:

> Section 301. Remediation standards.
>
> (a) Standards.--***Any person*** who proposes or is required to respond to the release of a regulated substance at a site and ***who wants to be eligible for the cleanup liability protection under Chapter 5 shall select and attain compliance with one or more of the following environmental standards when conducting remediation activities***:
>
> (1) a background standard which achieves background as further specified in section 302;
>
> (2) ***a Statewide health standard adopted by the Environmental Quality Board*** which achieves a uniform Statewide health-based level so that any substantial present or probable future risk to human health and the environment is eliminated as specified in section 303; or
>
> (3) ***a site-specific standard which achieves remediation levels based on a site-specific risk assessment*** so that any substantial present or probable future risk to human health and the environment is eliminated or reduced to protective levels based upon the present or currently planned future use of the property comprising the site as specified in section 304.

See Act 2 of 1995, §301(a) (bold italics added for emphasis). The regulations also contemplate the use of a risk assessment for developing a site-specific standard. *See* 25 Pa. Code §250.402 ("The development of site-specific standards shall be based on a site-specific risk assessment, if required.").

For lead in soil, this would mean that a site-specific standard would "almost always" be based on EPA's Adult Lead Methodology:

> I'm assuming the ALM was used to calculate the non-residential site-specific lead standard at the Philadelphia Refinery which resulted in a value of 2,240 mg/kg. ***When we calculated the non-residential direct contact value for the proposed rulemaking using the ALM default exposure factors we ended up with a very similar number of 2,500 mg/kg***. Thus, it is probably safe to say that the differences in the default exposure factors from the SEGH model and the ALM resulted in the difference between the current non-residential direct contact lead value and the site-specific value calculated for the Philadelphia Refinery.
>
> Keep in mind that the non-residential direct contact numeric value will never be the MSC because it is higher than the generic soil to groundwater numeric value of 450 mg/kg. So in cases where the

> SHS is being used, the soil MSC for lead will always be 450 mg/kg. ***For site-specific analyses, such as the Philadelphia Refinery, the ALM is almost always used which results in a value closer to our proposed direct contact non-residential soil lead value***.

Attachment 35, Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019 (bold italics added for emphasis).

In fact, the consultant used the ALM when it developed a site-specific standard of 2240 ppm for its remedial investigation at the Philadelphia oil refinery in 2015, based on a target blood concentration of 10 µg/dL. *See* Evergreen Resources Group, LLC, Human Health Risk Assessment, Section 8.0 (Risk Characterization), pages 9-11 (February 24, 2015, Attachment 36).

The Department approved the site-specific 2240 ppm standard several months later. *See* Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields) (April 30, 2015, Attachment 37) (recommending approval of 2240 ppm standard), Approval Letter from C. David Brown to Evergreen Resources Management Operations (May 6, 2015, Attachment 38).

The Department not only approved the site-specific standard of 2240 ppm for the Philadelphia oil refinery, but also endorsed the use of 10 µg/dL; *See* Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields), page 2 ("The target blood lead concentration is 10 µg/dL, which is considered to be a level in a pregnant worker above which fetal neurological damage could occur," Attachment 37).

The site-specific standard of 2240 ppm for the Philadelphia oil refinery and the Department's proposed nonresidential soil direct contact standard of 2500 ppm were both calculated using the same model (ALM) and the same target blood concentration (10 µg/dL). The minor difference in the two resulting values is due to the Department's use of EPA's updated values for the other model parameters. *See* Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K), June 14, 2017, Attachment 33).

C. The proposed direct contact numeric value would not be protective of public health at a broad range of nonresidential properties.

The Department's proposed increase in the direct contact numeric value from 1000 ppm to 2500 ppm would apply to nonresidential sites undergoing cleanups throughout Pennsylvania. The term "nonresidential" is broadly defined to include all industrial and commercial uses of land, as well as related administrative activities:

> ***Any real property on which commercial, industrial, manufacturing or any other activity is done to further either the development, manufacturing or distribution of goods and***

> ***services, intermediate and final products***, including, but not limited to, ***administration of business activities***, research and development, warehousing, shipping, transport, remanufacturing, stockpiling of raw materials, storage, repair and maintenance of commercial machinery and equipment, and solid waste management. This term shall not include schools, nursing homes or other residential-style facilities or recreational areas.

See Act 2 of 1995, §103 (bold italics added for emphasis). Nonresidential means not only oil refineries, but also office buildings and commercial properties. It means properties in both urban and rural areas. Because the proposed direct contact numeric value is not protective of public health, people working on nonresidential properties could be exposed to harmful levels of lead.

The Department proposes a direct contact numeric value that is not protective of human health and enables remediators developing their own site-specific standards to do the same. This is especially inappropriate given the wide range of nonresidential properties to which such standards would apply.

D. The proposed direct contact numeric value would be much greater than comparable cleanup levels in most of the states neighboring Pennsylvania.

With one exception, the states neighboring Pennsylvania have comparable cleanup levels for lead in nonresidential soil that are much lower than the proposed direct contact numeric value of 2500 ppm. The Department should follow the states that recognize harm at lower levels, and maintain the existing direct contact numeric value of 1000 ppm.

Maryland applies a cleanup level of 800 ppm for nonresidential soil in its guidance document. Maryland Department of the Environment, Cleanup Standards for Soil and Groundwater, Interim Final Guidance (Update No. 3) (October 2018, Attachment 39), page 24, Table 1 (setting forth non-residential clean-up standard of 800 mg/kg for soil).

Delaware applies a cleanup level of 1000 ppm in its guidance document. *See* Delaware Department of Natural Resources and Environmental Control, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act (Revised December 1999, Attachment 40), page 12 (defining "restricted use setting" to essentially mean nonresidential use), Attachment 3, page 8 (1000 mg/kg for restricted use). *See also* Delaware Department of Natural Resources and Environmental Control, Guidance for Human Health Risk Assessments (HHRA) under the Hazardous Substance Cleanup Act (HSCA) (October 2017, Attachment 41), page 19 ("Remediation for lead will normally be required if the EPC [Exposure Point Concentration] is greater than 400 mg/kg (or 800 mg/kg for restricted use sites").

New Jersey applies a cleanup level of 800 ppm in its regulations for nonresidential soil. *See* N.J.A.C. 7:26D (Remediation Standards) (last amended September 18, 2017, Attachment 42), Appendix 1, page 19, Table 1B (setting forth non-residential direct contact soil remediation standard of 800 mg/kg).

Ohio applies a cleanup level of 800 ppm in its regulations. *See* Ohio Environmental Protection Agency, VAP Rules Effective October 17, 2019, OAC 3745-300-08 Appendix A, page 42, Table III (Attachment 43) (setting forth direct-contact soil standard of 800 mg/kg for commercial and industrial land use).

West Virginia applies a cleanup level of 1000 ppm in its legislative rule. West Virginia Department of Environmental Protection, Technical Guidance and Templates, Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3) (effective April 1, 2018, Attachment 44), page 3, §60-3-2.24 (defining "industrial land use" to include "land used for commercial establishments"), page 80, Table 60-3B (setting forth risk-based concentration of 1000 mg/kg for industrial soil).

Unlike other neighboring states that set a single standard for nonresidential sites (applying to both commercial and industrial use), New York has set different standards for commercial and for industrial use. For commercial use, New York has set a soil cleanup objective of 1000 ppm, which is the current direct contact numeric value in Pennsylvania (6 CRR-NY 375-6.8(b): Restricted Use Soil Cleanup Objectives, Attachment 45).

For industrial use, New York has set a soil cleanup objective of 3900 ppm (*See* 6 CRR-NY 375-6.8(b): Restricted Use Soil Cleanup Objectives, Attachment 45). New York set this soil cleanup objective in 2006 -- six years before the Centers for Disease Control and Prevention embraced a reference value of 5 µg/dL. *See* 6 NYCRR PART 375 (Effective December 14, 2006, Attachment 45). Moreover, the Technical Support Document in that rulemaking notes that it was following the Centers for Disease Control and Prevention's "level of concern" from 1991:

> ***The blood lead level is typically 10 mcg/dL*** (micrograms of lead per deciliter of blood), ***which is the Centers for Disease Control and Prevention (CDC) level of concern for blood lead in young children*** (ATSDR, 1999; ***CDC, 1991***). In most cases, the guidelines are derived so that the blood levels of almost all children exposed at the guideline would be below 10 mcg/dL. ***This is the approach taken in the derivation of the SCOs for lead*** (see Section 5.3.4 Chronic Lead SCOs).

See New York State Department of Environmental Conservation and New York State Department of Health, Technical Support Document (September 2006, page 40, Attachment 46). The fact that New York has not amended its soil cleanup objective for industrial use to catch up with the science is not a justification for Pennsylvania to do the same for all nonresidential uses -- including both commercial and industrial uses.

4. <u>The Soil-to-Groundwater Numeric Value Does Not Render the Proposed Direct Contact Numeric Value Meaningless.</u>

The Department has asserted that the proposed direct contact numeric value for lead has no legal effect because it will always be superseded by a more stringent soil-to-groundwater numeric value. This is incorrect. Moreover, if the Department truly believes this, it should not

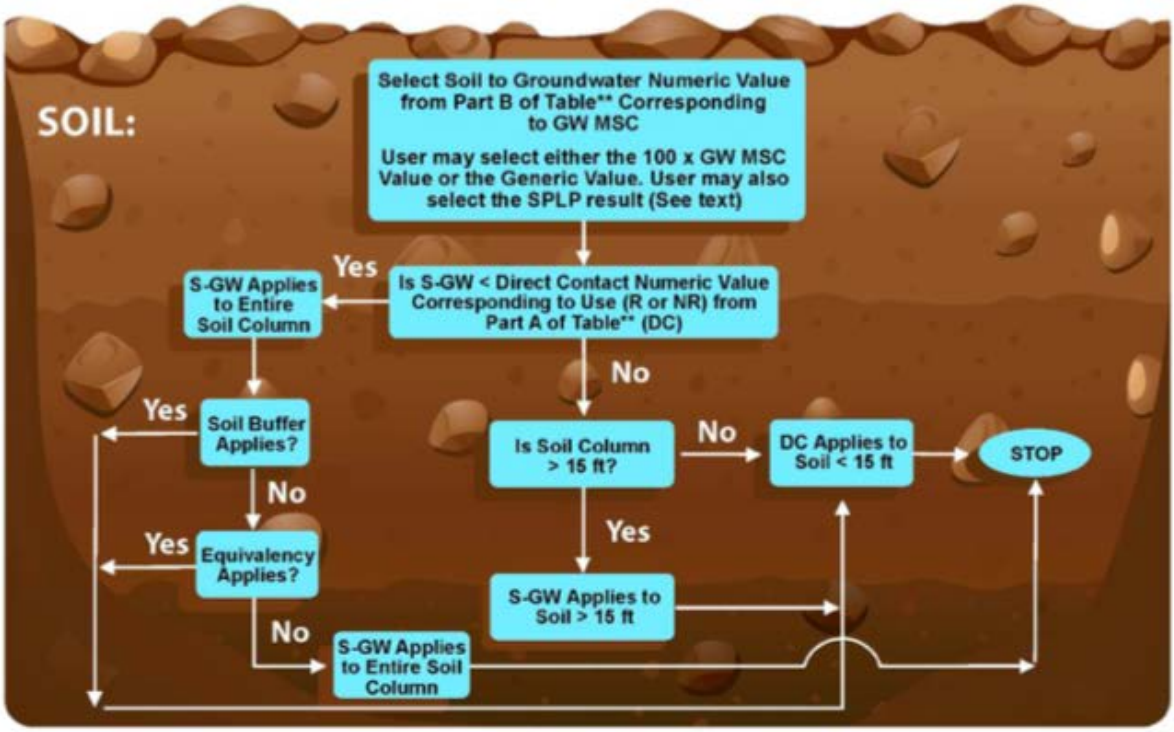
have any objection to not finalizing its proposed direct contact numeric value and retaining the current value of 1000 ppm in the regulations.

The source of the Department's position appears to be an email to the Southeast Regional Office relating to the remedial investigation at the Philadelphia oil refinery:

> Keep in mind that the non-residential direct contact numeric value will never be the MSC because it is higher than the generic soil to groundwater numeric value of 450 mg/kg. ***So in cases where the SHS is being used, the soil MSC for lead will always be 450 mg/kg***.

See Attachment 35, Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019 (bold italics added for emphasis). This statement framed the Department's erroneous press release relating to the proposed direct contact numeric value. *See* Department of Environmental Protection, Press Release, dated March 16, 2020 (Attachment 47), asserting that "[t]he non-residential statewide health standard of 450 ppm will remain unchanged."

The process of selecting statewide health standards is illustrated in the following decision tree [Figure II-11: Decision Tree for Selecting Statewide Health Standard MSCs for Groundwater and Soil)]



See Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019, Attachment 48), Section II (Act 2 Remediation Process), page II-52.

The Department is incorrect in asserting that a soil-to-groundwater numeric value will always prevail over a direct contact numeric value. In support of its argument, the Department relies on a subsection of the regulations that defines a medium-specific concentration as the lowest of three numbers -- the ingestion numeric value, the inhalation numeric value, and the soil-to-groundwater numeric value. *See* 25 Pa. Code §250.305(d)(1)(i)-(iii). But that is one-half the definition. The Department ignores the other half.

The other half of the definition defines a medium-specific concentration as the lowest of the first *two* numbers -- the ingestion numeric value and the inhalation numeric value, *without regard to the soil-to-groundwater numeric value*. *See id.*, §250.305(d)(2). To satisfy that other half of the definition, a remediator must perform a demonstration of the soil-to-groundwater pathway soil buffer or a soil-to-groundwater pathway equivalency demonstration. *See id.*, §250.305(d)(2)(i)-(iii).

The first demonstration involves a showing that "[t]he concentration of the regulated substance cannot exceed the limit related to the PQL [Practical quantitation limit] or background throughout the soil buffer," among other things. *See id.*, §250.308(b)(2). The soil buffer depth for lead is set at 10 feet. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4B (Attachment 10).

The second demonstration involves a showing that the regulated substances will not migrate to bedrock or the groundwater within 30 years at concentrations exceeding the greater of the groundwater medium-specific concentration or background in groundwater as the endpoint in soil pore water directly under the site, among other things. *See id.*, §250.308(d)(1).

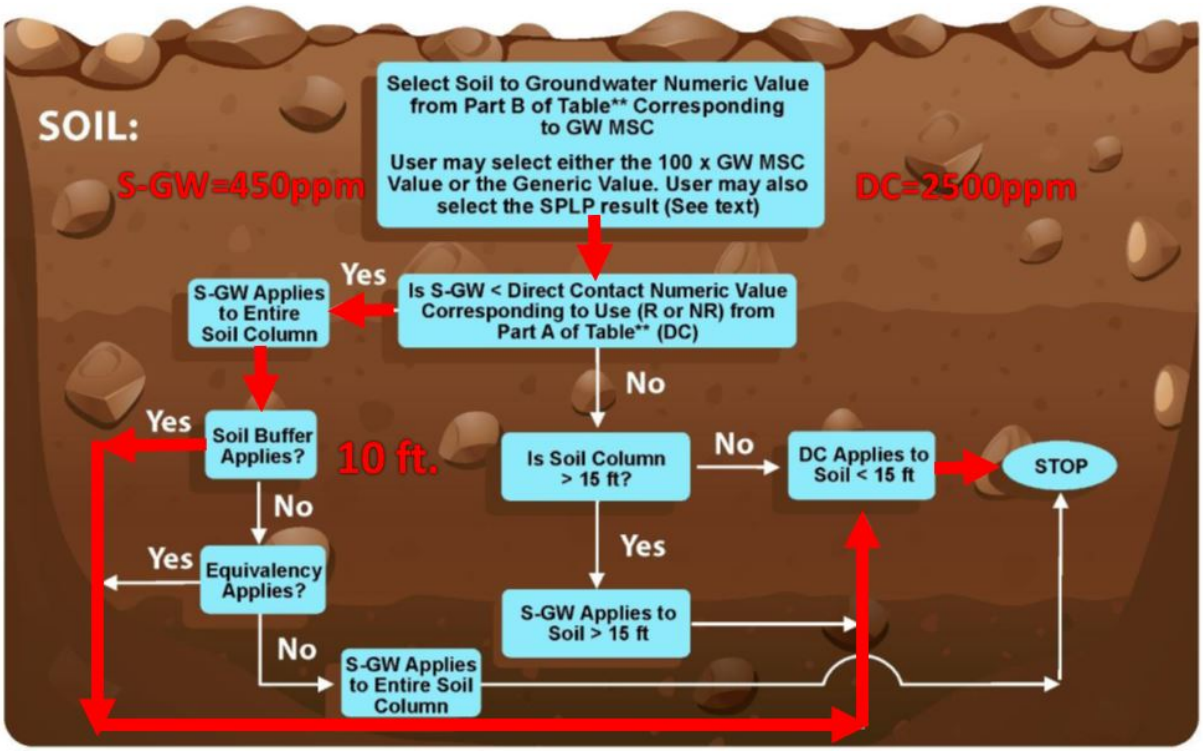
Assuming either demonstration is met, the soil-to-groundwater numeric value would not determine the medium-specific concentration. *See id.*, §250.305(d)(2).

In its own Technical Guidance Manual, the Department makes it clear that when either demonstration is met, the medium-specific concentration for soil will be the direct contact numeric value:

> ii) Determining Soil MSCs
>
> In determining the applicable soil standard, the remediator must compare the appropriate soil-to-groundwater numeric value to the direct contact numeric value for the corresponding depth interval within 15 feet from the ground surface. The lower of these two values is the applicable MSC for soil. ***If either the soil buffer distance (described in 25 Pa. Code § 250.308(b) and (c)) or the equivalency demonstration (described in 25 Pa. Code § 250.308(d)) is met, the soil-to-groundwater numeric value will be deemed to be satisfied, and the soil MSC will be the direct contact numeric value***. The soil-to-groundwater numeric value is the MSC

> for soil at depths below 15 feet, unless either the soil buffer distance or the equivalency demonstration is met.

See Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019, Attachment 48), Section II (Act 2 Remediation Process), page II-51 (bold italics added for emphasis).[3] To demonstrate how the direct contact numeric value of 2500 ppm for lead could apply, the Council has highlighted the following route in red below:



See id., page II-52 (arrows, lines, and text in red added for emphasis).

Therefore, there is no merit to the Department's argument that the proposed direct contact numeric value has no legal effect.

Moreover, it is presumed that when an agency proposes to do something, it intends some effect. In the past, the Department has told the Independent Regulatory Review Commission that its statewide health standards (including its direct contact numeric values) are important for the protection of public health:

> The Land Recycling Act requires the EQB to establish by regulation ***a uniform Statewide health standard that can be used to eliminate any substantial present or probable future risk to human health, welfare, and the environment***. The original standards were promulgated in 1997 and codified in Chapter 250.

[3] The document is on the Department's Web Page for Technical Guidance Manual.

> Section 104(a) of the Land Recycling Act explicitly recognizes that these standards would need to be updated over time as better science became available and as the need for clarification or enhancement of the program became apparent. ***Updating the standards serves the public, as DEP is able to use the most up-to-date health and scientific information to establish the cleanup standard for exposure to substances that cause cancer or have other toxic effects on human health or welfare***. The Statewide health standard is expressed as a list of MSCs, which apply to either soil or groundwater contamination and to residential and non-residential exposure scenarios as authorized under the Land Recycling Act.
>
> ***The changes in the MSCs in these amendments to Chapter 250 serve both the public and the regulated community as they provide clear information on what is required at contaminated sites***. Having access to that information allows the public to know the acceptable level of contamination at a site based on the intended use of the property, and it provides remediators with a uniform endpoint to the remediation process. ***Because each site and situation is unique, it is necessary to provide different MSCs for***: 1) specific constituents in groundwater at points of compliance, 2) ***specific constituents in soil, where there may be direct contact through ingestion or inhalation***, and 3) specific constituents in soil that may leech [sic] into groundwater. ***Each of these MSCs is based on the physical, toxicological, and esthetic properties of a specific regulated substance, which are based on scientific sources of information***.

Department of Environmental Protection, Regulatory Analysis Form, filed May 13, 2016, pages 2-3, Box No. 10 (Attachment 49. Bold italics added for emphasis).

If the Department feels compelled to come up with a number simply because it had to do so (as it has suggested), the Department should maintain the current direct contact numeric value of 1000 ppm.

5. <u>As a Matter of Law, the Proposed Direct Contact Numeric Value is Unreasonable</u>.

The Department has cherry-picked scientific information for the Adult Lead Methodology. It has used new scientific information that tends to make a standard less stringent (the baseline blood concentration) while ignoring other new scientific information that tends to make a standard more stringent (the target blood concentration). This is legally unreasonable.

It is significant that the target blood concentration is the only value in the EPA 2017 spreadsheet that the Department did *not* use when it calculated the proposed direct contact numeric value of 2500 ppm. *See* 50 Pa.B. 1097 (Appendix A, Table 7 ("Input Values Used in

the Adult Lead Model"); *see also* Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K) (June 14, 2017, Attachment 33).

As a basis for its choice of a target blood concentration of 10 µg/dL, the Department apparently relies solely on the EPA guidance document from 2003, ignoring new scientific information reflected in the 2017 EPA guidance document and the 2017 EPA spreadsheet. The Department has not identified any other documentary justification as a basis for using 10 µg/dL.

The meeting minutes of the CSSAB do not contain any discussion of arguments for or against a target blood concentration of 10 µg/dL or 5 µg/dL. The minutes only state that the Department sought input regarding the choice between these target blood concentrations, and that the CSSAB recommended the less protective one. *See* Meeting Minutes (April 4, 2018, Attachment 3), Meeting Minutes (August 1, 2018, Attachment 5), Meeting Minutes (February 13, 2019, Attachment 7).

Apart from the EPA representative, the only academic representative on the CSSAB has a field of expertise outside of environmental remediation and public health. *See* Cleanup Standards Scientific Advisory Board Members, Membership List (Updated June 2018, Attachment 50) (Tina M. Serafini, D.Sc.). The other members are representatives of business and industry.

One member of the CSSAB who was present at all three meetings is a consultant who prepared remedial investigation reports for lead contamination for the Philadelphia oil refinery. *See* Colleen Costello, Linkedin Page (employed with GHD from March 2015-March 2020, Attachment 51). Her company performed ongoing work relating to the delineation of lead contamination in the soil and anticipated remedies under the site-specific standard for lead approved in 2015. *See* Colleen Costello, GHD, Remedial Investigation Report (November 21, 2017, Attachment 52), Section 9.6 ("AOI 6 areas with identified soil exceedances of the direct-contact MSC for BaP and benzene, with the exception of BH-16-025, and SSS for lead have been delineated and remedies will be addressed in future Act 2 submissions, including a Facility-Wide Cleanup Plan."); *see also* Colleen Costello, GHD, Letter to David Brown (April 30, 2018, Attachment 53), page 1 ("Additionally, lead in the area between BH-17-004 and the bulkhead will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report or the site-wide Cleanup Plan. Additional sampling is anticipated to support either the Risk Assessment or the Cleanup Plan activities."). In addition, another representative of GHD (who was not a member of the CSSAB) attended the second and third meetings.

Neither the CSSAB's recommendation of 10 µg/dL nor the Department's acceptance of the recommendation was credible. Given the science and the implementation of policy by federal and state health agencies, the selection of 10 µg/dL was unreasonable as a matter of law.

6. As a Matter of Law, the Proposed Direct Contact Numeric Value is "Not in Accordance with Law."

According to the Pennsylvania state courts, the pre-enforcement doctrine generally forecloses a party from immediately challenging a final rulemaking. However, such a party does not forfeit the right to challenge the regulation. When the regulation is implemented in such a manner as to cause harm, a party with standing may commence a legal challenge at that time. *See Rand v. Pennsylvania State Bd. of Optometry*, 762 A.2d 392 (Cmwlth., 2000) (regulation establishing a testing deadline to qualify for a license invalidly exceeded the agency's statutory authority, where the deadline was unnecessary to advance the intent of the act and therefore outside the grant of authority).

This is not an academic point. The proposed direct contact numeric value would have an effect on the remedial investigation at the Philadelphia oil refinery, either by setting a medium-specific concentration or by affecting a site-specific standard. If and when the Department makes another determination regarding the applicability of cleanup standards for that project, a party with standing will have the opportunity to challenge the proposed direct contact numeric value (if finalized) at that time.

On a number of accounts, the proposed direct contact numeric value is legally flawed. Because it violates a number of statutory and regulatory requirements, it is "not in accordance with law."

A. The proposed direct contact numeric value violates a number of statutory requirements.

A state court may strike down a regulation that is "not in accordance with law." *See* 2 Pa.C.S. § 704, Pennsylvania Consolidated Statutes, Title 2. Because the proposed direct contact numeric value violates a number of statutory requirements, it is "not in accordance with law."

According to the declaration of policy in the statute, "[a]ny remediation standards adopted by this Commonwealth must provide for the protection of public health and the environment." Act 2, § 102(3). As discussed above, the Department proposes a direct contact numeric value based on a target blood lead concentration that has been linked to serious and irreversible health effects. Because the proposed direct contact numeric value was calculated using this variable (as will almost all site-specific standards for lead), the resulting standards would not be protective of public health, causing them to violate this declaration of policy.

The declaration of policy also states that "[p]ublic health and environmental hazards cannot be eliminated without clear, predictable environmental remediation standards and a process for developing those standards." Act 2, §102(3). But the Department's presentation and discussion of the proposed direct contact numeric value has not been clear and predictable. The Department asserts that the proposed direct contact numeric value would have no legal effect, under the mistaken rationale that a much lower soil-to-groundwater value will always apply. In addition, it ignores the fact that it would have a significant legal effect by enabling property owners to develop site-specific standards near 2500 ppm, by endorsing a target blood

concentration that is two times the blood lead level used by public health agencies for dealing with children exposed to lead.

The lack of clarity is compounded by the fact that the Department did not include the target blood concentration of 10 µg/dL anywhere in the notice of the proposed rulemaking. It actually set forth "TBD" (presumably, "to be determined") as the target blood concentration in the proposed table. *See* 50 Pa.B. 1097 (Appendix A, Table 7 ("Input Values Used in the Adult Lead Model"). This makes it difficult for the public to recognize the connection between the proposed direct contact numeric value and site-specific standards for lead -- a connection that the Department has emphatically denied.

By asserting that the proposed direct contact numeric value is essentially meaningless, and by listing a key variable used to calculate that value as "TBD," the Department proposes a regulation that lacks "clear, predictable" standards, in violation of the declaration of policy in Act 2.

The statute also requires the Environmental Quality Board to promulgate Statewide health standards "along with the methods used to calculate" those standards." Act 2, §303(a) ("The Environmental Quality Board shall promulgate Statewide health standards for regulated substances for each environmental medium.... The Environmental Quality Board shall also promulgate along with the standards the methods used to calculate the standards."). Again, the Department does not identify the target blood concentration for determining the proposed direct contact numeric value of 2500 ppm. Rather, it merely identifies it as "TBD." *See* 50 Pa.B. 1097 (Appendix A, Table 7). The fact that the Council was able to deduce that the Department is using a 10 µg/dL target blood concentration does not excuse this violation of the statute.

The statute requires the direct contact numeric value to be based on "valid scientific methods." *See* Act 2, §303(b)(5) ("For the nonresidential standard, the concentration of a regulated substance in soil shall not exceed either the direct contact soil medium-specific concentration based on nonresidential exposure factors within a depth of up to 15 feet from the existing ground surface using valid scientific methods reflecting worker exposure or the soil-to-groundwater pathway numeric value determined in accordance with paragraph (4)"). The Department's use of EPA's model with only *some* of EPA's updated default variables makes this proposal scientifically invalid and, therefore a violation of Act 2.

The statute also requires that exposure scenarios for medium-specific concentrations for nonresidential conditions be based on "valid scientific methods." *Id.*, §303(b)(6) ("Exposure scenarios for medium-specific concentrations for nonresidential conditions shall be established using valid scientific methods reflecting worker exposure."). For the same reason as above, the proposal violates this requirement.

Finally, the statute requires site-specific standards to be based on "sound scientific principles." *Id.*, §304(e) ("Concentrations of regulated substances in soil shall not exceed values calculated in accordance with subsections (b) and (c) based on human ingestion of soil where direct contact exposure to the soil may reasonably occur; .... Such determinations … shall be based on sound scientific principles …."). The proposal enables property owners to violate this

requirement by endorsing the use of methods and variables that are based on outdated information.

B. The proposed direct contact numeric value violates existing regulations.

The Department is required to "review new scientific information that relates to the basis of the MSCs as it becomes available" and "propose appropriate changes for the consideration of the EQB as necessary." 25 Pa. Code §250.11. The proposal violates this requirement by *ignoring* new scientific data and by proposing a change to the nonresidential direct contact value for lead based on outdated information.

A person is required to "implement a remedy under the Statewide health standard that is protective of human health and the environment." 25 Pa. Code §250.305(a). As discussed above, the proposed nonresidential direct contact value is not protective of human health. The proposal enables parties remediating a site to a Statewide health standard or site-specific standard to implement a remedy that violates the regulation.

For all these reasons, the proposal is unreasonable, violates statutory and regulatory requirements, and would not survive a legal challenge under 2 Pa.C.S. § 704.

Conclusion

The Department should not finalize the proposed direct contact numeric value of 2500 ppm. It should retain the current value of 1000 ppm.

Thank you for your consideration of the Council's comments.

Sincerely,

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Christopher D. Ahlers, Esq.
Staff Attorney

Michelle Tolodziecki
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Table of Attachments

1. U.S. Environmental Protection Agency, Lead at Superfund Sites

2. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (February 13, 2019)

3. Cleanup Standards Scientific Advisory Board, Meeting Minutes (April 4, 2018)

4. Department of Environmental Protection, PowerPoint Presentation (August 1, 2018)

5. Cleanup Standards Scientific Advisory Board, Meeting Minutes (August 1, 2018)

6. Department of Environmental Protection, Lead Model Comparison Sheet (undated)

7. Cleanup Standards Scientific Advisory Board, Meeting Minutes (February 13, 2019)

8. Department of Environmental Protection, PowerPoint Presentation (February 13, 2019)

9. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (February 13, 2019)

10. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (June 12, 2019)

11. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 4A (October 29, 2019)

12. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (June 12, 2019)

13. Department of Environmental Protection, Draft Chapter 250 rulemaking Table 7 (October 29, 2019)

14. U.S. Environmental Protection Agency, Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology

15. The American College of Obstetricians and Gynecologists, Committee Opinion, Lead Screening During Pregnancy and Lactation (August 2012, reaffirmed in 2016)

16. The World Health Organization, Lead Poisoning and Health, (August 23, 2019)

17. Centers for Disease Control and Prevention, Breastfeeding

18. The National Capital Poison Center, Lead and Pregnancy

19. HealthyChildren.org (associated with the American Academy of Pediatrics), Blood Lead Levels in Pregnant & Breastfeeding Moms

20. U.S. Department of Health and Human Services, National Toxicology Program, NTP Monograph on Health Effects of Low-Level Lead (June 2012)

21. Centers for Disease Control and Prevention, Lead Poisoning Prevention

22. Centers for Disease Control and Prevention, Blood Lead Levels in Children

23. Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention (January 4, 2012)

24. Centers for Disease Control and Prevention, CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention" (June 7, 2012)

25. Centers for Disease Control and Prevention, Recommended Actions Based on Blood Lead Level

26. Pennsylvania Department of Public Health, Childhood Lead Poisoning Prevention Program, 2018 Childhood Lead Surveillance Annual Report (January 2020)

27. Allegheny County Health Department, Universal Blood Lead Level Testing Regulations

28. Allegheny County Health Department, Blood Lead Level Testing

29. Philadelphia Department of Public Health, Childhood Lead Poisoning Surveillance Report (2017)

30. Joint State Government Commission, Advisory Committee and Task Force on Lead Exposure, Lead Exposure Risks and Responses in Pennsylvania (April 2019)

31. U.S. EPA, Technical Review Workgroup for Lead, Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (EPA-540-R-03-001, January 2003)

32. U.S. EPA, OLEM Directive 9285.6-56, Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable (May 2017)

33. U.S. EPA Technical Review Workgroup for Lead, Spreadsheet for Calculation of PRGs: Appendix B of ALM document (2 pp, 18 K) (June 14, 2017)

34. Email from C. David Brown to Peter Winslow, dated January 3, 2020

35. Email from Michael Maddigan, Environmental Group Manager (Land Recycling Program) to C. David Brown, Professional Geologist Manager (Southeast Regional Office), dated December 20, 2019

36. Evergreen Resources Group, LLC, Human Health Risk Assessment (Risk Characterization) (February 24, 2015)

37. Memo from C. David Brown to Stephan Sinding, Regional Manager (Environmental Cleanup and Brownfields) (April 30, 2015)

38. Approval Letter from C. David Brown to Evergreen Resources Management Operations (May 6, 2015)

39. Maryland Department of the Environment, Cleanup Standards for Soil and Groundwater, Interim Final Guidance (Update No. 3) (October 2018)

40. Delaware Department of Natural Resources and Environmental Control, Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act (Revised December 1999)

41. Delaware Department of Natural Resources and Environmental Control, Guidance for Human Health Risk Assessments (HHRA) under the Hazardous Substance Cleanup Act (HSCA) (October 2017)

42. State of New Jersey, N.J.A.C. 7:26D (Remediation Standards) (last amended September 18, 2017)

43. Ohio Environmental Protection Agency, VAP Rules Effective October 17, 2019, OAC 3745-300-08 Appendix A

44. West Virginia Department of Environmental Protection, Technical Guidance and Templates, Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3) (effective April 1, 2018)

45. New York State Department of Environmental Conservation, 6 NYCRR PART 375 (Effective December 14, 2006)

46. New York State Department of Environmental Conservation and New York State Department of Health, Technical Support Document (September 2006)

47. Department of Environmental Protection, Press Release (March 16, 2020)

48. Department of Environmental Protection, Technical Guidance Memorandum (revised January 19, 2019)

49. Department of Environmental Protection, Regulatory Analysis Form, filed May 13, 2016

50. Cleanup Standards Scientific Advisory Board Members, Membership List (Updated June 2018)

51. Colleen Costello, Linkedin Page

52. Colleen Costello, GHD, Remedial Investigation Report (November 21, 2017)

53. Colleen Costello, GHD, Letter to David Brown (April 30, 2018)

Attachment 5

(Attachments 1-26 to
Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

Attachment 1

Lead at Superfund Sites

On this page:

What is the issue and why should people care?

Lead contamination at Superfund sites presents a threat to human health and the environment. Lead, a naturally occurring element, can be harmful to humans (particularly children) when ingested or inhaled. Over time, lead has become a common environmental contaminant at Superfund sites across the country. To learn more about the effects of lead poisoning and EPA's role in reducing the presence of lead in the environment, visit EPA's Lead Web page.

- EPA's Lead Web page
- EPA's actions under Federal Lead Action Plan

What is EPA doing about it?

EPA response actions at Superfund sites address a release or threat of release of a hazardous substance such as lead into the environment. Childhood blood lead (PbB) concentrations at or above 10 micrograms of Pb per deciliter of blood (µg Pb/dL) present risks to children's health. Accordingly, EPA response actions seek to limit the risk that children will have lead concentrations above 10 µg Pb/dL. The Agency’s risk assessments reduce the likelihood that such exposures will occur.

To help in making this determination, the Integrated Exposure Uptake Biokinetic (IEUBK) model and the Adult Lead Methodology (ALM) estimate the concentration of lead in the blood of children, pregnant women and their developing fetuses who might be exposed to lead-contaminated soils. The level to which EPA remediates lead contamination at Superfund sites is guided by risk assessors' application of the IEUBK model and the ALM to estimate blood lead concentrations. These findings help EPA estimate possible adverse health effect exposures.

- Integrated Exposure Uptake Biokinetic (IEUBK) model
- Adult Lead Methodology (ALM)

EPA has convened two workgroups to assist in the use of the IEUBK model and the ALM:

- Technical Review Workgroup for Metals and Asbestos (TRW) Lead Committee
- Lead Sites Workgroup (LSW)

The workgroups address risk assessment and risk management issues.

Please refer to the Software and Users' Manuals page as well as the Guidance page for important documents related to the LSW, the TRW, the IEUBK model, the ALM and risk assessment.

- Software and Users' Manuals page
- Guidance page

What are others doing about it?

To learn more about the efforts of other federal agencies, states, counties and organizations to prevent lead exposure, visit EPA's Other Lead Links page.

- EPA’s Other Lead Links page

What can you (as a person or as an organization) do about it?

Education is the key. EPA's Lead Awareness Program designs outreach activities and education materials, awards grants, and manages a toll-free hotline. The hotline helps parents, homeowners and lead professionals learn what they can do to protect their families and themselves from the dangers of lead.

- EPA's Lead Awareness Program

Other resources to learn more

EPA's Related Links page provides other resources to learn more.

- Related Links page

Examples of Superfund Site Cleanups

Superfund cleans up contaminated media, such as soil, to protect human health and the environment. Lead can be toxic when ingested or inhaled and blood lead levels can be used as a measure of exposure. Blood lead levels measured before and after cleanup confirm that exposure to lead has been reduced. The process of cleanup and changes in blood lead levels can be better understood by examining site cleanup work.

Below are a few examples of Superfund cleanup actions that show blood lead level reductions among children. At each of these sites, blood lead testing took place before and during cleanup. The table below provides additional information on the cleanups.

Superfund cleanup actions at sites where lead testing was performed

Site Name	City	State	Sources of Contamination
Vasquez Boulevard and I-70	Denver	CO	Historic smelting operations
Bunker Hill Mining & Metallurgical Complex	Smelterville	ID	Historic mining and smelting operations (More information on blood lead levels)
Cherokee County	Galena	KS	Historic mining operations
Big River Mine Slag/St. Joe Minerals Corp.	Desloge	MO	Historic mining operations
Madison County Mines	Fredericktown	MO	Historic mining operations

Site Name	City	State	Sources of Contamination
Oronogo-Duenweg Mining Belt	Joplin	MO	Historic mining and smelting operations (More information on blood lead levels)
East Helena Site	East Helena	MT	Historic smelting operations
Omaha Lead	Omaha	NE	Historic smelting operations
National Zinc Corp.	Bartlesville	OK	Historic smelting operations
Midvale Slag	Midvale	UT	Historic smelting operations (More information on blood lead levels)
Tar Creek (Ottawa County)	Ottawa County	OK	Historic mining operations (More information on blood lead levels)
RSR Corporation	Dallas	TX	Historic smelting operations
Eureka Mills	Eureka	UT	Historic mining operations

LAST UPDATED ON APRIL 3, 2019

Attachment 2

APPENDIX A
Table 7
DEFAULT VALUES FOR CALCULATING MEDIUM-SPECIFIC CONCENTRATIONS FOR LEAD

[Input Values Used in UBK Model for Lead] [(for residential exposure scenario)]			
[Geometric Standard Deviation] [(GSD)]	[1.42] [(default)]	[Drinking water intake]	[Model default]
[Outdoor air lead concentration]	[0.2 μg/m^3] [(default)]	[Soil lead level]	[495 μg/g]
[Indoor air lead concentration] [(% of outdoor)]	[30]	[Indoor dust lead level]	[495 μg/g]
[Time spent outdoors]	[Model default]	[Soil/dust ingestion weighting factor] [(%)]	[45]
[Ventilation rate]	[Model default]	[Paint lead intake]	[Model default]
[Lung absorption]	[Model default]	[Maternal contribution method]	[Infant model]
[Dietary lead intake]	[Model default]	[Mother's blood lead at birth]	[7.5 μg/dL blood] [(model default)]
[GI method/bioavailability]	[Non-linear]	[Target blood lead level]	[10 μg/dL blood]
[Lead concentration in drinking water]	[4.00 μg/L] [(default)]		

[Input Values Used in SEGH Equation] [(for nonresidential exposure scenario)]	
[Concentration of lead in soil (S)]	[987 μg/g]
[Target blood lead level in adults (T)]	[20 μg/dL blood]
[Geometric standard deviation of blood lead distribution (G)]	[1.4]
[Baseline blood lead level in target population (B)]	[4 μg/dL blood]
[Number of standard deviations corresponding to degree of protection required for the target population (n)]	[1.645 (for 95% of population)]
[Slope of blood lead to soil lead relationship (δ)]	[7.5 μg/dL blood per μg/g soil]

[REFERENCE]

[WIXSON, B.G. (1991). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. Trace Substances in Environmental Health . 11-20.]

Input Values Used in IEUBK Model for Lead (for residential exposure scenario)		
Parameter	**Value**	
Outdoor Air Pb Concentration (µg/m^3)	**Constant Value: 0.1**	
Dietary Lead Intake (µg/day)	**Age (Years)**	**Input**
	0-1	**2.26**
	1-2	**1.96**
	2-3	**2.13**
	3-4	**2.04**
	4-5	**1.95**
	5-6	**2.05**
	6-7	**2.22**
Water Consumption (L/day)	**Age (Years)**	**Input**
	0-1	**0.2**
	1-2	**0.5**
	2-3	**0.52**
	3-4	**0.53**
	4-5	**0.55**
	5-6	**0.58**
	6-7	**0.59**
Use Alternate Water Value?	**NO**	
Lead concentration in drinking water (µg/L)	**4**	
MEDIA	**ABSORPTION FRACTION PERCENT**	
Soil	**30**	
Dust	**30**	
Water	**50**	
Diet	**50**	
Alternate	**0**	
Calculate PRG		
Select Age Group for Graph	**0 to 84 months**	
Change Cutoff	**TBD**	
Change GSD	**1.6**	
Probability of Exceeding the Cutoff	**5**	

Input Values Used in the Adult Lead Model (ALM) (for non-residential exposure scenario)			
Variable	**Description of Variable**	**Units**	**Value**
$PbB_{fetal,\ 0.95}$	**Target PbB in fetus**	**µg/dL**	**TBD**
$R_{fetal/maternal}$	**Fetal/maternal PbB ratio**	**--**	**0.9**
BKSF	**Biokinetic Slope Factor**	**µg/dL per µg/day**	**0.4**
GSD_i	**Geometric standard deviation PbB**	**--**	**1.8**
PbB_0	**Baseline PbB**	**µg/dL**	**0.6**

IR_S	**Soil ingestion rate**	**g/day**	**0.050**
$AF_{S, D}$	**Absorption fraction**	**--**	**0.12**
$EF_{S, D}$	**Exposure frequency**	**days/yr**	**219**
$AT_{S, D}$	**Averaging time**	**days/yr**	**365**

Attachment 3

Cleanup Standards Scientific Advisory Board
Meeting Minutes
RCSOB Room 105
April 4, 2018

CSSAB Members Present:

Ronald Buchanan, Chairman
Joel Bolstein
Chuck Campbell
James Connor
Colleen Costello
Annette Guiseppi-Elie
Michael Meloy
Craig Robertson
Mark Smith
Mark Urbassik
Don Wagner

Department of Environmental Protection (DEP) Staff Present:

Abbey Cadden
Troy Conrad
Carolyn Fair
George Hartenstein
Mike Maddigan
Frank Nemec
Brie Sterling
Ali Tarquino Morris
Sharon Trostle

Others Present:

John Clarke – Penn DOT
Jenny DeBoer – Stantec
Will Hitchcock – Manko, Gold, Katcher, & Fox
J. Neil Ketchum – Groundwater Sciences
Kay Linnell - Langan
Ted Mosher – React Environmental

Call to Order

Chairman Ronald Buchanan called the Cleanup Standards Scientific Advisory Board (CSSAB) meeting to order at 9:10 a.m.

Administrative Items

The draft meeting minutes of the September 7, 2017, CSSAB conference call were approved unanimously without comment or revision.

Troy Conrad announced that Mr. Buchanan is retiring after many years of service. Mr. Conrad read a letter of appreciation from PA DEP Secretary McDonnell aloud. Mr. Buchanan subsequently requested nominations from the Board to elect a new Chairman. Craig Robertson nominated Chuck Campbell, which was seconded by Mike Meloy. Mr. Campbell accepted the nomination, and it was unanimously approved by the Board pending approval from Mr.

Campbell's employer. Mr. Meloy will remain Vice-Chairman. Upon acceptance, Mr. Campbell chaired the remainder of the meeting.

Mr. Conrad reminded the Board that recent revisions to the bylaws allow members with expired terms to remain active on the Board until reappointment. Michael Maddigan reviewed the list of Board members' terms and expiration dates. Currently, Mr. Campbell (term expired 7/2013) and Mark Urbassik (term expired 7/2016) will remain active while awaiting reappointment, and there are currently two vacant positions on the Board. Additionally, J. Neil Ketchum has been appointed by Secretary McDonnell as an alternate for Mr. Robertson on the Board.

Land Recycling Program (LRP) Update

George Hartenstein announced that Mr. Conrad has been named Acting Director of the Bureau of Environmental Cleanup & Brownfields. Mr. Hartenstein reported on the financial status of the Bureau. The Hazardous Sites Cleanup Fund (HSCF), which funds the operating budget of the Bureau, is expected to provide sufficient funds to fully maintain operation of the Bureau until the fiscal year ending June 30, 2019. At that point, HSCF is expected to provide only 40-50 percent of the funds required to maintain Bureau functions at full capacity. Solutions to the upcoming financial situation remain under consideration by DEP executive staff and the legislature. Joel Bolstein offered to discuss the financial shortfall with PENNVEST to determine if financing opportunities exist. Colleen Costello suggested the Brownfields Reauthorization Act as a possible funding source.

Mr. Conrad reported that the final-omit rulemaking was published on March 17, 2018, in the *Pennsylvania Bulletin*. This rulemaking was solely to correct specific errors in the MSCs and toxicity values. The errors were due to a transcription error for the groundwater medium-specific concentration (MSC) for Aldrin and transcription errors for the toxicity values used to calculate soil MSCs for beryllium and cadmium.

The Chapter 250 regulations contain a requirement to review and propose necessary revisions to the MSCs every 36 months. Therefore, in support of the next rulemaking cycle, the Bureau expects to share concepts for the upcoming rulemaking (36-month period expires September 2019) with the CSSAB during the next Board meeting on August 1, 2018.

Mr. Conrad provided an update on the Department's activity regarding emerging contaminants Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA). EPA issued drinking water Health Advisory Levels (HAL) in 2016 for the chemicals. By law, the HAL is adopted as the MSC for groundwater upon publication in EPA's most recent edition of the Drinking Water Standards and Health Advisories. The PFOS/PFOA MSC will be added to the next Chapter 250 rulemaking. Mr. Bolstein expressed concern with the use of the HAL outside of its intended use as a drinking water advisory level. He is concerned that the HAL has limitations that may prevent it from being used as a cleanup value for groundwater or surface water. Mr. Bolstein also suggested the Department evaluate the equations in Chapter 250 to determine if they can be used to calculate MSCs for PFAS chemicals. Brie Sterling of DEP is closely monitoring the U.S. Environmental Protection Agency's (EPA's) research and is a member of ITRC's PFOS/PFOA

research team. All newsworthy items regarding this issue will be posted on DEP's webpage devoted to this issue. Mr. Campbell states that this set of chemicals may be extremely challenging for remediators who are attempting to attain the Background cleanup standard. He also requested that the Board have ample time ahead of the next scheduled meeting if any input is required regarding the development of toxicity values for these chemicals. Audience member John Clarke requested that the cost of analytical testing be considered when the relevant parties develop methodologies.

Mr. Conrad reported that the public comment period for the draft publication of the LRP Technical Guidance Manual (TGM) ended on March 16, 2018. A total of nine commentators submitted nearly 100 total comments to the Bureau. LRP staff are presently consolidating comments and preparing a comment-response document. An overview of the comments will be discussed at the next Board meeting with the goal of finalizing the TGM in the 4th quarter of 2018. The Board suggested an ongoing review of portions of the TGM for future meetings rather than being asked to review the entire revised document all at one time.

Management of Fill Policy Presentation

Ali Tarquino Morris, Municipal and Residual Waste Program Manager from the Bureau of Waste Management, provided a PowerPoint presentation regarding proposed revisions to DEP's Management of Fill Policy (MoFP). Don Wagner indicated that some native materials in Pennsylvania may contain regulated substances at concentrations higher than what is designated as clean fill. He requested that the revised MoFP emphasize that a spill or release must occur for fill material to be considered regulated fill. Mr. Wagner also noted the term "background" is defined differently by the Bureau of Waste Management than the LRP. Ms. Tarquino Morris stated that the issue of naturally occurring substances with concentrations above clean fill thresholds is currently addressed on the MoFP FAQ webpage. It was suggested that a "Decision Tree" be included in the revised MoFP for those not familiar with the process. Mr. Meloy stated that it is important to differentiate the terms "background" versus "point source," especially at urban sites. Mr. Bolstein queried whether DEP performs investigation/enforcement regarding fill sources originating from other states. Ms. Tarquino Morris responded that regional Waste Management staff review information provided by out-of-state sources and follow up as needed. Mr. Bolstein asked the Department to ensure major changes to the clean fill values are highlighted in the revised policy. Mr. Robertson suggested removing the word "uncontaminated" from the policy, as the definition of that term may differ between DEP programs. Mr. Meloy suggested that remediators be able to use due diligence information to demonstrate inorganics concentrations are at background levels without the need to collect additional samples. Mark Smith suggested short lists be developed for sampling at specific sites such as gas stations, oil and gas sites, etc. Mr. Campbell inquired about timing aspects regarding sampling plans when moving fill from one site to another. Mr. Hartenstein reported that if soil is from an unknown source, a sampling plan may be warranted. DEP would have 10 days to review the submitted sampling plan, or the plan would be deemed approved.

Chapter 250 Technical Questions

DEP posed the following technical issues to the Board:

1. The recommended groundwater ingestion rate as issued by EPA's Office of Solid Waste and Emergency Response has increased from 2.0 to 2.5 L/day. By implementing this revision, PA's groundwater MSC values would become lower. Annette Guiseppi-Elie recommended usage of the Exposure Factors Handbook for further assistance on this matter. The Board will form a workgroup to evaluate other exposure factors to determine if any additional updates to the Chapter 250 MSC equations are needed.
2. EPA allows for rounding risk characterization results to one significant figure. The Land Recycling and Environmental Remediation Standards Act (Act 2) uses a hazard index of 1.0 which is at odds with EPA's risk assessment guidance. After some discussion, the Board advised the Department that rounding to one significant figure seemed reasonable.
3. § 250.305(g) states that a remediator conducting a remediation of soils contaminated with a substance having a secondary Maximum Contaminant Level (MCL) will not be required to comply with the soil-to-groundwater pathway requirements for those substances to protect groundwater in aquifers for drinking water. However, as an example, the substance fluoride has both a primary and secondary MCL. The Board suggested using the primary MCL in this case. Or, if a Health Advisory Level (HAL) exists for a substance, the HAL should be utilized to calculate an MSC.
4. EPA and Centers for Disease Control and Prevention (CDC) have determined that childhood blood lead concentrations at or above 10 micrograms of lead per deciliter (µg/dL) present risks to children's health. However, CDC has a blood lead action level of 5 µg/dL. Additionally, the input parameters used in calculating the residential ingestion numeric value for lead in soil are based on EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model from 1990. Guidance was requested regarding which level should be used and whether DEP should update the model used for the input parameters. Ms. Guiseppi-Elie stated that blood lead action levels are a top priority for EPA and it is possible that the action level could go as low as 3 µg/dL. She recommended the Department monitor the development of this issue, and she offered to research this issue further and report back to DEP. Ms. Guiseppi-Elie also recommended the Department update the input values on Table 7 in Chapter 250 and the model references.
5. The current definition of a volatile compound in § 250.1 is based solely on boiling point which results in the exclusion of naphthalene as well as several other semi-volatiles. It also is incongruent with the volatile description provided in the current DEP Vapor Intrusion Guidance (see Appendix A, Section 1, page 74). After some discussion, the Board recommended the Department revise the definition of a volatile in the Chapter 250 regulations so that it is consistent with the definition in the DEP Vapor Intrusion Guidance and the most widely accepted science for what is a volatile compound.
6. The recommendation was made by the Board to add the EPA Office of Pesticide Program's toxicity value database to the toxicity value source hierarchy in § 250.605.

Other Business

- Ms. Guiseppi-Elie agreed to further investigate toxicity values/updates for vanadium and report back at a future Board meeting. Provisionally peer-reviewed toxicity values (PPRTV) for vanadium (pentoxide) have a low level of confidence.
- Mr. Campbell requested that DEP examine the use of statistical analysis at sites being remediated to the Background standard. Mr. Campbell related that DEP staff may be too dependent on requiring statistical analysis of sampling data when it is not warranted. Mr. Conrad encouraged any Board member who may have similar experiences in the future to contact Central Office for additional assistance.
- Mr. Conrad and Mr. Maddigan agreed to provide clarification on the terms 'subcommittee' vs. 'workgroup' and their respective public notification requirements at the next Board meeting.
- Mr. Meloy reported that a meeting in which he participated between DEP's Oil & Gas Program and the Land Recycling Program was a good step forward towards the goal of site cleanup policy integration.

Meeting Adjourned at 2:10 p.m.

Attachment 4



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Bureau of Environmental Cleanup & Brownfields

Land Recycling Program
Concepts for Potential Regulatory Changes for the Chapter 250 Rulemaking

Cleanup Standards Scientific Advisory Board Meeting
August 1, 2018

presented by
Michael Maddigan
PADEP

Tom Wolf, Governor

Patrick McDonnell, Secretary

Concepts Overview

Today's Discussion

- Summary and discussion of potential minor changes.
- Discussion of potential substantive changes.
- Next steps in rulemaking process.

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Minor Changes Summary

- Updating document references and section references.
- Updating medium-specific concentration (MSC) tables by adding new chemicals, correcting footnotes, correcting Chemical Abstract Service (CAS) number errors, etc.
- Minor text clarifications and updates.

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Minor Changes

- Update US Environmental Protection Agency (EPA) Exposure Factors Handbook (EFH) reference.
- Add conversion factor to § 306 and § 307 equations so output units (µg/L) match units in tables.
- § 250.704(d) - Replace § 250.707(b)(2)(i) reference with § 250.707. § 250.707(b)(2)(i) relates only to the 75% 10x rule, not all statistical tests.
- Remove chemicals with both primary and secondary Maximum Contaminant Levels (MCLs) from secondary contaminants list at the end of Table 2 and update § 250.305(g) text.

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Minor Changes

- Reword text in § 250.402(d) to clarify that the Statewide health standard eco-screen process described in § 250.311(e) cannot be used to protect ecological receptors under the site specific standard.
- Correct the CAS number for dichloroacetic acid in Table 1 from “76-43-6” to “79-43-6.”
- Explain Act 2 does not provide liability protection for analytes reported by labs not accredited for those analytes for which accreditation is available.
- Correct misuse of the word “standards” when “MSCs” should be used.

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Minor Changes

- Update all table footnotes.
- Add Office of Pesticide Programs (OPP) to toxicity value source hierarchy in § 250.605.
- Add “24 hours/day” to numerator in § 250.307(g)(1) equation. Inadvertently omitted in last rulemaking.
- Update Constituents of Potential Ecological Concern (CPEC) list in Table 8.
- State in § 250.408 or § 250.409 that an approved remedial investigation report is needed to have an approvable risk assessment report.

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Minor Changes

- Change references to the Groundwater Monitoring Guidance in § 250.10 to reference Appendix A of revised Technical Guidance Manual (TGM).
- Explain in § 250.503(e) that when land use changes from non-residential to residential at Special Industrial Area (SIA) sites, a revised baseline environmental report needs to be submitted, not just a new remediation plan.
- Update aqueous solubility sources in § 250.304(f).

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Substantive Changes

Increase Groundwater Ingestion Rate

- Change groundwater ingestion rate for adults from 2.0 L/day to 3.0 L/day.
- EPA EFH recommends 3.0 L/day for ages ≥ 21 years old (adults). This value represents both per capita and consumer-only water ingestion rates.
- Change would cause ingestion-based numeric values to decrease.

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Substantive Changes

Lead in Soil Evaluations

- Use the Integrated Exposure Uptake Biokinetic (IEUBK) model and the Adult Lead Methodology (ALM) to calculate MSCs for residential and non-residential lead exposure, respectively.
- EPA – *"Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below. OSRTI is developing a new soil lead policy to address this new information."*
- Should DEP use 10 or 5 µg/dL?

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Substantive Changes

Change Volatile Definition

- Change the definition of a volatile in § 250.1. Current definition results in the exclusion of naphthalene as well as several other semi-volatiles that are included in the new vapor intrusion (VI) guidance. EPA has a better definition that DEP could adopt, and it is more appropriate given the recent changes in the VI guidance.
- New definition would lead to some numeric values changes.

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Substantive Changes

Add Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) to Tables

- Add PFOS/PFOA HAL to Table 1 as MSCs
- Add footnote that the HAL/MSC also applies when PFOS and PFOA are combined.
- Add PFOS/PFOA toxicity data to Table 5A.
- Calculate PFOS/PFOA soil MSCs for Tables 3A and 3B.

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Substantive Changes

Additional Changes

- Add language to § 250.707(b)(1)(iii) clarifying when/if a vapor intrusion analysis is needed.
- Add language to Subchapter A similar to § 245.314 making requirements for professional geologist (PG) and professional engineer (PE) seals on reports for Act 2 and storage tanks sites consistent.

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Next Steps for Rulemaking

- Draft proposed language for Annex, including draft tables, to be provide to CSSAB at December 6, 2018, meeting.
- EQB consideration of proposed rulemaking in Spring 2019.

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Questions?

Mike Maddigan

mmaddigan@pa.gov

Attachment 5

Cleanup Standards Scientific Advisory Board
Meeting Minutes
RCSOB Room 105
August 1, 2018

CSSAB Members Present:

Chuck Campbell, Chairman
Joel Bolstein
Colleen Costello
Neil Ketchum (Alternate for Craig Robertson)
Michael Meloy
James Connor
Don Wagner

Department of Environmental Protection (DEP) Staff Present:

Abbey Cadden
Troy Conrad
Carolyn Fair
Mike Maddigan
Frank Nemec
Robert Schena
Brie Sterling

Others Present:

Jenny DeBoer Kachel - GHD
Ben Myers - GTA
Terence O'Reilly – TriState Environmental

Call to Order

Chairperson Chuck Campbell called the Cleanup Standards Scientific Advisory Board (CSSAB) meeting to order at 0923.

Administrative Items

The draft meeting minutes of the April 4, 2018, CSSAB meeting were approved unanimously without comment or revision.

Mr. Campbell reported that several CSSAB members are interested in developing workgroups to discuss relevant issues.

Two vacancies on the CSSAB remain. There are no new developments since the April 2018 meeting regarding filling these vacancies.

Mr. Campbell also requested that the Board receive a preview of the revised draft Technical Guidance Manual (TGM) prior to final publication. CSSAB would like a chance to review a red-

line version of the final document and provide input on any potential concerns with the final wording or other issues identified.

Land Recycling Program (LRP) Update

Troy Conrad gave an update on the health of the Hazardous Sites Cleanup Fund (HSCF), which funds the operating budget of the Bureau. The HSCF, along with funds received by the Environmental Protection Agency's (EPA) Section 128(a) Grant Program for State and Tribal Response Programs, is expected to provide sufficient funds to maintain 100% operation of Bureau of Environmental Cleanup & Brownfields (BECB) until the fiscal year ending June 30, 2019. Beyond this point, DEP will explore staff attrition and/or fewer response actions at Hazardous Sites Cleanup Act sites.

Personnel update – Mr. Conrad reported on the status of open managerial positions in the Bureau: The Environmental Program Manager (EPM) position in Central Office is expected to be filled later in 2018; the EPM position in the Southwest Regional Office (SWRO) will soon be vacant as Kevin Halloran, current EPM, is moving to the Assistant Regional Director position; two managerial positions in the Southeast Regional Office (SERO) remain unfilled. Colleen Costello inquired if DEP may implement a program such as New Jersey DEP's Licensed Remediation Site Professional due to staff attrition. There are no plans for PA DEP to transition to that type of program.

Per- and Polyfluoroalkyl Substances (PFAS) update – Mr. Conrad reported that he accompanied Lisa Daniels, Bureau Director of Safe Drinking Water, to the National PFAS Summit hosted by EPA in Washington, D.C. DEP and PA Department of Health will be exploring the feasibility of hiring a toxicologist to explore developing a maximum contaminant level for drinking water. Mr. Bolstein inquired as to whether Act 2 cleanups involving these substances can be undertaken utilizing the background cleanup standard. Mr. Conrad replied that yes, the background standard can be used, but most if not all Act 2 cleanups involving these substances have been undertaken using the site-specific standard with a pathway elimination remedy.

CSSAB subcommittee vs. workgroup public notification requirements – Mike Maddigan explained the difference between the entities and their respective notification requirements as requested by the CSSAB. A subcommittee is a subgroup of CSSAB members developed to address broad on-going topics and is comprised entirely of Board members. Subcommittee meetings are subject to the same notification requirements as full CSSAB meetings (meetings must be announced on the DEP website as well as comply with any other PA Sunshine Act requirements). Workgroups can be established to discuss a specific topic but can be comprised of CSSAB members, DEP staff, and other stakeholders and generally disband once a specific issue is resolved. There are no notification requirements for workgroup meetings. Also, conversations/emails between Board members on specific topics have no notification requirements.
(Editor's Note: According to DEP's draft Advisory Committee Guidelines (document # 012-1920-002), workgroups are established by DEP in concert with advisory committees and are

subject to the same notification requirements, when practicable, as subcommittees and advisory committees.)

TGM revision timeline – Mr. Conrad reported that the final TGM is anticipated to be published in December 2018. Going forward, DEP expects to update the TGM every 3 years. DEP is not planning on producing a comment/response document specifically addressing CSSAB comments regarding draft versions of the TGM as these comments have been addressed in CSSAB meetings over the past few years. DEP will consider providing the CSSAB with a redline version of the final document prior to publication to identify any minor grammatical changes. Michael Meloy inquired whether a redline version or user's guide will be available to the public to help readers understand the revisions to the TGM. DEP will consider publishing a summary of major revisions. DEP is also producing a Response to Comments document which will be published simultaneously with the final TGM.

New Rulemaking Timeline – Mr. Conrad reported that proposed revisions to the Chapter 250 regulations will be presented to the CSSAB during the December 2018 meeting. The entire new rulemaking process is anticipated to last 15-18 months in total.

Overview of TGM responses to public comments presentation

Mr. Maddigan presented an overview of public comments received regarding the draft TGM.

Mr. Meloy emphasized the importance of giving the CSSAB access to a redline version of the revised draft TGM prior to its final publication. DEP agreed to take Mr. Meloy's request under consideration. Mr. Campbell requested DEP to distribute a calendar indicating future milestones regarding TGM publication. The calendar would greatly benefit CSSAB with the knowledge of internal DEP deadlines, enabling CSSAB members to review and offer input on topics in a timely manner.

Mr. Bolstein inquired as to whether a Q&A database will continue after final TGM publication. Mr. Conrad replied yes.

Mr. Campbell inquired if separate phase liquid (SPL) guidance is forthcoming from DEP. Specific SPL requirements as detailed in Chapter 245 regulations (Storage Tank and Spill Prevention Program) that are applicable to Act 2 will be added to the revised TGM.

Mr. Meloy asked if Act 2 program interaction with Oil & Gas and with the Toxic Substances Control Act (specifically, the cleanup of polychlorinated biphenyls – PCBs) will be addressed as requested in the comments he submitted during the public comment period. Mr. Conrad reported that language regarding Act 2 interaction with those two programs will not be integrated into the final TGM.

Mr. Bolstein and Ms. Costello have reportedly been experiencing a recent surge in excess site characterization activities required by Act 2 project staff. Ms. Costello stated that characterization activities have been required on offsite downgradient properties, causing delays

and unnecessary expenditures that can be avoided with the acceptance of groundwater modeling. As such, Mr. Bolstein and Ms. Costello are requesting more robust language in the TGM suggesting that groundwater modeling be an acceptable instrument for demonstrating attainment of a cleanup standard. Mr. Conrad stated the DEP will take the request under consideration. In the meantime, any disputes that may arise regarding this topic can be taken to the project officer's supervisory chain-of-command and, without satisfactory conclusion, to Central Office BECB staff.

Summary of possible Chapter 250 rulemaking revisions

Mr. Maddigan presented an overview of possible Chapter 250 rulemaking revisions for the CSSAB to consider. The proposed revisions were divided into the categories "potential minor changes" and "potential substantive changes." The following present significant discussion points during the presentation:

- Minor change – Mr. Maddigan asked if Act 2 provides liability protection for analytes reported by labs not accredited for those analytes for which accreditation is available. It was determined that this is rare and should be handled on a case-by-case basis. The Board recommended against adding this language as part of the rulemaking.
- Minor change – Explain in § 250.503(e) that when land use changes from non-residential to residential at Special Industrial Area (SIA) sites, a revised baseline environmental report (BER) needs to be submitted, not just a new remediation plan. CSSAB objected to the wording of the proposed change, as they believe the Act 2 project officer may be inclined to interpret 'revised' to indicate an entirely new BER is required in this instance. DEP will consider revising the wording for this change from "revised" to "amend" to avoid confusion.
- Substantive change – Increase groundwater ingestion rate from 2.0 L/day to 3.0 L/day. This change would cause ingestion-based numeric values to decrease. CSSAB was not in agreement with the volumetric revision as typical for human consumption. The CSSAB stated that a value of 2.5 L/day would be more appropriate and asked if the PA Department of Health or the Safe Drinking Water Program have an accepted value that can be used. After further discussion it was decided to form a CSSAB workgroup to further discuss this change.
- Substantive change – DEP requesting guidance on whether 5 µg/dL or 10 µg/dL is the proper blood lead concentration that demonstrates adverse health effects. CSSAB recommended that 10 µg/dL be used in the equation to calculate medium-specific concentrations (MSCs) for residential and non-residential lead exposure.
- Substantive change – The definition of a "volatile" is to be revised in § 250.1 to include several semi-volatiles that are included in the definition of a "volatile" in the vapor intrusion guidance. It was determined that this issue would be assigned to a CSSAB workgroup to further evaluate the implications of the proposed change.
- Substantive change – Add Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) to tables. Since a Health Advisory Limit (HAL) has been issued, the groundwater MSCs for these substances will be added to the regulations. The soil MSCs

will require calculation. It was determined that the PFOS/PFOA MSC derivation will be forwarded to a workgroup for further discussion.

Presentation and discussion of potential Chapter 250 numeric value changes (tables)

Brie Sterling presented the summary of potential numeric changes to the Chapter 250 regulations and the procedures for rounding the MSCs. Following Ms. Sterling's presentation, the following topics were discussed:

- Mr. Meloy expressed his continuing concern with the reportedly unjustified decrease in MSC by several orders of magnitude for vanadium in soil because of the previous Chapter 250 rulemaking revisions.
- On Table 4A of the Chapter 250 regulations (MSCs for Inorganic Regulated Substances in Soil) Mr. Meloy requested chlorides to be added. He believes the MSC for chlorides in soil can be calculated in a similar manner as the MSC for aluminum, which is included on the table.

Other Business

Mr. Bolstein asked for an update on the general health of the LRP regarding the number of incoming Act 2 sites observed across the Commonwealth. Mr. Conrad reported that the number of incoming sites has remained consistent over the past year.

Mr. Campbell concluded proceedings by reviewing potential action items: DEP to add calendar of milestones to CSSAB members; CSSAB to form one or more workgroups to further discuss: lead blood level concentrations, groundwater ingestion rates, definition of a volatile, PFOS/PFOA issue, toxicity value of vanadium, and development of a soil MSC for chlorides. CSSAB may call upon DEP staff and the public for assistance as needed. Mr. Conrad suggested that all workgroup considerations for DEP be submitted by the end of September 2018.

Mr. Conrad reported that the PA Brownfields Conference is being held October 1-3, 2018, at the Sands Casino in Bethlehem, PA. Registration at the conference website is open.

Meeting Adjourned at 1520.

Attachment 6

Lead Model Comparison

Direct contact Soil Lead Numeric Value	Current Value mg/kg	New Modeled Value Target Pb_b = 10 µg/dL	New Modeled Value Target Pb_b = 5 µg/dL
Residential	500 (UBK)	420 (IEUBK)	153 (IEUBK)
Non-residential	1,000 (SEGH)	2,517 (ALM)	1,050 (ALM)

Pb_b = Blood lead level

Current Values

The current residential soil direct contact numeric value for lead was calculated using EPA's 1990 version of the Uptake Biokinetic (UBK) model with a target child blood lead level of 10 µg/dL. The default UBK model input parameters used to calculate this value are listed in Table 7 of Chapter 250.

The current non-residential soil direct contact numeric value for lead was calculated using the Society for Environmental Geochemistry and Health (SEGH) model from 1991 with a target adult blood lead level of 20 µg/dL. The default SEGH model input parameters used to calculate this value are listed in Table 7 of Chapter 250.

Proposed Values

EPA's lead guidance website states, *"Recent scientific evidence has demonstrated adverse health effects at blood lead concentrations below 10 µg/dL down to 5 µg/dL, and possibly below. OSRTI is developing a new soil lead policy to address this new information."* Thus, the Department has calculated residential and non-residential soil direct contact numeric values using the most up-to-date EPA models at both target blood lead levels to demonstrate the difference between the two.

EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model (2010) was used to calculate the residential soil direct contact numeric values. The IEUBK model is similar to the 1990 UBK model in that its purpose is to predict an acceptable soil concentration given a target child blood lead level. The IEUBK model was run using the most current default values set by EPA with target blood lead levels of 10 µg/dL and 5 µg/dL.

EPA's Adult Lead Methodology (ALM) (2003) was used to calculate the non-residential soil direct contact numeric value. The SEGH model's target receptor is an adult while the ALM's target receptor is the potential fetus of a female adult worker. The ALM was also run using the most current default values set by EPA and target blood lead levels of 10 µg/dL and 5 µg/dL.

EPA's guidance for the ALM cautions that the values calculated using this new model are high and may not be protective of all receptors, i.e. a school or playground that borders a non-residential property. This is not necessarily in-line with the purpose of the statewide health standard which should be protective across the entire state.

Attachment 7

Meeting Minutes
Cleanup Standards Scientific Advisory Board
Rachel Carson State Office Building – Room 105
February 13, 2019

CSSAB Members Present:

Chuck Campbell, Chairman
Joel Bolstein
James Connor
Colleen Costello
Annette Guiseppi-Elie (via telephone)
Michael Meloy
Craig Robertson
Mark Urbassik (via telephone)
Don Wagner

Department of Environmental Protection (DEP) Staff Present:

C. David Brown
Abbey Cadden
Troy Conrad
Laura Edinger
Mike Maddigan
Lee McDonnell
Frank Nemec
Robert Schena
Brie Sterling

Others Present:

Jenny Kachel - GHD
Neil Ketchum – Groundwater Sciences Corporation
Ed Layton – BAI Group
Kay Linnell - Langan

Call to Order

Mr. Chuck Campbell, Chairman of the Cleanup Standards Scientific Advisory Board (CSSAB), called the meeting to order at 0920. Around the room introductions proceeded.

The draft meeting minutes of the August 1, 2018 CSSAB meeting were approved unanimously without comment or revision.

Membership update: Mr. Troy Conrad confirmed that any CSSAB members whose term has expired may remain on the Board and actively participate until re-appointment or replacement. Mr. Conrad reported that obtaining member re-appointments and filling vacancies on a timely basis has been problematic for many DEP advisory boards.

Mr. Campbell proposed future CSSAB meetings to start at 0930 as Call to Order usually has occurred closer to 0930 than 0900. Mr. Campbell also suggested that future meetings be preceded by a CSSAB Workgroup telephone conference for meeting preparation.

Land Recycling Program (LRP) Update

Funding Update: Mr. Conrad gave an update on the status of the Hazardous Sites Cleanup Fund (HSCF), which funds the operating budget of the Bureau of Environmental Cleanup & Brownfields (BECB). As a result of reduced funding available, there is a growing number of vacancies across the Bureau. Going forward, central and regional office staff will be focused on providing customer service, and less focus will be given to state-funded hazardous site cleanups. The Agency will continue to explore possible funding sources for beyond the fiscal year ending June 2020. Mr. Joel Bolstein inquired about Industrial Sites Reuse Program funding administered by the Department of Community & Economic Development, and its availability to provide funding to the program. Mr. Bolstein stated that funding from this program for remediation work has been drastically reduced.

Personnel update: Mr. Conrad introduced Mr. Lee McDonnell to the CSSAB. Mr. McDonnell is the Bureau's new Environmental Program Manager for the Division of Cleanup Standards.

Per- and Polyfluoroalkyl Substances (PFAS) update: Mr. Conrad reported on continuing statewide efforts for this emerging contaminant. Presently, PA is in the process of attaining proper instrumentation and trained staff to conduct laboratory analysis. DEP staff is collecting samples from drinking water suppliers for laboratory analysis. DEP is working in coordination with PA Department of Transportation to identify sources of fire-fighting foam usage throughout the Commonwealth. DEP is also focusing on expansion of data collection in areas where continuing sources of PFAS persist. Additionally, DEP is investigating the possible promulgation of medium specific concentrations (MSC) for PFAS in soil and a PA state drinking water maximum contaminant level (MCL). Mr. Bolstein inquired who would take responsibility for any associated contamination resulting from a firefight using PFAS-laden foam. Mr. Conrad reported that no discussions regarding this issue have been undertaken. Ms. Colleen Costello inquired whether PFAS compounds can be remediated under the Act 2 background cleanup standard. Mr. Conrad stated that the background standard would be available for PFAS contaminated sites. Mr. Bolstein reminded the Board and DEP that Act 2 cleanups allow contaminants to remain in-place above their respective MSCs (e.g. 75%/10x rule for Statewide health standard cleanup attainment). Ms. Annette Guiseppi-Elie inquired if PA has representation in the Environmental Council of States (ECOS); Ms. Guiseppe-Elie offered to work with the DEP regarding this emerging contaminant's toxicological research.

New Rulemaking Timeline: Mr. Conrad reported that proposed revisions to the Chapter 250 regulations are expected to be promulgated within a 22-24-month timeframe. Mr. Michael Meloy stated that the Bureau of Waste Management's Management of Fill Policy (MOFP) and its interaction with the Chapter 250 regulations may continue to produce confusion to the consulting community due to the lack of consistency between the adopted MSCs, the proposed MSC revisions, and the regulated fill concentrations proposed for the MOFP.

Technical Guidance Manual (TGM): Mr. Conrad reported that final publication of the TGM occurred on 1/19/2019. DEP appreciated all the time and effort that CSSAB devoted to finalizing

this publication. Updates to the TGM are planned to occur on a 24-36-month basis going forward. Since the Question & Answer (Q&A) database has been removed from the LRP website, Mr. Bolstein questioned the protocol for general technical questions going forward. Mr. Conrad requested that all technical questions be forwarded to Mr. Michael Maddigan. Mr. Meloy suggested keeping the Q&A database on the LRP website. Ms. Costello suggested keeping the Q&A database on the LRP website but removing the answers and replacing them with section references indicating the location of the answers in the revised TGM. Ms. Costello and Mr. Craig Robertson volunteered to assist in this effort.

Discussion of proposed capping guidance addendum to TGM

Mr. Maddigan presented a proposed addendum to the TGM regarding guidance of the construction of caps as engineering controls. Following Mr. Maddigan's presentation regarding the origin and proposed text, he opened the proceedings for questions/comments from the Board.

Several members of the CSSAB commented that the cap construction guidance is overly prescriptive. There is concern that regional Act 2 project officers will consider this guidance as a 'requirement' with respect to engineering control cap construction. The consensus from the CSSAB is that this guidance is not needed and that implementing such guidance makes the Act 2 process more cumbersome which may discourage some from entering the Act 2 process. The CSSAB expressed particular concern with the Inspections and Maintenance section of the proposed capping guidance as being particularly prescriptive. It was suggested that this section be removed and replaced with a reference to the post-remediation care plan section of the TGM and focusing the guidance on the goals of the remedy. Mr. Conrad stated that DEP would consider the recommended revision.

Mr. C. David Brown, Professional Geologist Manager in the Southeast Regional Office (SERO) explained that SERO has been receiving inquiries from consultants and stakeholders seeking guidance for constructing engineering control caps. In addition, SERO has experienced instances of failure to document construction of caps after workplan approval has been issued. Additionally, Secretary McDonnell of DEP has requested that LRP develop guidance for this engineering remedy.

The CSSAB committed to developing a workgroup to review the proposed capping guidance developed by the DEP and will propose revisions/recommendations. The workgroup will be chaired by Ms. Jenny Kachel of GHD; Ms. Costello will assist and inform DEP of other CSSAB members who will participate in the workgroup. DEP informed CSSAB that any revisions/recommendations proposed to the guidance should be presented to DEP within six to ten weeks from the date of this meeting.

Summary of possible Chapter 250 rulemaking revisions presentation

Mr. Maddigan presented an overview of proposed Chapter 250 rulemaking revisions for the CSSAB to consider. The following present significant discussion points and CSSAB

recommendations during the presentation, and is based on distributed hard copy proposed language revisions:

- § 250.6 Public Participation: After discussion, it was suggested that in § 250.6(c)(4) the word "measures" should be substituted for the word "opportunities"; in § 250.6(d) revise language as follows: "If a public involvement plan has been requested, it shall be provided to the municipality and the Department prior to implementation of the plan/report", delete rest of the sentence, and delete subsections (1) and (2).
- § 250.306 Ingestion numeric values: The default groundwater ingestion rate is 2.0 L/day. The proposed revision has been increased to 2.5 L/day. However, since DEP's Clean Water Program has proposed to use 2.4 L/day as a default water ingestion rate, it was suggested the LRP also use 2.4 L/day to maintain consistency.
- § 250.409(1) Risk assessment report: CSSAB stated that the proposed new language, "A risk assessment report that uses **site characterization information from an approved Remedial Investigation Report to** describe[s] the potential adverse effects, …" reads as if a remediator can no longer submit a Remedial Investigation Report with a Risk Assessment Report simultaneously. This subsection will be revised further to prevent this misinterpretation.
- § 250.410(d) Cleanup plan: The proposed revision of this section follows: "A cleanup plan is not required and no **new** remedy is required to be proposed or completed if no current or future exposure pathways exist **in the absence of institutional or engineering controls.**" CSSAB noted that a cleanup plan is not necessary for groundwater prohibition ordinances. It was suggested that the phrase "already in-place" be added to the revised subsection.
- § 250.704(d) General attainment requirements for groundwater: the consensus among the CSSAB was no revision to this subsection is warranted.
- Subchapter G. Demonstration of Attainment: It was determined that the terms "Statewide health standard" and "medium-specific concentrations" are inconsistently used throughout this referenced section of Chapter 250. It was suggested that the entire section be reviewed and revised as necessary for consistency.

Discussion and recommendations from the Board

Due to time constraints, the discussion regarding the remaining proposed rulemaking revisions were postponed. It was confirmed by Mr. Conrad that the CSSAB will be able to review the Chapter 250 proposed revisions again prior to being presented to the Environmental Quality Board.

Mr. Meloy presented four topics for additional discussion/consideration prior to meeting adjournment:

- Polychlorinated Biphenyls (PCBs): Mr. Craig Robertson and Mr. Meloy expressed concern with the proposed revision of removing individual aroclor MSCs from the Chapter 250 regulations and replacing them with a Total PCBs MSC. Mr. Meloy stated that each individual aroclor has different specific chemical characteristics. Additionally,

revising this PCB MSC structure will cause conflict with the Bureau of Waste Management's proposed Management of Fill Policy.

- Vanadium: Mr. Meloy stated that the revised residential MSC (0-15 feet) for vanadium in soil (15 mg/kg) is unreasonably conservative and is below what is considered naturally occurring throughout Pennsylvania.
- Polycyclic Aromatic Hydrocarbons (PAHs): Mr. Meloy stated that some of the revised MSCs for PAHs are based on California toxicity values rather that EPA's Provisional Peer-Reviewed Toxicity Values (PPRTV). The California toxicity values are much more stringent that EPA's PPRTV. Additionally, some PAH MSCs have been revised based on their solubility limits as opposed to their risk-based values. The solubility limits values result in a more conservative MSC than the risk-based values would create.
- Chlorides: Mr. Meloy stated that methodology to generate an MSC for chlorides in soil is available. He emphasized that having an MSC would be extremely beneficial to the Agency and the regulated community.

Mr. Conrad stated that the Agency is willing to work with the CSSAB further on these issues.

Other Business/Closing Issues

Mr. Campbell confirmed that the next CSSAB meeting (scheduled for June 12, 2019) will begin at 9:30 AM. Mr. Campbell also confirmed that there are no PA Sunshine notification requirements for any workgroups that will be formed by the CSSAB as a result of today's proceedings. Lastly, the CSSAB will compile a summary of outstanding issues regarding the proposed Chapter 250 MSC revisions and present it to the DEP.

Meeting Adjourned at 1542.

Attachment 8


Land Recycling Program
Chapter 250 Rulemaking Overview

Cleanup Standards Scientific Advisory Board Meeting
February 13, 2019

presented by
Michael Maddigan
PADEP

Tom Wolf, Governor

Patrick McDonnell, Secretary

Concepts Overview

Today's Discussion

- Overview of rulemaking text changes.
- Overview of changes to medium-specific concentration (MSC) and other tables.
- Next steps in rulemaking process.

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Subchapter A – GENERAL PROVISIONS

- 250.1 – Changed the definition of a volatile compound.
- 250.4 – Updated practical quantitation limit (PQL) calculation language.
- 250.6(c) and (d) – Updated public involvement plan (PIP) language.
- 250.10 – Changed references to the Groundwater Monitoring Guidance to reference Appendix A of the Technical Guidance Manual (TGM).
- Addition of § 250.12 – Professional Seals

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Subchapter C. SATEWIDE HEALTH STANDARD

- 250.304(f) – Added five aqueous solubility sources.
- 250.305(g) – Clarified that this provision does not apply to compounds with a primary Maximum Contaminant Level (MCL) or Health Advisory Level (HAL) and a secondary MCL (SMCL). Removed fluoride and manganese from Table 2 Secondary Contaminants table.
- 250.306(d) – Changed groundwater ingestion rate from 2 L/day to 2.5 L/day. This resulted in changes to the groundwater ingestion related exposure factors in the table in § 250.306(d).

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Subchapter C. STATEWIDE HEALTH STANDARD

- 250.306(e) – Changed the references and text of this section to reflect new blood lead model use.
- 250.307(g)(1) – Added “x 24 hr/day” to the numerator in the equation in § 250.307(g)(1). This was inadvertently omitted from the equation in the previous rulemaking.
- 250.308(a)(2)(ii) – The word “standard” was replaced with “generic numeric value” to avoid the implication that the 1/10th value is always the soil MSC for saturated soil.

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Subchapter D. SITE-SPECIFIC STANDARD

- 250.402(d) – Clarified that 250.311(e) cannot be used to protect ecological receptors under the site-specific standard (SSS).
- 250.409(1) – Clarified that an approved remedial investigation report is needed prior to having an approvable risk assessment report.
- 250.410(d) – Clarified that a cleanup plan is required when institutional or engineering controls are used to attain the SSS.

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Subchapter E. SIA STANDARDS

- 250.503(e) – Added language to clarify that when land use changes from non-residential to residential at Special Industrial Area (SIA) sites, an amendment to the baseline environmental report may be needed, not just a new remediation plan.

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Subchapter F. EXPOSURE AND RISK DETERMINATIONS

- 250.603 – Changed citation of the EPA's 1992 *Final Guidelines for Exposure Assessment* to EPA's 2011 *Exposure Factors Handbook*.
- 250.605 – Added EPA's Office of Pesticide Program's Human Health Benchmarks for Pesticides to the toxicity value source hierarchy.

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Subchapter G. DEMONSTRATION OF ATTAINMENT

- 250.704(d) – Changed reference to § 250.707 because § 250.707(b)(2)(i) relates only to the 75% 10x rule, not all statistical tests.
- 250.707(b)(1)(ii) – Replaced “Statewide health standard” with “Medium-Specific Concentration.”
- 250.707(b)(1)(iii) – Add language clarifying when or if a vapor intrusion analysis is necessary at sites with localized petroleum releases.

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Tables 1 & 2

- Table 1 – Added perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutane sulfonate (PFBS).
- Table 1 – Added footnote that the PFOS and PFOA MSC also applies when combined.
- Tables 1 & 2 – Added TDS units of “mg/L” in the headers.
- Table 2 – Added footnote stating that the MSCs for copper and lead are PA State MCLs.

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Tables 3A & 3B

- Tables 3A & 3B – Calculated PFOS, PFOA, and PFBS soil numeric values.
- Tables 3A & 3B – Calculated total PCB soil numeric values and deleted individual Aroclors.
- Table 3B – Footnotes regarding trihalomethanes (THMs) and haloacetic acids (HAAs) removed.

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Tables 4A, 4B, & 5A

- Table 4A – Residential and non-residential direct contact values calculated for lead using updated models and target blood lead level of 10 µg/dL.
- Table 4B – No soil or groundwater numeric values for aluminum or iron so removed all “NA’s.”
- Table 4B – Calculated copper values and removed all “NA’s.”
- Table 5A – Added PFOS, PFOA, and PFBS toxicity data.

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Table 7 – Default Values for Calculating MSCs for Lead

- Updated the residential exposure input parameters for use in the IEUBK blood lead model.
- Updated the non-residential exposure input parameters for use in the Adult Lead Model used by EPA.

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PCBs

- Total PCB groundwater value based on MCL.
- Removed individual Aroclor PCB values from Tables 1, 3A, 3B, and 5A.
- Calculated total PCB numeric values for soil (Tables 3A and 3B).
- This approach is more consistent with EPA's evaluation of PCBs in soil.

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Next Steps for Rulemaking

- Finalize language for proposed annex, including proposed changes to tables.
- Environmental Quality Board consideration of proposed rulemaking in mid-2019.

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Bureau of Environmental Cleanup & Brownfields

Questions?

Mike Maddigan

mmaddigan@pa.gov

Attachment 9

Appendix A
Table 4 – Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	*CASRN*	*Residential MSC 0-15 feet*		*Nonresidential MSCs*			
				Surface Soil 0-2 feet		*Subsurface Soil 2-15 feet*	
ALUMINUM	7429-90-5	190,000	C	190,000	C	190,000	C
ANTIMONY	7440-36-0	88	G	1,300	G	190,000	C
ARSENIC	7440-38-2	12	G	61	G	190,000	C
BARIUM AND COMPOUNDS	7440-39-3	44,000	G	190,000	C	190,000	C
BERYLLIUM	7440-41-7	440	G	6,400	G	190,000	C
BORON AND COMPOUNDS	7440-42-8	44,000	G	190,000	C	190,000	C
CADMIUM	7440-43-9	110	G	1,600	G	190,000	C
CHROMIUM III	16065-83-1	190,000	C	190,000	C	190,000	C
CHROMIUM VI	18540-29-9	**[4] 37**	G	**[220] 180**	G	**[20,000] 140,000**	N
COBALT	7440-48-4	66	G	960	G	190,000	N
COPPER	7440-50-8	**[8,100] 7,200**	G	**[120,000] 100,000**	G	190,000	C
CYANIDE, FREE	57-12-5	130	G	1,900	G	190,000	C
FLUORIDE	16984-48-8	8,800	G	130,000	G	190,000	C
IRON	7439-89-6	150,000	G	190,000	C	190,000	C
LEAD	7439-92-1	**[500] 420**	U	**[1,000] 2,517**	**[S] A**	190,000	C
LITHIUM	7439-93-2	440	G	6,400	G	190,000	C
MANGANESE	7439-96-5	**[10,000] 31,000**	G	**[150,000] 190,000**	**[G] C**	190,000	C
MERCURY	7439-97-6	35	G	510	G	190,000	C
MOLYBDENUM	7439-98-7	1,100	G	16,000	G	190,000	C
NICKEL	7440-02-0	4,400	G	64,000	G	190,000	C
PERCHLORATE	7790-98-9	150	G	2,200	G	190,000	C
SELENIUM	7782-49-2	1,100	G	16,000	G	190,000	C
SILVER	7440-22-4	1,100	G	16,000	G	190,000	C
STRONTIUM	7440-24-6	130,000	G	190,000	C	190,000	C
THALLIUM	7440-28-0	**[2] 2.2**	G	32	G	190,000	C
TIN	7440-31-5	130,000	G	190,000	C	190,000	C
VANADIUM	7440-62-2	15	G	220	G	190,000	C
ZINC	7440-66-6	66,000	G	190,000	C	190,000	C

All concentrations in mg/kg
R – Residential
NR – Non-Residential
G – Ingestion
N – Inhalation
C- Cap
U – **[UBK Model] Integrated Exposure Uptake Biokinetic (IEUBK) Model**
[S – SEGH Model] A – Adult Lead Model
[NA – Not Applicable]

Attachment 10

Appendix A
Table 4 – Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
A. Direct Contact Numeric Values

REGULATED SUBSTANCE	CASRN	Residential MSC 0-15 feet		Nonresidential MSCs			
				Surface Soil 0-2 feet		Subsurface Soil 2-15 feet	
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ANTIMONY	7440-36-0	88	G	1,300	G	190,000	C
ARSENIC	7440-38-2	12	G	61	G	190,000	C
BARIUM AND COMPOUNDS	7440-39-3	44,000	G	190,000	C	190,000	C
BERYLLIUM	7440-41-7	440	G	6,400	G	190,000	C
BORON AND COMPOUNDS	7440-42-8	44,000	G	190,000	C	190,000	C
CADMIUM	7440-43-9	110	G	1,600	G	190,000	C
CHROMIUM III	16065-83-1	190,000	C	190,000	C	190,000	C
CHROMIUM VI	18540-29-9	**[4] 37**	G	**[220] 180**	G	**[20,000] 140,000**	N
COBALT	7440-48-4	66	G	960	G	190,000	N
COPPER	7440-50-8	**[8,100] 7,200**	G	**[120,000] 100,000**	G	190,000	C
CYANIDE, FREE	57-12-5	130	G	1,900	G	190,000	C
FLUORIDE	16984-48-8	8,800	G	130,000	G	190,000	C
IRON	7439-89-6	150,000	G	190,000	C	190,000	C
LEAD	7439-92-1	**[500] 420**	U	**[1,000] 2,500**	**[S] A**	190,000	C
LITHIUM	7439-93-2	440	G	6,400	G	190,000	C
MANGANESE	7439-96-5	**[10,000] 31,000**	G	**[150,000] 190,000**	**[G] C**	190,000	C
MERCURY	7439-97-6	35	G	510	G	190,000	C
MOLYBDENUM	7439-98-7	1,100	G	16,000	G	190,000	C
NICKEL	7440-02-0	4,400	G	64,000	G	190,000	C
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STRONTIUM	7440-24-6	130,000	G	190,000	C	190,000	C
THALLIUM	7440-28-0	**[2] 2.2**	G	32	G	190,000	C
TIN	7440-31-5	130,000	G	190,000	C	190,000	C
VANADIUM	7440-62-2	15	G	220	G	190,000	C
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All concentrations in mg/kg
R – Residential
NR – Non-Residential
G – Ingestion
N – Inhalation
C- Cap
U – **[UBK Model] IEUBK Model**
[S – SEGH Model] A – Adult Lead Model
NA – Not Applicable

Attachment 11

Appendix A
Table 4 – Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil
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				Surface Soil 0-2 feet		Subsurface Soil 2-15 feet	
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ARSENIC	7440-38-2	12	G	61	G	190,000	C
BARIUM AND COMPOUNDS	7440-39-3	44,000	G	190,000	C	190,000	C
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CADMIUM	7440-43-9	110	G	1,600	G	190,000	C
CHROMIUM III	16065-83-1	190,000	C	190,000	C	190,000	C
CHROMIUM VI	18540-29-9	**[4] 37**	G	**[220] 180**	G	**[20,000] 140,000**	N
COBALT	7440-48-4	66	G	960	G	190,000	N
COPPER	7440-50-8	**[8,100] 7,200**	G	**[120,000] 100,000**	G	190,000	C
CYANIDE, FREE	57-12-5	130	G	1,900	G	190,000	C
FLUORIDE	16984-48-8	8,800	G	130,000	G	190,000	C
IRON	7439-89-6	150,000	G	190,000	C	190,000	C
LEAD	7439-92-1	**[500] 420**	U	**[1,000] 2,500**	**[S] A**	190,000	C
LITHIUM	7439-93-2	440	G	6,400	G	190,000	C
MANGANESE	7439-96-5	**[10,000] 31,000**	G	**[150,000] 190,000**	**[G] C**	190,000	C
MERCURY	7439-97-6	35	G	510	G	190,000	C
MOLYBDENUM	7439-98-7	1,100	G	16,000	G	190,000	C
NICKEL	7440-02-0	4,400	G	64,000	G	190,000	C
PERCHLORATE	7790-98-9	150	G	2,200	G	190,000	C
SELENIUM	7782-49-2	1,100	G	16,000	G	190,000	C
SILVER	7440-22-4	1,100	G	16,000	G	190,000	C
STRONTIUM	7440-24-6	130,000	G	190,000	C	190,000	C
THALLIUM	7440-28-0	**[2] 2.2**	G	32	G	190,000	C
TIN	7440-31-5	130,000	G	190,000	C	190,000	C
VANADIUM	7440-62-2	15	G	220	G	190,000	C
ZINC	7440-66-6	66,000	G	190,000	C	190,000	C

All concentrations in mg/kg
R – Residential
NR – Non-Residential
G – Ingestion
N – Inhalation
C- Cap
U – **[UBK Model] IEUBK Model**
[S – SEGH Model] A – Adult Lead Model
NA – Not Applicable

Attachment 12

APPENDIX A
Table 7
DEFAULT VALUES FOR CALCULATING MEDIUM-SPECIFIC CONCENTRATIONS FOR LEAD

[Input Values Used in UBK Model for Lead] [(for residential exposure scenario)]			
[Geometric Standard Deviation] [(GSD)]	[1.42] [(default)]	[Drinking water intake]	[Model default]
[Outdoor air lead concentration]	[0.2 μg/m^3] [(default)]	[Soil lead level]	[495 μg/g]
[Indoor air lead concentration] [(% of outdoor)]	[30]	[Indoor dust lead level]	[495 μg/g]
[Time spent outdoors]	[Model default]	[Soil/dust ingestion weighting factor] [(%)]	[45]
[Ventilation rate]	[Model default]	[Paint lead intake]	[Model default]
[Lung absorption]	[Model default]	[Maternal contribution method]	[Infant model]
[Dietary lead intake]	[Model default]	[Mother's blood lead at birth]	[7.5 μg/dL blood] [(model default)]
[GI method/bioavailability]	[Non-linear]	[Target blood lead level]	[10 μg/dL blood]
[Lead concentration in drinking water]	[4.00 μg/L] [(default)]		

[Input Values Used in SEGH Equation] [(for nonresidential exposure scenario)]	
[Concentration of lead in soil (S)]	[987 μg/g]
[Target blood lead level in adults (T)]	[20 μg/dL blood]
[Geometric standard deviation of blood lead distribution (G)]	[1.4]
[Baseline blood lead level in target population (B)]	[4 μg/dL blood]
[Number of standard deviations corresponding to degree of protection required for the target population (n)]	[1.645 (for 95% of population)]
[Slope of blood lead to soil lead relationship (δ)]	[7.5 μg/dL blood per μg/g soil]

[REFERENCE]

[WIXSON, B.G. (1991). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. Trace Substances in Environmental Health . 11-20.]

Input Values Used in IEUBK Model for Lead (for residential exposure scenario)		
Parameter	**Value**	
Outdoor Air Pb Concentration (µg/m^3)	**Constant Value: 0.1**	
Dietary Lead Intake (µg/day)	**Age (Years)**	**Input**
	0-1	**2.26**
	1-2	**1.96**
	2-3	**2.13**
	3-4	**2.04**
	4-5	**1.95**
	5-6	**2.05**
	6-7	**2.22**
Water Consumption (L/day)	**Age (Years)**	**Input**
	0-1	**0.2**
	1-2	**0.5**
	2-3	**0.52**
	3-4	**0.53**
	4-5	**0.55**
	5-6	**0.58**
	6-7	**0.59**
Use Alternate Water Value?	**NO**	
Lead concentration in drinking water (µg/L)	**4**	
MEDIA	**ABSORPTION FRACTION PERCENT**	
Soil	**30**	
Dust	**30**	
Water	**50**	
Diet	**50**	
Alternate	**0**	
Calculate PRG		
Select Age Group for Graph	**0 to 84 months**	
Change Cutoff	**TBD**	
Change GSD	**1.6**	
Probability of Exceeding the Cutoff	**5**	

Input Values Used in the Adult Lead Model (ALM) (for non-residential exposure scenario)			
Variable	**Description of Variable**	**Units**	**Value**
$PbB_{fetal,\ 0.95}$	**Target PbB in fetus**	**µg/dL**	**TBD**
$R_{fetal/maternal}$	**Fetal/maternal PbB ratio**	**--**	**0.9**
BKSF	**Biokinetic Slope Factor**	**µg/dL per µg/day**	**0.4**
GSD_i	**Geometric standard deviation PbB**	**--**	**1.8**
PbB_0	**Baseline PbB**	**µg/dL**	**0.6**

IR_S	**Soil ingestion rate**	**g/day**	**0.050**
$AF_{S, D}$	**Absorption fraction**	**--**	**0.12**
$EF_{S, D}$	**Exposure frequency**	**days/yr**	**219**
$AT_{S, D}$	**Averaging time**	**days/yr**	**365**

Attachment 13

APPENDIX A
Table 7
DEFAULT VALUES FOR CALCULATING MEDIUM-SPECIFIC CONCENTRATIONS FOR LEAD

[Input Values Used in UBK Model for Lead] [(for residential exposure scenario)]			
[Geometric Standard Deviation] [(GSD)]	[1.42] [(default)]	[Drinking water intake]	[Model default]
[Outdoor air lead concentration]	[0.2 μg/m^3] [(default)]	[Soil lead level]	[495 μg/g]
[Indoor air lead concentration] [(% of outdoor)]	[30]	[Indoor dust lead level]	[495 μg/g]
[Time spent outdoors]	[Model default]	[Soil/dust ingestion weighting factor] [(%)]	[45]
[Ventilation rate]	[Model default]	[Paint lead intake]	[Model default]
[Lung absorption]	[Model default]	[Maternal contribution method]	[Infant model]
[Dietary lead intake]	[Model default]	[Mother's blood lead at birth]	[7.5 μg/dL blood] [(model default)]
[GI method/bioavailability]	[Non-linear]	[Target blood lead level]	[10 μg/dL blood]
[Lead concentration in drinking water]	[4.00 μg/L] [(default)]		

[Input Values Used in SEGH Equation] [(for nonresidential exposure scenario)]	
[Concentration of lead in soil (S)]	[987 μg/g]
[Target blood lead level in adults (T)]	[20 μg/dL blood]
[Geometric standard deviation of blood lead distribution (G)]	[1.4]
[Baseline blood lead level in target population (B)]	[4 μg/dL blood]
[Number of standard deviations corresponding to degree of protection required for the target population (n)]	[1.645 (for 95% of population)]
[Slope of blood lead to soil lead relationship (δ)]	[7.5 μg/dL blood per μg/g soil]

[REFERENCE]

[WIXSON, B.G. (1991). The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil. Trace Substances in Environmental Health . 11-20.]

Input Values Used in IEUBK Model for Lead (for residential exposure scenario)		
Parameter	**Value**	
Outdoor Air Pb Concentration (µg/m^3)	**Constant Value: 0.1**	
Dietary Lead Intake (µg/day)	**Age (Years)**	**Input**
	0-1	**2.26**
	1-2	**1.96**
	2-3	**2.13**
	3-4	**2.04**
	4-5	**1.95**
	5-6	**2.05**
	6-7	**2.22**
Water Consumption (L/day)	**Age (Years)**	**Input**
	0-1	**0.2**
	1-2	**0.5**
	2-3	**0.52**
	3-4	**0.53**
	4-5	**0.55**
	5-6	**0.58**
	6-7	**0.59**
Use Alternate Water Value?	**NO**	
Lead concentration in drinking water (µg/L)	**4**	
MEDIA	**ABSORPTION FRACTION PERCENT**	
Soil	**30**	
Dust	**30**	
Water	**50**	
Diet	**50**	
Alternate	**0**	
Calculate PRG		
Select Age Group for Graph	**0 to 84 months**	
Change Cutoff	**TBD**	
Change GSD	**1.6**	
Probability of Exceeding the Cutoff	**5**	

Input Values Used in the Adult Lead Model (ALM) (for non-residential exposure scenario)			
Variable	**Description of Variable**	**Units**	**Value**
$PbB_{fetal,\ 0.95}$	**Target PbB in fetus**	**µg/dL**	**TBD**
$R_{fetal/maternal}$	**Fetal/maternal PbB ratio**	**--**	**0.9**
BKSF	**Biokinetic Slope Factor**	**µg/dL per µg/day**	**0.4**
GSD_i	**Geometric standard deviation PbB**	**--**	**1.8**
PbB_0	**Baseline PbB**	**µg/dL**	**0.6**

IR_S	**Soil ingestion rate**	**g/day**	**0.050**
$AF_{S, D}$	**Absorption fraction**	**--**	**0.12**
$EF_{S, D}$	**Exposure frequency**	**days/yr**	**219**
$AT_{S, D}$	**Averaging time**	**days/yr**	**365**

Attachment 14

Lead at Superfund Sites: Frequent Questions from Risk Assessors on the Adult Lead Methodology

- Back to Lead: Frequent Questions

The following frequent questions on the Adult Lead Methodology (ALM) have been divided into three categories:

General Questions

Input Variables

Application

General Questions

What is the receptor population for the Adult Lead Methodology?

In the commercial/industrial setting, the most sensitive receptor is the fetus of a worker who develops a body burden as a result of non-residential exposure to lead. This body burden is available to transfer to the fetus for several years after

exposure ends (Gulson et al., 1998; Gulson et al., 1999). Based on the available scientific data, a fetus is more sensitive to the adverse effects of lead than an adult (National Academy of Sciences, 1993). We assume that cleanup goals (preliminary remediation goals, or PRGs) that are protective of a fetus will also afford protection for male or female adult workers. The model equations were developed to calculate cleanup goals such that there would be no more than a 5 percent probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 micrograms lead per deciliter of blood (µg/dL). This same approach also appears to be protective for lead's effect on blood pressure in adult males (see the *Adult Lead Methodology Review Report*, available on the Software and Users' Manuals page).

- Software and Users' Manuals page

Does the ALM calculate a value for a commercial worker or an industrial worker?

The ALM does not distinguish between commercial and industrial workers; rather, it is applicable to non-residential exposure scenarios. According to EPA's guidance on the ALM, a soil ingestion rate of 50 mg/day is recommended as a plausible central tendency value for non-contact-intensive activities (U.S. EPA, 1997). Either commercial or industrial workers may work primarily indoors, so that exposure to soil occurs primarily via indoor dust. Workers' limited and occasional contact with outdoor soils (e.g., picnicking, walking to parking lots, standing on a loading dock) should be adequately accounted for via the 50 mg/day incidental soil ingestion. If an individual is performing a contact-intensive activity with soil, then a soil ingestion rate greater than 50 mg/day would be expected. At sites where lead materials have historically been used, exposure scenarios would have to be evaluated individually to determine the indoor and outdoor activities that may result in greater exposure to soil and the corresponding soil ingestion rate.

What is a reasonable screening value for soil lead at commercial/industrial sites?

A screening goal is often more protective than a cleanup goal. A screening goal is intended to provide health protection without knowledge of the specific exposure conditions at a site. A cleanup goal can be derived using exposure assumptions based on site-specific data rather than default values (which are often more conservative). An updated screening level for soil lead at commercial/industrial (i.e., non-residential) sites of 800 part per million (ppm) is based on a recent analysis of the combined phases of the National Health and Nutrition Examination Survey (NHANES III) that choose a cleanup goal protective for all subpopulations.

What is a reasonable baseline blood lead level (PbB_0) to use for a future exposure scenario?

Although the best estimates for PbB_0 are based on site-specific data, such information may not be available for a future exposure scenario. Application of this value should consider the proportion of each population (present on site or anticipated in the future) as defined by the NHANES III study and as described in the TRW's recommendations for use of NHANES III data for adult lead risk assessment. For site applications of the adult lead methodology, estimates of the $PbB_{adult,0}$ and $GSD_{i,adult}$ parameters could be based on either race/ethnicity or geographic categories determined appropriate based on the specific demographic or geographic characteristics of the site. Because of the small sample sizes that result, the TRW recommends that users do not use data from the NHANES III survey that are stratified by both census region and race/ethnicity group to derive $PbB_{adult,0}$ and $GSD_{i,adult}$.

- Guidance page

How can I obtain the IEUBK model source code?

Source code for the IEUBK model software is EPA property and is not distributed. Because EPA's Superfund program uses the IEUBK model to implement hazardous waste regulations, the Agency controls the code and performs validation checks to ensure the model performs adequately.

The Parameters and Equations Dictionary in the System Requirements Document for the IEUBK model may be used to better understand the operation of the IEUBK model software. However, is not intended to be an exact, line-by-line documentation of the source code.

- System Requirements Document

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LAST UPDATED ON JUNE 4, 2018

Attachment 15

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

COMMITTEE OPINION

Number 533 • August 2012 (Reaffirmed 2016)

Committee on Obstetric Practice

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

Lead Screening During Pregnancy and Lactation

Abstract: Prenatal lead exposure has known adverse effects on maternal health and infant outcomes across a wide range of maternal blood lead levels. Adverse effects of lead exposure are being identified at lower levels of exposure than previously recognized in both children and adults. In 2010, the Centers for Disease Control and Prevention issued the first guidelines regarding the screening and management of pregnant and lactating women who have been exposed to lead.

Prenatal lead exposure has known adverse effects on maternal health and infant outcomes across a wide range of maternal blood lead levels (1). Adverse effects of lead exposure are being identified at lower levels of exposure than previously recognized in both children and adults (2–7). In 2010, the Centers for Disease Control and Prevention issued the first guidelines regarding the screening and management of pregnant and lactating women who have been exposed to lead (8).

Background

Environmental policies and public health education programs have led to significant reductions in cases of lead exposure in the United States (9). Despite these improvements, approximately 1% of women of childbearing age (15–49 years) have blood lead levels greater than or equal to 5 micrograms/dL (8).

Although no threshold has been found to trigger the adverse health effects of lead (8), in nonpregnant adults blood lead levels less than 5 micrograms/dL are considered normal, blood lead levels between 5 micrograms/dL and 10 micrograms/dL require follow-up, and blood lead levels greater than 10 micrograms/dL are managed with environmental assessment and abatement of exposures. Chelation therapy is considered at blood lead levels greater than 40 micrograms/dL for symptomatic individuals, and levels greater than 70 micrograms/dL are considered a medical emergency. In children, treatment is recommended at blood lead levels of 45 micrograms/dL or greater.

The main target for lead toxicity is the nervous system, both in adults and children (10). High levels of exposure can result in delirium, seizures, stupor, coma, or even death. Other overt signs and symptoms of lead toxicity may include hypertension, peripheral neuropathy, ataxia, tremor, headache, loss of appetite, weight loss, fatigue, muscle and joint aches, changes in behavior and concentration, gout, nephropathy, lead colic, and anemia. Health effects of chronic low-level exposure in adults include cognitive decline, hypertension and other cardiovascular effects, decrements in renal function, and adverse reproductive outcome. The developing nervous systems in children make them more susceptible to the neurologic effects of lead toxicity.

Adverse Health Effects of Prenatal Exposure

Lead readily crosses the placenta by passive diffusion and has been detected in the fetal brain as early as the end of the first trimester (8). Elevated lead levels in pregnancy have been associated with several adverse outcomes, including gestational hypertension, spontaneous abortion, low birth weight, and impaired neurodevelopment (11–14).

Lead exposure has been associated with an increased risk of gestational hypertension, but the magnitude of the effect, the exposure level at which risk begins to increase, and whether risk is most associated with acute or cumulative exposure remain uncertain. Also, it is unclear whether lead-induced increases in blood pressure during pregnancy lead to severe hypertension or preeclampsia (11, 15–18).

Evidence shows that maternal exposure to high levels of lead increases the risk of spontaneous abortion (19).

However, data for an association between low or moderate lead levels and spontaneous abortion are inconsistent. The strongest available evidence comes from a prospective study of 668 pregnant women in Mexico City that demonstrated a statistically significant dose–response relationship between low-to-moderate maternal blood lead levels and the risk of spontaneous abortion (12). Yet, another longitudinal study of 351 women in Japan showed no difference in blood lead levels between spontaneous abortion cases (n=15) and ongoing pregnancies (20). Larger prospective studies are needed to further clarify the effects of low and moderate levels of lead on spontaneous abortion risk.

More recent and well-designed studies suggest that maternal lead exposure during pregnancy is inversely related to fetal growth, as reflected by duration of pregnancy and infant size. One study that used a registry-based approach found that offspring of mothers occupationally exposed to lead had an increased risk of low birth weight (relative risk [RR], 1.34; confidence interval [CI], 1.12–1.6) compared with infants of women not exposed to lead (13). A case–control study in Mexico City found umbilical cord blood lead levels to be higher in preterm infants (mean value, 9.8 micrograms/dL) compared with term infants (mean value, 8.4 micrograms/dL) (21). A birth cohort study, also conducted in Mexico City, found maternal bone lead burden to be inversely related to offspring weight (22), length, and head circumference at birth (23).

A large number of studies provide evidence that prenatal lead exposure impairs children's neurodevelopment. Some prospective studies have included children with low levels of prenatal lead exposure and continue to detect inverse associations with neurodevelopment, although these data are less consistent than those related to the high levels of lead exposure. In one study, each 1 microgram/dL increase in umbilical cord blood lead was found to be associated with a reduction of 0.6 points in the mental development index scores of the Bayley Scales of Infant Development at age 3 months, with similar results at age 6 months (14, 24). However, another prospective cohort study found that the relationship between prenatal blood lead levels and early childhood IQ is not linear, with the strongest postnatal effects noted at low levels of prenatal exposure (25). The available data are inadequate to establish the presence or absence of an association between maternal lead exposure and major congenital anomalies in the fetus.

Lead Exposure During Breastfeeding

Although the benefits of breastfeeding generally outweigh the risks of environmental exposure, the effects of breastfeeding on infant lead levels have been studied. Lead has been detected in the breast milk of women in population-based studies; however, the availability of high-quality data to assess the risk for toxicity to the breastfeeding infant is limited (8). Although infant blood lead levels have been correlated with the duration of breastfeeding (26), the ratio of breast milk lead levels to blood lead levels has been found to be less than 3% (27). According to the American Academy of Pediatrics, because of the contribution of lead levels found in infant formula and other infant foods, breastfed infants of mothers with normal blood lead levels are actually exposed to slightly less lead than if they were not breastfed (28).

Screening and Management

Pregnancy

The Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists do not recommend blood lead testing of all pregnant women in the United States. Obstetric health care providers should consider the possibility of lead exposure in individual pregnant women by evaluating risk factors for exposure as part of a comprehensive health risk assessment and perform blood lead testing if a single risk factor is identified. Assessment of lead exposure should take place at the earliest contact with the pregnant patient.

Important risk factors for lead exposure in pregnant women are listed in Box 1. Lead-based paint is less likely to be an important exposure source for pregnant women than it is for children, except during renovation or remodeling in older homes. Women should take precautions when repainting surfaces with deteriorated paint or performing any remodeling or renovation work that disturbs painted surfaces, such as scraping off paint or tearing out walls (8).

For pregnant women with blood lead levels of 5 micrograms/dL or higher, sources of lead exposure should be identified and women should receive counseling regarding avoidance of further exposure. Confirmatory and follow-up blood lead testing should be performed in accordance with the CDC's recommended schedules (Table 1) and maternal or umbilical cord blood lead levels should be measured at delivery (8). Women with confirmed blood lead levels of 45 micrograms/dL or more should be treated in consultation with clinicians experienced in the management of lead toxicity and high-risk pregnancy. Once the source of lead exposure is identified and eliminated, the initial decrease in blood lead level occurs relatively rapidly because of lead's short (35-day) initial half-life in blood (29). This initial rapid decrease is followed by a slow, continuous decrease over several months to several years because of mobilization of lead from stores in the bone (8). Recommendations for the frequency of blood lead follow-up tests are included in Table 1.

Adequate dietary intake of calcium, iron, zinc, vitamin C, vitamin D, and vitamin E is known to decrease lead absorption (30, 31). Iron-deficiency anemia is associated with elevated blood lead levels and may increase lead absorption. During pregnancy and lactation, lead from prior exposures can be mobilized from bones because

Box 1. Risk Factors for Lead Exposure in Pregnant and Lactating Women ⇦

- Recent emigration from or residency in areas where ambient lead contamination is high—women from countries where leaded gasoline is still being used (or was recently phased out) or where industrial emissions are not well controlled.
- Living near a point source of lead—examples include lead mines, smelters, or battery recycling plants (even if the establishment is closed).
- Working with lead or living with someone who does—women who work in or who have family members who work in an industry that uses lead (eg, lead production, battery manufacturing, paint manufacturing, ship building, ammunition production, or plastic manufacturing).
- Using lead-glazed ceramic pottery—women who cook, store, or serve food in lead-glazed ceramic pottery made in a traditional process and usually imported by individuals outside the normal commercial channels.
- Eating nonfood substances (pica)—women who eat or mouth nonfood items that may be contaminated with lead, such as soil or lead-glazed ceramic pottery.
- Using alternative or complementary substances, herbs, or therapies—women who use imported home remedies or certain therapeutic herbs traditionally used by East Indian, Indian, Middle Eastern, West Asian, and Hispanic cultures that may be contaminated with lead.
- Using imported cosmetics or certain food products—women who use imported cosmetics, such as kohl or surma or certain imported foods or spices that may be contaminated with lead.
- Engaging in certain high-risk hobbies or recreational activities—women who engage in high-risk activities (eg, stained glass production or pottery making with certain leaded glazes and paints) or have family members who do.
- Renovating or remodeling older homes without lead hazard controls in place—women who have been disturbing lead paint, creating lead dust, or both or have been spending time in such a home environment.
- Consumption of lead-contaminated drinking water—women whose homes have leaded pipes or source lines with lead.
- Having a history of previous lead exposure or evidence of elevated body burden of lead—women who may have high body burdens of lead from past exposure, particularly those who have deficiencies in certain key nutrients (calcium or iron).
- Living with someone identified with an elevated lead level—women who may have exposure in common with a child, close friend, or other relative living in the same environment.

Modified from Centers for Disease Control and Prevention. Guidelines for the identification and management of lead exposure in pregnant and lactating women. Atlanta (GA): CDC; 2010. Available at: http://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf. Retrieved March 7, 2012.

Table 1. Frequency of Maternal Blood Lead Follow-up Testing During Pregnancy ⇦

Venous Blood Lead Level* (micrograms/dL)	Perform Follow-up Test(s)†
Less than 5	• None (no follow-up testing is indicated)
5–14	• Within 1 month • Obtain a maternal blood lead level‡ or cord blood lead level at delivery
15–24	• Within 1 month and then every 2–3 months • Obtain a maternal blood lead level‡ or cord blood lead level at delivery • More frequent testing may be indicated based on risk factors
25–44	• Within 1–4 weeks and then every month • Obtain a maternal blood lead level‡ or cord blood lead level at delivery
45 or more	• Within 24 hours and then at frequent intervals depending on clinical interventions and trend in blood lead levels • Consultation with a clinician experienced in the management of pregnant women with blood lead levels in this range is strongly advised • Obtain a maternal blood lead level or cord blood lead level at delivery

*Venous blood sample is recommended for maternal blood lead testing.

†The higher the blood lead level on the screening test, the more urgent the need for confirmatory testing.

‡If possible, obtain a maternal blood lead level before delivery because blood lead levels tend to increase over the course of pregnancy.

Modified from Centers for Disease Control and Prevention. Guidelines for the identification and management of lead exposure in pregnant and lactating women. Atlanta (GA): CDC; 2010. Available at: http://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf. Retrieved March 7, 2012.

of the increased bone turnover. Pregnant and lactating women with a current or past blood lead level of 5 micrograms/dL or higher should receive specific nutritional recommendations regarding calcium and iron supplementation. A balanced diet that contains 2,000 mg of calcium and 60–120 mg of iron daily is recommended (8). This can be achieved through either food intake or supplementation. Supplements should be divided into doses of 500 mg of calcium and 60 mg of iron to improve absorption.

Lactation

Women with risk factors for elevated lead levels (Box 1) who have not been screened during pregnancy should be screened postpartum if they plan to breastfeed. Initiation of breastfeeding should be encouraged postpartum in a woman with a blood lead level less than 40 micrograms/dL.

A woman with a confirmed blood lead level of 40 micrograms/dL or higher should not initiate breastfeeding and should be advised to pump and discard her breast milk until her blood lead level has decreased to less than 40 micrograms/dL. Blood lead measurements should be repeated every 1–2 weeks after the source of exposure has been identified and removed. At maternal blood lead levels of 5–39 micrograms/dL, breastfeeding should be initiated and accompanied by sequential testing of infant blood lead levels to monitor trends. If the infant's blood lead level is greater than 5 micrograms/dL, breastfeeding should be discontinued until the maternal blood lead level decreases. If no external source is identified, and the maternal blood lead level is greater than 20 micrograms/dL and the infant blood lead level is 5 micrograms/dL or more, breast milk should be suspected as the source and temporary interruption of breastfeeding until the maternal blood lead level decreases should be considered.

In addition to removing the source of lead exposure for the mother and infant, several nutritional interventions have been studied. Calcium supplementation (1,200 mg daily) has been associated with a 5–10% decrease in breast milk lead levels among women over the course of lactation (31–34), suggesting that calcium supplementation also may be an intervention strategy to reduce lead in breast milk from both current and previously accumulated sources. Among women in the postpartum period, increased intakes of vitamin C also have been associated with decreased levels of lead in breast milk.

Conclusions and Recommendations

- Routine blood lead testing of all pregnant women is not recommended.
- Risk assessment of lead exposure should take place at the earliest contact with pregnant or lactating women, and blood lead testing should be performed if a single risk factor is identified (Box 1).
- Elevated lead levels in pregnancy have been associated with gestational hypertension, spontaneous abortion, low birth weight, and impaired neurodevelopment.
- Prenatal lead exposure has known adverse effects on maternal health and infant outcomes across a wide range of maternal blood lead levels.
- Pregnant women with blood lead levels of 5 micrograms/dL or higher should be treated as follows:
  - — Sources of lead exposure should be identified.
  - — Women should receive counseling regarding avoidance of further exposure and receive specific nutritional recommendations regarding calcium and iron supplementation because these strategies can decrease their lead levels.
  - — Confirmatory and follow-up blood lead testing should be performed in accordance with the CDC's recommended schedules (Table 1).
- Women with confirmed blood lead levels of 45 micrograms/dL or more should be treated in consultation with clinicians experienced in the management of lead toxicity and high-risk pregnancy.
- Initiation of breastfeeding should be encouraged postpartum in a woman with a blood lead level less than 40 micrograms/dL.
- A breastfeeding woman with a confirmed blood lead level of 40 micrograms/dL or higher should be advised to pump and discard her breast milk until her blood lead level has decreased to less than 40 micrograms/dL.
- If no external source is identified, and the maternal blood lead level is greater than 20 micrograms/dL and the infant blood lead level is 5 micrograms/dL or more, breast milk should be suspected as the source and temporary interruption of breastfeeding until the maternal blood lead level decreases should be considered.

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Attachment 16

World Health Organization

Lead poisoning and health

23 August 2019

Key facts

- **Lead is a cumulative toxicant that affects multiple body systems and is particularly harmful to young children.**
- **Lead in the body is distributed to the brain, liver, kidney and bones. It is stored in the teeth and bones, where it accumulates over time. Human exposure is usually assessed through the measurement of lead in blood.**
- **Lead in bone is released into blood during pregnancy and becomes a source of exposure to the developing fetus.**
- **There is no level of exposure to lead that is known to be without harmful effects.**
- **Lead exposure is preventable.**

Lead is a naturally occurring toxic metal found in the Earth's crust. Its widespread use has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world.

Important sources of environmental contamination include mining, smelting, manufacturing and recycling activities, and, in some countries, the continued use of leaded paint, leaded gasoline, and leaded aviation fuel. More than three quarters of global lead consumption is for the manufacture of lead-acid batteries for motor vehicles. Lead is, however, also used in many other products, for example pigments, paints, solder, stained glass, lead crystal glassware, ammunition, ceramic glazes, jewellery, toys and in some cosmetics and traditional medicines. Drinking water delivered through lead pipes or pipes joined with lead solder may contain lead. Much of the lead in global commerce is now obtained from recycling.

Young children are particularly vulnerable to the toxic effects of lead and can suffer profound and permanent adverse health effects, particularly affecting the development of the brain and nervous system. Lead also causes long-term harm in adults, including increased risk of high blood pressure and kidney damage. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight.

Sources and routes of exposure

People can become exposed to lead through occupational and environmental sources. This mainly results from:

- **inhalation of lead particles generated by burning materials containing lead, for example, during smelting, recycling, stripping leaded paint, and using leaded gasoline or leaded aviation fuel; and**
- **ingestion of lead-contaminated dust, water (from leaded pipes), and food (from lead-glazed or lead-soldered containers).**

An additional source of exposure is the use of certain types of unregulated cosmetics and medicines. High levels of lead have, for example, been reported in certain types of kohl, as well as in some traditional medicines used in countries such as India, Mexico and Viet Nam. Consumers should therefore take care only to buy and use regulated products.

Young children are particularly vulnerable to lead poisoning because they absorb 4–5 times as much ingested lead as adults from a given source. Moreover, children's innate curiosity and their age-appropriate hand-to-mouth behaviour result in their mouthing and swallowing lead-containing or lead-coated objects, such as contaminated soil or dust and flakes from decaying lead-containing paint. This route of exposure is magnified in children with a psychological disorder called pica (persistent and compulsive cravings to eat non-food items), who may, for example pick away at, and eat, leaded paint from walls, door frames and furniture. Exposure to lead-contaminated soil and dust resulting from battery recycling and mining has caused mass lead poisoning and multiple deaths in young children in Nigeria, Senegal and other countries.

Once lead enters the body, it is distributed to organs such as the brain, kidneys, liver and bones. The body stores lead in the teeth and bones where it accumulates over time. Lead stored in bone may be remobilized into the blood during pregnancy, thus exposing the fetus. Undernourished children are more susceptible to lead because their bodies absorb more lead if other nutrients, such as calcium or iron, are lacking. Children at highest risk are the very young (including the developing fetus) and the economically disadvantaged.

Health effects of lead poisoning on children

Lead exposure can have serious consequences for the health of children. At high levels of exposure, lead attacks the brain and central nervous system to cause coma, convulsions and even death. Children who survive severe lead poisoning may be left with mental retardation and behavioural disorders. At lower levels of exposure that cause no obvious symptoms lead is now known to produce a spectrum of injury across multiple body systems. In particular lead can affect children's brain development resulting in reduced intelligence quotient (IQ), behavioural changes such as reduced attention span and increased antisocial behavior, and reduced educational attainment. Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. The neurological and behavioural effects of lead are believed to be irreversible.

There is no known 'safe' blood lead concentration; even blood lead concentrations as low as 5 µg/dL, may be associated with decreased intelligence in children, behavioral difficulties and learning problems. As lead exposure increases, the range and severity of symptoms and effects also increases.

Encouragingly, the successful phasing out of leaded gasoline in most countries, together with other lead control measures, has resulted in a significant decline in population-level blood lead concentrations. There is now only one country that continues to use leaded fuel *(1)*. More, however, needs to be done regarding the phasing out of lead paint: so far only 37% of countries have introduced legally binding controls on lead paint *(2)*

Burden of disease from lead exposure

The Institute for Health Metrics and Evaluation (IHME) estimated that in 2017, lead exposure accounted for 1.06 million deaths and 24.4 million years of healthy life lost (disability-adjusted life years (DALYs)) worldwide due to long-term effects on health. The highest burden was in low- and middle-income countries. IHME also estimated that in 2016, lead exposure accounted for 63.2% of the global burden of idiopathic developmental intellectual disability, 10.3% of the global burden of hypertensive heart disease, 5.6% of the global burden of the ischaemic heart disease and 6.2% of the global burden of stroke *(3)*.

WHO response

WHO has identified lead as 1 of 10 chemicals of major public health concern, needing action by Member States to protect the health of workers, children and women of reproductive age.

WHO has made available through its website a range of information on lead, including information for policy-makers, technical guidance and advocacy materials.

WHO is currently developing guidelines on the prevention and management of lead poisoning, which will provide policy-makers, public health authorities and health professionals with evidence-based guidance on the measures that they can take to protect the health of children and adults from lead exposure.

Since leaded paint is a continuing source of exposure in many countries, WHO has joined with the United Nations Environment Programme to form the Global Alliance to Eliminate Lead Paint. This is a cooperative initiative to focus and catalyse efforts to achieve international goals to prevent children's exposure to lead from leaded paints and to minimize occupational exposures to such paint. Its broad objective is to promote a phase-out of the manufacture and sale of paints containing lead and eventually eliminate the risks that such paints pose.

The Global Alliance to Eliminate Lead Paint is an important means of contributing to the implementation of paragraph 57 of the *"Plan of Implementation"* of the World Summit on Sustainable Development and to resolution II/4B of the Strategic Approach to International Chemicals Management (SAICM), which both concern the phasing out of lead paint.

WHO is also a partner in a project funded by the Global Environment Facility that aims to support at least 40 countries in enacting legally binding controls on lead paint. *(4)*

The phasing out of lead paint by 2020 is one of the priority actions for governments included in the WHO *Road map to enhance health sector engagement in the Strategic Approach to International Chemicals Management towards the 2020 goal and beyond*. This road map was approved by the Seventieth World Health Assembly in decision WHA70(23).

The elimination of lead paint will contribute to the achievement of the following Sustainable Development Goal targets:

- **3.9: By 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination; and**
- **12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.**

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(1) Leaded Petrol Phase-out globally (2019)
Nairobi: United Nations Environment Programme; 2019.
(2) Global Health Observatory: Regulations and controls on lead paint.
Geneva: World Health Organization; 2019
(3) Institute for Health Metrics and Evaluation (IHME). GBD Compare.
Seattle, WA: IHME, University of Washington; 2017.
(4) SAICM GEF Project - Lead in Paint Component

Attachment 17

Breastfeeding

Lead

Protecting children from exposure to lead is important for lifelong good health. No safe blood lead level has been identified. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. The effects of lead exposure cannot be corrected.

How Might Lead Affect Breastfeeding Mothers and Infants?

Women who have been or are currently exposed to lead can expose their fetus or infant to lead during pregnancy and lactation through blood and breast milk, which can have long-term effects on the neurodevelopment of their child. During pregnancy and lactation, mothers can have lead in their blood or breast milk for two reasons:

1. They have been directly exposed to lead during pregnancy or lactation.
2. Lead that is stored in a woman's bones and teeth from a prior exposure to lead can be released during pregnancy or lactation.

Can Mothers Breastfeed Their Children If They Have Elevated Blood Lead Levels (BLLs)?

If a pregnant or lactating woman has blood lead levels (BLLs) ≥5 µg/dL, the health care provider should attempt to determine the source(s) of lead exposure, working with the local health department and occupational medicine specialists as needed for environmental assessment and case management.

It is recommended that mothers with BLLs <40 µg/dL should breastfeed, but it is important to note:

- Infant BLLs should be monitored if his or her mother's BLLs are between 5 and 39 µg/dL. Breastfeeding should continue for all infants with BLLs below 5 µg/dL.
- If infant BLLs are rising or failing to decline by 5 µg/dL or more, the healthcare provider should contact the local health department for environmental sampling. If no external source is identified, and maternal BLLs are ≥20 µg/dL and infant BLLs are ≥5 µg/dL, then breast milk may be the source of lead exposure. Mothers should consider temporarily pumping and discarding their breast milk until maternal BLLs are lower.

Mothers with BLLs ≥40 µg/dL are encouraged to pump and discard their milk until their BLLs drop below 40 µg/dL.

- Testing breast milk for lead is not recommended.

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What Are Some Kinds of Lead Hazards Breastfeeding Women Might Be Exposed To? How Can They Protect Themselves and Their Infants?

Breastfeeding women should be aware of or avoid the following:

- **Lead-based paint** (typically found in homes built before 1978). Stay away from repair, repainting, renovation, and remodeling work. Test paint before starting home improvements that disturb paint. If hiring someone else to perform work, make sure they follow lead paint repair rules from the Environmental Protection Agency (EPA).
- **Pica.** Never eat or mouth clay, soil, pottery, or paint chips because they may be contaminated with lead.
- **Tainted food.** Use caution when eating candies, spices, food additives, and other foods from abroad, especially if they appear to be noncommercial products of unknown safety. Limit eating game meat—such as deer—that have been hunted with lead ammunition.
- **Tainted foodware.** Avoid using imported lead-glazed ceramic pottery and pewter or brass containers or utensils to cook, serve, or store food. Avoid using leaded crystal to serve or store beverages. Do not use dishes that are chipped or cracked.
- **Tainted medicine or personal care products.** Avoid imported medicines and herbal remedies (azarcon, Ayurvedics); cosmetics and ceremonial powders (tiro, kohl, kajal, surma); and personal care products (litargirio) that may contain lead.
- **Water with lead levels exceeding 15 parts per billion (ppb).** If water lead levels exceed EPA's action level of 15 ppb, use bottled water or water from a filtration system certified by an independent testing organization to reduce or eliminate lead for cooking and drinking.
- **Some** occupations or hobbies that may involve lead exposure. These include construction or home renovation/repair in pre-1978 homes; firing ranges and military or police work; battery or electronics manufacturing or recycling; soldering or casting metal; oil field work; mining; and aviation gas used in small planes. If a household member works with lead, take precautions to avoid taking home lead dust in cars or on clothing, skin, hair, and shoes.
- **Prior exposure.** Prior significant exposure such as childhood environmental exposure or previous occupational exposure could lead to large stores of lead in bone which can become mobilized during pregnancy.
- **Recent immigration.** Recent immigration to the United States from countries where relatively high lead exposure is endemic, such as countries where leaded gasoline is still used or where use of consumer products containing lead is widespread.

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Learn More

- Angelon-Gaetz KA, Klaus C, Chaudhry EA, et al. (2018) Lead in Spices, Herbal Remedies, and Ceremonial Powders Sampled from Home Investigations for Children with Elevated Blood Lead Levels — North Carolina, 2011–2018. *MMWR*, 67(46):1290–1294. [PDF-131KB]
- Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women [PDF-3.67MB]

- Resources for Workers with Lead Exposure
- Prevention Tips for Pregnant Women
- What Do Parents Need to Know to Protect Their Children?

External Resources

- Lead Screening During Pregnancy and Lactation – American College of Obstetricians and Gynecologists
- Prevention of Childhood Lead Toxicity – American Academy of Pediatrics

Page last reviewed: December 22, 2019

Attachment 18

Lead and Pregnancy
Know the Risks

The Bottom Line

Pregnant women with high blood lead levels can have high blood pressure, spontaneous abortion, small babies, and brain damage in the infant. All pregnant women with even one risk factor for lead poisoning should have a blood lead level done. Pregnant women with lead levels at or above 5 micrograms/deciliter must have further assessment and treatment.

The Full Story

For thousands of years, we've known that lead is harmful. It is especially dangerous for young children. Lead damages the brain and nervous system, especially when children are still growing. They can have a lower IQ, behavior problems, damaged hearing, abdominal pains, and trouble learning.

Pregnant women with high lead levels can pass lead to their unborn children. (Lead also can be passed to children in breast milk.) Now, there are guidelines for when pregnant women should be tested for high lead levels.

The Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists recommend that all pregnant women be asked about their risk factors for lead poisoning.

Pregnant women should be tested for lead if they have any one of these risk factors:

- Recent arrival to the U.S. from a country with a lot of environmental lead.
- Living near a source of lead, for example lead mines or battery recycling plants.
- Working in a lead industry or living with someone who does.
- Having a lead-based hobby, for example stained glass.
- Using lead-based pottery for food or drinks.

- Using lead-based cosmetics, such as imported kohl or sarma.
- Using spices, herbs, or medicines that could be contaminated with lead. These are usually imported from other countries.
- Repairing or renovating a home with lead paint.
- Living in a home with lead in the water pipes.
- Having a history of lead poisoning; lead is stored in bone for decades and is released into the blood during pregnancy.
- Living with someone with a high lead level.

If a pregnant woman's level is less than 5 micrograms per deciliter (mcg/dL), nothing more needs to be done.

If the level is 5 or above, repeat testing is needed. How often a woman is re-tested depends on her blood lead level. Pregnant women with lead levels of 5 mcg/dL or above also need extra calcium and iron in their diets. These supplements help prevent higher blood lead levels.

Every pregnant woman should discuss possible lead risks with her health provider. For questions about lead and lead poisoning, call Poison Control at 1-800-222-1222.

Take Home Messages:

High blood lead levels are dangerous for a pregnant woman and her fetus. Possible problems include high blood pressure, spontaneous abortion, small babies, and brain damage in the infant. Now, there are specific guidelines for pregnant women:

- All pregnant women should talk to their doctors (or other health care providers) about risk factors for lead poisoning.
- All pregnant women with even one risk factor should have a blood lead level done.
- All pregnant women with lead levels at or above 5 micrograms/deciliter (mcg/dL) must have further assessment and treatment.

Rose Ann Gould Soloway, RN, BSN, MSEd, DABAT *emerita*
Clinical Toxicologist

For More Information

Prevent lead poisoning before getting pregnant (https://www.cdc.gov/nceh/lead/tips/pregnant.htm) (CDC).

Background information and recommendations about lead screening in pregnancy (https://www.acog.org/~/media/Committee%20Opinions/Committee%20on%20Obstetric%20Practice/co533.pdf?dmc=1&ts=20131016T1426013489)(American College of Obstetricians and Gynecologists).

For questions about lead and lead poisoning, call Poison Control at 1-800-222-1222.

References

American College of Obstetricians and Gynecologists. Lead screening during pregnancy and lactation. Committee Opinion N. 533. American College of Obstetrics and Gynecologists. Obstet Gynecol 2012;120:416-20.

Centers for Disease Control and Prevention. Blood lead levels in children aged 1-5 years - United States, 1999-2010. MMWR 2013;62:245-248. (https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6213a3.htm?s_cid=mm6213a3_w)

Poisoned?

Prevention Tips

If you are pregnant, talk to your health care provider about lead. If you have risk factors for lead poisoning, have a blood test for lead.

This Really Happened

A 38-year-old woman who was 25 weeks pregnant came into the emergency room complaining of chronic abdominal pain, fatigue, constipation and body aches. Blood work obtained prior to her pregnancy revealed anemia and an abnormally high whole-blood lead level (67.5 mcg/dL; a normal level is less than 5). At that time, the woman did not seek treatment.

When she went to the emergency room during her pregnancy, her whole-blood lead level was again high (62.8 mcg/dL), her anemia had worsened, and her blood showed characteristics of lead poisoning when viewed under the microscope. The ultrasound of the fetus appeared normal at that time.

Four weeks after her diagnosis of lead poisoning, the patient was treated with oral chelators. These are medicines that help the body excrete some of the lead. The goal was to prevent some of the severe effects of lead poisoning in both the woman and her fetus.

At birth, the baby had a very high lead level (74.7 mcg/dL). Although the child was born 3 weeks early, she appeared normal and healthy at that time. The child was treated in the hospital with intravenous chelators for 3 days. Then, she was given an oral chelator for another 19 days. At 6 weeks old, the child's whole-blood lead level was still high (30.7 mcg/dL); she was treated with another 19 days of chelation therapy.

After 6 months of monitoring, the child's lead level was still elevated (30.5 mcg/dL). At that time, her pediatrician felt that she appeared normal. She did not have any apparent developmental delay. It is unknown if the child showed any problems with learning, behavior, or health as she continued to grow and develop.

Summarized from: Horowitz BZ, Mirkin, DB. Lead poisoning and chelation in a mother-neonate pair. Clinical Toxicology. 2001; 39(7):727-731.

Attachment 19

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CELEBRATING 10 YEARS

Blood Lead Levels in Pregnant & Breastfeeding Moms

Lead is toxic and particularly harmful for developing nervous systems. Lead can be passed through a pregnant woman's placenta to the fetus, or through breast milk to a baby.

To minimize the risk to you and your baby from lead, take a moment to educate yourself about making your environment more lead safe.

Is there anything I can do to lower my exposure to lead during pregnancy?

Yes, you can avoid exposure to any known sources of lead before and during pregnancy.

- If you are working with lead in your job or have a hobby such as making jewelry or stained glass, have your health care provider check your blood lead level.
- If you are fixing up an older home containing lead-based paint, be sure that the people working it are following safe procedures (http://www.health.state.mn.us/divs/eh/lead/homes/interior.html) to protect you and your family from lead exposure. About 75% of homes built before 1978 contain some lead-based paint. The older the home the more likely it is to contain lead-based paint.
- Water from public sources is regularly tested for lead. You can get information about your drinking water from your local board of health. Houses that use well water should have the water tested regularly for lead and other possible contaminants. *See Lead in Tap Water & Household Plumbing: Parent FAQs* (/English/safety-prevention/at-home/Pages/Lead-in-Tap-Water-Household-Plumbing.aspx).
- Eat frequent and regular meals. Environmental lead is more easily absorbed into your bloodstream and retained in your body if you have an empty stomach.
- A diet poor in calcium, iron, zinc, vitamin C, vitamin D and vitamin E *can* be associated with increased amount of lead absorbed into your bloodstream. Therefore, it is important for pregnant woman to eat a well-balanced diet and take prenatal vitamins.

Is there a test to tell how much lead I have been exposed to?

Yes, a blood lead test (/English/safety-prevention/all-around/Pages/Where-We-Stand-Lead-Screening.aspx) can be done to see how much lead is present. Although most people will have some lead in their blood, levels greater than 5 micrograms per deciliter (μg/dL) indicate that there is some exposure that needs to be addressed. While there is no clear safe level of lead in the body, the goal is to have the lowest level possible. Women who had exposure to lead in the past should have levels checked.

The Centers for Disease Control and Prevention (CDC) recommends blood lead testing for pregnant and lactating women with one or more important risk factors for lead exposure and increased blood lead levels:

- Recent immigration (from an area where lead contamination is high)
- Living near point source of lead (e.g., lead mines, smelters, battery recycling plants, home remodeling)
- Pica (i.e., compulsive eating of non-food items)
- Occupational exposures (e.g., painters, those exposed to batteries or radiators, living with someone who works in lead industry)

- Environmental exposures (e.g., lead-contaminated soil, water, or food)
- Use of lead-containing cosmetics
- Cooking/storing in lead-glazed pottery
- Use of some herbal/alternative medicines

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What effects could lead have on my baby?

The most serious effect of high levels of lead during pregnancy can cause miscarriage and stillbirth. Other pregnancy problems such as low birth weight and premature delivery can also occur. Additionally, high maternal lead levels can cause learning and behavior problems in exposed babies. It is unlikely that exposure to lead during pregnancy would significantly increase the chance for major physical birth defects.

Is there concern about lead if I am breastfeeding?

Generally speaking, breastfeeding is safe for women with elevated blood lead levels; however, babies of breastfeeding mothers with very high blood lead levels should be closely monitored.

A blood test should be performed within two weeks of baseline measurement and then at least on a monthly basis:

- **For babies with a blood lead level of 5 µg/dL or greater or rising:** An environmental assessment is recommended.
- **For babies with a blood lead level that stays below 10 µg/dL:** Breastfeeding should continue.

Additional Information:

- Lead Exposure: Steps to Protect Your Family (/English/safety-prevention/all-around/Pages/Lead-Screening-for-Children.aspx)
- Lead in Tap Water & Household Plumbing: Parent FAQs (/English/safety-prevention/at-home/Pages/Lead-in-Tap-Water-Household-Plumbing.aspx)
- Lead Screening during Pregnancy and Lactation (http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Lead-Screening-During-Pregnancy-and-Lactation) (American College of Obstetricians and Gynecologists)
- Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women (http://www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf) (Centers for Disease Control and Prevention)

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Attachment 20

NTP | National Toxicology Program
U.S. Department of Health and Human Services

NTP Monograph

Health Effects of Low-Level Lead

EXCERPTED BY
CLEAN AIR COUNCIL

June 2012

NTP
National Toxicology Program
U.S. Department of Health and Human Services

NTP MONOGRAPH ON HEALTH EFFECTS OF LOW-LEVEL LEAD

June 13, 2012

Office of Health Assessment and Translation

Division of the National Toxicology Program

National Institute of Environmental Health Sciences

National Institutes of Health

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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PEER REVIEW OF THE DRAFT NTP MONOGRAPH

Peer review of the Draft NTP Monograph was conducted by an *ad hoc* expert panel at a public meeting held November 17-18, 2011, at the National Institute of Environmental Health Sciences, Research Triangle Park, NC (see *http://ntp.niehs.nih.gov/go/37090* for materials, minutes, and panel recommendations from the peer review meeting). The selection of panel members and conduct of the peer review were performed in accordance with the Federal Advisory Committee Act and Federal policies and regulations. The panel members served as independent scientists, not as representatives of any institution, company, or governmental agency. In this capacity, panel members had two major responsibilities in reviewing the draft NTP Monograph: (1) to determine whether the scientific information cited in the draft monograph is technically correct, clearly stated, and objectively presented and (2) to determine whether the scientific evidence presented in the draft monograph supports the NTP's conclusions regarding health effects of low-level lead (Pb).

The panel agreed with the draft NTP overall conclusions on cardiovascular, renal, and immune health effects associated with blood Pb levels <10 µg/dL. The panel recommended changing the draft summary conclusion for neurological effects in children and for reproductive effects in adult women from *sufficient* evidence of an association at blood Pb levels <10 ug/dL to *sufficient* evidence of an association at blood Pb levels <5 ug/dL. Comments from the peer reviewers and written public comments received on the draft monograph were considered during finalization of the document. The NTP concurred with the expert panel on all of its recommendations on the conclusions regarding health effects of Pb in this final document.

Peer-Review Panel

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ABSTRACT

Although reductions in lead (Pb) exposure for the U.S. population have resulted in lower blood Pb levels over time, epidemiological studies continue to provide evidence of health effects at lower and lower blood Pb levels. Low-level Pb was selected for evaluation by the National Toxicology Program (NTP) because of (1) the availability of a large number of epidemiological studies of Pb, (2) a nomination by the National Institute for Occupational Safety and Health for an assessment of Pb at lower levels of exposure, and (3) public concern for effects of Pb in children and adults. This evaluation summarizes the evidence in humans and presents conclusions on health effects in children and adults associated with low-level Pb exposure as indicated by less than 10 micrograms of Pb per deciliter of blood (<10 µg/dL). The assessment focuses on epidemiological evidence at blood Pb levels <10 µg/dL and <5 µg/dL because health effects at higher blood Pb levels are well established. The NTP evaluation was conducted through the Office of Health Assessment and Translation (OHAT, formerly the Center for the Evaluation of Risks to Human Reproduction) and completed in April of 2012.

The results of this evaluation are published in the NTP Monograph on Health Effects of Low-Level Lead. The document and appendices are available at *http://ntp.niehs.nih.gov/go/evals.* This document provides background on Pb exposure and includes a review of the primary epidemiological literature for evidence that low-level Pb is associated with neurological, immunological, cardiovascular, renal, and/or reproductive and developmental effects. The NTP Monograph presents specific conclusions for each health effect area. Overall, the NTP concludes that there is *sufficient* evidence that blood Pb levels <10 µg/dL and <5 µg/dL are associated with adverse health effects in children and adults.

This conclusion was based on a review of the primary epidemiological literature, scientific input from technical advisors that reviewed pre-public release drafts of each chapter summarizing the evidence for specific health effects associated with low-level Pb, public comments received during the course of the evaluation, and comments from an expert panel of *ad hoc* reviewers during a public meeting to review the Draft NTP Monograph on November 17-18, 2011 *(http://ntp.niehs.nih.gov/go/37090).*

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Lead (Pb) exposure remains a significant health concern despite policies and practices that have resulted in continued progress in reducing exposure and lowering blood Pb levels in the U.S. population. Pb is one of the most extensively studied environmental toxicants, with more than 28,900 publications on health effects and exposure in the peer-reviewed literature[1]. While the toxicity associated with exposure to high levels of Pb was recognized by the ancient Greeks and Romans, the adverse health effects associated with low-level Pb exposure became widely recognized only in the second half of the 20th century. Over the past 40 years, epidemiological studies, particularly in children, continue to provide evidence of health effects at lower and lower blood Pb levels. In response, the Centers for Disease Control and Prevention (CDC) has repeatedly lowered the concentration of Pb in blood that is considered "elevated" in children (from 30 µg/dL to 25 µg/dL in 1985 and to the current level of 10 µg/dL in 1991).

The purpose of this evaluation is to summarize the evidence in humans and to reach conclusions about whether health effects are associated with low-level Pb exposure as indicated by less than 10 micrograms of Pb per deciliter of blood (<10 µg/dL), with specific focus on the life stage (childhood, adulthood) associated with these health effects. This evaluation focuses on epidemiological evidence at blood Pb levels <10 µg/dL because health effects at higher blood Pb levels are well established such that the definition of an elevated blood Pb level is ≥10 µg/dL for both children and adults (ABLES 2009, CDC 2010a). Pb was nominated by the National Institute for Occupational Safety and Health for a National Toxicology Program (NTP) evaluation to assess the reproductive and developmental effects of Pb (see *http://ntp.niehs.nih.gov/mtg?date=20100510&meeting=BSC*). The scope of the evaluation has been expanded from the original nomination to include an evaluation of health effects other than reproduction and development (e.g., cardiovascular effects in adults) in order to maximize the utility of the evaluation.

[1] Based on an April 2012 PubMed search for keyword (MeSH) "lead" or "lead poisoning."

1.2 Methods

The key questions and general approach for developing the conclusions on the health effects of low-level Pb are outlined below. **Section 2.0** of this document contains additional details on the authoritative sources considered, the literature search strategy, and the peer-review process.

1.2.1 Key Questions

What is the evidence that adverse health effects are associated with blood Pb <10 µg/dL?

- ❖ What reproductive, developmental, neurological, immune, cardiovascular, and renal health effects are associated with blood Pb levels <10 µg/dL?
- ❖ What is the blood Pb level associated with a given health effect (i.e., <10 µg/dL or <5 µg/dL)?
- ❖ At which life stages (childhood or adulthood) is the effect identified?
- ❖ Are there data to evaluate the association between bone Pb and the health effect, and how does the association to this biomarker of Pb exposure compare to the association with blood Pb?

1.2.2 Approach to Develop Health Effects Conclusions

Conclusions in the NTP evaluation of Pb-related health effects in humans associated with low-level Pb were derived by evaluating the data from epidemiological studies with a focus on blood Pb levels <10 µg/dL. The evaluation includes a review of the primary epidemiological literature for evidence that low-level Pb is associated with neurological, immunological, cardiovascular, renal, and/or reproductive and developmental effects. These health effect areas were selected because there is a relatively large database of human studies in each area. The NTP considered four possible conclusions for specific health effects within each area:

Sufficient Evidence of an Association:
An association is observed between the exposure and health outcome in studies in which chance, bias, and confounding could be ruled out with reasonable confidence.

Limited Evidence of an Association:
An association is observed between the exposure and health outcome in studies in which chance, bias, and confounding could not be ruled out with reasonable confidence.

Inadequate Evidence of an Association:
The available studies are insufficient in quality, consistency, or statistical power to permit a conclusion regarding the presence or absence of an association between exposure and health outcome, or no data in humans are available.

Evidence of No Association:
Several adequate studies covering the full range of levels of exposure that humans are known to encounter (in this case limited to blood Pb levels <10 µg/dL) are mutually consistent in not showing an association between exposure to the agent and any studied endpoint.

The discussion of each health effect begins with a statement of the NTP's conclusion regarding whether the specific effect is associated with a blood Pb level <10 µg/dL or <5 µg/dL and the age group (childhood or adulthood) in which it is or is not identified, as well as the timing of exposure associated with the effect (prenatal, childhood, concurrent) if available. Then key data and principal studies considered in developing the NTP's conclusions are discussed in detail. General strengths and limitations of study designs were considered when developing conclusions, with prospective studies providing stronger evidence than cross-sectional or case-control studies. Each section concludes with a summary discussing each health effect, describing experimental animal data that relate to the human data, and stating the basis for the NTP conclusions.

For the purposes of this evaluation, "children" refers to individuals <18 years of age unless otherwise specified. In addition to the blood Pb level of <10 µg/dL, a lower effect level of <5 µg/dL was also selected because it is commonly used in epidemiological studies to categorize health effects data by exposure levels; therefore, data are often available to evaluate health effects for groups above and below this value as well.

1.2.3 Appendices of Studies Considered

The information to support the NTP's conclusions for individual health effects is presented in each chapter. In addition, human studies of groups with low-level Pb exposure that were considered in developing the conclusions are also abstracted for further reference and included in separate appendices for neurological effects, immune effects, cardiovascular effects, renal effects, and reproductive and developmental effects.

1.2.4 Authoritative Sources and Peer Review

In this evaluation, the NTP made extensive use of recent government assessments of the health effects of Pb, especially the U.S. Environmental Protection Agency (EPA) 2006 Air Quality Criteria Document (AQCD) for Lead (U.S. EPA 2006 and a draft updated version, 2012), which has undergone extensive external public peer review. In addition to the EPA's 2006 AQCD for Lead, sources include the Agency for Toxic Substances and Disease Registry's (ATSDR) 2007 Toxicological Profile for Lead (ATSDR 2007) and the CDC's Advisory Committee on Childhood Lead Poisoning Prevention reports, such as the 2010 Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women (CDC 2010b).

The NTP used independent subject matter experts as technical advisers to provide scientific input and to review pre-public release drafts of each chapter summarizing the evidence that health effects are associated with low-level Pb, the appendices, and **Section 3.0** that provides background on Pb exposure (see **Contributors** for a list of technical advisers). Peer review of the draft document was conducted by an expert panel of *ad hoc* reviewers at a public meeting held November 17-18, 2011, in Research Triangle Park, NC (see **Peer-Review of the Draft NTP Monograph** for details). Comments from peer reviewers and written public comments received on the draft monograph were considered during finalization of the document. The NTP concurred with the expert panel on all of the conclusions regarding health effects of Pb in this final document.

1.3 What Does It Mean to Refer to Blood Pb Levels <10 µg/dL?

The overwhelming majority of human epidemiological studies with Pb exposure data measured Pb in whole blood, and this measure of exposure serves as the basis for the evaluation of Pb levels <10 µg/dL. An individual's blood Pb level reflects an equilibrium between current environmental Pb exposure and the preexisting amount of Pb in the body, stored primarily in bone (Factor-Litvak *et al.* 1999, Brown *et al.* 2000, Chuang *et al.* 2001). In adults, bone and teeth store 90-95% of the total body burden of Pb, while in young children, bone Pb represents a smaller fraction (down to 70%) (Barry 1981, for review, see Barbosa *et al.* 2005, Hu *et al.* 2007). The body eliminates half of

the Pb in circulating blood (half-life) in approximately one month, while bone is a more stable repository for Pb and, therefore, bone Pb levels reflect cumulative exposure to Pb integrated over years or even decades (reviewed in Hu *et al.* 1998, Hu *et al.* 2007). The half-life of Pb in bone ranges from 10 to 30 years, depending on the rate of bone turnover, which in turn varies by type of bone and life stage (Rabinowitz 1991). In young children, continuous growth results in constant bone remodeling, and bone Pb is exchanged with blood Pb much more frequently than in adults (reviewed in Barbosa *et al.* 2005, Hu *et al.* 2007).

This evaluation focuses on the relationship between health effects and blood Pb levels because blood Pb is the most widely available measure of exposure, blood Pb reflects the equilibrium between current and past exposure, as described above, and numerous studies have reported an association between blood Pb levels and health outcomes. However, measuring Pb in one tissue at one point in time does not present a complete picture of either current or cumulative Pb exposure, and bone Pb reflects long-term stores of Pb in the body better than does blood Pb (reviewed in Barbosa *et al.* 2005, Hu *et al.* 2007); therefore, bone Pb data were also considered when available. Note that measuring bone Pb is expensive, requires specialized equipment that is not generally accessible, and requires study subjects to travel to the location of the measurement apparatus (K-x-ray fluorescence); thus, fewer Pb data are available for bone than for blood.

Before bans on Pb in paint, solder, and gasoline, environmental Pb levels in the United States were higher, so older adults accumulated more Pb as children than children do today. Average blood Pb levels in children 1-5 years of age have decreased 10-fold over the last 30 years, from 15.1 µg/dL in 1976-1980 to 1.51 µg/dL in 2007-2008 (geometric means; CDC 2007, 2011). This is clearly good news for current populations of children and represents a significant public health accomplishment. However, most U.S. adults who were born before 1980 had blood Pb levels >10 µg/dL during early childhood, so health effects in adults today may have been influenced by blood Pb levels >10 µg/dL that many individuals experienced earlier in life.

Keeping childhood blood Pb levels in mind, there are data on multiple health effects in adults for which studies report a significant relationship between concurrent blood Pb levels as adults and the health effect (e.g., elevated blood pressure, reduced kidney function, or decreases in specific measures of cognitive function). There is a considerable body of evidence that these health effects are associated with Pb exposure, and multiple studies report a significant association with concurrent blood Pb levels <10 µg/dL. Furthermore, the association with blood Pb is supported by the consistency of effects among epidemiological studies and biological coherence with animal data. It is well recognized that the role of early-life Pb exposure cannot be discriminated from the role of concurrent blood Pb without additional long-term studies. To eliminate the potential role of early-life blood Pb levels >10 µg/dL on health effects observed in adults with blood Pb levels <10 µg/dL, prospective studies (following a group over time) would be required in a group with blood Pb levels consistently <10 µg/dL from birth until measurement of the outcome of interest.

As described in **Section 1.2.2**, the NTP's conclusions were derived by evaluating data from epidemiological studies with a focus on blood Pb levels <10 µg/dL. The evidence discussed for specific health outcomes within each chapter varies by study design and type of analyses used to examine the relationship of the health outcome with blood Pb across the hundreds of studies evaluated. In some cases, studies examined only groups with blood Pb levels <10 µg/dL, <5 µg/dL, or even lower, and the association of the health effect with the blood Pb level is clear. For example, Lanphear *et al.* (2000) reported that higher blood Pb levels were associated with lower academic performance in a cross-sectional study (examining one point in time) of 4,853 children 6-16 years of age from the NHANES III data set. When they analyzed only children with blood Pb <10 µg/dL (n=4,681) or <5 µg/dL (n=4,043), the association with blood Pb was still significant ($p<0.001$ for <10 µg/dL and <5 µg/dL). In other cases, studies reported a significant association between blood Pb and an effect in a group whose mean blood Pb level was <10 µg/dL (e.g., higher blood Pb levels were associated with higher blood pressure in 964 adults in the Baltimore Memory Study (Martin *et al.* 2006)). These analyses support an effect of a blood Pb level <10 µg/dL, but they do not exclude the possibility that individuals significantly above or below the mean blood Pb level are driving the effect, or that past exposure levels are

driving the effect. Finally, some studies compared effects between two groups with higher and lower blood Pb levels. For example, Naicker *et al.* (2010) compared the effect of a blood Pb level ≥5 µg/dL with a blood Pb level <5 µg/dL on developmental markers of puberty in 13-year-old girls in South Africa (n=682) and found that a blood Pb level ≥5 µg/dL was significantly associated with delayed breast development, pubic hair development, and age of menarche.

1.4 Health Effects Evidence

1.4.1 NTP Conclusions

The NTP concludes that there is *sufficient* evidence for adverse health effects in children and adults at blood Pb levels <10 µg/dL, and <5 µg/dL as well (see **Table 1.1** for summary of effect by life stage at which the effect is identified). A major strength of the evidence supporting effects of low-level Pb comes from the consistency demonstrated by adverse effects associated with blood Pb <10 µg/dL across a wide range of health outcomes, across major physiological systems from reproductive to renal, among multiple groups, from studies using substantially different methods and techniques, and for health effects in both children and adults.

In children, there is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with increased diagnosis of attention-related behavioral problems, greater incidence of problem behaviors, and decreased cognitive performance as indicated by (1) lower academic achievement, (2) decreased intelligence quotient (IQ), and (3) reductions in specific cognitive measures. There is also *limited* evidence that blood Pb <5 µg/dL is associated with delayed puberty and decreased kidney function in children ≥12 years of age. There is *sufficient* evidence that blood Pb levels <10 µg/dL in children are associated with delayed puberty and reduced postnatal growth. There is *limited* evidence that blood Pb levels <10 µg/dL are associated with elevated serum immunoglobulin E (IgE), which is a principal mediator of hypersensitivity; consistent with this effect, there is *limited* evidence that blood Pb levels <10 µg/dL are associated with changes to an IgE-related health effect, allergy diagnosed by skin prick test to common allergens. There is *inadequate* evidence of an association between blood Pb <10 µg/dL in children and other allergic diseases, such as eczema or asthma. There is also *inadequate* evidence of an association between blood Pb <10 µg/dL and cardiovascular effects in children of any age, or renal function in children <12 years of age.

In adults, there is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with decreased renal function and that blood Pb levels <10 µg/dL are associated with increased blood pressure and hypertension. There is *sufficient* evidence that maternal blood Pb levels <5 µg/dL are associated with reduced fetal growth and *limited* evidence that maternal blood Pb levels <10 µg/dL are associated with increased spontaneous abortion and preterm birth. There is *sufficient* evidence that blood Pb levels <10 µg/dL, and *limited* evidence that blood Pb levels <5 µg/dL, are associated with essential tremor in adults. There is also *limited* evidence for an association between blood Pb <10 µg/dL and increased cardiovascular-related mortality, decreased auditory function, the neurodegenerative disease amyotrophic lateral sclerosis (ALS), and decreases in specific measures of cognitive function in older adults. The NTP conclusions of associations between blood Pb levels <10 µg/dL in adults and health effects cannot completely eliminate the potential contributing effects of early-life blood Pb levels, as discussed in **Section 1.3**.

Although the relationship between many health effects and bone Pb as a measure of exposure has not been examined, the data support the importance of cumulative Pb exposure on cardiovascular effects of Pb in adults, as well as neurocognitive decline in adults, because the association between Pb and these endpoints is more consistent for bone Pb than for blood Pb.

1.4.2 Neurological Effects

The NTP concludes that there is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with adverse neurological effects in children and *limited* evidence that blood Pb levels <10 µg/dL are associated with adverse neurological effects in adults (see **Table 1.2** for summary of effects).

Unlike the data set for most other health effect areas, there are a number of prospective studies of neurological effects that include measures of prenatal exposure (either maternal blood or umbilical cord blood Pb levels). These prospective studies provide *limited* evidence that prenatal exposure to blood Pb levels <5 µg/dL is associated with decreases in measures of general and specific cognitive function

Table 1.1: NTP conclusions on health effects of low-level Pb by life stage

Life Stage	Blood Pb Level	NTP Conclusion	Principal Health Effects	Bone Pb Evidence
Children	<5 µg/dL	*Sufficient*	Decreased academic achievement, IQ, and specific cognitive measures; increased incidence of attention-related behaviors and problem behaviors	Tibia and dentin Pb are associated with attention-related behaviors, problem behaviors, and cognition.
		Limited	Delayed puberty and decreased kidney function in children ≥12 years of age	The one available study of bone Pb in children does not support an association with postnatal growth.
	<10 µg/dL	*Sufficient*	Delayed puberty, reduced postnatal growth, decreased IQ, and decreased hearing	No data
		Limited	Increased hypersensitivity/allergy by skin prick test to allergens and increased IgE* (not a health outcome)	No data
		Inadequate	*Any age* – asthma, eczema, nonallergy immune function, cardiovascular effects; *<12 years of age* – renal function	No data
Adults	<5 µg/dL	*Sufficient*	Decreased glomerular filtration rate; maternal blood Pb associated with reduced fetal growth	The one available study of bone Pb in the general population supports an association between bone Pb and decreased kidney function. Maternal bone Pb is associated with reduced fetal growth.
		Limited	Increased incidence of essential tremor	No data
	<10 µg/dL	*Sufficient*	Increased blood pressure, increased risk of hypertension, and increased incidence of essential tremor	The association between bone Pb and cardiovascular effects is more consistent than for blood Pb.
		Limited	Psychological effects, decreased cognitive function, decreased hearing, increased incidence of ALS, and increased cardiovascular-related mortality; maternal blood Pb associated with increased incidence of spontaneous abortion and preterm birth	The association between bone Pb and cognitive decline is more consistent than for blood Pb.
		Inadequate	Immune function, stillbirth, endocrine effects, birth defects, fertility or time to pregnancy**, sperm parameters**	No data

Abbreviations: ALS, amyotrophic lateral sclerosis; IgE, immunoglobulin E; IQ, intelligence quotient

*Increased serum IgE is associated with hypersensitivity; however, as described in **Section 1.4.3**, increased IgE does not equate to disease.

The NTP concludes that there is *inadequate* evidence that blood Pb levels <10 µg/dL are associated with fertility, time to pregnancy, and sperm parameters; however, given the basis of the original nomination, the NTP evaluated the evidence that higher blood Pb levels (i.e., >10 µg/dL) are associated with reproductive and developmental effects, and those conclusions are discussed in **Section 1.4.6 and presented in **Table 1.2**.

Table 1.2: NTP conclusions on health effects of low-level Pb by major health effect areas

Health Area	Population or Exposure Window		NTP Conclusion	Principal Health Effects	Blood Pb Evidence	Bone Pb Evidence
Neurological	Prenatal		*Limited*	Decrease in measures of cognitive function	Yes, <5 µg/dL	No data
			Limited	Decreased IQ, increased incidence of attention-related and problem behaviors, decreased hearing	Yes, <10 µg/dL	No data
	Children		*Sufficient*	Decreased academic achievement, IQ, and specific cognitive measures; increased incidence of attention-related and problem behaviors	Yes, <5 µg/dL	Tibia and dentin Pb are associated with attention, behavior, and cognition.
			Sufficient	Decreased hearing	Yes, <10 µg/dL	No data
	Adults		*Sufficient*	Increased incidence of essential tremor	Yes, <10 µg/dL	No data
			Limited	Psychiatric effects, decreased hearing, decreased cognitive function, increased incidence of ALS	Yes, <10 µg/dL	The association between bone Pb and cognitive decline is more consistent than blood.
			Limited	Increased incidence of essential tremor	Yes, <5 µg/dL	
Immune	Children		*Limited*	Increased hypersensitivity/allergy by skin prick test to common allergens and IgE* (not a health outcome)	Yes, <10 µg/dL	No data
			Inadequate	Asthma, eczema	Unclear	No data
	Adults		*Inadequate*	–	Unclear	No data
Cardiovascular	Children		*Inadequate*	–	Unclear	No data
	Adults		*Sufficient*	Increased blood pressure and increased risk of hypertension	Yes, <10 µg/dL	The association between bone Pb and cardiovascular effects is more consistent than blood.
			Limited	Increased cardiovascular-related mortality and ECG abnormalities	Yes, <10 µg/dL	
Renal	Children <12 years old		*Inadequate*	–	Unclear	No data
	Children ≥12 years old		*Limited*	Decreased glomerular filtration rate	Yes, <5 µg/dL	No data
	Adults		*Sufficient*	Decreased glomerular filtration rate	Yes, <5 µg/dL	Yes, one study
Reproductive and Developmental	Prenatal		*Limited*	Reduced postnatal growth	Yes, <10 µg/dL	No data
	Children		*Sufficient*	Delayed puberty, reduced postnatal growth	Yes, <10 µg/dL	One study does not support effects of bone Pb on growth.
			Limited	Delayed puberty	Yes, <5 µg/dL	
	Adults	Women	*Sufficient*	Reduced fetal growth	Yes, <5 µg/dL	Maternal tibia Pb is associated
			Limited	Increase in spontaneous abortion and preterm birth	Yes, <10 µg/dL	No data
		Men	*Sufficient*	Adverse changes in sperm parameters and increased time to pregnancy	Yes, ≥15-20 µg/dL	No data
			Limited	Decreased fertility	Yes, ≥10 µg/dL	No data
			Limited	Increased spontaneous abortion	Yes, >31 µg/dL	No data
		Adults	*Inadequate*	Stillbirth, endocrine effects, birth defects	Unclear	No data

Abbreviations: ALS, amyotrophic lateral sclerosis; ECG, electrocardiography; IgE, immunoglobulin E; IQ, intelligence quotient.
*Increased serum IgE is associated with hypersensitivity; however, as described in **Section 1.4.3**, increased IgE does not equate to disease.

evaluated in children. There is also *limited* evidence that prenatal exposure to blood Pb levels <10 µg/dL is associated with decreased IQ, increased incidence of attention-related behaviors and antisocial behavior problems, and decreased hearing measured in children. However, conclusions about effects of prenatal Pb exposure for outcomes evaluated as children are complicated by the high degree of correlation between prenatal and childhood blood Pb levels and as described below, blood Pb levels during childhood are also associated with these effects.

In children, there is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with decreases in broad based and specific indices of cognitive function and an increase in attention-related behavioral problems and antisocial behavioral problems. The association between blood Pb and decreased IQ has been demonstrated in multiple prospective studies of children with blood Pb levels <10 µg/dL, pooled analyses that reported effects with peak blood Pb levels <7.5 µg/dL (Lanphear *et al.* 2005), and multiple cross-sectional studies that reported effects with mean blood Pb levels <5 µg/dL. Lower levels of academic achievement, as determined by class rank and achievement tests, have been reported in multiple prospective and cross-sectional studies of children with blood Pb <5 µg/dL. An association between blood Pb <5 µg/dL and decreases in specific measures of cognitive function has been demonstrated in prospective and cross-sectional studies using a wide range of tests to assess cognitive function. Increases in attention-related and problem behaviors are consistently reported in studies with mean blood Pb levels <5 µg/dL. The NTP concludes that blood Pb is associated with attention-related behaviors rather than attention deficit hyperactivity disorder (ADHD) alone because (1) this broad term more accurately reflects the range of Pb-associated behavioral effects in the area of attention, of which ADHD is one example on the more severe end of the spectrum, and (2) determination of ADHD in children from available studies are not as precise as an ADHD diagnosis by trained clinicians using specific *DSM-IV-TR* criteria. There is *sufficient* evidence that blood Pb levels <10 µg/dL in children are associated with decreased auditory acuity. Multiple cross-sectional studies reported hearing loss, as indicated by higher hearing thresholds and increased latency of brainstem auditory evoked potentials (BAEPs), in children with blood Pb levels <10 µg/dL.

In adults, there is *limited* evidence that blood Pb levels <10 µg/dL are associated with psychiatric outcomes (including anxiety and depression), decreased auditory function, ALS, and decreases in specific measures of cognitive function in older adults. There is *sufficient* evidence that blood Pb levels <10 µg/dL are associated with essential tremor in adults, and *limited* evidence for blood Pb levels <5 µg/dL. Associations with decreases in cognitive function in adults are more consistent for bone Pb than for blood Pb, suggesting a role for cumulative Pb exposure.

1.4.3 Immune Effects

The NTP concludes that there is *limited* evidence that blood Pb levels <10 µg/dL are associated with adverse immune effects in children and that there is *inadequate* evidence in adults (see **Table 1.2**).

In children, there is *limited* evidence that blood Pb levels <10 µg/dL are associated with changes to an immune-related health outcome such as allergy or increased hypersensitivity. There is also *limited* evidence that blood Pb levels <10 µg/dL are associated with elevated serum IgE levels. Five studies of groups with mean blood Pb levels of 10 µg/dL and below support the relationship between blood Pb and increased serum IgE. Two of these studies reported an association at blood Pb levels of ≥10 µg/dL rather than <10 µg/dL, and only one of the remaining studies adjusted for age, a particularly important confounder in analyses of IgE in children. Although increases in serum levels of total IgE are not definitive indicators of allergic disease, elevated levels of IgE are primary mediators of hypersensitivity associated with sensitization and allergic disease. Therefore, the studies demonstrating Pb-related increases in IgE suggest a link to hypersensitivity and support more definitive data such as a prospective study that found blood Pb levels <10 µg/dL were associated with increased hypersensitivity (or allergy by skin prick testing) in children. These data support the conclusion of *limited* evidence that increased hypersensitivity responses or allergy are associated with blood Pb levels <10 µg/dL in children; however, there is *inadequate* evidence of an association between blood Pb and other allergic diseases such as eczema or asthma.

There is *inadequate* evidence in adults to address the potential association between blood Pb <10 µg/dL and IgE, allergy, eczema, or asthma. Few studies have investigated the relationship between

immune function and Pb in humans, and most studies reported general observational markers of immunity rather than function. There is *inadequate* evidence that blood Pb levels <10 µg/dL are associated with observational immune effects such as altered lymphocyte counts or serum levels of IgG, IgM, or IgA in the blood of children or adults, because few studies have examined the lower exposure level and the available data are inconsistent. There is also *inadequate* evidence that blood Pb levels <10 µg/dL are associated with changes in immune function other than hypersensitivity, because few studies have examined immune function at lower blood Pb levels.

Bone Pb levels may be particularly relevant for cells of the immune system and immune function. All of the white blood cells or leukocytes that develop after birth are derived from progenitor cells in the bone marrow. Unfortunately, very few studies of immune effects have measured exposure other than blood Pb; therefore, the relative importance of blood or bone Pb levels for immune effects of Pb is unknown.

1.4.4 Cardiovascular Effects

The NTP concludes that there is *sufficient* evidence that blood Pb levels <10 µg/dL in adults are associated with adverse effects on cardiovascular function and that there is *inadequate* evidence to evaluate cardiovascular effects in children (see **Table 1.2** for summary of effects).

There is *sufficient* evidence of a bone Pb-related increase in the risk of hypertension and increases in blood pressure in adults. Two prospective studies and five cross-sectional studies support a significant association between bone Pb and blood pressure or hypertension in groups with blood Pb levels <10 µg/dL. Studies show less consistent associations between blood Pb and blood pressure or hypertension than for bone Pb; however, most of the recent studies with mean blood Pb levels <5 µg/dL found significant associations between concurrent blood Pb levels and increased blood pressure. There is *sufficient* evidence that blood Pb levels <10 µg/dL increase the risk of hypertension during pregnancy, supported by one prospective study and five cross-sectional studies with blood Pb levels during pregnancy <10 µg/dL. There is *limited* evidence of increased risk of cardiovascular mortality associated with blood Pb levels <10 µg/dL. An association between increased cardiovascular mortality and blood Pb is supported by three prospective studies (two of which used the same NHANES III sample) but is not supported by two other prospective studies. One of the studies that did not find an association with blood Pb (at a mean blood Pb level of 5.6 µg/dL) reported a significant association between bone Pb levels and increased cardiovascular mortality. There is *limited* evidence for Pb effects on other cardiovascular outcomes, including electrocardiography (ECG) abnormalities and clinical cardiovascular disease primarily due to lack of replication studies. Chronic Pb exposure appears to be more critical than current Pb exposure, as shown by more consistent associations between chronic cardiovascular effects and bone Pb than for blood Pb. Studies support an association with concurrent blood Pb levels; however, the potential effect of early-life blood Pb levels on cardiovascular outcomes in adults cannot be discriminated from the effect of concurrent blood Pb levels without additional prospective studies in a population for which blood Pb levels remain consistently below 10 µg/dL from birth until evaluation of the various cardiovascular outcomes as described in **Section 1.3**. There is *inadequate* evidence for Pb effects on heart rate variability, due to a lack of replicated studies.

There is *inadequate* evidence to assess whether children or menopausal women present a sensitive life stage for cardiovascular effects of Pb. No prospective studies have followed children with early-life Pb measures and evaluated cardiovascular health in adulthood. During periods of bone demineralization such as menopause and with osteoporosis, Pb stored in bone may enter the blood stream at a higher rate, increasing circulating Pb levels; for example, increased blood Pb levels have been demonstrated in women after menopause in several studies (e.g., Silbergeld *et al.* 1988, Symanski and Hertz-Picciotto 1995, Webber *et al.* 1995, Korrick *et al.* 2002). Too few studies have examined Pb-related cardiovascular health risks in postmenopausal women to enable conclusions.

Although hypertension can contribute to adverse renal effects, and kidney dysfunction can contribute to increased blood pressure, effects are considered separately in this evaluation because most studies examined one outcome or the other, rather than testing both systems comprehensively.

1.4.5 Renal Effects

The NTP concludes that there is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with

adverse renal effects in adults (see **Table 1.2** for summary of effects). There is *limited* evidence that blood Pb levels <5 µg/dL are associated with adverse renal effects in children ≥12 years of age, and the current evidence is inadequate to conclude that blood Pb <10 µg/dL is associated with renal effects in children <12 years of age.

There is *sufficient* evidence that blood Pb levels <5 µg/dL are associated with adverse effects on kidney function in adults. Most of the 13 epidemiological studies of the general population reported blood Pb levels <10 µg/dL are associated with (1) increased risk of chronic kidney disease (CKD), and (2) decreases in the estimated glomerular filtration rate (eGFR) and creatinine clearance, markers of kidney function. The associations are typically stronger in studies of groups with hypertension or diabetes. Few studies have examined other markers of Pb exposure, such as bone Pb; therefore, it is unknown whether blood or bone Pb levels would be a better measure of exposure for kidney effects related to Pb. Epidemiological data from the general population support an association with concurrent blood Pb levels in adults; however, the potential effect of early-life blood Pb levels on kidney function in adults cannot be discriminated from the effect of concurrent blood Pb levels without additional prospective studies in a group for which blood Pb levels remain consistently below 10 µg/dL from birth until evaluation of kidney function as described in **Section 1.3**.

There is *inadequate* evidence to address the potential association between blood Pb levels <10 µg/dL in children <12 years of age and impaired kidney function, because results are inconsistent and available studies of kidney function in young children are less reliable in general because tests of kidney function lack clear predictive value in this age group. There is *limited* evidence that blood Pb levels <5 µg/dL are associated with adverse effects on kidney function in children ≥12 years of age. This conclusion is based on one study of NHANES data, which reported effects in children ≥12 years of age that are consistent with reduced eGFR reported in adults in several NHANES studies.

1.4.6 Reproduction and Developmental Effects

The NTP concludes that there is *sufficient* evidence that blood Pb levels <10 µg/dL are associated with adverse health effects on development in children and that blood Pb levels <5 µg/dL are associated with adverse health effects on reproduction in adult women (see **Table 1.2** for summary of effects).

Because most data on reproductive effects come from studies of occupational exposure, many of the available studies are for blood Pb levels >10 µg/dL. For this reason, and because the original nomination focused on reproductive and developmental effects, the evaluation of health effects in this area includes higher blood Pb levels, unlike other sections of this document. Consideration of these higher blood Pb levels resulted in several conclusions for Pb-related reproductive effects in men but did not affect the conclusions for women or children.

Unlike the data for most other health effect areas, a number of prospective studies of developmental effects have included prenatal measures of exposure (either maternal blood or umbilical cord blood). These prospective studies provide *limited* evidence that prenatal exposure to blood Pb levels <10 µg/dL is associated with reduced postnatal growth in children. Conclusions about effects of prenatal Pb exposure in children are complicated because blood Pb levels <10 µg/dL during childhood are also associated with reduced postnatal growth, and prenatal Pb levels are highly correlated with childhood Pb levels.

In children, there is *sufficient* evidence that blood Pb levels <10 µg/dL are associated with delayed puberty and *limited* evidence for this effect at blood Pb levels <5 µg/dL. Nine studies reported that concurrent blood Pb levels <10 µg/dL in children are associated with delayed puberty. There is *sufficient* evidence that blood Pb levels <10 µg/dL are associated with decreased postnatal growth. Numerous cross-sectional studies, including studies with large sample sizes such as the NHANES data sets, reported that concurrent blood Pb <10 µg/dL in children is associated with reduced head circumference, height, or other indicators of growth.

In adults, there is *sufficient* evidence that maternal blood Pb levels <5 µg/dL are associated with reduced fetal growth or lower birth weight. Three prospective studies with maternal blood Pb data during pregnancy, a large retrospective study (examining medical history) of >43,000 mother-infant pairs with a mean maternal blood Pb level of 2.1 µg/dL, and several cross-sectional studies of Pb levels in maternal or cord blood at delivery support an association

between higher blood Pb and reduced fetal growth at mean blood Pb levels from 1 to 10 µg/dL. Although maternal or paternal bone Pb data are not available in most studies of reproductive health outcomes, a set of studies of a single group reported that higher maternal bone Pb is related to lower fetal growth. There is also *limited* evidence that maternal blood Pb levels <10 µg/dL are associated with preterm birth and spontaneous abortion. Although several prospective studies reported an association between maternal blood Pb and preterm birth, the conclusion of *limited* evidence is due to inconsistent results and a retrospective study with a large cohort of >43,000 mother-infant pairs not finding an association between maternal blood Pb levels and preterm birth. The conclusion of *limited* evidence for an association with spontaneous abortion is based primarily on the strength of a single prospective nested case-control study in women, with additional support provided by occupational studies that reported an association with Pb exposure but lacked blood Pb measurements. In men, there is *inadequate* evidence that blood Pb levels <10 µg/dL are associated with effects on reproduction.

In men there is *sufficient* evidence that blood Pb levels ≥15 µg/dL are associated with adverse effects on sperm or semen and that blood Pb levels ≥20 µg/dL are associated with delayed conception time. Decreases in sperm count, density, and concentration have been reported in multiple retrospective and cross-sectional occupational studies of men with mean blood Pb levels from 15 to 68 µg/dL. Four studies reported increased time to pregnancy in women whose male partners had blood Pb levels of 20-40 µg/dL. A single retrospective occupational study reported increased risk of infertility among men with blood Pb levels ≥10 µg/dL, and the consistency of this observation with other studies reporting effects on time to pregnancy at higher blood Pb levels supports a conclusion of *limited* evidence that blood Pb levels ≥10 µg/dL in men are associated with other measures of reduced fertility. There is also *limited* evidence that paternal blood Pb levels >31 µg/dL are associated with spontaneous abortion, based primarily on the strength of a single retrospective nested case-control study in men, with additional support provided by occupational studies that reported an association with Pb exposure but lacked blood Pb measurements.

1.5 Future Research

There are robust data and *sufficient* evidence that blood Pb levels <10 µg/dL in children and adults are associated with adverse health effects across a wide range of health outcomes, as described above. Over time, epidemiological studies have provided data to support health effects at lower and lower blood Pb levels, particularly in children. Prospective studies in children better address the lower limits of Pb exposure associated with health effects because they focus on children whose blood Pb levels remain <10 µg/dL or <5 µg/dL with certainty throughout their lifetime. Studies of health effects in adults cannot eliminate the potential effects of early-life blood Pb levels on health effects observed as adults. This is particularly important in an evaluation of the health effects of blood Pb levels <10 µg/dL because older adults were likely to have had blood Pb levels >10 µg/dL as children (see discussion in **Section 1.3**), compared with only 0.8% of children with confirmed blood Pb levels >10 µg/dL in 2008.

Clarification of the effects of early-life blood Pb levels relative to the effects of concurrent blood Pb levels remains a significant issue for evaluating Pb-related health effects in adults. Epidemiological data from adults support an association between concurrent blood Pb levels <5 µg/dL and decreased renal function and between concurrent blood Pb levels <10 µg/dL and increased blood pressure and hypertension. Future research should be directed at clarifying the extent to which early life exposure (e.g., blood Pb levels >10 µg/dL) contribute to health effects observed in adults. Long-term prospective studies in a group for which blood Pb levels remain consistently <10 µg/dL from birth until the outcome of interest is measured would take one step in this direction by eliminating the potential role of early-life blood Pb levels >10 µg/dL on health effects observed in adults with concurrent blood Pb levels <10 µg/dL.

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Attachment 21

Childhood Lead Poisoning Prevention

Lead Poisoning Prevention

The goal is to **prevent** childhood lead exposure before any harm occurs.

- *Primary prevention* – the removal of lead hazards from the environment before a child is exposed – is the most effective way to ensure that children do not experience harmful long-term effects of lead exposure.
- *Secondary prevention* – including blood lead testing and follow-up – remains an essential safety net for children who may already be exposed to lead.

A blood test is the best readily available way to measure exposure to lead. The amount of lead in blood is referred to as blood lead level which is measured in micrograms of lead per deciliter of blood (µg/dL).

No safe blood lead level in children has been identified. Even low levels of lead in blood have been shown to affect IQ, the ability to pay attention, and academic achievement. The good news is that childhood lead poisoning is 100% preventable.

Preventing childhood lead exposure is cost-effective.

View Larger Text Equivalent

According to a 2017 report from the Health Impact Project, a federal investment of $80 billion would prevent all U.S. children born in 2018 from having any detectable levels of lead in their blood. This investment has an estimated $83.9 billion in societal benefits, which represents a 5% return on investment. If it cost less than $80 billion to remove lead from the environment, then the cost-benefit ratio would be greater. Additionally, permanently removing lead hazards from the environment would benefit future birth cohorts, and savings would continue to grow over time.

CDC is committed to help address this threat and improve health outcomes for our nation's most vulnerable citizens – our children.

Sources of Lead

At Risk Populations

Blood Lead Levels in Children

Health Effects

Lead FAQs

Page last reviewed: July 30, 2019

Attachment 22

Childhood Lead Poisoning Prevention

Blood Lead Levels in Children

Protecting children from exposure to lead is important to lifelong good health. No safe blood lead level in children has been identified. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. And effects of lead exposure cannot be corrected.

The most important step parents, doctors, and others can take is to prevent lead exposure before it occurs.

Highlights

- In 2012, CDC updated its recommendations on children's blood lead levels.
- By shifting our focus to primary prevention of lead exposure, we can reduce or eliminate dangerous lead sources in children's environments BEFORE they are exposed.
- What has not changed is the recommendation for when to use medical treatment for children. Experts recommend chelation therapy when a child is found with a test result of greater than or equal to 45 micrograms per deciliter of lead in blood.
- Though lead can be found in many sources, lead exposure is entirely preventable. The key is stopping children from coming into contact with lead and treating children who have been poisoned by lead. Parents can take simple steps to make their homes more lead-safe.
- Children can be given a blood test to measure the level of lead in their blood. Talk to your child's doctor if you are concerned about lead exposure.

CDC Blood Lead Reference Value (BLRV)

- CDC now uses a blood lead reference value of 5 micrograms per deciliter to identify children with blood lead levels that are much higher than most children's levels. This new level is based on the U.S. population of children ages 1-5 years who are in the highest 2.5% of children when tested for lead in their blood.
- This reference value is based on the 97.5th percentile of the National Health and Nutrition Examination Survey (NHANES)'s blood lead distribution in children. The current reference value is based on NHANES data from 2007-2008 and 2009-2010.
- Every four years, CDC will review the most recent two sets of NHANES data to find the 97.5th percentile of blood lead distribution in children.
- NHANES is a population-based survey to assess the health and nutritional status of adults and children in the United States and determine the prevalence of major diseases and risk factors for diseases.

Previous Terminology

- Until 2012, children were identified as having a blood lead "level of concern" if the test result is 10 or more micrograms per deciliter of lead in blood. CDC is no longer using the term "level of concern" and is instead using the reference value to identify children who have been exposed to lead and who require case management.
- In the past, blood lead level tests below 10 micrograms per deciliter of lead in blood may, or may not, have been reported to parents. The new lower value means that more children will likely be identified as having lead exposure allowing parents, doctors, public health officials, and communities to take action earlier to reduce the child's future exposure to lead.

What Has Not Changed

- What has not changed is the recommendation for when medical treatment is advised for children with high blood lead levels. The new recommendation does not change the guidance that chelation therapy be considered when a child has a blood lead test result greater than or equal to 45 micrograms per deciliter.

- Children can be given a blood test to measure the level of lead in their blood. These tests are covered by Medicaid and most private health insurance.

Additional Resources

- CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in “Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention” [PDF – 165 KB]
- Recommendations of the Advisory Committee for Childhood Lead Poisoning Prevention [PDF – 890 KB]
- Summary of Recommendations for Follow-up and Case Management of Children Based on Confirmed Blood Lead Levels

Page last reviewed: July 30, 2019

Attachment 23

Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention

Report of the

Advisory Committee on Childhood Lead Poisoning Prevention

of the Centers for Disease Control and Prevention

January 4, 2012

Disclaimer

This document was solely produced by the Advisory Committee for Childhood Lead Poisoning Prevention. The posting of this document to our website in no way authorizes approval or adoption of the recommendations by CDC. Following the committee vote on January 4, 2012 to approve these recommendations, HHS and CDC will begin an internal review process to determine whether to accept all or some of the recommendations and how to implement any accepted recommendations.

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Executive Summary

Based on a growing body of studies concluding that blood lead levels (BLLs) <10 µg/dL harm children, the Centers for Disease Control and Prevention (CDC) Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) recommends elimination of the use of the term "blood lead level of concern". This recommendation is based on the weight of evidence that includes studies with a large number and diverse group of children with low BLLs and associated IQ deficits. Effects at BLLs < 10 µg/dL are also reported for other behavioral domains, particularly attention-related behaviors and academic achievement. New findings suggest that the adverse health effects of BLLs less than 10 µg/dL in children extend beyond cognitive function to include cardiovascular, immunological, and endocrine effects. Additionally, such effects do not appear to be confined to lower socioeconomic status populations. Therefore, the absence of an identified BLL without deleterious effects combined with the evidence that these effects, in the absence of other interventions, appear to be irreversible, underscores the critical importance of primary prevention.

Primary prevention is a strategy that emphasizes the prevention of lead exposure, rather than a response to exposure after it has taken place. Primary prevention is necessary because the effects of lead appear to be irreversible. In the U.S., this strategy will largely require that children not live in older housing with lead-based paint hazards. Screening children for elevated BLLs and dealing with their housing only when their BLL is already elevated should no longer be acceptable practice.

The purpose of this report is to recommend to the CDC how to shift priorities to implement primary prevention strategies and how to best provide guidance to respond to children with BLLs <10 µg/dL. This report also makes recommendations to other local, state and federal agencies, and the

ACCLPP recommends that CDC work cooperatively with these other stakeholders to provide advice and guidance on the suggested actions.

This report recommends that a reference value based on the 97.5th percentile of the NHANES-generated BLL distribution in children 1-5 years old (currently 5 µg/dL) be used to identify children with elevated BLL. There are approximately 450,000 U.S. children with BLLs above this cut-off value that should trigger lead education, environmental investigations, and additional medical monitoring.

In the pediatric primary care office, primary prevention must start with counseling – even prenatally when possible. This includes recommending environmental assessments for children PRIOR to screening BLLs in children at risk for lead exposure. After confirmatory testing, children at or above the reference value of 5 µg/dL must undergo ongoing monitoring of BLLs. These children should also be assessed for iron deficiency and general nutrition (*e.g.* calcium and vitamin C levels), consistent with American Academy of Pediatrics (AAP) guidelines. Iron-deficient children should be provided with iron supplements. All BLL test results should be communicated to families in a timely and appropriate manner. Children with elevated BLLs will need to be followed over time until the environmental investigations and subsequent responses are complete.

Despite significant progress in reducing geometric mean BLLs in recent decades, racial and income disparities persist. These observed differences can be traced to differences in housing quality, environmental conditions, nutrition, and other factors. The goal of primary prevention is to ensure that all homes become lead-safe and do not contribute to childhood lead exposure. Prevention requires that we reduce environmental exposures from soil, dust, paint and water, before children are exposed to these hazards. Efforts to increase awareness of lead hazards and ameliorative nutritional interventions are also key components of a successful prevention policy.

Historical information on where children with elevated BLLs reside, and other housing data can be used to direct resources for environmental testing and evaluation to homes where lead hazards are more likely to be found. Because lead-based paint hazards are the primary source of childhood exposure to lead in the U.S, and because lead-paint is present in one-third of the nation's dwellings, additional investment is needed to reduce lead hazards in older homes. Housing policies to protect children against lead exposure must target the highest risk properties for priority action, ensure that lead-safe practices are followed during renovation, repair and painting of pre-1978 homes, and to prohibit lead-based paint hazards, including deteriorated paint, in pre-1978 homes.

Local and state government must facilitate data-sharing between health and housing agencies, enact and enforce preventive lead-safe housing standards for rental and owner-occupied housing, help identify financing for lead hazard remediation, and provide families with the information needed to protect their children from hazards in the home.

Additional research is needed to develop and evaluate interventions that effectively maintain BLLs below the reference value in children who reside in pre-1978 housing. Other research priorities should include efforts to improve the use of data from screening programs, develop next-generation point-of-care lead analyzers, and improve the understanding of epigenetic mechanisms of lead action.

Introduction

The Lead Contamination Control Act of 1988 authorized the Centers for Disease Control and Prevention (CDC) to initiate efforts to eliminate childhood lead poisoning in the U.S. As a result, the CDC Childhood Lead Poisoning Prevention Program was created, with primary responsibility to: 1) develop programs and policies to prevent childhood lead poisoning; 2) educate the public and health-care providers about childhood lead poisoning; 3) provide funding to state and local health departments to determine the extent of childhood lead poisoning by screening children for elevated blood lead levels (BLLs), helping to ensure that lead-poisoned infants and children receive medical and environmental follow-up and developing neighborhood-based efforts to prevent childhood lead poisoning; and 4) support research to determine the effectiveness of prevention efforts at federal, state, and local levels.

Furthermore, CDCs Healthy People 2010 initiative set forth as one of its 10-year goals the elimination of childhood lead poisoning. Therefore, CDC, the Department of Housing and Urban Development, the Environmental Protection Agency, and other agencies have developed a federal interagency strategy to achieve this goal by 2010. The key elements of this interagency strategy include: identification and control of lead paint hazards, identification and care for children with elevated blood lead levels, surveillance of elevated BLLs in children to monitor progress; and research to further improve childhood lead poisoning prevention methods.

Advisory Committee On Childhood Lead Poisoning Prevention (ACCLPP)

The Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) was established by the CDC to advise and guide the CDC regarding new scientific knowledge and technical advances and their practical implications for childhood lead poisoning prevention efforts. The overall goal of the ACCLPP is to provide advice that will assist the nation in reducing the incidence and prevalence of

childhood lead poisoning. ACCLPP is charged with evaluating information about the health effects of lead exposure in children, the epidemiology of childhood lead poisoning, implementation issues, and other factors. Furthermore, according to its charter, ACCLPP:

- reviews and reports regularly on childhood lead poisoning prevention practices;
- recommends improvement in national childhood lead poisoning prevention efforts;
- develops written recommendations for the prevention and control of childhood lead poisoning.

Blood Lead Level of Concern Work Group Charge

In keeping with this assignment, ACCLPP established the Blood Lead Level Work Group in November 2010 to recommend a new approach, terminology, and strategy for responding to and preventing elevated BLLs in children. The charge of this working group was to:

- Recommend how to best replace the 'level of concern' in relation to accumulating scientific evidence of adverse effects of BLLs <10 µg/dL in children.
- Consider laboratory capability for measuring BLLs in establishing new guidance on childhood BLLs.
- Advise CDC on how to communicate advisories to groups impacted by policy changes concerning: 1) interpretation of childhood BLLs and trends in childhood BLLs over time; 2) screening and re-screening intervals; 3) requirements and procedures for notifying relevant family members concerning BLL test results; and 4) interventions known to reduce lead exposure.
- Make recommendations for future research on lead-exposure prevention and intervention strategies.

I. Scientific Rationale for Eliminating the CDCs 10 μg/dL Blood Lead Level of Concern

KEY POINTS/RECOMMENDATIONS

- ***Based on the scientific evidence, the ACCLPP recommends that the term "level of concern" be eliminated from all future agency policies, guidance documents, and other CDC publications, and that current recommendations based on the "level of concern" be updated according to the recommendations contained in this report.***

- ***CDC should use a childhood BLL reference value based on the 97.5th percentile of the population BLL in children ages 1-5 (currently 5 μg/dL) to identify children and environments associated with lead-exposure hazards. The reference value should be updated by CDC every four years based on the most recent population based blood lead surveys among children.***

Prior ACCLPP Guidance

The adverse health effects associated with elevated BLLs have been widely studied and documented (http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=158823#Download). In the past, the CDC responded to the accumulated evidence of adverse effects of elevated BLLs by lowering the level requiring intervention or what is now deemed the "blood lead level of concern." Over the period from 1960 to 1990, the designated BLL of concern was lowered incrementally from 60 to 25 μg/dL. In 1991, the CDC recommended lowering the BLL for individual intervention to 15 μg/dL, and implementing community-wide primary lead-poisoning prevention activities in areas where many children had BLLs > 10 μg/dL ([1] (http://www.cdc.gov/nceh/lead/publications/>).

In 2005, the ACCLPP again considered the BLL of concern and evaluated new studies that had been published through 2003 relating toxic effects, especially cognitive impairment in children, to BLLs < 10 μg/dL. Based on that evaluation, the CDC issued a statement in 2005[2] (http://www.cdc.gov/nceh/lead/publications/PrevLeadPoisoning.pdf) citing several reasons not to lower the BLL level of concern. These reasons included: 1) the absence of effective clinical or public health interventions identified that could reliably and consistently lower BLLs that were already <10

μg/dL, 2) the assessment that data on IQ in association with BLLs <10 μg/dL relied on fewer than 200 children, 3) the fact that because poor housing, poverty, lead exposure, and cognitive impairment often occurred together especially in the U.S., the role of any specific component in influencing IQ, was difficult to isolate with certainty, and, 4) uncertainties of BLL classification related to laboratory testing precision. The 2005 document also strongly endorsed primary prevention and incorporated these strategies into CDC-funded programs, as well as recommended to other agencies that they act accordingly to carry out primary prevention. In addition, the 2010 Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women [3] (http://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf) gave the level of 5 μg/dL as the level at which to take action by healthcare and public health providers.

New Evidence and Updating Guidance

However, for multiple reasons, the reliance on both the 10 μg/dL BLL, as well as the concept of a "level of concern" has been increasingly questioned. Since 2003, additional reports of associations between BLLs <10 μg/dL in children with adverse cognitive, and increasingly with other physiological consequences, have been published. Additionally, data from earlier cross-sectional studies of IQ in older children, not considered central to the argument in 2003, have since been re-interpreted as highly relevant, based on reanalysis of prospective data focusing specifically on the time course of associations between blood lead and IQ. The process for setting a "level of concern" for lead has always failed to include consideration of uncertainty or the inclusion of a margin of safety. Although initially intended as a designation of a population-based action level, the level of concern has been widely treated as an individual toxicity threshold. At this time, other countries and even individual U.S. states, have abandoned both 10 μg/dL and the "level of concern."

Consequently, ACCLPP convened a Work Group in 2010 to reconsider the approach, terminology and strategy for elevated BLLs in children. After careful consideration of the current scientific literature, the ACCLPP recommends discontinuation of a designated 'level of concern' for elevated BLL in children. Because no measureable level of blood lead is known to be without deleterious effects, and because once engendered, the effects appear to be irreversible in the absence of any other interventions, public health, environmental and housing policies should encourage prevention of all exposures to lead. Correspondingly, this document emphasizes prevention of exposure rather than responses to specific BLLs, a strategy deemed 'primary prevention.' Public health goals must target the reduction of the disparities in children's BLLs that occur as a result of housing conditions, environmental contamination, race/ethnicity, and socioeconomic status.

As stated in reports from the State of California [5] and Healey et al [4] and, ***a biological "threshold" or "effect level" BLL is not synonymous with a BLL at which intervention is required or effective. Correspondingly, the ACCLPP recognizes that the selection of any BLL as a trigger for action or inaction at an individual or community level will be primarily dependent upon the availability of effective remediation approaches and financial means to accomplish them and, to some degree, related analytical considerations.*** Given those facts, recommendations in the later sections of the document refer to the use of reference values.

A statistically derived reference value characterizes the upper margin of the distribution of the laboratory measurement of a given analyte in a given population. A reference value is useful to characterize individual results as "elevated" or "not elevated" in comparison to the population average or mean value. These values have also been used to set health policy goals and to interpret results from measures of chemical exposure by CDC, the World Health Organization and other

government bodies. The German Federal Environmental Agency has recently applied the use of reference values to define "precautionary action values" for exposures to lead among children and adults [6].

A reference value* is derived from the distribution of concentrations of a specific compound or element in a body fluid of a reference population (often the 97.5th percentile). Therefore, these levels only apply to a specific population at a specific time. In the context of childhood BLLs in the U.S., NHANES data provides an appropriate source for characterizing a reference value for BLLs in children 1-5 years old. We propose that the 97.5th percentile derived from the combination of the two most recent cycles of NHANES data be used to identify individuals with increased exposure and set public health goals. The current reference value (approximately 5 µg/dL) for children's BLLs should be re-considered by the CDC every four years to ensure that changes in this population are adequately assessed.

* The term "reference value" used in this document should be distinguished from the term "reference dose" used by U.S. EPA, which refers to "An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime", or to U.S. EPA's definition of "Reference value (RfV) as "An estimate of an exposure for a given duration to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime" [cf: http://www.epa.gov/iris/help_gloss.htm#r] [accessed 11/09/2011].

Focus on the Weight of Evidence

Section I of this document describes the scientific rationale for the recommendation to eliminate the term "blood lead level of concern." This document is not intended as a risk assessment for lead, nor as a comprehensive review of the current scientific literature. Indeed, the scientific rationale presented here builds upon risk assessments carried out by other regulatory and policy bodies, including the German Human Biomonitoring Commission [6], the State of California [5], and

the literature reviewed in the 2005 CDC statement [2]. Advice on clinical, public health, housing and environmental interventions in relation to BLLs will be described in later sections.

Recognizing that any individual study may have shortcomings, the BLL Work Group based its conclusions on the overall weight-of-the-evidence from epidemiological studies of BLLs <10 μg/dL and the consistency of outcomes. In addition, it considered supporting biological plausibility evidence from animal studies.

Additional Evidence Relating Increasing BLLs with Reductions in IQ

The recommendation of the ACCLPP arises from several considerations. In 2003, Canfield et al. reported decrements in school age IQ among 213 children whose peak BLLs had never exceeded 10 μg/dL [7]. Similarly, Bellinger and Needleman, in a re-analysis of data from 48 children from the Boston cohort study whose BLLs never exceeded 10 μg/dL, reported a similar association [8]. ACCLPP reviewed these and other data, and stated in 2005 that these associations, more likely than not, were causal. There are now additional compelling studies in the scientific literature, reporting associations between BLLs <10 μg/dL and adverse effects in children, forming a more substantive body of evidence than was available at the time of the 2005 CDC statement. Collectively, these new studies and re-interpretation of past studies have demonstrated that it is not possible to determine a threshold below which BLL is not inversely related to IQ.

Healey et al. [4], citing Lanphear et al. [9] as the critical study in its toxicological assessment, asserted that that there is a negative slope relating BLL and IQ down to concurrent BLLs of 1 μg/dL. An increase in concurrent BLL from 1.0 to 4.0 μg/dL is associated with a change in mean IQ of approximately -2.3 to -5.2 IQ points, with a best estimate of -3.7 IQ points. The German Human

Biomonitoring Commission [6] concluded that it is not possible to identify a threshold BLL below which there are no cognitive deficits.

Evidence for Reductions in Academic Achievement and Specific Areas of Cognitive Dysfunction

Studies have also now extended the effects of low BLLs, and suggest the involvement of specific areas of cognitive dysfunction. These include measures of academic achievement such as reading and writing, as well as attention deficits, specifically impulsivity. For example, Chandramouli et al. [10] reported that BLLs in the range 5-10 μg/dL in 30 month-old children were associated with reductions in reading and writing scores in 7-8 year old children from the Avon Longitudinal Study. In a case-control study of children 6-17 years old [11], where the mean BLL was 0.73 and maximum BLL was 2.2 μg/dL, higher BLLs was associated with parent-reported combined-type attention deficit hyperactivity disorder and hyperactivity-impulsivity after controlling for IQ and prenatal smoking.

Significance of the Impact of BLLs on Intelligence

Although only 1 – 4% of the variance in cognitive ability in prospective cohort studies is attributable to lead, the public health impact of low level lead-exposure on the distribution of intelligence in society is considerable. Because exposure to lead is still widespread, it may be responsible for a general reduction in the mean IQ of children. A small change in mean IQ of even 3-5 points associated with BLLs between 1 and 10 μg/dL can shift the entire population IQ distribution, thereby reducing the number of high achieving individuals with IQs above 130, and increasing the number of children with IQ scores below 70, many of whom would need substantial remedial education services [12].

Critical Role of Concurrent BLLs and Intelligence

Studies published since 2005 have also established the importance of concurrent BLLs to IQ reductions. In the U.S., BLLs peak at approximately 2 years of age, after which they decline to lower levels in the absence of specific intervention. Bellinger et al. [13] reported that BLLs measured at 24 months of age, but not at 6, 12, 18 or 57 months of age, were associated with decrements in IQ when measured at 10 years of age in children from the Boston cohort [14]. These findings had cast doubt on any study that did not include data on early childhood BLLs, suggesting that any relationship between BLLs and IQ reductions in large surveys of school age children, such as NHANES, were not causal associations, but rather residual effects of higher BLLs that went unmeasured in early childhood. However, other studies noted that the findings from the Boston cohort appeared to be an exception, as most prospective studies showed stronger associations between concurrent BLLs and IQ reductions at school age, *even though the average BLL at that age was much lower* [15, 16]. In 2005, Chen et al. studied 780 children who qualified for a clinical trial by virtue of having BLLs in the range 20-44 µg/dL when they were "toddlers," and found that lower IQ at age 7 was strongly associated with concurrent BLL, but not associated with peak BLL at 2 years of age [17]. Similar findings were reported in a pooled analysis of major prospective cohort studies of IQ and BLLs, which involved children with and without such high BLLs [9]. Thus, since 2003, data from a much larger number and more diverse group of children with low BLLs and associated IQ deficits have informed consideration of the effect levels. The associations of concurrent BLLs with reduced IQ in this age group suggests a window of developmental vulnerability extending to older children, or perhaps the consequences of protracted exposure during childhood.

Low BLL Effects in Children Extend to Other Organs/Systems

Some recent studies have suggested that the adverse health effects of childhood BLLs <10 μg/dL extend beyond cognitive function to include cardiovascular, immunological, endocrine, and behavioral effects [18-22]. While the data on these outcomes are less extensive than the data characterizing the impact of lead on neurocognitive development, and therefore merit further investigation, they nevertheless raise the possibility that BLLs <10 μg/dL might be associated with broader public health consequences.

Elevated BLL Effects in Children are not Restricted to Low Socioeconomic Status Communities

The conclusions of the 2005 Working Group included concerns for residual confounding by socioeconomic status. It is noteworthy that several studies report associations in populations of relatively "advantaged" socioeconomic status. For example, the analyses from the Boston cohort study, including assessment of children whose BLLs never exceeded 10 μg/dL, was carried out in a "socioeconomically-advantaged population" [8, 13]. Moreover, the BLL-associated reductions in IQ in the Yugoslavian prospective study were seen in Mitrovica, where BLLs were elevated by the local smelter, even though the town also had higher HOME scores and higher maternal IQ scores than the comparison town, Pristina [23]. As pointed out in Healey et al.'s review of 12 longitudinal studies of BLLs and IQ ([4] p. xix), "The pattern of results does not appear to be dependent on cohort demographics, such as SES [socioeconomic status], nor do they appear to be dependent on exposure range – significant associations have been reported among both relatively low and relatively high socioeconomic strata…."

Expectations of Lower BLLs and Changes in IQ and Achievement

It has been argued that even though BLLs have declined, measures on standardized indices such as reading and IQ scores have not correspondingly increased in the U.S., which contradicts the proposed negative association between these measures. As far as the ACCLPP is aware, there are no published data that support this conclusion. Numerous studies have actually reported significant increases in IQ scores over the past century, a phenomenon dubbed the Flynn effect, which has been attributed both to characteristics of the IQ tests themselves and to cultural biases [24, 25]. While this does not demonstrate that lowering BLL is accompanied by higher IQ, it is not incompatible with that possibility. U.S reading scores have increased (http://nces.ed.gov/nationsreportcard/pdf/main2011/2012457.pdf), although to a lesser extent; changes over time are difficult to evaluate given changes in assessment format during this period (National Assessment of Education Progress (NAEP): http://nationsreportcard.gov/ltt_2008/ltt0003.asp and http://nationsreportcard.gov/ltt_2008/ltt0002.asp). (Note however the recent analysis suggesting that the reduction in childhood BLLs in Massachusetts underlies a modest but statistically significant improvement in scores on standardized English and mathematics tests (http://www.bos.frb.org/econoomic/wp/index.htm). Over the same time period, many other significant changes have occurred that could reduce any gains in these cognitive measures, as such functions clearly have multifactorial determinants. For example, the poverty rate has continued to increase (http://www.census.gov/hhes/www/poverty/data/incpovhlth/2010/tables.html), the rates of childhood obesity (http://www.cdc.gov/obesity/data/trends.html#State) and diabetes (http://www.diabetesandenvironment.org/home/incidence/historical) have increased dramatically, and have been associated with cognitive dysfunction [26, 27], and nutritional status has also changed. It is also clear that the U.S. has lost ground in terms of prenatal mortality

(http://www.cdc.gov/omhd/amh/factsheets/infant.htm#1). Moreover, as noted by Healey et al. ([4]p. xxxix): "While the magnitude of the slope of the recommended relationship between mean population IQ and concurrent blood lead in children is undoubtedly influenced to some unknown degree by confounding, it is also likely attenuated by over-control." Other outcomes, such as high school graduation, delinquency, violent crime, or incarceration have a less clear relationship with BLL and perhaps a variable latency. A comprehensive examination of such outcomes might be of interest; however, for reasons of multifactorial determination noted above, it seems unlikely that such effort would yield a consistent interpretation, nor that it would inform judgment about the toxicity of lead at a given BLL.

Shape of the BLL Curve and Outcomes

Other arguments also weigh in this decision. Recognizing the potential for residual confounding, the CDC's 2005 statement ([28]; http://www.cdc.gov/nceh/lead/publications/PrevLeadPoisoning.pdf) explored the question of the steeper dose response at lower BLLs, and evaluated how the interactions among lower dust lead, hand to mouth activity, IQ and BLL might artifactually produce the steeper curve. The document concluded that "Though this hypothetical example cannot demonstrate that residual confounding underlies the steep blood lead-IQ slopes observed at low levels, it does support the need for caution in interpreting the absolute value of the estimated effect sizes." However, it also did not state that the existence of a steeper slope in some data was evidence against any role for lead in cognitive impairment. As such, the specific shape of the curve above vs. below 10 µg/dL is not actually relevant to the question of an association of BLLs with effects below 10 µg/dL. Additionally, for other outcome

measures, effects below 10 μg/dL are found without reports of these effects being of greater magnitude than those above 10 μg/dL.

Uncertainties Regarding the Ability to Reverse Lead Effects in Children

While trials involving chelating agents did not result in improved IQ or behavioral outcomes relative to placebo [29], both human and animal studies have suggested that developmental effects arising from lead exposure could be at least partially ameliorated by opportunities for environmental 'enrichment' [30-33]. The extent to which the developmental impacts of lead-exposure in children can be fully reversed by such strategies as yet remains uncertain. The fact that significant stores of lead are present in bone with a half-life of decades, coupled with the fact that lead can be mobilized from bone back into the bloodstream to maintain equilibrium, if external lead exposure is reduced, makes it difficult to directly test this possibility. Moreover, the prospect that some environmental conditions or host factors (nutritional status, psychosocial stress, etc.) may aggravate the impact of developmental lead exposure has yet to be considered. In general, non-specific interventions that work in Head Start and other enrichment programs might be expected to produce similar results in children with and without a history of elevated BLLs. Tactics aimed solely at lowering BLLs with the expectation of reversing effects, however are unlikely to produce a benefit.

Biological Plausibility Support from Experimental Animal and In Vitro Studies

Finally, the effects reported in children are supported by biological plausibility, i.e., experimental animal studies. Rodent studies have revealed adverse consequences of BLLs of 7-11 μg/dL on cognitive domains comparable to those associated with elevated BLLs in children; these studies have not yet systematically attempted to define clear BLL threshold effects [34, 35].

Moreover, the alterations in the stress response of children in relation to low BLLs [19], particularly the delay in glucocorticoid negative feedback, actually replicates findings in animal models [34, 36].

Animal and *in vitro* studies have identified mechanisms of lead toxicity that could explain the observed greater magnitude of adverse outcomes at lower BLLs for some outcome measures. Reports of non-linear dose effect relationships between BLLs and multiple outcomes, both in human and experimental animal studies, are well established as first detailed by Davis and Svenndsgaard in 1990 [37]. A recent study found a greater delay in post-stress challenge reduction in corticosterone (the rodent version of cortisol) in rats with lower BLLs (maternal exposure yielding peak BLLs of 15-20 μg/dL) than at higher BLLs (30-35 μg/dL) [36].

Furthermore, with respect to the mechanisms of lead effects and possible differential effects at lower rather than higher BLLs, the work of Audesirk and colleagues [38, 39] is highly instructive. Based on a general belief that many effects of lead exposure arise from its ability to substitute for calcium, a metal which is essential to a substantive number of biochemical reactions and physiological processes, this group examined the effects of lead alone or lead plus calcium on the activity of Ca^{2+}/calmodulin-dependent calcineurin. This study demonstrated that lead had the potential, depending upon free concentration of Pb^{2+}, to either stimulate or inhibit Ca^{2+}/calmodulin-dependent calcineurin, with lower lead concentrations increasing and higher lead concentrations decreasing activation of calcineurin.

Summary of Scientific Rationale

In summary, many of the uncertainties associated with effects of BLLs <10 μg/dL cited by the CDC in 2005 [2] have been minimized by more recently published studies. As a result, a BLL without deleterious effects can not be identified at present, and thus the term 'level of concern', or any

suggestion of the existence of a BLL threshold, should be discarded from CDC guidance policies and replaced by new policies and terminology that offer scientifically-based and practical guidance for application in the clinical, laboratory, and public health contexts. Consequently, public health and environmental policies should encourage actions to reduce **all** lead exposure, to the extent feasible [40], and, should specifically focus on minimizing disparities in childhood BLLs as demonstrated by NHANES-documented disparities in housing conditions, environmental contamination, race/ethnicity, and socioeconomic status. Even though the most recent NHANES survey (2007 - 2008) demonstrates considerable progress in lowering BLLs in the U.S., it also confirms that higher BLLs persist in non-Hispanic black children. Similar disparities were noted when BLLs were stratified by poverty-income ratio [41].

A Renewed Call for Primary Prevention

The above arguments as well as those that follow all underscore the critical importance of primary prevention. Using a strategy of identifying lead poisoning or elevated BLL relies on detection in the child, relegating the child to the function of a sensing device for poor/contaminated housing, contaminated water and/or tainted consumer products. Thus, the child can be considered the proverbial 'canary in the coal mine.' The current strategy, which relies on the identifying extant elevated BLLs), while still warranted to some extent, does not prevent the damage already incurred. Moreover, while agents such as chelators can be used to treat overt lead poisoning and possibly reduce the case fatality rate, these agents have been demonstrated not to improve IQ or behavioral consequences of lead exposure. Therefore, primary prevention is the most important and significant strategy.

Attachment 24

CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "*Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention*"

BACKGROUND

In late 2010, the Centers for Disease Control and Prevention's (CDC) Advisory Committee for Childhood Lead Poisoning Prevention (ACCLPP) formed a workgroup to evaluate new approaches, terminology, and strategies for defining elevated blood-lead levels (BLLs) among children. ACCLPP established the ad hoc Blood Lead Level workgroup on November 10, 2010. The charge of this workgroup was to:

1. Recommend how to best replace the term, 'level of concern,' regarding accumulating scientific evidence of adverse effects of BLLs at < 10 μg/dL in children.
2. Consider laboratory capability for measuring BLLs in establishing new guidance on childhood BLLs.
3. Advise ACCLPP on how CDC should communicate advisories to groups affected by policy changes concerning:
    a. Interpretation of childhood BLLs and trends in childhood BLLs over time;
    b. Screening and follow-up screening intervals;
    c. Requirements and procedures for notifying parents or guardians concerning BLL test results; and,
    d. Interventions known to control or eliminate lead exposure.

June 7, 2012 NOTE: This version of the CDC response has been slightly modified from one released on May 13, 2012. This version reflects the verbatim recommendations made by the ACCLPP on January 04, 2012 and has been formatted to link each recommendation to its response. No other changes were made.

On November 16–17, 2011, the ACCLPP met and deliberated on the ad hoc workgroup draft report. On January 4, 2012, the ACCLPP met and a majority approved the report, including the recommendations.

In brief, the ACCLPP recommendations include:

- Elimination of the use of the term "blood lead level of concern" based on the compelling evidence that low BLLs are associated with IQ deficits, attention-related behaviors, and poor academic achievement. The absence of an identified BLL without deleterious effects, combined with the evidence that these effects appear to be irreversible, underscores the critical importance of primary prevention. This strategy emphasizes preventing lead exposure rather than responding after the exposure has taken place. ACCLPP recommends specific actions that CDC and other local, state, and federal agencies should take to shift priorities to primary prevention and provides guidance to respond to BLLs < 10 μg/dL in children. The ACCLPP recommends that CDC collaborate with these and other stakeholders, and provide advice and guidance. ACCLPP also recommends using a reference value based on the 97.5th percentile of the BLL distribution among children 1–5 years old in the United States (currently 5 μg/dL) to identify children with elevated BLLs using data generated by the National Health and Nutrition Examination Survey (NHANES). Approximately 450,000 children in the United States have BLLs higher than this reference value.
- Additional research is needed to develop and evaluate interventions that effectively maintain BLLs below the reference value in children. Other research priorities should include efforts that better use data from screening programs; develop next-generation,

point-of-care lead analyzers; and improve the understanding of epigenetic mechanisms of lead action.

Herein we describe CDC's response to each of the ACCLPP recommendations. The proposed methods to address recommendations are contingent on the availability of resources. In FY 2012, funding for CDC's Childhood Lead Poisoning Prevention activities was reduced significantly from FY 2011. As a result, funding is not available for state and local Childhood Lead Poisoning Prevention Programs (CLPPPs). In many instances, these reductions limit CDC's ability to fully implement many of these recommendations in the short term. This draft response was prepared by CDC's National Center for Environmental Health (NCEH).

For the purpose of these responses:

Concur – We agree, and we have the funding, staff, and control over the means to implement the recommendation. The response provides potential strategies which are achievable within current FY 2012 or proposed FY 2013 resources.

Concur in principle – We agree, but we do not have the funding, staff, or control over the means to implement the recommendation. The response highlights strategies that have been shown to be effective, however a commitment to implement actions cannot be made due to our lack of control over available resources.

Nonconcur – We disagree with the recommendations and provide the reasons for the disagreement.

CDC concurred or concurred in principle with all of the recommendations approved by the ACCLPP.

RECOMMENDATIONS

I. Recommendation: ***Based on the scientific evidence, the ACCLPP recommends that the term, "level of concern", be eliminated from all future agency policies, guidance documents, and other CDC publications, and that current recommendations based on the "level of concern" be updated according to the recommendations contained in this report.***

Concur

Specific Means to Address or Implement

a. CDC will emphasize that the best way to end childhood lead poisoning is to prevent, control or eliminate lead exposures. Since no safe blood lead level in children has been identified, a blood lead "level of concern" cannot be used to define individuals in need of intervention.

b. In FY2012, CDC will discontinue using the term 'level of concern' in future publications and replace it with the reference value and the date of the NHANES that was used to calculate the reference value. CDC also will make this standard language available to operating divisions across CDC and use the cross-clearance procedure to ensure that authors adopt this language.

c. Publications on the Web site (www.cdc.gov/nceh/lead) will use the terminology in place at the time of their publication. The CDC Lead statement 1975–1991 includes

an asterisked note that "these documents are being kept on this website for historical purposes and are no longer in print." In FY2012, CDC will add the asterisk to the 2005 statement and the footnote will be edited to include the words "These documents refer to various blood-lead thresholds and levels of concern for adverse health outcomes in children. This terminology is outdated and readers are referred to the ACCLPP recommendations of 2012." A similar note will be applied to the document, "Managing Elevated Blood Lead Levels Among Children" (CDC, 2002) that states: "This document refers to a blood-lead level of 10 µg/dL as the CDC level of concern for adverse health outcomes in children. This terminology is outdated and readers are referred to the ACCLPP recommendations of 2012. However, the 2012 document does not recommend changes to the guidelines for the evaluation and treatment of children requiring chelation (BLLs ≥ 45 µg/dL) published here."

Status: The statement will be placed on www.cdc.gov/nceh/lead no later than two weeks following agency clearance. A joint publication summarizing the ACCLPP recommendations and CDC's response will be submitted jointly to the *Morbidity Mortality Weekly Review* and the journal, *Pediatrics*, no later than May 2012.

II. Recommendation: ***CDC should use a childhood BLL reference value based on the 97.5th percentile of the population BLL in children ages 1-5 (currently 5 µg/dL) to identify children and environments associated with lead-exposure hazards. The reference value should be updated by CDC every four years based on the most recent population based blood lead surveys among children.***

Concur in principle

Specific Means to Address or Implement

In FY12, CDC will:

a. Use the reference value in recommendations that involve follow-up evaluation of children after BLL testing.

b. Use the reference value as defined to identify high-risk childhood populations and geographic areas most in need of primary prevention.

c. Provide this information, including specific high-risk areas, to a wide variety of federal, state, and local government agencies and nongovernment organizations interested in lead-poisoning prevention.

In addition, CDC will update the value every 4 years using the two most recent NHANES surveys. The updated reference value will be posted at www.cdc.gov/nceh/lead and widely distributed through various Web-based LISTSERV sites, pediatric associations, and partners at the federal, state, and local level. Updated reference values will be reported in the National Report on Human Exposures to Environmental Chemicals and other relevant journals.

Status: CDC's National Center for Health Statistics (NCHS) will continue to monitor BLLs in the United States and make data tapes available on its Web site for public use at 2-year intervals.

CDC publications will use the reference value to provide guidance to clinical health care providers and others as these publications are prepared. Broader dissemination through Web sites, notices to clinical pediatric care providers, and the MMWR will be considered by CDC in the future.

III. Recommendation: ***CDC should develop and help implement a nationwide primary prevention policy to ensure that no children in the U.S. live or spend significant time in homes, buildings or other environments with lead-exposure hazards.***

Concur in Principle

Specific Means to Address or Implement

CDC recognizes the value of primary prevention. As feasible, CDC will develop strategies and guidelines for primary prevention. Implementation of primary-prevention programs is not currently practicable.

Status: CDC may examine the possibilities of working with the U.S. Department of Housing and Urban Development (HUD), the Health Resources and Services Administration (HRSA), state and local governments, and philanthropic organizations to identify opportunities for collaboration on primary prevention in the future.

IV. Recommendation: ***Clinicians should be a reliable source of information on lead hazards and take the primary role in educating families about preventing lead exposures. This includes***

recommending environmental assessments PRIOR to blood lead screening of children at risk for lead exposure.

Concur in Principle

Specific Means to Address or Implement

Although this recommendation is directed to clinicians, CDC may play a supportive role in enhancing the recommendation by working with providers to provide educational material. Some currently available resources can be used to update CDC/ATSDR documents to reflect the primacy of clinical health care providers in educating families about preventing lead exposure. For example, revisions to the ATSDR Lead Toxicity Case Study (available at http://www.atsdr.cdc.gov/csem/csem.html) are scheduled for 2012, and these changes can be incorporated.

Status: Full implementation contingent on funding

V. Recommendation: ***Clinicians should monitor the health status of all children with a confirmed BLL ≥5 µg/dL for subsequent increase or decrease in BLL until all recommended environmental investigations and mitigation strategies are complete, and should notify the family of all affected children of BLL test results in a timely and appropriate manner.***

Concur in Principle

Specific Means to Address or Implement

Although this recommendation is directed to clinicians, CDC may play a supportive role in enhancing the recommendation by working with clinical care providers and professional organizations to achieve this goal. Ensuring that children with BLLs > 5 µg/dL can be retested is feasible within the current resources because these tests are covered by Medicaid and many private health care insurance providers. As discussed earlier, some provider training will be conducted.

Status: Full implementation contingent on funding

VI. Recommendation: ***Clinicians should ensure that BLL values at or above the reference value are reported to local and state health and/or housing departments if no mandatory reporting exists and collaborate with these agencies in providing the appropriate services and resources to children and their families.***

Concur in Principle

Specific Means to Address or Implement

Although this recommendation is directed to clinicians, CDC may play a supportive role in enhancing the recommendation through CDC's continued work with testing laboratories, point-of-care instrument manufacturers, and clinical health care providers to ensure the availability of high-caliber laboratory services. In addition, most of the state CLPPPs funded by CDC have mandatory reporting laws in place, and those that do not are required to implement such laws during this year of funding.

Status: Full implementation contingent on funding

VII. Recommendation: ***Educate families, service providers, advocates, and public officials on primary prevention of lead exposure in homes and other child-occupied facilities, so that lead hazards are eliminated before children are exposed.***

Concur in Principle

Specific Means to Address or Implement

In FY12, CDC will provide available educational materials through its Web site, and seek the assistance of partner agencies and organizations to implement this recommendation. In FY 2012, funding is not available for state and local CLPPPs.

Status: Implementation contingent on funding

VIII. Recommendation: ***CDC should encourage local, state, and other federal agencies to: (a) facilitate data-sharing between health and housing agencies, (b) develop and enforce preventive lead-safe housing standards for rental and owner-occupied housing, (c) identify financing for lead hazard remediation, and (d) provide families with the information needed to protect their children from hazards in the home.***

Concur in Principle (a.-c.)

Specific Means to Address or Implement

a. In FY12, CDC will continue to recommend that health and housing agencies share data that can be used to identify geographic areas where lead-exposure risk is high. In the future, CDC can explore strategies to facilitate data sharing between health and housing agencies. If funds for CLPPPs become available, CDC will require data sharing between CLPPPs and housing agencies in all CLPPP grant programs.

b. CDC has developed guidelines for lead-safe housing and in FY2012 will encourage local, state, and federal agencies to enforce these standards.

c. HUD Lead Hazard Control Program provides approximately $100 million annually and is the most easily identifiable and largest source of federal funding for lead-hazard remediation. Many CLPPPs help property owners complete the HUD application process, help to identify alternative funding sources, and negotiate with local banks. In FY 2012, however, funding is not available for state and local CLPPPs.

Concur (d.)

Specific Means to Address or Implement

d. These materials currently exist and are distributed through a wide variety of networks. Future development of new materials could be considered by CDC in the future.

Status: Implementation contingent on funding

IX. Recommendation: ***Elected officials and the leaders of health, housing, and code enforcement agencies can help protect the children in their jurisdictions from lead exposure in their homes through many activities. CDC should work with officials to ensure adoption of a suite of preventive policies.***

Concur in Principle

Specific Means to Address or Implement

In the future, CDC could consider educating state and local elected officials about the importance of primary prevention and evidenced-based strategies at a national level. In FY 2012, funding is not available for state and local CLPPPs.

Status: Full implementation contingent on funding

X. Recommendation: ***CDC should (a) emphasize the importance of environmental assessments to identify and mitigate lead hazards before children demonstrate BLLs at or higher than the reference value and (b) adopt prevention strategies to reduce environmental lead exposures in soil, dust, paint, and water before children are exposed.***

Concur (a.)

Specific Means to Address or Implement

a. For more than 20 years CDC has emphasized the importance of environmental assessment and mitigation of lead hazards before children are exposed (before their BLLs are at or higher than the reference value) through policies, cooperative agreements, interagency agreements, and publications. CDC will continue these efforts.

Status: Ongoing

Concur in Principle (b.)

Specific Means to Address or Implement

b. In FY12 and FY13, CDC will work with federal agencies that may also be affected by these recommendations including, but not limited to, HUD and the Environmental Protection Agency (EPA). The goal of the summit will be to develop primary prevention strategies. In FY 2012, funding is not available for state and local CLPPPs.

Status: Full implementation contingent on funding

XI. Recommendation:

If lead hazards trigger a response in any unit in a multi-family housing complex, the same response action should be applied to all similar untested units in the housing complex, unless a risk assessment demonstrates that no lead hazards are present in the other units.

(Note: During editing of this document, the wording of this recommendation was changed in the CDC response to the ACCLPP recommendations. On May 23, 2012 this error was corrected and the wording is now the same as that in the original ACCLPP recommendations.)

Concur in Principle

Specific Means to Address or Implement

CDC concurs with the evidence that a building that houses one child with lead poisoning is an indication that other children in that building are likely at risk. In the future, CDC may explore implementing recommendations for increased inspections.

Status: Implementation contingent on funding

XII. Recommendation: CDC should encourage additional research directed towards developing interventions capable of maintaining children's BLLs lower than the reference value.

Concur in Principle

Specific Means to Address or Implement

CDC will work with the National Institute of Environmental Health Sciences (NIEHS) and academic partners to encourage research. This research will be designed to develop and evaluate effective, broadly useful interventions that are effective in the complex lead-exposure situations

that are commonly encountered. In the future, CDC may explore strategies to support additional research.

Status: NIEHS is working with other partners to foster collaboration on developing a research agenda that will address the spirit of the recommendation. In the future, CDC may explore strategies to support additional research.

XIII. Recommendation: ***Additional research priorities should include improve the use of data from screening programs, develop next generation point-of-care lead analyzers, and improve the understanding of epigenetic mechanisms of lead action.***

Concur

Specific Means to Address or Implement

As funding permits, CDC will work with NIEHS, academic partners, and laboratory instrument manufacturers to encourage research in these important areas.

Status: There is ongoing interaction with NIEHS and others to foster collaboration on developing a research agenda.

Attachment 25

CDC Centers for Disease Control and Prevention

Childhood Lead Poisoning Prevention

Recommended Actions Based on Blood Lead Level

Summary of Recommendations for Follow-up and Case Management of Children Based on Confirmed* Blood Lead Levels

Blood Lead Level (BLL)					
<5 µg/dL	**5–9 µg/dL**	**10–19 µg/dL**	**20–44 µg/dL**	**45–69 µg/dL**	**≥70 µg/dL**
Routine assessment of nutritional and developmental milestones	Routine assessment of nutritional and developmental milestones	Routine assessment of nutritional and developmental milestones	Complete history and physical exam with neurodevelopmental assessment	Complete history and physical exam with neurodevelopmental assessment and complete neurological exam	Hospitalize and commence chelation therapy in conjunction with consultation with a medical toxicologist or a pediatric environmental health specialty unit
Anticipatory guidance about common sources of lead exposure	Environmental exposure history to identify potential sources of lead -and- environmental investigation of the home to identify potential sources of lead, as required**	Environmental exposure history to identify potential sources of lead-and-environmental investigation of the home to identify potential sources of lead	Environmental investigation of the home and lead hazard reduction	Environmental investigation of the home and lead hazard reduction	Environmental investigation of the home and lead hazard reduction; child receiving chelation therapy should not return to home until lead hazard remediation is completed
Follow-up blood lead testing at recommended intervals based on child's age according to schedule below	Follow-up blood lead monitoring at recommended intervals according to schedule below	Follow-up blood lead monitoring at recommended intervals according to schedule below	Follow-up blood lead monitoring at recommended intervals according to schedule below	Follow-up blood lead monitoring at recommended intervals according to schedule below	Follow-up blood lead monitoring at recommended intervals according to schedule below

Blood Lead Level (BLL)					
	Nutritional counseling related to calcium and iron intake	Nutritional counseling related to calcium and iron intake; consider lab work to assess iron status	Lab work: – Iron status – Hemoglobin or hematocrit	Lab work: – Iron status – Hemoglobin or hematocrit	Lab work: – Iron status – Hemoglobin or hematocrit
			Abdominal X-ray (with bowel decontamination if indicated)	Abdominal X-ray (with bowel decontamination if indicated)	Abdominal X-ray (with bowel decontamination if indicated)
				Oral chelation therapy may be considered in consultation with a medical toxicologist or a pediatric environmental health specialty unit; consider hospitalization, if lead-safe home environment cannot be assured	

µg/dL: micrograms per deciliter

***Confirmed BLL**: elevated capillary screening results should be confirmed with blood drawn by venipuncture (see Recommended Schedule for Obtaining a Confirmatory Venous Sample below).

References:

1. Binns HJ, Campbell C, Brown MJ, for the Advisory Committee on Childhood Lead Poisoning Prevention. Interpreting and Managing Blood Lead Levels of Less Than 10 µg/dL in Children and Reducing Childhood Exposure to Lead: Recommendations of the Centers for Disease Control and Prevention Advisory Committee on Childhood Lead Poisoning Prevention. Pediatrics 2007 Nov;120(5): e1285. www.pediatrics.org/cgi/doi/10.1542/peds.2005-1770
2. Caldwell KL, Cheng PY, Jarrett JM, Makhmudov A, Vance K, Ward CD, Jones RL, Mortensen ME. Measurement Challenges at Low Blood Lead Levels. Pediatrics 2017 Aug;140(2): e0272. www.pediatrics.org/cgi/doi/10.1542/peds.2017-0272
3. The Clinical & Laboratory Standards Institute (CLSI) Guidelines #C40: Measurement Procedures for the Determination of Lead Concentrations in Blood and Urine, 2nd Edition (October 2013). https://clsi.org/standards/products/clinical-chemistry-and-toxicology/documents/c40/

****** Environmental investigations** at BLLs 5–19 µg/dL vary according to local conditions based on jurisdictional requirements and available resources

Recommended Schedule for Obtaining a Confirmatory Venous Sample

Blood Lead Level (µg/dL)	Time to Confirmation Testing
≥5–9	1–3 months
10–44	1 week–1 month*

Blood Lead Level (µg/dL)	Time to Confirmation Testing
45–59	48 hours
60–69	24 hours
≥70	Urgently as emergency test

*The higher the BLL on the screening test, the more urgent the need for confirmatory testing.

Schedule for Follow-Up Blood Lead Testing[a]

Venous Blood lead Levels (µg/dL)	Early follow up testing (2-4 tests after identification)	Later follow up testing after BLL declining
≥5–9	3 months*	6–9 months
10–19	1–3 months*	3–6 months
20–24	1–3 months*	1–3 months
25–44	2 weeks–1 month	1–months
≥45	As soon as possible	As soon as possible

[a]Seasonal variation of BLLs exists and may be more apparent in colder climate areas. Greater exposure in the summer months may necessitate more frequent follow ups.
*Some case managers or healthcare providers may choose to repeat blood lead tests on all new patients within a month to ensure that their BLL level is not rising more quickly than anticipated.

References:

- Centers for Disease Control and Prevention, 2002. Managing Elevated Blood Lead Levels Among Young Children
- Advisory Committee for Childhood Lead Poisoning Prevention, 2012. Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention
- American Academy of Pediatrics, 2016. Prevention of Childhood Lead Toxicity [PDF – 1 MB]

The following actions are NOT recommended at any BLL:

- Searching for gingival lead lines
- Testing of neurophysiologic function
- Evaluation of renal function (except during chelation with EDTA)
- Testing of hair, teeth, or fingernails for lead
- Radiographic imaging of long bones
- X-ray fluorescence of long bones

Page last reviewed: November 25, 2019

Attachment 26

2018 Childhood Lead Surveillance Annual Report

Childhood Lead Poisoning Prevention Program

January 2020

pennsylvania
DEPARTMENT OF HEALTH

Table of Contents 1

Executive Summary

This is the Pennsylvania Department of Health's (Department) 13th childhood lead surveillance annual report, covering data for children tested in Pennsylvania during calendar year 2018. Data were extracted from the Department's electronic reportable disease surveillance system, Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS). This report is provided as a source of information for the public: federal, state and local agencies; health care providers; and other organizations and individuals interested in lead poisoning prevention in Pennsylvania. The report is an overview of lead testing in Pennsylvania and provides information about testing for children under the age of 2, as well as under the age of 6 by: confirmation status; method of testing; method of reporting; county of residence; municipality; race and ethnicity; and residence in a rural county or an urban county.

Exposure to lead, even at low levels, can cause intellectual, behavioral and academic deficits.[1,2] For this reason, in 2012, the Centers for Disease Control and Prevention (CDC) defined an elevated blood lead level (EBLL) as a blood lead level (BLL) ≥ 5 micrograms per deciliter (µg/dL).[3] This value is also used to identify children who require case management because, even at low levels, lead has been known to affect IQ, the ability to pay attention and educational achievement.

This report will be used by the Department to 1) identify areas that may be at high risk for lead exposure; 2) locate areas of potential under-testing; and 3) make data available for state and local needs assessments. This report may also be used by federal agencies, hospitals, universities, providers and county/municipal health departments.

The Department received 194,945 blood lead test reports for 184,310 blood lead tests for children ages 0-15 in 2018. Of the 5,491 children aged 0-15 with an initial capillary test > 5 µg/dL, 3,158 (57.51%) were retested appropriately. There were 84,475 children (30.88% of the population) under age 2 tested and 160,986 (19.01% of the population) children under age 6 tested in 2018. There were 2,562 children under the age of 2 (3.03% of those tested and 0.94% of the population) with a confirmed EBLL ≥ 5 µg/dL. There were 6,585 children under the age of 6 (4.09% of those tested and 0.78% of the population) with a confirmed EBLL > 5 µg/dL.

Nearly 60% of children did not have race or ethnicity information provided in their blood lead testing results data. This is the first year Pennsylvania was able to more fully explore race and ethnicity data by matching children's blood lead testing data to birth certificate data to determine race. Among those children 0-23 months of age, testing rates for non-Hispanic black or African American children and for Hispanic children, were higher statewide than for non-Hispanic white children (36.94% and 28.32 % versus 25.39%, respectively). Non-Hispanic black or African American and Hispanic children had higher percentages of EBLLs of 5-9.9 µg/dL than non-Hispanic white children (3.83% and 2.63% versus 1.61%, respectively) among those tested. Percentages of test results ≥ 10 µg/dL were also higher among non-Hispanic black or African American and among Hispanic children than for non-Hispanic white children (1.42% and 1.15% versus 0.62%, respectively), among those tested Non-Hispanic black or African American and Hispanic children also had higher percentages

of unconfirmed elevated results among those tested than did non-Hispanic white children. These same relationships were seen for children ages 0-71 months.

The 2018 annual report also provides more detailed data for the largest counties and for the largest municipalities/cities. Testing rates and percentages of children with EBLLs among major municipalities/cities were generally higher than for their respective county for both children under the age of 2 and under the age of 6. This finding likely highlights the historical burden of older housing stock and other urban sources of lead in Pennsylvania municipalities/cities. For children 0-23 months, testing rates were highest in Pittsburgh (43.37% of children tested) and lowest in Harrisburg (24.18% of children tested). Pittsburgh's testing rates may be that much higher due to the fact that, in 2018, Allegheny County started mandatory blood lead testing for children between 9 and 12 months and at 24 months. The percentage of EBLL ≥ 5 µg/dL as a percentage of those tested were highest in the cities of York (12.94% EBLL) and Reading (8.43% EBLL).

Nationally, among states with older housing stock, lead-based paint is a significant source of lead exposure in young children. According to the 2018 American Community Survey estimate, Pennsylvania ranks fifth in the nation for the percentage of housing units identified as having been built before 1950, when lead was most prevalent.[4] Other sources of lead exposure include toys, ceramics and other consumer products.[3] Drinking water can also be a source of lead exposure when it flows through older lead plumbing or pipes where lead solder has been used (which can occur in newer plumbing as well).

Lead poisoning is a preventable environmental health hazard and, if not addressed, affects families regardless of race, ethnicity or socioeconomic status. In recent years, there has been a national reduction in children's BLLs. The Department continues to provide resources to families to prevent and address elevated blood lead through multiple strategies. Through the federally funded Childhood Lead Poisoning Prevention Program (CLPPP), the Department is working collabortatively with six local county and municipal health departments in Allegheny, Chester, Montgomery, Luzerne, Lehigh and York counties to reduce lead exposure and promote childhood lead poisoning prevention. Specifically, local partners are utilizing CLPPP funding to implement strategies and activities to increase blood lead testing; strengthen population-based interventions; and strengthen processes to identify lead-exposed children and link them to services. Additionally, the Department maintains a toll free lead information hotline to provide information about lead poisoning prevention, testing, follow-up and local resources for assistance.

In 2018, lead abatement efforts were continued through the federally funded Lead Hazard Control Program (LHCP), which provided funding to local partners to contract with certified lead professionals. The department worked with partners in targeted high risk areas across the commonwealth to identify and remove lead hazards in housing units occupied by low income families with children 6 years of age and under. The goal of the LHCP is to protect Pennsylvania's children from the long-term effects of lead poisoning as well as evaluate the overall living conditions within the home to obtain healthier outcomes for Pennsylvania families.

The Department's community health nurses (CHNs) continue to monitor elevated lead levels (≥ 5 µg/dL) in children aged 6 and under living in Pennsylvania. The Department's community health nurses cover the counties and areas of the state not covered by the 10 county and municipal health departments (CMHDs). The CMHDs include six county (Allegheny, Bucks, Chester, Erie, Montgomery, and Philadelphia) and four municipal (Allentown, Bethlehem, Wilkes-Barre, and York city) health departments and have their own specific case management protocols. The Department's CHNs contact families to provide education on laboratory results, potential sources of lead exposure, and actions to take to prevent/decrease the risk of exposure and help facilitate follow-up testing between clients and their pediatricians. The CHNs encourage every family of children with levels of 5 and above to discuss the potential need for an environmental investigation with their provider; CHNs work with the pediatrician and facilitate referrals to obtain home inspections, which could identify the source of exposure as well as provide hands-on education to parents. CHNs also work to provide referrals to the Pennsylvania Special Supplemental Nutrition Program for Women, Infants and Children and to early intervention programs where appropriate.

In 2018, the Department also continued an ongoing collaboration with the Department of Human Services on a data match project to share data between the Medicaid claims database and the lead surveillance database. The data match will lead to improved quality lead data and better service provision for Medicaid-enrolled children.

The Wolf administration, through the Lead-Free PA Initiative, and the Department are committed to preventing lead exposure and, by coordinating with state agencies, will work toward improving the outcomes of children throughout the commonwealth. In August 2019, Governor Wolf launched the Lead-Free PA Initiative, which seeks to increase access to blood lead level testing for children, increase local response efforts and plan for training of more certified lead abatement professionals. The Department and other state agencies participate in an interagency workgroup to achieve the goals of the Lead-Free PA Initiative. This report is intended to provide information that is succinct, comprehensible and accessible to the public. Although lead surveillance should be considered an ongoing process, the goal of the report is to provide meaningful, useful and easy-to-access data to the commonwealth and its citizens, so that the data can be better utilized for decision-making, targeting of resources and implementing initiatives aimed at preventing exposure to lead.

Data Methods and Case Definitions

Reporting of Test Results and Case Investigations

In Pennsylvania, clinical laboratories are required to report all BLL results from both venous and capillary specimens for persons under 16 years of age to the Pennsylvania Department of Health (28 Pa. Code § 27.34). In addition, clinicians are required to report cases of lead poisoning for children under 16 and for pregnant women (28 Pa. Code § 27.34). Reports are submitted electronically (either through electronic laboratory reporting or online key entry) to the Department through NEDSS. In 2018, reports with a BLL ≥ 5 µg/dL were assigned to public health investigators for follow-up based on the location of the patients' residence. Investigators reviewed, verified and corrected, when necessary, critical pieces of information such as date of birth, address and specimen source.

It is quite common for different entities to report the same BLL test result. For example, the ordering provider and the lab performing the analysis may both report a test. The Department does not discourage reporting from multiple sources, as it maximizes the likelihood that reporting will occur. In addition, different reporters often have different information about the patient – for instance, one may know more details about the specimen source (capillary or venous) and another may have better address information. PA-NEDSS is designed to handle duplicate reports from different sources. Several strategies are used in PA-NEDSS to ensure that all reports pertaining to a single patient are assigned to a single patient identifier. For the purposes of this annual report, tests with identical specimen collection dates and identical BLL results from the same patient were considered as a single test. The total number of BLL tests was defined as the total number of deduplicated BLL tests obtained from children who were within the specified age categories during 2018. All BLL tests were included, including those collected for screening, confirmation or follow-up purposes. Since many children had more than one BLL test during the year, the total number of children tested is less than the total number of BLL tests performed. Per-child summary BLL measures were calculated using all BLL results obtained while the child was in the given age category.

Case Definition

In May 2012, the CDC accepted the recommendation from the Advisory Committee on Lead Poisoning Prevention to eliminate the term "level of concern" (associated with the level of 10 µg/dL) and to begin using a reference value of 5 µg/dL based on the 97.5 percentile of the blood lead distribution among U.S. children.[3,5] A new case definition was officially implemented by CDC in 2016, and is used in this report to identify children with confirmed EBLL. A confirmed EBLL is defined as a venous blood lead test ≥ 5 µg/dL, or two capillary blood lead tests ≥ 5 µg/dL drawn within 84 days (12 weeks) of each other. An unconfirmed EBLL is defined as a capillary blood lead test ≥ 5 µg/dL with no other blood lead test done in the next 84 days.[6,7]

To apply the CDC case definition, a number of different data elements need to be evaluated. These data elements were handled as follows in our analyses:

- If the specimen collection date was missing or illogical, the laboratory received date or result date was used instead. If all three were missing, the reported date was used.
- Specimens with unknown specimen source or characterized as simply “blood” (as opposed to venous or capillary) were treated as if they were capillary specimens.
- Tests with undetectable BLLs were either reported as below a numeric detection limit or with a qualitative result of “negative,” “not detected” or “normal.” For statistical purposes, these results were given a numeric BLL value of 0.1 µg/dL.
- If an elevated capillary test was obtained on a child near the end of 2018 or as the child neared the limit of a particular age category, and if another elevated test result was obtained within the next 84 days, the initial elevated test was considered to be confirmed, even if the confirmatory test occurred in 2019 or outside of the age category. For example, if a child had an elevated capillary test at 23 months of age in November 2018 and received a confirmatory follow-up test within 12 weeks (in 2019), this was considered an EBLL result in 2018 for a child “aged 0−23 months.”

For children who had multiple BLL tests performed, it was possible for them to qualify for more than one case definition category (for example, they may have had an unconfirmed elevated test and then, six months later, had another elevated test that was confirmed). In these situations, a child was assigned to the highest BLL case definition category for which they qualified.

Statistical Methods

All BLL test data obtained on children less than 16 years of age in 2018 was extracted from the PA-NEDSS database. Analyses were performed on a per-test or per-child basis as indicated in the tables below.

Most of the analyses in this report are limited to children in two overlapping age categories, under 2 years of age (0–23 months) and under 6 years of age (0–71 months). Age was defined as age at the time of the specimen collection date.

Information on race and ethnicity is not routinely collected or stored by most laboratories. No usable race information was reported in PA-NEDSS for almost 60% of children. Since obtaining more complete race and ethnicity data is critical to the evaluation of disparities in screening and lead exposures, data in PA-NEDSS was supplemented with data from the Pa. Birth registry, supplied by the Bureau of Health Statistics. Children with lead test results in PA-NEDSS were matched to 2012-2018 birth certificate data using a deterministic matching method. Deterministic matching is a rules-based process to determine an “exact match” between two records, followed by iterative loosening of criteria. We matched 85% (137,120 out of 160,986) of children under the age of 6 who had BLL test results reported in PA-NEDSS to children in the birth registry. If a PA-NEDSS record matched to a birth registry record by name and a combination of date of birth, sex, and residential zip code, race and ethnicity information from the birth registry was added to the PA-NEDSS data if ethnicity was missing or unknown and if race was listed as “Unknown” or “Other.” After the matching process was completed, race information was available for nearly 90% of the children under 6 years of age reported to PA-NEDSS with BLL test results. The race and ethnicity

categories aligned with those used in the U.S. census. Because of small numbers, multiracial children, American Indians, Alaskan Natives, and Pacific Islanders were combined into an "Other" category. For race and ethnicity analyses by county, categories were combined and collapsed into non-Hispanic black or African American, non-Hispanic white, and Hispanic. Children in the Asian, Pacific Islander, American Indian, Alaska Native, "Other" and unknown categories were not included in the county analyses due to small numbers.

For the per-child analyses, two measures were used to indicate their BLL status:

- The maximum BLL was defined as the highest venous BLL obtained from a child in 2018 while they were in the specified age category. If a child had no venous BLL test performed during that time period, maximum BLL was defined as the highest BLL from a capillary or unknown specimen source. Venous results were ranked over capillary results because capillary test results may be skewed by the presence of lead dust on the skin .
- EBLL confirmation status was determined as described in the case definition section above.

County-specific Analysis

For county-specific analyses, the residential address accompanying the report that contained the BLL result of interest was used to determine the county. For the maximum BLL measure, the county was determined from the report containing the maximum test result. For the EBLL confirmation status measure, county was determined from the address accompanying the initial EBLL. PA-NEDSS attempts to geocode all residential addresses. For addresses that were successfully verified, county was based on the actual home address. If an address was not able to be verified, the county was based on the centroid of the residential zip code. A small proportion of children did not have a residential address reported; the county was set by the location of the provider who ordered the test.

Intercensal population estimates for 2018 by county, age, race and ethnicity were obtained from the National Center for Health Statistics (NCHS) website (Vintage 2018 bridged-race postcensal population estimates, https://www.cdc.gov/nchs/nvss/bridged_race.htm).[8] These figures were used to calculate the proportion of children tested for BLL and the proportion of children with EBLLs in the county-specific analysis.

The 17 counties in Pennsylvania with the largest number of children under 6 years of age were selected for county-specific race/ethnicity analyses.

Municipality-specific Analysis

For the municipality-level analyses, the residential address accompanying the report that contained the EBLL confirmation status measure was used to determine the specific municipality. PA-NEDSS attempts to geocode all residential addresses. For addresses that were successfully verified, municipality was based on the actual home address. If an address was not able to be verified automatically, it was verified by the application of manual geocoding. If a child's residential address in the lead report was missing, his/her mother's residential address reported in matched birth certificate data was geocoded to determine the municipality and census tract. If an address was not able to be verified, municipality was

based on the centroid of the residential zip code. A small proportion of children (8 children under 2 years of age and 103 children under 6 years of age) whose municipality could not be determined were excluded for sub-county analyses.

For municipality-level analyses, the population estimate of children was obtained by the 2017 American Community Survey, the most recent and available population data source at municipal level.

The 10 municipalities in Pennsylvania with the highest number of children under 6 years of age, as well as two other cities with an Act 315 municipal health department were selected for municipality-specific analyses. These included Philadelphia, Pittsburgh, Allentown, Reading, Erie (city), Upper Darby township, Harrisburg, Scranton, Lancaster, York City, Bethlehem and Wilkes-Barre.

Limitations

The 2018 Childhood Lead Surveillance Annual Report presents an analysis of surveillance data displayed in graphic and tabular form, in keeping with CDC guidance for analysis of childhood lead data.

Users of the report should be aware that public health surveillance data for childhood lead has inherent limitations that influences interpretation of the data. Data such as specimen source, residence of child, race and ethnicity, and other important information may be missing on laboratory test results. As described in the Methods section, efforts were made to fill these gaps. Supplementing race and ethnicity data with information from the birth registry was done for the first time for the 2018 report.

In addition, Allegheny County is the only county in Pennsylvania with mandatory testing for children between 9 and 12 months and at 24 months. Pennsylvania does not mandate universal and complete screening of all children. Therefore, testing of children for BLL is targeted rather than random, which makes interpretation of rates of EBLLs by geographic area or demographic factors difficult.

An emerging issue is the increasing use of point-of-care testing devices for blood lead screening. A growing number of clinical practices are able to do their own capillary screening tests on children on-site. These providers are often unaccustomed to reporting results for the Department and are unaware of reporting requirements. This could adversely affect the number of screening test results counted and skew the proportion of children screened downwards. The Department is working with many clinics using this equipment to ensure that BLLs are reported. Furthermore, some point-of-care analyzers have been found to give falsely low BLL results when used to analyze venous blood. These devices should be used only on capillary specimens, but the Department generally does not know the type of equipment used to perform BLL tests and cannot control for this source of uncertainty. The impact of this issue cannot be assessed, as the type of testing device used is not captured in the PA-NEDSS surveillance data sets.

High rates of children with EBLLs in one area may reflect a true higher exposure risk in that area, or it may reflect more robust and targeted testing in that area. The burden of childhood EBLLs is best understood through a series of metrics: the percentage of children tested; the percentage who go on to have retests where appropriate (and conversely the percentage who do not get appropriate testing and follow-up); and, finally, the percentage of children with BLLs ≥ 5 µg/dL and those ≥ 10 µg/dL. This report shows both the number and percentage of children tested with BLLs ≥ 5 µg/dL and those ≥ 10 µg/dL.

Discussion

Between 2017 and 2018. the percent of children under the age of 2 tested for lead increased from 29.55% to 30.88% (an increase of 2,159 children tested). The percent of children under the age of 6 tested increased from 17.79% to 19.01% (an increase of 9,230 children tested) from 2017 to 2018. Between 2017 and 2018, the percent of children under age 2 with a confirmed EBLL $\geq$ 5 µg/dL decreased from 3.27% to 3.03% of those tested (a decrease of 127 children), while the percent of children under age 6 with a confirmed EBLL decreased from 4.52% to 4.09% of those tested (a decrease of 269 children). The percent of children with an unconfirmed EBLL $\geq$ 5 µg/dL decreased from 1.33% to 1.18% for children under age 2 (a decrease of 98 children) and from 1.66% to 1.42% for children under age 6 (a decrease of 224 children), among those tested. The percent of children aged 0-15 who were appropriately retested after an elevated capillary test increased from 54.81% to 57.51% between 2017 and 2018. In summary, in 2018 compared to 2017, small gains were made in the percentages of children tested and reductions were seen in the percentages of Pennsylvania children with EBLLs and with the number of children who did not have the appropriate confirmatory follow-up testings.

Pennsylvania was able to more fully explore race and ethnicity data for the first time in 2018 by matching children's BLL testing data to birth certificate data to determine race for the nearly 60% of children who did not have race or ethnicity information provided on their BLL testing results data. For non-Hispanic black or African American children, testing rates were higher statewide than for non-Hispanic white children. Confirmed EBLL rates were also higher among non-Hispanic black or African American children as were the percentages of unconfirmed EBLLs, both as a percentage of children tested and as a percentage of the population, for both age groups. In general, Hispanic and non-Hispanic Asian children had testing rates and percentages of EBLLs in between values for non-Hispanic black or African American children and non-Hispanic white children.

In general, for children under the age of 2 and under the age of 6, municipalities/cities had a higher percentage of children tested for lead than in their respective counties. In general, the percentage of children with EBLLs among those tested and as a percentage of the population was also higher in all munipalities/cities than in their respective counties. For the largest counties, where race and ethnicity data are presented, most had higher testing rates among non-Hispanic black or African American and Hispanic children than among non-Hispanic white children, although that pattern was not seen in Allegheny, Erie, Luzerne, Westmoreland and York counties. In many of these counties, the percentage of those tested with EBLLs was highest among minority populations, but not all counties had this pattern.

As mentioned previously, not all of the point-of-care testing results were reported to PA-NEDSS. Because of this, for some areas, the testing rates may actually be higher than reported and the percent tested with EBLLs may actually be lower than what is in this report. As providers move toward point of care testing, the Department is working to facilitate reporting of test results so that an accurate understanding of the burden of childhood lead exposure is achieved. The Department is also working with laboratories to increase the use of electronic reporting of testing results to reduce the resource burden and errors associated with faxed results and hand-keyed data entry.

Definitions

Age: Age of the child at the time of the test, expressed in months. Children under age 2 are 0−23 months, and children under age 6 are 0−71 months.

Blood lead level (BLL): The numeric result of a blood lead test, expressed in micrograms per deciliter (µg/dL)

Capillary: A blood lead test with blood drawn by a finger stick

Confirmed EBLL ≥ 5 µg/dL: One venous blood lead test ≥ 5 µg/dL or two capillary blood lead tests ≥ 5 µg/dL drawn within 12 weeks of each other.

Confirmed EBLL ≥ 10 µg/dL: One venous blood lead test ≥ 10 µg/dL or two capillary blood lead tests ≥ 10 µg/dL drawn within 12 weeks of each other

Electronic lab reporting (ELR): The system by which blood lead reports are submitted electronically from a laboratory's system to PA-NEDSS

Elevated blood lead level (EBLL): A BLL ≥ 5 µg/dL

Ethnicity: Hispanic or non-Hispanic

Micrograms per deciliter (µg/dL): The amount of lead in the blood, measured by micrograms of lead per deciliter of blood

Municipality: A political subdivision of a state within which a municipal corporation has been established to provide general local government for a specific population concentration in a defined area.

Not elevated: A child with a confirmed venous or capillary BLL < 5 µg/dL, or who had an initial elevated capillary BLL that was found to be < 5 µg/dL on either a venous or capillary follow-up test

Online key entry: Manual entry of blood lead reports into PA-NEDSS

Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS): the Pennsylvania Department of Health's online disease surveillance system. It serves as the Department's reporting system for all reportable conditions and has been utilized for childhood lead surveillance since 2003.

Race: White, black or African American, Asian, Other (multiracial children, American Indians, Alaska Native, and Pacific Islanders), or Unknown

Race/Ethnicity: Non-Hispanic white, non-Hispanic black or African American, Hispanic, and non-Hispanic Asian

Rural versus urban counties: The Center for Rural Pennsylvania defines rural and urban counties in terms of population density. Those counties with a population density above the state average (284 persons per square mile) are considered urban, and those below the state average are considered rural. For more information and definitions concerning rural and urban counties, please see the Center for Rural Pa's website at: http://www.rural.palegislature.us/demographics_rural_urban.html.

Findings

Statewide Summaries by Age:

Pennsylvania does not have a universal childhood BLL testing law, so there is no mandate for children to be tested by a certain age. However, the Early Periodic Screening, Diagnosis and Treatment (EPSDT) program (administered by the Pennsylvania Department of Human Services) requires providers to test children on Medical Assistance at ages 1 and 2. Furthermore, most clinical practice guidelines recommend testing children under age 7 and focusing on children at ages 1 and 2.

The following charts include statewide aggregate childhood lead testing data broken out by the age groupings of children tested, as well as the age at the time of their highest result. The charts also include breakouts of sex, race, ethnicity and the range of the highest BLL.

Table 1: Summary of Blood Lead Tests Performed in 2018 by Age Category

Age Category*	Total Number of Tests†	Capillary Test#		Venous Test	
		N	%	N	%
0−23 months (under 2 years)	90,737	49,708	54.78	41,029	45.22
0−71 months (under 6 years)	175,098	90,532	51.70	84,566	48.30
0−15 years	184,310	91,625	49.71	92,685	50.29

*Age at time of specimen collection
†Total number of deduplicated blood tests obtained on children within the age category. A blood lead test may be collected for screening, confirmation or follow-up. Many children had more than one test in any given year. The remainder of tables were analyzed on a per child basis rather than per test.
#Blood specimens of unknown source were treated as though they were capillary tests.
Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 2: Characteristics of Children Tested for Lead by Age Category, 2018

	Children Aged 0–23 months		Children Aged 0–71 months	
	N	% of total	N	% of total
Total number of children tested†	84,475	100.00	160,986	100.00
Age at time of maximum BLL				
Under 1 year	45,383	53.72	45,383	28.19
One year	39,092	46.28	38,578	23.96
Two years	-	-	47,669	29.61
Three years	-	-	11,533	7.16
Four years	-	-	9,252	5.75
Five years	-	-	8,571	5.32
Sex				
Female	40,843	48.35	77,603	48.20
Male	43,338	51.30	82,696	51.37
Unknown	294	0.35	687	0.43
Race				
Asian	8,532	10.10	16,753	10.41
Black or African American	15,361	18.18	32,189	19.99
White	50,911	60.27	90,585	56.27
Other^	2,621	3.10	4,390	2.73
Unknown	7,050	8.35	17,069	10.60
Ethnicity				
Hispanic	10,350	12.25	20,211	12.55
Non-Hispanic	64,576	76.44	117,723	73.13
Unknown or missing	9,549	11.30	23,052	14.32
Maximum BLL (µg/dL)*				
< 5	80,889	95.76	152,163	94.52
5–9.9	2,719	3.22	6,721	4.17
10–19.9	702	0.83	1,676	1.04
20–44.9	150	0.18	382	0.24
45–59.9	10	0.01	24	0.01
60–69.9	4	0.00	12	0.01
≥ 70	1	0.00	5	0.00

†Number of Pennsylvania children within the age category who had at least one blood lead test done with a specimen collection date in 2018
^Other race includes multiracial children, American Indians and Pacific Islanders.
*Highest venous blood lead level (BLL) obtained per child in 2018, or highest BLL from a capillary or unknown specimen source, if no venous test was performed
Data sources: Pennsylvania Department of Health, PA-NEDSS, Vital Records

Statewide Summaries by Confirmed Elevated Status:

The following charts display EBLL by confirmation status. Confirmation status can be: not elevated, elevated but not confirmed or confirmed elevated. Also included is data on how the results were confirmed. Children can be tested for lead by either a finger stick (capillary) or blood draw (venous). Because capillary tests are more subject to contamination, they are less reliable than venous tests, so venous tests are preferred to get the most accurate result. It is not always possible to perform a venous test, so elevated capillary results are confirmed with either another capillary test or a venous test. Venous testing requires a trained phlebotomist, and some clinical settings may not have this expertise; in addition, successfully getting a venous specimen in very small children can be difficult.

Table 3: Elevated Blood Lead Confirmation Status per 2016 CDC Case Definition* by Age Category, 2018

	Children Aged 0−23 months		Children Aged 0−71 months	
	N	% of total	N	% of total
Total number of children tested	84,475	100.00	160,986	100.00
Confirmation status				
Not elevated (< 5 µg/dL)**	80,918	95.79	152,113	94.49
Unconfirmed elevated (≥ 5 µg/dL)†	995	1.18	2,288	1.42
Confirmed 5−9.9 µg/dL	1,843	2.18	4,809	2.99
Confirmed ≥ 10 µg/dL	719	0.85	1,776	1.10

*CDC case definition defines a confirmed elevated BLL as one venous blood lead test ≥5 µg/dL, or two capillary blood lead tests ≥5 µg/dL drawn within 12 weeks of each other.
**The child had either no BLL ≥5 µg/dL or had an initially elevated capillary BLL that was found to be <5 µg/dL on either venous or capillary retest.
†Initial capillary test was ≥5 µg/dL, but test result was not confirmed by a venous or capillary retest within 12 weeks.
Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 4: Details of Elevated Blood Lead Confirmation Status* by Age Category, 2018

		Children Aged 0−23 months		Children Aged 0−71 months	
		N	% of total	N	% of total
Total number of children tested		84,475	100	160,986	100
Confirmation status	**Outcome**				
Not elevated (< 5 µg/dL)	BLL< 5 µg/dL	79,926	94.61	150,072	93.22
	Repeat capillary test did NOT confirm initial elevated capillary test.	54	0.06	94	0.06
	Venous test did NOT confirm initial elevated capillary test.	938	1.11	1,947	1.21
Unconfirmed elevated (≥ 5 µg/dL)†	Not retested appropriately	995	1.18	2,288	1.42
Confirmed 5–9.9 µg/dL	Capillary confirmed by repeat capillary test	23	0.03	37	0.02
	Capillary confirmed by venous test	363	0.43	714	0.44
	Venous test	1,457	1.72	4,058	2.52
Confirmed ≥ 10 µg/dL	Capillary confirmed by repeat capillary test	4	0	13	0.01
	Capillary confirmed by venous test	174	0.21	320	0.20
	Venous test	541	0.64	1,443	0.90

*Per CDC 2016 Confirmed Elevated Blood Lead case definition
† Initial capillary test was ≥5 µg/dL, but test result was not confirmed by a venous or capillary retest within 12 weeks.
Data sources: Pennsylvania Department of Health, PA-NEDSS.

Table 5: Confirmation After an Elevated Capillary Blood Lead Test by Capillary Test Level, Children Aged 0-15 years, 2018

Blood Lead Level of Initial Elevated Capillary Test (µg/dL)	Number of Children*	Children with a Diagnostic Venous Test Within 12 weeks†		Children with Either a Venous or Capillary Retest Within 12 weeks†	
		N	%	N	%
5–9.9	4,247	2,109	49.66	2,224	52.37
10–19.9	962	672	69.85	694	72.14
20–44.9	250	205	82.00	212	84.80
45–59.9	19	17	89.47	17	89.47
60–69.9	8	5	62.50	6	75.00
≥ 70	5	5	100.00	5	100.00
Overall	5,491	3,013	54.87	3,158	57.51

*Children aged 0–15 years
†Retest results may not be in the same blood lead level range as the initial capillary test.
Data sources: Pennsylvania Department of Health, PA-NEDSS.

Reporting by Method and Organization:

The chart below displays data on how BLL reports were submitted to PA-NEDSS and who submitted the report. By law, all BLL tests analyzed by laboratories on children under 16 years of age are required to be reported to the Department. Reports can be submitted by ELR or by online key-entry. ELR is the preferred method of receiving reports, as the information is usually more accurate, complete and timely. From 2013 to 2018, the number of laboratories reporting through electronic laboratory reporting increased from 20 to 23, and the proportion of lead reports received via ELR increased from 87% to 90%.

Table 6: Blood Lead Reporting by Method of Report and Type of Reporting Organization, 2013–2018

	Method of Report	2013	2014	2015	2016	2017	2018
Number of reports submitted†	ELR*	147,522	149,334	146,104	160,488	169,675	175,802
	Online key-entry by lab	21,225	16,978	14,997	14,561	13,011	11,720
	Online key-entry by provider#	1,440	2,065	2,642	3,401	2,775	7,423
	Total	170,187	168,377	163,743	178,450	185,461	194,945
% ELR		86.68	88.69	89.23	89.93	91.49	90.18

*ELR=electronic laboratory reporting
†The same test result may be reported by the ordering provider, the receiving laboratory and/or the reference lab that performs the test. The data in this table are not deduplicated. Also, reports may contain more than one test result.
#Online key-entry by provider includes some test results key-entered by Department staff on behalf of providers.
Data sources: Pennsylvania Department of Health, PA-NEDSS.

Testing Summaries by Race and Ethnicity:

The following are summaries of children under age 2 and under age 6 tested by race and ethnicity, including number of children tested, the percent of population tested and confirmation status. For children ages 0-23 months, non-Hispanic black or African American children and Hispanic children were more often tested than non-Hispanic white children (36.94% and 28.32% versus 25.39%, respectively). Among those tested, non-Hispanic black or African American and Hispanic children had higher percentages of EBLLs of 5-9.9 µg/dL than non-Hispanic white children (3.83% and 2.63% versus 1.61%, respectively). Percentages of tests results ≥ 10 µg /dL were also higher among non-Hispanic black or African American and Hispanic children than non-Hispanic white children (1.42% and 1.15% versus 0.62%, respectively). Among those tested, non-Hispanic black or African American and Hispanic children also had higher percentages of unconfirmed elevated results among those tested than did non-Hispanic white children. These same relationships were seen for children ages 0-71 months.

Table 7: Number of Children Aged 0–23 Months by Race/Ethnicity and Elevated Blood Lead Confirmation Status,* 2018

Race/Ethnicity	Population of Children Aged 0–23 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population ***	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Total	273,577	84,475	30.88	995	1.18	0.36	1,843	2.18	0.67	719	0.85	0.26
Race/Ethnicity^												
Non-Hispanic white	186,034	47,237	25.39	513	1.09	0.28	762	1.61	0.41	292	0.62	0.16
Non-Hispanic black or African-American	39,272	14,507	36.94	203	1.40	0.52	556	3.83	1.42	206	1.42	0.52
Hispanic	36,546	10,350	28.32	132	1.28	0.36	272	2.63	0.74	119	1.15	0.33
Non-Hispanic Asian	11,197	3,716	33.19	33	0.89	0.29	84	2.26	0.75	33	0.89	0.29

*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
***Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
^Other and Unknown are not included in table
Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Table 8: Number of Children Aged 0–71 Months by Race/Ethnicity and Elevated Blood Lead Confirmation Status,* 2018

Race/Ethnicity	Population of Children Aged 0–71 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population***	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Total	847,012	160,986	19.01	2,288	1.42	0.27	4,809	2.99	0.57	1,776	1.10	0.21
Race/Ethnicity^												
Non-Hispanic white	568,234	83,998	14.78	1,111	1.32	0.20	1,626	1.94	0.29	624	0.74	0.11
Non-Hispanic black or African-American	127,175	30,520	24.00	509	1.67	0.40	1,813	5.94	1.43	618	2.02	0.49
Hispanic	113,909	20,211	17.74	310	1.53	0.27	686	3.39	0.60	279	1.38	0.24
Non-Hispanic Asian	35,915	7,011	19.52	95	1.36	0.26	183	2.61	0.51	79	1.13	0.22

*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
***Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
^Other and Unknown are not included in table
Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Testing Summaries by Major Municipality:

The following are summaries of children under age 2 and under age 6 tested in major municipalities, including number of children tested, the percent of population tested and confirmation status. Testing rates and percentages of children with EBLLs among major municipalities/cities were generally higher than for their respective county (except for Bethlehem), for both children under the age of 2 and under the age of 6. This finding likely highlights the historical burden of older housing stock and other urban sources of lead in Pennsylvania municipalities/cities. For children 0-23 months, testing rates were highest in Pittsburgh and lowest in Harrisburg, and the percentages of EBLL ≥ 5 µg/dL as a percentage of those tested were highest in the cities of York and Reading. Pittsburgh's testing rates may be higher due to the fact that in 2018, Allegheny County started mandatory blood lead testing for children between 9 and 12 months and at 24 months.

Table 9: Number of Children Aged 0–23 Months by Major Municipality and Elevated Blood Lead Confirmation Status,* 2018

Residence		Population of Children Aged 0–23 Months†	Children Tested**		Unconfirmed ≥ 5 µg/dL			Confirmed ≥ 5 µg/dL		
Municipality	**County**		**N**	**% of population*** **	**N**	**% of tested**	**% of population**	**N**	**% of tested**	**% of population**
Philadelphia city	Philadelphia	44,338	17,958	40.50	148	0.82	0.33	845	4.71	1.91
Pittsburgh city	Allegheny	6,265	2,717	43.37	66	2.43	1.05	97	3.57	1.55
Allentown city	Lehigh	3,667	1,575	42.95	35	2.22	0.95	48	3.05	1.31
Reading city	Berks	3,065	1,020	33.28	30	2.94	0.98	86	8.43	2.81
Erie city	Erie	2,575	1,076	41.79	33	3.07	1.28	38	3.53	1.48
Upper Darby township	Delaware	2,625	1,091	41.57	13	1.19	0.50	40	3.67	1.52
Harrisburg city	Dauphin	1,903	460	24.18	8	1.74	0.42	30	6.52	1.58
Scranton city	Lackawanna	1,825	498	27.28	20	4.02	1.10	35	7.03	1.92
Lancaster city	Lancaster	1,786	631	35.33	6	0.95	0.34	49	7.77	2.74
Bethlehem city	Northampton/ Lehigh	1,686	428	25.38	6	1.40	0.36	6	1.40	0.36
York city	York	1,424	402	28.24	0	0.00	0.00	52	12.94	3.65
Wilkes-Barre city	Luzerne	932	386	41.43	22	5.70	2.36	16	4.15	1.72
Pennsylvania Total		273,577	84,475	30.88	995	1.18	0.36	2,562	3.03	0.94

*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
***Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2017 American Community Survey
Data sources: Pennsylvania Department of Health, PA-NEDSS., 2017 American Community Survey

Table 10: Number of Children Aged 0–71 Months by Major Municipality and Elevated Blood Lead Confirmation Status,* 2018

Residence		Population of Children Aged 0–71 Months†	Children Tested**		Unconfirmed ≥ 5 µg/dL			Confirmed ≥ 5 µg/dL		
Municipality	County		N	% of population ***	N	% of tested	% of population	N	% of tested	% of population
Philadelphia city	Philadelphia	127,072	37,520	29.53	372	0.99	0.29	2,496	6.65	1.96
Pittsburgh city	Allegheny	17,576	5,366	30.53	139	2.59	0.79	203	3.78	1.15
Allentown city	Lehigh	10,921	3,038	27.82	82	2.70	0.75	116	3.82	1.06
Reading city	Berks	9,223	2,476	26.85	80	3.23	0.87	270	10.9	2.93
Erie city	Erie	7,633	1,936	25.36	64	3.31	0.84	103	5.32	1.35
Upper Darby township	Delaware	7,403	2,093	28.27	19	0.91	0.26	90	4.30	1.22
Harrisburg city	Dauphin	5,524	1,012	18.32	38	3.75	0.69	64	6.32	1.16
Scranton city	Lackawanna	5,381	1,195	22.21	46	3.85	0.85	117	9.79	2.17
Bethlehem city	Northampton/ Lehigh	5,051	883	17.48	13	1.47	0.26	15	1.70	0.30
Lancaster city	Lancaster	5,011	1,187	23.69	15	1.26	0.30	109	9.18	2.18
York city	York	4,220	707	16.75	0	0.00	0.00	111	15.70	2.63
Wilkes-Barre city	Luzerne	2,744	840	30.61	38	4.52	1.38	45	5.36	1.64
Pennsylvania Total		847,012	160,986	19.01	2,288	1.42	0.27	6,585	4.09	0.78

*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
***Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2017 American Community Survey
Data sources: Pennsylvania Department of Health, PA-NEDSS., 2017 American Community Survey

Testing Summaries by County and Race/Ethnicity for Selected Counties:

The following are summaries of children under age 2 and under age 6 by county and race/ethnicity, including number of children tested, the percent of population tested and confirmed EBLLs of ≥5 µg/dL. Other, unknown, Asian, Pacific Islander, American Indian and Alaska Native races are not included. The 17 counties with the largest populations were selected to include the largest cities and the counties with county or municipal health departments

Table 11: Number of Children with Confirmed EBLL* by County of Residence and Race/Ethnicity, Children Aged 0–23 Months, 2018 for Select Counties**

County of Residence	Race/Ethnicity	Population 0-23 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Allegheny	Non-Hispanic black or African American	4,745	2,251	47.44	88	3.91	1.85
Allegheny	Hispanic	757	202	26.68	6	2.97	0.79
Allegheny	Non-Hispanic white	18,814	7,183	38.18	92	1.28	0.49
Berks	Non-Hispanic black or African American	518	100	19.31	6	6.00	1.16
Berks	Hispanic	3,803	984	25.87	78	7.93	2.05
Berks	Non-Hispanic white	4,900	810	16.53	49	6.05	1.00
Bucks	Non-Hispanic black or African American	790	167	21.14	1	0.60	0.13
Bucks	Hispanic	1,221	351	28.75	9	2.56	0.74
Bucks	Non-Hispanic white	9,157	1,613	17.61	9	0.56	0.10
Chester	Non-Hispanic black or African American	780	229	29.36	1	0.44	0.13
Chester	Hispanic	1,669	511	30.62	13	2.54	0.78
Chester	Non-Hispanic white	7,487	1,522	20.33	16	1.05	0.21
Cumberland	Non-Hispanic black or African American	353	58	16.43	0	0.00	0.00
Cumberland	Hispanic	319	46	14.42	1	2.17	0.31
Cumberland	Non-Hispanic white	4,381	503	11.48	12	2.39	0.27
Dauphin	Non-Hispanic black or African American	1,586	393	24.78	14	3.56	0.88
Dauphin	Hispanic	1,129	188	16.65	8	4.26	0.71
Dauphin	Non-Hispanic white	3,670	543	14.80	16	2.95	0.44
Delaware	Non-Hispanic black or African American	3,763	1,443	38.35	39	2.70	1.04
Delaware	Hispanic	853	311	36.46	11	3.54	1.29
Delaware	Non-Hispanic white	7,454	2,140	28.71	23	1.07	0.31

County of Residence	Race/Ethnicity	Population 0-23 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Erie	Non-Hispanic black or African American	732	267	36.48	12	4.49	1.64
Erie	Hispanic	495	127	25.66	1	0.79	0.20
Erie	Non-Hispanic white	4,568	1432	31.35	25	1.75	0.55
Lackawanna	Non-Hispanic black or African American	245	70	28.57	5	7.14	2.04
Lackawanna	Hispanic	782	165	21.10	11	6.67	1.41
Lackawanna	Non-Hispanic white	3,275	574	17.53	18	3.14	0.55
Lancaster	Non-Hispanic black or African American	831	169	20.34	22	13.02	2.65
Lancaster	Hispanic	2,232	562	25.18	26	4.63	1.16
Lancaster	Non-Hispanic white	10,325	1,480	14.33	86	5.81	0.83
Lehigh	Non-Hispanic black or African American	696	232	33.33	7	3.02	1.01
Lehigh	Hispanic	3,522	1,077	30.58	24	2.23	0.68
Lehigh	Non-Hispanic white	3,977	568	14.28	16	2.82	0.40
Luzerne	Non-Hispanic black or African American	416	193	46.39	4	2.07	0.96
Luzerne	Hispanic	1,773	455	25.66	17	3.74	0.96
Luzerne	Non-Hispanic white	4,057	1,246	30.71	28	2.25	0.69
Montgomery	Non-Hispanic black or African American	1,989	583	29.31	15	2.57	0.75
Montgomery	Hispanic	1,734	650	37.49	44	6.77	2.54
Montgomery	Non-Hispanic white	12,054	3,233	26.82	33	1.02	0.27
Northampton	Non-Hispanic black or African American	448	100	22.32	2	2.00	0.45
Northampton	Hispanic	1,334	299	22.41	3	1.00	0.22
Northampton	Non-Hispanic white	3,748	508	13.55	13	2.56	0.35
Philadelphia	Non-Hispanic black or African American	16,709	7,308	43.74	504	6.90	3.02
Philadelphia	Hispanic	9,366	3,232	34.51	101	3.13	1.08
Philadelphia	Non-Hispanic white	12,526	4,244	33.88	105	2.47	0.84

County of Residence	Race/Ethnicity	Population 0-23 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Westmoreland	Non-Hispanic black or African American	295	89	30.17	4	4.49	1.36
Westmoreland	Hispanic	137	23	16.79	1	4.35	0.73
Westmoreland	Non-Hispanic white	5,226	1,820	34.83	22	1.21	0.42
York	Non-Hispanic black or African American	863	112	12.98	14	12.50	1.62
York	Hispanic	1,351	299	22.13	18	6.02	1.33
York	Non-Hispanic white	7,358	1,090	14.81	39	3.58	0.53
Pennsylvania Total	Non-Hispanic black or African American	39,727	14,507	36.94	762	5.25	1.92
Pennsylvania Total	Hispanic	36,546	10,350	28.32	391	3.78	1.07
Pennsylvania Total	Non-Hispanic white	186,034	47,237	25.39	1,054	2.23	0.57
Pennsylvania Total		273,577	84,475	30.88	2,562	3.03	0.94

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
**Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
****Per CDC 2016 Elevated Blood Lead case definition
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Table 12: Number of Children with Confirmed EBLL* by County of Residence and Race/Ethnicity, Children Aged 0–71 Months, 2018, for Select Counties**

County of Residence	Race/Ethnicity	Population 0-71 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Allegheny	Non-Hispanic black or African American	15,457	4,568	29.55	214	4.68	1.38
Allegheny	Hispanic	2,498	394	15.77	11	2.79	0.44
Allegheny	Non-Hispanic white	54,358	15,149	27.87	181	1.19	0.33
Berks	Non-Hispanic black or African American	1,662	228	13.72	19	8.33	1.14
Berks	Hispanic	11,422	2,133	18.67	218	10.22	1.91
Berks	Non-Hispanic white	15,648	1,295	8.28	84	6.49	0.54
Bucks	Non-Hispanic black or African American	2,410	281	11.66	5	1.78	0.21
Bucks	Hispanic	3,726	628	16.85	11	1.75	0.3
Bucks	Non-Hispanic white	28,520	2,370	8.31	16	0.68	0.06
Chester	Non-Hispanic black or African American	2,389	480	20.09	17	3.54	0.71
Chester	Hispanic	4,870	975	20.02	22	2.26	0.45
Chester	Non-Hispanic white	24,878	2,435	9.79	30	1.23	0.12
Cumberland	Non-Hispanic black or African American	1,184	107	9.04	2	1.87	0.17
Cumberland	Hispanic	1,048	80	7.63	2	2.50	0.19
Cumberland	Non-Hispanic white	13,218	878	6.64	20	2.28	0.15
Dauphin	Non-Hispanic black or African American	5,123	780	15.23	40	5.13	0.78
Dauphin	Hispanic	3,681	395	10.73	20	5.06	0.54
Dauphin	Non-Hispanic white	10,587	998	9.43	28	2.81	0.26
Delaware	Non-Hispanic black or African American	11,582	2,948	25.45	122	4.14	1.05
Delaware	Hispanic	2,488	604	24.28	24	3.97	0.96
Delaware	Non-Hispanic white	23,201	3,585	15.45	52	1.45	0.22

County of Residence	Race/Ethnicity	Population 0-71 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Erie	Non-Hispanic black or African American	2,528	510	20.17	39	7.65	1.54
Erie	Hispanic	1,537	242	15.74	9	3.72	0.59
Erie	Non-Hispanic white	13,673	2,371	17.34	46	1.94	0.34
Lackawanna	Non-Hispanic black or African American	830	157	18.92	19	12.1	2.29
Lackawanna	Hispanic	2,313	352	15.22	22	6.25	0.95
Lackawanna	Non-Hispanic white	9,863	1,175	11.91	56	4.77	0.57
Lancaster	Non-Hispanic black or African American	2,528	275	10.88	41	14.91	1.62
Lancaster	Hispanic	6,775	1,021	15.07	56	5.48	0.83
Lancaster	Non-Hispanic white	31,698	2,200	6.94	132	6.00	0.42
Lehigh	Non-Hispanic black or African American	2,272	424	18.66	16	3.77	0.70
Lehigh	Hispanic	10,811	1,909	17.66	67	3.51	0.62
Lehigh	Non-Hispanic white	12,184	1,074	8.81	38	3.54	0.31
Luzerne	Non-Hispanic black or African American	1,461	396	27.10	16	4.04	1.10
Luzerne	Hispanic	5,373	770	14.33	48	6.23	0.89
Luzerne	Non-Hispanic white	12,401	2,277	18.36	67	2.94	0.54
Montgomery	Non-Hispanic black or African American	6,097	1,096	17.98	54	4.93	0.89
Montgomery	Hispanic	5,333	1,238	23.21	90	7.27	1.69
Montgomery	Non-Hispanic white	38,187	5,056	13.24	59	1.17	0.15
Northampton	Non-Hispanic black or African American	1,512	205	13.56	8	3.90	0.53
Northampton	Hispanic	4,236	623	14.71	14	2.25	0.33
Northampton	Non-Hispanic white	11,574	1,003	8.67	29	2.89	0.25
Philadelphia	Non-Hispanic black or African American	55,171	16,165	29.30	1,664	10.29	3.02
Philadelphia	Hispanic	28,889	6,740	23.33	274	4.07	0.95
Philadelphia	Non-Hispanic white	32,128	7,237	22.53	214	2.96	0.67

County of Residence	Race/Ethnicity	Population 0-71 Months†	Children Tested*		Confirmed EBLL ≥ 5		
			N	% of population**	N	% of tested	% of population
Westmoreland	Non-Hispanic black or African American	1,034	191	18.47	10	5.24	0.97
Westmoreland	Hispanic	483	38	7.87	2	5.26	0.41
Westmoreland	Non-Hispanic white	17,229	3,155	18.31	49	1.55	0.28
York	Non-Hispanic black or African American	2,841	217	7.64	40	18.43	1.41
York	Hispanic	4,465	463	10.37	33	7.13	0.74
York	Non-Hispanic white	22,897	1,871	8.17	80	4.28	0.35
Pennsylvania Total	Non-Hispanic black or African American	127,175	30,520	24.00	2,431	7.97	1.91
Pennsylvania Total	Hispanic	113,909	20,211	17.74	965	4.77	0.85
Pennsylvania Total	Non-Hispanic white	568,234	83,988	14.78	2,250	2.68	0.40
Pennsylvania Total		847,012	160,986	19.01	6,585	4.09	0.78

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
**Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
****Per CDC 2016 Elevated Blood Lead case definition
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., Vital Records, National Center for Health Statistics

Testing Summaries by County:

The following are summaries of children under age 2 and under age 6 tested by county, including number of children tested, the percent of population tested, and BLLs of 5−9.9 and ≥ 10 µg/dL by maximum blood level and by confirmed blood level for all 67 counties.

Table 13: Number of Children Tested for Lead by Maximum Blood Lead Level and County of Residence, Children Aged 0–23 Months, 2018

County of Residence	Population of Children Aged 0–23 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Adams	1,849	551	29.80	16	2.90	0.87	4	0.73	0.22
Allegheny	25,690	11,267	43.86	278	2.47	1.08	97	0.86	0.38
Armstrong	1,305	550	42.15	16	2.91	1.23	3	0.55	0.23
Beaver	3,274	970	29.63	22	2.27	0.67	3	0.31	0.09
Bedford	1,000	345	34.50	15	4.35	1.50	2	0.58	0.20
Berks	9,359	2,161	23.09	147	6.80	1.57	47	2.17	0.50
Blair	2,449	842	34.38	34	4.04	1.39	8	0.95	0.33
Bradford	1,362	297	21.81	8	2.69	0.59	3	1.01	0.22
Bucks	11,899	2,535	21.30	23	0.91	0.19	5	0.20	0.04
Butler	3,667	1,364	37.20	20	1.47	0.55	9	0.66	0.25
Cambria	2,609	819	31.39	51	6.23	1.95	13	1.59	0.50
Cameron	73	37	50.68	3	8.11	4.11	2	5.41	2.74
Carbon	1,203	292	24.27	16	5.48	1.33	4	1.37	0.33
Centre	2,443	630	25.79	8	1.27	0.33	1	0.16	0.04
Chester	10,702	2,788	26.05	53	1.90	0.50	16	0.57	0.15
Clarion	750	198	26.40	9	4.55	1.20	5	2.53	0.67
Clearfield	1,432	485	33.87	10	2.06	0.70	3	0.62	0.21
Clinton	769	193	25.10	6	3.11	0.78	1	0.52	0.13
Columbia	1,122	202	18.00	3	1.49	0.27	4	1.98	0.36
Crawford	1,770	434	24.52	20	4.61	1.13	5	1.15	0.28
Cumberland	5,360	739	13.79	17	2.30	0.32	4	0.54	0.07
Dauphin	6,748	1,440	21.34	51	3.54	0.76	23	1.60	0.34

County of Residence	Population of Children Aged 0–23 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Delaware	12,918	4,634	35.87	110	2.37	0.85	29	0.63	0.22
Elk	593	130	21.92	1	0.77	0.17	1	0.77	0.17
Erie	5,973	2,155	36.08	64	2.97	1.07	34	1.58	0.57
Fayette	2,567	648	25.24	6	0.93	0.23	1	0.15	0.04
Forest	51	14	27.45	0	0.00	0.00	1	7.14	1.96
Franklin	3,703	839	22.66	26	3.10	0.70	9	1.07	0.24
Fulton	302	90	29.80	4	4.44	1.32	1	1.11	0.33
Greene	732	269	36.75	5	1.86	0.68	3	1.12	0.41
Huntingdon	748	229	30.61	1	0.44	0.13	3	1.31	0.40
Indiana	1,626	471	28.97	14	2.97	0.86	4	0.85	0.25
Jefferson	869	210	24.17	7	3.33	0.81	6	2.86	0.69
Juniata	566	133	23.50	6	4.51	1.06	3	2.26	0.53
Lackawanna	4,497	959	21.33	51	5.32	1.13	13	1.36	0.29
Lancaster	13,760	2,565	18.64	119	4.64	0.86	46	1.79	0.33
Lawrence	1,720	566	32.91	14	2.47	0.81	4	0.71	0.23
Lebanon	3,225	624	19.35	32	5.13	0.99	13	2.08	0.40
Lehigh	8,493	2,310	27.20	82	3.55	0.97	20	0.87	0.24
Luzerne	6,350	2,054	32.35	80	3.89	1.26	24	1.17	0.38
Lycoming	2,301	652	28.34	20	3.07	0.87	14	2.15	0.61
McKean	702	337	48.01	15	4.45	2.14	3	0.89	0.43
Mercer	2,230	684	30.67	30	4.39	1.35	5	0.73	0.22
Mifflin	1,075	285	26.51	7	2.46	0.65	3	1.05	0.28
Monroe	2,984	590	19.77	7	1.19	0.23	1	0.17	0.03
Montgomery	17,413	5,390	30.95	100	1.86	0.57	34	0.63	0.20
Montour	423	108	25.53	3	2.78	0.71	0	0.00	0.00
Northampton	5,716	1,136	19.87	41	3.61	0.72	9	0.79	0.16
Northumberland	1,794	529	29.49	18	3.40	1.00	13	2.46	0.72
Perry	1,009	227	22.50	9	3.96	0.89	4	1.76	0.40
Philadelphia	41,407	18,330	44.27	768	4.19	1.85	218	1.19	0.53

County of Residence	Population of Children Aged 0–23 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Pike	886	200	22.57	0	0.00	0.00	1	0.50	0.11
Potter	325	149	45.85	6	4.03	1.85	0	0.00	0.00
Schuylkill	2,702	947	35.05	47	4.96	1.74	11	1.16	0.41
Snyder	866	112	12.93	6	5.36	0.69	1	0.89	0.12
Somerset	1,323	410	30.99	8	1.95	0.6	5	1.22	0.38
Sullivan	63	25	39.68	2	8.00	3.17	0	0.00	0.00
Susquehanna	688	119	17.30	2	1.68	0.29	1	0.84	0.15
Tioga	781	174	22.28	6	3.47	0.77	0	0.00	0.00
Union	821	176	21.44	12	6.82	1.46	1	0.57	0.12
Venango	1,015	217	21.38	16	7.37	1.58	4	1.84	0.39
Warren	762	203	26.64	12	5.91	1.57	6	2.96	0.79
Washington	3,965	1,273	32.11	28	2.20	0.71	7	0.55	0.18
Wayne	817	219	26.81	5	2.28	0.61	0	0.00	0.00
Westmoreland	5,742	2,055	35.79	40	1.95	0.70	11	0.54	0.19
Wyoming	480	76	15.83	0	0.00	0.00	1	1.32	0.21
York	9,759	1,813	18.58	63	3.47	0.65	37	2.04	0.38
Total	273,577	84,475	30.88	2,719	3.22	0.99	867	1.03	0.32

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
**Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Table 14: Number of Children Aged 0–23 Months by County of Residence and Elevated Blood Lead Confirmation Status,* 2018

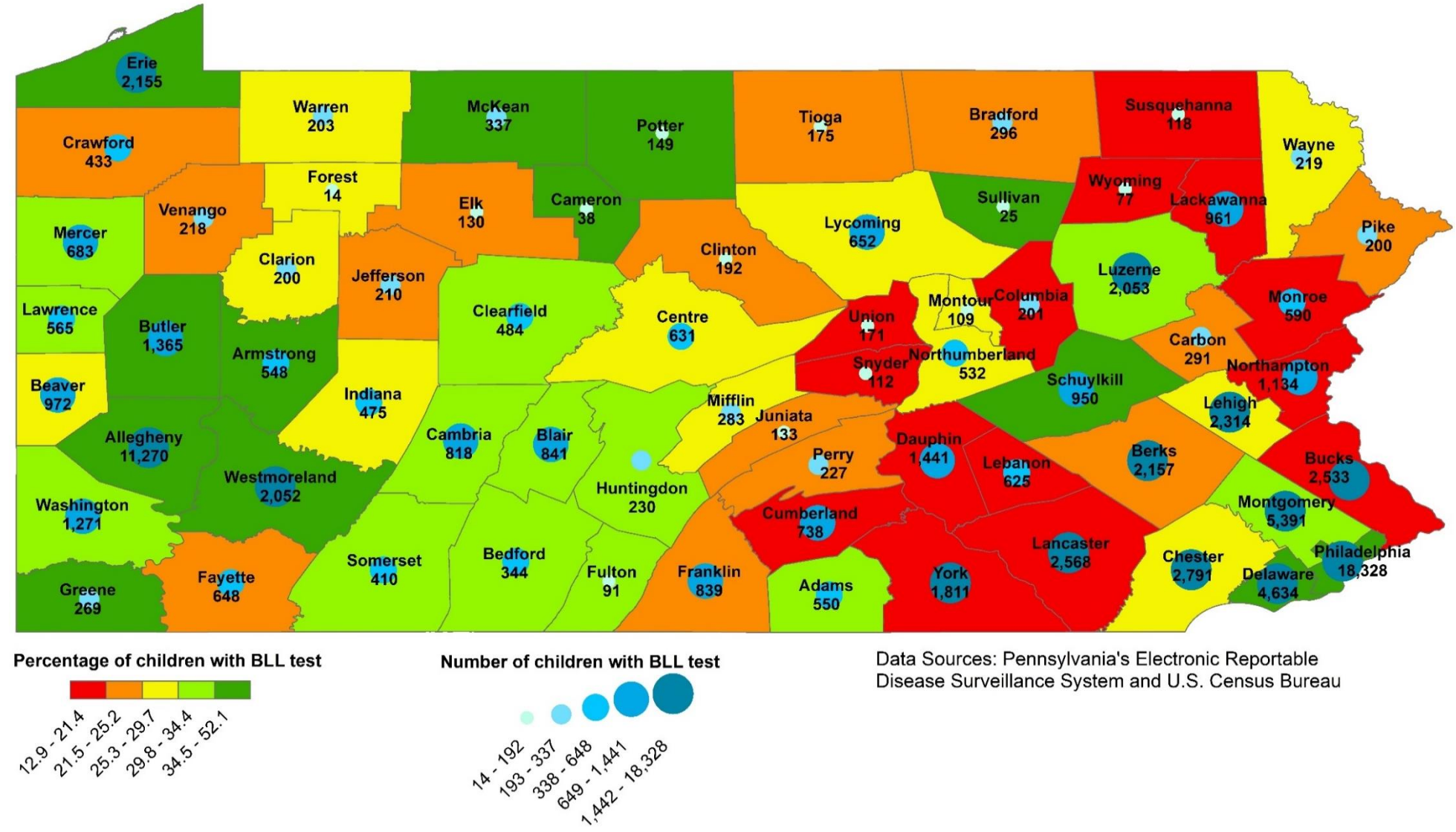
County of Residence	Population of Children Aged 0–23 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Adams	1,849	550	29.75	5	0.91	0.27	9	1.64	0.49	4	0.73	0.22
Allegheny	25,690	11,270	43.87	147	1.30	0.57	143	1.27	0.56	74	0.66	0.29
Armstrong	1,305	548	41.99	4	0.73	0.31	11	2.01	0.84	2	0.36	0.15
Beaver	3,274	972	29.69	18	1.85	0.55	6	0.62	0.18	2	0.21	0.06
Bedford	1,000	344	34.40	2	0.58	0.20	11	3.20	1.10	1	0.29	0.10
Berks	9,359	2,157	23.05	40	1.85	0.43	113	5.24	1.21	40	1.85	0.43
Blair	2,449	841	34.34	11	1.31	0.45	24	2.85	0.98	7	0.83	0.29
Bradford	1,362	296	21.73	1	0.34	0.07	7	2.36	0.51	3	1.01	0.22
Bucks	11,899	2,533	21.29	7	0.28	0.06	17	0.67	0.14	5	0.20	0.04
Butler	3,667	1,365	37.22	9	0.66	0.25	12	0.88	0.33	5	0.37	0.14
Cambria	2,609	818	31.35	43	5.26	1.65	11	1.34	0.42	4	0.49	0.15
Cameron	73	38	52.05	1	2.63	1.37	2	5.26	2.74	2	5.26	2.74
Carbon	1,203	291	24.19	8	2.75	0.67	10	3.44	0.83	2	0.69	0.17
Centre	2,443	631	25.83	4	0.63	0.16	4	0.63	0.16	0	0.00	0.00
Chester	10,702	2,791	26.08	27	0.97	0.25	30	1.07	0.28	10	0.36	0.09
Clarion	750	200	26.67	0	0.00	0.00	9	4.50	1.20	4	2.00	0.53
Clearfield	1,432	484	33.80	5	1.03	0.35	4	0.83	0.28	3	0.62	0.21
Clinton	769	192	24.97	2	1.04	0.26	4	2.08	0.52	1	0.52	0.13
Columbia	1,122	201	17.91	1	0.50	0.09	3	1.49	0.27	4	1.99	0.36
Crawford	1,770	433	24.46	16	3.70	0.90	8	1.85	0.45	3	0.69	0.17
Cumberland	5,360	738	13.77	7	0.95	0.13	11	1.49	0.21	4	0.54	0.07
Dauphin	6,748	1,441	21.35	21	1.46	0.31	33	2.29	0.49	19	1.32	0.28
Delaware	12,918	4,634	35.87	39	0.84	0.30	75	1.62	0.58	24	0.52	0.19
Elk	593	130	21.92	1	0.77	0.17	1	0.77	0.17	1	0.77	0.17
Erie	5,973	2,155	36.08	50	2.32	0.84	25	1.16	0.42	23	1.07	0.39

County of Residence	Population of Children Aged 0–23 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Fayette	2,567	648	25.24	1	0.15	0.04	4	0.62	0.16	1	0.15	0.04
Forest	51	14	27.45	0	0.00	0.00	0	0.00	0.00	1	7.14	1.96
Franklin	3,703	839	22.66	17	2.03	0.46	14	1.67	0.38	4	0.48	0.11
Fulton	302	91	30.13	0	0.00	0.00	4	4.40	1.32	1	1.10	0.33
Greene	732	269	36.75	1	0.37	0.14	4	1.49	0.55	3	1.12	0.41
Huntingdon	748	230	30.75	0	0.00	0.00	1	0.43	0.13	3	1.30	0.40
Indiana	1,626	475	29.21	6	1.26	0.37	6	1.26	0.37	3	0.63	0.18
Jefferson	869	210	24.17	3	1.43	0.35	4	1.90	0.46	4	1.90	0.46
Juniata	566	133	23.50	2	1.50	0.35	4	3.01	0.71	3	2.26	0.53
Lackawanna	4,497	961	21.37	22	2.29	0.49	36	3.75	0.80	11	1.14	0.24
Lancaster	13,760	2,568	18.66	18	0.70	0.13	108	4.21	0.78	44	1.71	0.32
Lawrence	1,720	565	32.85	6	1.06	0.35	9	1.59	0.52	3	0.53	0.17
Lebanon	3,225	625	19.38	14	2.24	0.43	20	3.20	0.62	8	1.28	0.25
Lehigh	8,493	2,314	27.25	43	1.86	0.51	42	1.82	0.49	17	0.73	0.20
Luzerne	6,350	2,053	32.33	49	2.39	0.77	41	2.00	0.65	15	0.73	0.24
Lycoming	2,301	652	28.34	3	0.46	0.13	18	2.76	0.78	12	1.84	0.52
McKean	702	337	48.01	6	1.78	0.85	9	2.67	1.28	2	0.59	0.28
Mercer	2,230	683	30.63	16	2.34	0.72	13	1.90	0.58	4	0.59	0.18
Mifflin	1,075	283	26.33	0	0.00	0.00	7	2.47	0.65	3	1.06	0.28
Monroe	2,984	590	19.77	2	0.34	0.07	5	0.85	0.17	1	0.17	0.03
Montgomery	17,413	5,391	30.96	26	0.48	0.15	76	1.41	0.44	32	0.59	0.18
Montour	423	109	25.77	0	0.00	0.00	3	2.75	0.71	0	0.00	0.00
Northampton	5,716	1,134	19.84	28	2.47	0.49	13	1.15	0.23	7	0.62	0.12
Northumberland	1,794	532	29.65	6	1.13	0.33	16	3.01	0.89	12	2.26	0.67
Perry	1,009	227	22.50	3	1.32	0.30	7	3.08	0.69	3	1.32	0.30
Philadelphia	41,407	18,328	44.26	155	0.85	0.37	633	3.45	1.53	204	1.11	0.49
Pike	886	200	22.57	1	0.50	0.11	0	0.00	0.00	1	0.50	0.11

County of Residence	Population of Children Aged 0–23 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Potter	325	149	45.85	0	0.00	0.00	5	3.36	1.54	0	0.00	0.00
Schuylkill	2,702	950	35.16	22	2.32	0.81	27	2.84	1.00	8	0.84	0.30
Snyder	866	112	12.93	5	4.46	0.58	1	0.89	0.12	1	0.89	0.12
Somerset	1,323	410	30.99	3	0.73	0.23	4	0.98	0.30	4	0.98	0.30
Sullivan	63	25	39.68	0	0.00	0.00	2	8.00	3.17	0	0.00	0.00
Susquehanna	688	118	17.15	0	0.00	0.00	2	1.69	0.29	1	0.85	0.15
Tioga	781	175	22.41	3	1.71	0.38	3	1.71	0.38	0	0.00	0.00
Union	821	171	20.83	1	0.58	0.12	9	5.26	1.10	1	0.58	0.12
Venango	1,015	218	21.48	5	2.29	0.49	10	4.59	0.99	4	1.83	0.39
Warren	762	203	26.64	10	4.93	1.31	5	2.46	0.66	3	1.48	0.39
Washington	3,965	1,271	32.06	17	1.34	0.43	15	1.18	0.38	5	0.39	0.13
Wayne	817	219	26.81	0	0.00	0.00	5	2.28	0.61	0	0.00	0.00
Westmoreland	5,742	2,052	35.74	24	1.17	0.42	20	0.97	0.35	8	0.39	0.14
Wyoming	480	77	16.04	1	1.30	0.21	0	0.00	0.00	0	0.00	0.00
York	9,759	1,811	18.56	7	0.39	0.07	55	3.04	0.56	35	1.93	0.36
Total	273,577	84,475	30.88	995	1.18	0.36	1,843	2.18	0.67	719	0.85	0.26

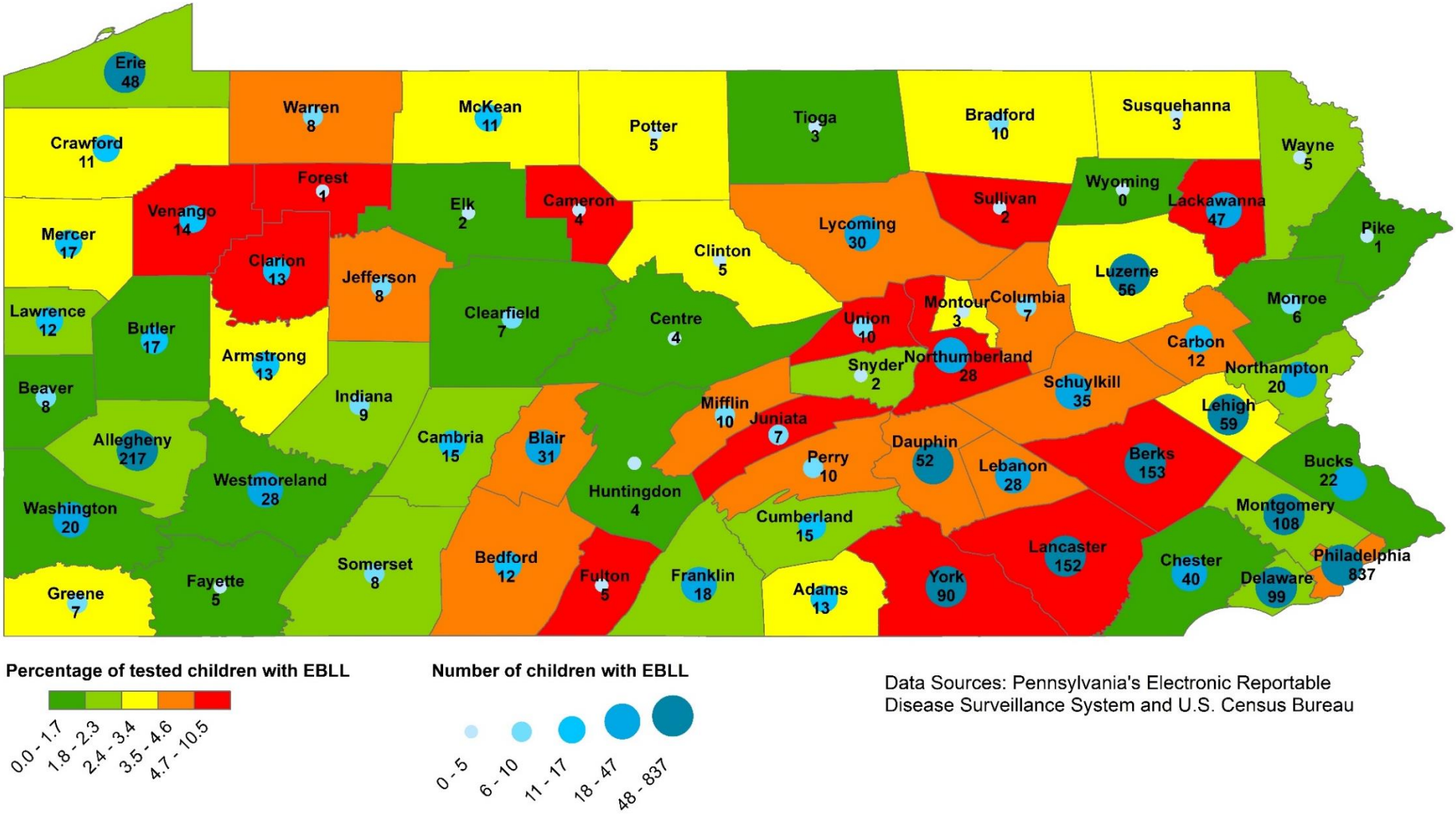
*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
^Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Figure 2: Number and Percentage* of Children Aged 0–23 Months Tested for Blood Lead Level by County, 2018



*Percentage was calculated by dividing the number of children aged 0−23 months tested in each county by the 2018 intercensal estimate of the number of children aged 0−23 months residing in the county

Figure 3: Number and Percentage* of Children Aged 0–23 Months with Confirmed Elevated Blood Lead Level by County, 2018



*Percentage was calculated by dividing the number of children aged 0−23 months with EBLL by the total number of children aged 0−23 months tested for blood lead level in 2018.

Table 15: Number of Children Tested for Lead by Maximum Blood Lead Level and County of Residence, Children Aged 0–71 Months, 2018

County of Residence	Population of Children Aged 0–71 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Adams	6,270	1,072	17.10	27	2.52	0.43	6	0.56	0.10
Allegheny	76,592	23,862	31.15	649	2.72	0.85	197	0.83	0.26
Armstrong	3,880	1,020	26.29	31	3.04	0.80	10	0.98	0.26
Beaver	10,183	1,705	16.74	37	2.17	0.36	8	0.47	0.08
Bedford	2,926	638	21.80	32	5.02	1.09	6	0.94	0.21
Berks	29,154	4,435	15.21	372	8.39	1.28	112	2.53	0.38
Blair	7,772	1,361	17.51	67	4.92	0.86	23	1.69	0.30
Bradford	4,329	576	13.31	19	3.30	0.44	12	2.08	0.28
Bucks	37,125	3,994	10.76	39	0.98	0.11	13	0.33	0.04
Butler	11,709	2,412	20.60	36	1.49	0.31	10	0.41	0.09
Cambria	7,949	1,601	20.14	122	7.62	1.53	35	2.19	0.44
Cameron	254	66	25.98	5	7.58	1.97	2	3.03	0.79
Carbon	3,699	570	15.41	45	7.89	1.22	9	1.58	0.24
Centre	7,669	795	10.37	11	1.38	0.14	2	0.25	0.03
Chester	34,849	4,795	13.76	117	2.44	0.34	34	0.71	0.10
Clarion	2,405	342	14.22	18	5.26	0.75	9	2.63	0.37
Clearfield	4,493	793	17.65	25	3.15	0.56	8	1.01	0.18
Clinton	2,490	341	13.69	13	3.81	0.52	3	0.88	0.12
Columbia	3,580	352	9.83	14	3.98	0.39	6	1.70	0.17
Crawford	5,529	856	15.48	40	4.67	0.72	12	1.40	0.22
Cumberland	16,417	1,379	8.40	31	2.25	0.19	11	0.80	0.07
Dauphin	20,658	2,888	13.98	130	4.50	0.63	45	1.56	0.22
Delaware	40,097	8,565	21.36	250	2.92	0.62	83	0.97	0.21
Elk	1,851	247	13.34	2	0.81	0.11	1	0.40	0.05
Erie	18,391	3,717	20.21	153	4.12	0.83	65	1.75	0.35
Fayette	7,998	1,259	15.74	29	2.30	0.36	9	0.71	0.11

County of Residence	Population of Children Aged 0–71 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Forest	185	26	14.05	0	0.00	0.00	1	3.85	0.54
Franklin	11,107	1,626	14.64	47	2.89	0.42	18	1.11	0.16
Fulton	901	173	19.20	7	4.05	0.78	1	0.58	0.11
Greene	2,292	471	20.55	21	4.46	0.92	6	1.27	0.26
Huntingdon	2,434	444	18.24	12	2.70	0.49	6	1.35	0.25
Indiana	4,860	838	17.24	33	3.94	0.68	6	0.72	0.12
Jefferson	2,923	382	13.07	17	4.45	0.58	15	3.93	0.51
Juniata	1,684	200	11.88	8	4.00	0.48	4	2.00	0.24
Lackawanna	13,640	2121	15.55	143	6.74	1.05	53	2.50	0.39
Lancaster	42,235	4,175	9.89	222	5.32	0.53	91	2.18	0.22
Lawrence	5,358	1,002	18.70	34	3.39	0.63	9	0.90	0.17
Lebanon	10,086	1,232	12.21	64	5.19	0.63	26	2.11	0.26
Lehigh	26,269	4,483	17.07	178	3.97	0.68	62	1.38	0.24
Luzerne	19,623	3774	19.23	190	5.03	0.97	58	1.54	0.30
Lycoming	7,369	1,041	14.13	61	5.86	0.83	22	2.11	0.30
McKean	2,378	642	27.00	29	4.52	1.22	11	1.71	0.46
Mercer	6,579	1,090	16.57	58	5.32	0.88	16	1.47	0.24
Mifflin	3,392	417	12.29	16	3.84	0.47	4	0.96	0.12
Monroe	9,246	1,074	11.62	7	0.65	0.08	1	0.09	0.01
Montgomery	55,005	9,017	16.39	220	2.44	0.40	73	0.81	0.13
Montour	1,277	375	29.37	8	2.13	0.63	1	0.27	0.08
Northampton	17,934	2,362	13.17	108	4.57	0.60	16	0.68	0.09
Northumberland	5,640	1,005	17.82	68	6.77	1.21	32	3.18	0.57
Perry	3,192	419	13.13	17	4.06	0.53	4	0.95	0.13
Philadelphia	124,751	37,874	30.36	2,253	5.95	1.81	628	1.66	0.50
Pike	2,594	415	16.00	5	1.20	0.19	1	0.24	0.04
Potter	1,063	273	25.68	10	3.66	0.94	1	0.37	0.09
Schuylkill	8,433	1,668	19.78	114	6.83	1.35	38	2.28	0.45

County of Residence	Population of Children Aged 0–71 Months†	Children Tested*		Maximum BLL 5–9.9 µg/dL			Maximum BLL ≥ 10 µg/dL		
		N	% of population**	N	% of tested	% of population	N	% of tested	% of population
Snyder	2,642	197	7.46	9	4.57	0.34	4	2.03	0.15
Somerset	4,039	728	18.02	27	3.71	0.67	8	1.10	0.20
Sullivan	205	48	23.41	3	6.25	1.46	0	0.00	0.00
Susquehanna	2,205	223	10.11	9	4.04	0.41	2	0.90	0.09
Tioga	2,599	338	13.01	12	3.55	0.46	1	0.30	0.04
Union	2,509	326	12.99	16	4.91	0.64	6	1.84	0.24
Venango	3,074	590	19.19	49	8.31	1.59	16	2.71	0.52
Warren	2,393	405	16.92	35	8.64	1.46	8	1.98	0.33
Washington	12,642	2,520	19.93	64	2.54	0.51	16	0.63	0.13
Wayne	2,620	440	16.79	10	2.27	0.38	5	1.14	0.19
Westmoreland	19,045	3,632	19.07	80	2.20	0.42	30	0.83	0.16
Wyoming	1,555	139	8.94	3	2.16	0.19	1	0.72	0.06
York	30,765	3,140	10.21	140	4.46	0.46	69	2.20	0.22
Total	847,012	160,986	19.01	6,721	4.17	0.79	2,101	1.31	0.25

*Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
**Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Table 16: Number of Children Aged 0–71 Months by County of Residence and Elevated Blood Lead Confirmation Status,* 2018

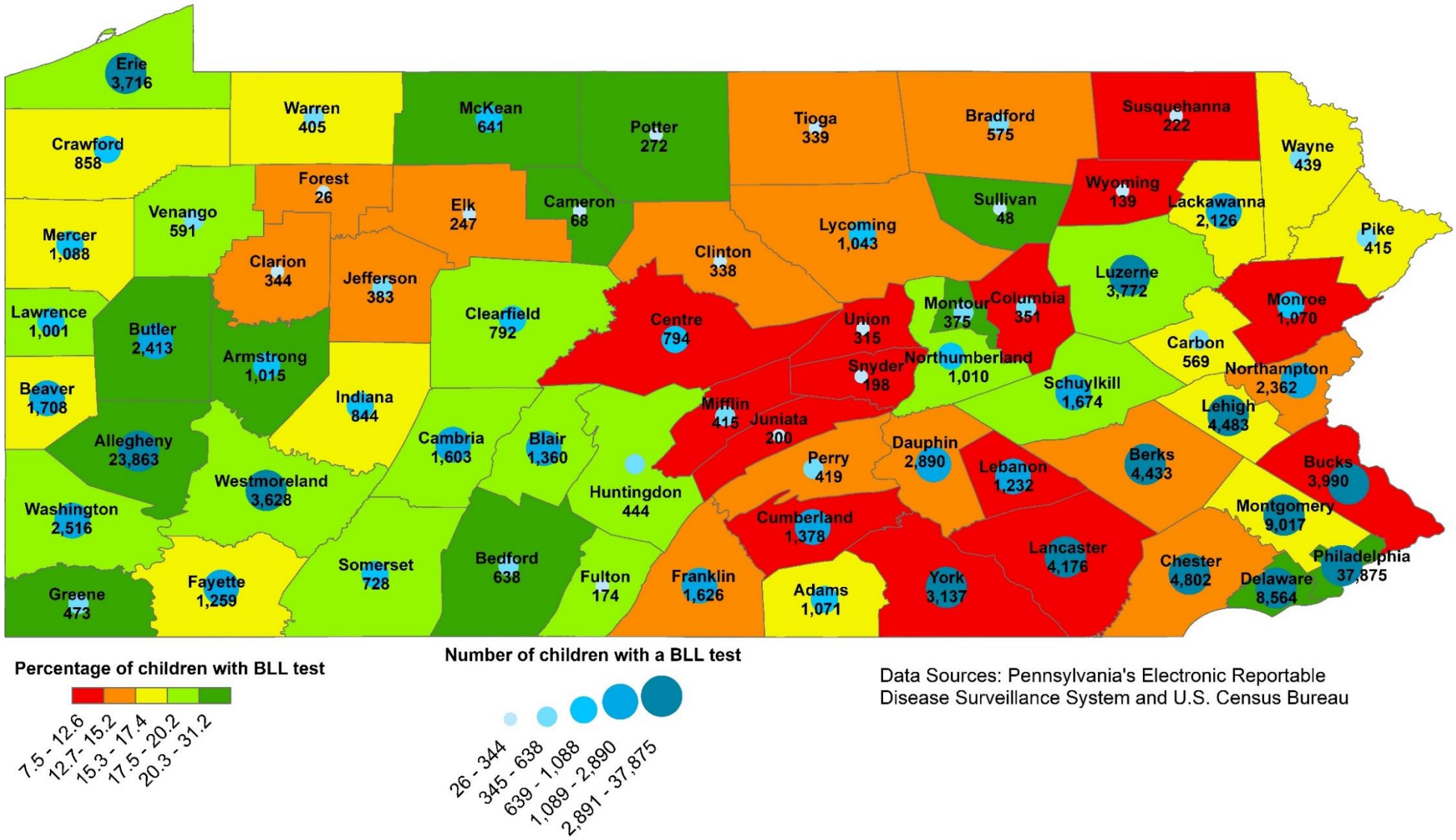
County of Residence	Population of Children Aged 0–71 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Adams	6,270	1,071	17.08	13	1.21	0.21	14	1.31	0.22	4	0.37	0.06
Allegheny	76,592	23,863	31.16	344	1.44	0.45	340	1.42	0.44	147	0.62	0.19
Armstrong	3,880	1,015	26.16	13	1.28	0.34	20	1.97	0.52	7	0.69	0.18
Beaver	10,183	1,708	16.77	28	1.64	0.27	18	1.05	0.18	3	0.18	0.03
Bedford	2,926	638	21.80	10	1.57	0.34	21	3.29	0.72	4	0.63	0.14
Berks	29,154	4,433	15.21	108	2.44	0.37	283	6.38	0.97	98	2.21	0.34
Blair	7,772	1,361	17.51	22	1.62	0.28	51	3.75	0.66	20	1.47	0.26
Bradford	4,329	575	13.28	3	0.52	0.07	16	2.78	0.37	12	2.09	0.28
Bucks	37,125	3,990	10.75	11	0.28	0.03	29	0.73	0.08	12	0.30	0.03
Butler	11,709	2,413	20.61	17	0.70	0.15	24	0.99	0.20	5	0.21	0.04
Cambria	7,949	1,603	20.17	85	5.30	1.07	47	2.93	0.59	26	1.62	0.33
Cameron	254	68	26.77	2	2.94	0.79	4	5.88	1.57	2	2.94	0.79
Carbon	3,699	569	15.38	15	2.64	0.41	31	5.45	0.84	7	1.23	0.19
Centre	7,669	794	10.35	5	0.63	0.07	5	0.63	0.07	1	0.13	0.01
Chester	34,849	4,802	13.78	70	1.46	0.20	60	1.25	0.17	25	0.52	0.07
Clarion	2,405	344	14.30	3	0.87	0.12	17	4.94	0.71	8	2.33	0.33
Clearfield	4,493	792	17.63	12	1.52	0.27	11	1.39	0.24	8	1.01	0.18
Clinton	2,490	338	13.57	4	1.18	0.16	10	2.96	0.40	2	0.59	0.08
Columbia	3,580	351	9.80	2	0.57	0.06	13	3.70	0.36	6	1.71	0.17
Crawford	5,529	858	15.52	27	3.15	0.49	21	2.45	0.38	7	0.82	0.13
Cumberland	16,417	1,378	8.39	9	0.65	0.05	24	1.74	0.15	11	0.80	0.07
Dauphin	20,658	2,890	13.99	63	2.18	0.30	84	2.91	0.41	35	1.21	0.17
Delaware	40,097	8,565	21.36	81	0.95	0.20	178	2.08	0.44	73	0.85	0.18
Elk	1,851	247	13.34	1	0.40	0.05	2	0.81	0.11	1	0.40	0.05
Erie	18,391	3,716	20.21	99	2.66	0.54	75	2.02	0.41	51	1.37	0.28

County of Residence	Population of Children Aged 0–71 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Fayette	7,998	1,259	15.74	7	0.56	0.09	23	1.83	0.29	9	0.71	0.11
Forest	185	26	14.05	0	0.00	0.00	0	0.00	0.00	1	3.85	0.54
Franklin	11,107	1,626	14.64	36	2.21	0.32	24	1.48	0.22	8	0.49	0.07
Fulton	901	174	19.31	1	0.57	0.11	6	3.45	0.67	1	0.57	0.11
Greene	2,292	473	20.64	7	1.48	0.31	14	2.96	0.61	6	1.27	0.26
Huntingdon	2,434	444	18.24	4	0.90	0.16	8	1.80	0.33	6	1.35	0.25
Indiana	4,860	844	17.37	18	2.13	0.37	15	1.78	0.31	5	0.59	0.10
Jefferson	2,923	383	13.10	10	2.61	0.34	9	2.35	0.31	11	2.87	0.38
Juniata	1,684	200	11.88	2	1.00	0.12	6	3.00	0.36	4	2.00	0.24
Lackawanna	13,640	2,126	15.59	55	2.59	0.40	105	4.94	0.77	43	2.02	0.32
Lancaster	42,235	4,176	9.89	34	0.81	0.08	199	4.77	0.47	85	2.04	0.20
Lawrence	5,358	1,001	18.68	12	1.20	0.22	23	2.30	0.43	7	0.70	0.13
Lebanon	10,086	1,232	12.21	29	2.35	0.29	41	3.33	0.41	20	1.62	0.20
Lehigh	26,269	4,483	17.07	98	2.19	0.37	103	2.30	0.39	48	1.07	0.18
Luzerne	19,623	3,772	19.22	106	2.81	0.54	108	2.86	0.55	38	1.01	0.19
Lycoming	7,369	1,043	14.15	8	0.77	0.11	56	5.37	0.76	20	1.92	0.27
McKean	2,378	641	26.96	12	1.87	0.50	18	2.81	0.76	8	1.25	0.34
Mercer	6,579	1,088	16.54	31	2.85	0.47	30	2.76	0.46	13	1.19	0.20
Mifflin	3,392	415	12.23	1	0.24	0.03	16	3.86	0.47	4	0.96	0.12
Monroe	9,246	1,070	11.57	2	0.19	0.02	5	0.47	0.05	1	0.09	0.01
Montgomery	55,005	9,017	16.39	60	0.67	0.11	164	1.82	0.30	67	0.74	0.12
Montour	1,277	375	29.37	3	0.80	0.23	5	1.33	0.39	1	0.27	0.08
Northampton	17,934	2,362	13.17	61	2.58	0.34	47	1.99	0.26	13	0.55	0.07
Northumberland	5,640	1,010	17.91	19	1.88	0.34	57	5.64	1.01	30	2.97	0.53
Perry	3,192	419	13.13	4	0.95	0.13	15	3.58	0.47	3	0.72	0.09
Philadelphia	124,751	37,875	30.36	374	0.99	0.30	1,933	5.10	1.55	586	1.55	0.47

County of Residence	Population of Children Aged 0–71 Months†	Children Tested**		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population^	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Pike	2,594	415	16.00	4	0.9	0.15	2	0.48	0.08	1	0.24	0.04
Potter	1,063	272	25.59	1	0.37	0.09	9	3.31	0.85	1	0.37	0.09
Schuylkill	8,433	1,674	19.85	65	3.88	0.77	65	3.88	0.77	22	1.31	0.26
Snyder	2,642	198	7.49	9	4.55	0.34	3	1.52	0.11	2	1.01	0.08
Somerset	4,039	728	18.02	14	1.92	0.35	15	2.06	0.37	7	0.96	0.17
Sullivan	205	48	23.41	0	0.00	0.00	3	6.25	1.46	0	0.00	0.00
Susquehanna	2,205	222	10.07	3	1.35	0.14	6	2.70	0.27	2	0.90	0.09
Tioga	2,599	339	13.04	5	1.47	0.19	7	2.06	0.27	1	0.29	0.04
Union	2,509	315	12.55	1	0.32	0.04	13	4.13	0.52	4	1.27	0.16
Venango	3,074	591	19.23	18	3.05	0.59	36	6.09	1.17	12	2.03	0.39
Warren	2,393	405	16.92	20	4.94	0.84	19	4.69	0.79	4	0.99	0.17
Washington	12,642	2,516	19.90	40	1.59	0.32	31	1.23	0.25	11	0.44	0.09
Wayne	2,620	439	16.76	3	0.68	0.11	8	1.82	0.31	5	1.14	0.19
Westmoreland	19,045	3,628	19.05	47	1.30	0.25	38	1.05	0.20	25	0.69	0.13
Wyoming	1,555	139	8.94	1	0.72	0.06	3	2.16	0.19	0	0.00	0.00
York	30,765	3,137	10.20	16	0.51	0.05	123	3.92	0.40	66	2.10	0.21
Total	847,012	160,986	19.01	2,288	1.42	0.27	4,809	2.99	0.57	1,776	1.10	0.21

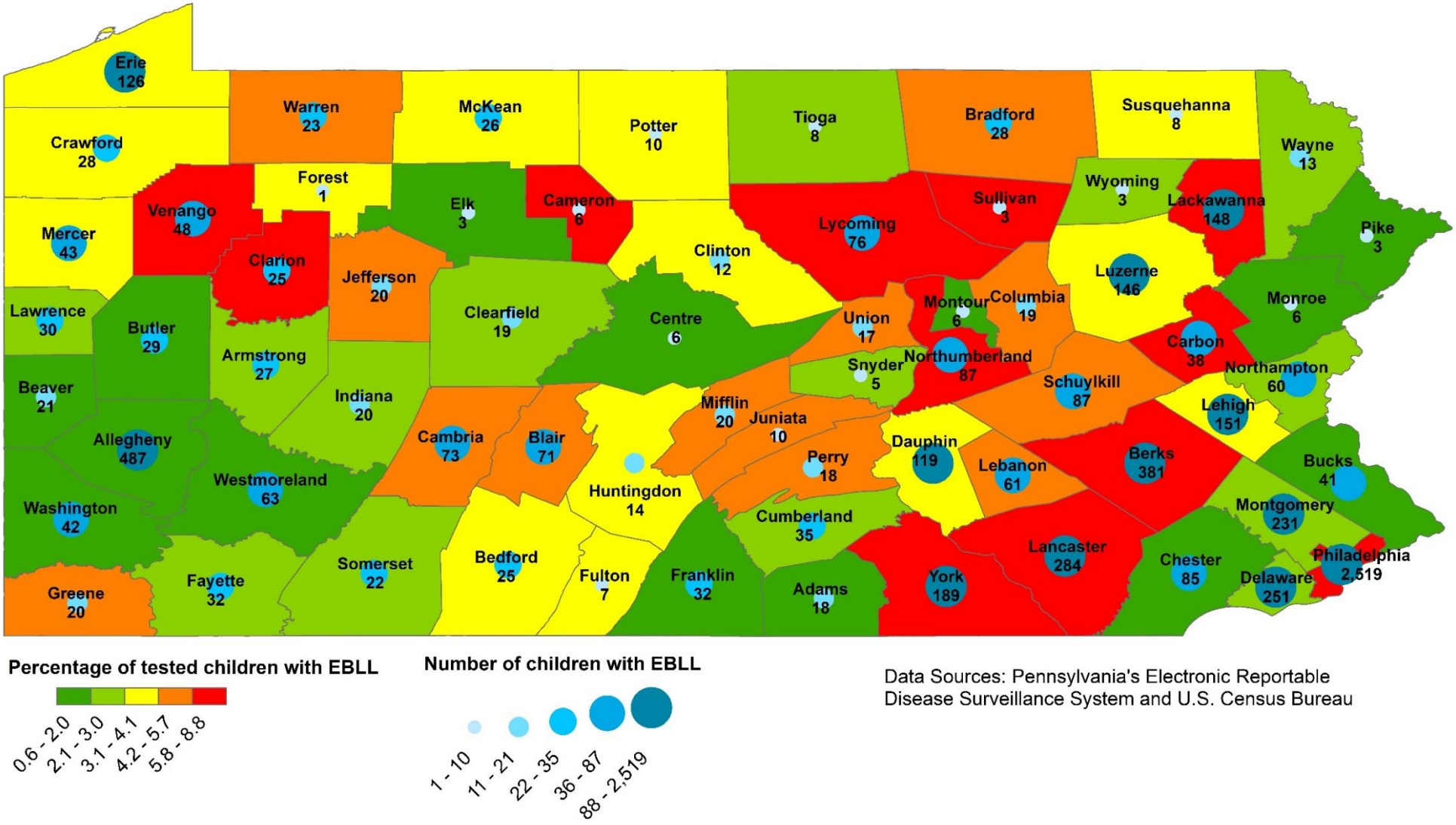
*Per CDC 2016 Confirmed Elevated Blood Lead case definition
**Note that Pennsylvania does not mandate universal screening of children; screening of children is recommended between 9 and 12 months and at 24 months. Allegheny County is currently the only county with mandatory testing.
^Percent was calculated as number of children tested divided by the population of children in the county for the specified age range.
†2018 intercensal estimate
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Figure 4: Number and Percentage* of Children Aged 0–71 Months Tested for Blood Lead Level by County, 2018



*Percentage was calculated by dividing the number of children aged 0−71 months tested in each county by the 2018 intercensal estimate of the number of children aged 0−71 months residing in the county.

Figure 5: Number and Percentage* of Children Aged 0–71 Months with Confirmed Elevated Blood Lead Level by County, 2018.



*Percentage was calculated by dividing the number of children aged 0−71 months with EBLL by the total number of children aged 0−71 months tested for blood lead level in 2018.

Testing in Rural and Urban Counties:

The chart below contains testing data on children under 6, broken out by residence in either a rural or urban county. The chart also further displays results broken out by EBLL and whether they were confirmed.

Table 17: Number of Children Aged 0–71 Months by Urban/Rural Status of County of Residence and Elevated Blood Lead Confirmation Status,* 2018

Status of County of Residence	Population of Children Aged 0–71 Months**	Children Tested		Unconfirmed elevated (≥ 5 µg/dL)			Confirmed 5–9.9 µg/dL			Confirmed ≥ 10 µg/dL		
		N	% of population†	N	% of tested	% of population	N	% of tested	% of population	N	% of tested	% of population
Rural	204,193	33,832	16.57	595	1.75	0.29	857	2.53	0.42	330	0.98	0.16
Urban	642,819	127,154	19.78	1,693	1.33	0.26	3,952	3.11	0.61	1,446	1.14	0.22
Total	847,012	160,986	19.01	2,288	1.42	0.27	4,809	2.99	0.57	1,776	1.10	0.21

*Per CDC 2016 Elevated Blood Lead case definition
**2018 intercensal estimate
†Percent was calculated as number of children tested/population of children in county for specified age range.
Data sources: Pennsylvania Department of Health, PA-NEDSS., National Center for Health Statistics

Note: A county is rural when the number of persons per square mile within the county is less than 284. Counties that have 284 persons or more per square mile are considered urban. The current mix of 48 rural and 19 urban counties has remained unchanged since 1970. Population projections from the Pennsylvania State Data Center shows that this current mix of rural/urban counties will remain the same until 2040. Urban counties are Allegheny, Beaver, Berks, Bucks, Chester, Cumberland, Dauphin, Delaware, Erie, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Montgomery, Northampton, Philadelphia, Westmoreland and York.

References:

1. National Toxicology Program. 2012. Monograph on health effects of low-level lead. Research triangle park, NC. Available from: https://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf.
2. Agency for Toxic Substances & Disease Registry. 2017. Environmental health and medicine education, lead toxicity, what are the possible health effects from lead exposure? Available from: https://www.atsdr.cdc.gov/csem/csem.asp?csem=34&po=10.
3. Advisory Committee for Childhood Lead Poisoning Prevention, 2012. Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention. Available from: https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm.
4. U.S. Census Bureau. American community survey population estimate program. 2014-2018 American Community Survey 5-Year Estimates, table B25034: year structure built.
5. Centers for Disease Control and Prevention, 2002. Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention. Available from: https://www.cdc.gov/nceh/lead/casemanagement/managingEBLLs.pdf.
6. American Academy of Pediatrics, Council on Environmental Health. 2016. Prevention of Childhood Lead Toxicity. Available from: http://pediatrics.aappublications.org/content/pediatrics/early/2016/06/16/peds.2016-1493.full.pdf.
7. Center for Disease Control and Prevention. Recommended actions based on blood lead level. Available fromhttps://www.cdc.gov/nceh/lead/advisory/acclpp/actions-blls.htm
8. National Center for Health Statistics. Vintage 2018 postcensal estimates of the resident population of the United States by year, county, single-year of age (0, 1, 2,…, 85 years and over), bridged race, Hispanic origin, and sex. Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: https://www.cdc.gov/nchs/nvss/bridged_race.htm.

Contact Information

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For information about the Department of Health's Lead Prevention Program, contact:

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Division of Child and Adult Health Services
Bureau of Family Health
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625 Forster St. | Harrisburg, PA 17120
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This report can be found at: https://www.health.pa.gov/Pages/default.aspx.

Attachment 6

(Attachments 27-30 to
Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

Attachment 27

Passed by Allegheny County Board of Health on May 3, 2017, and Allegheny County Council on July 5, 2017.

ALLEGHENY COUNTY
HEALTH DEPARTMENT

RULES AND REGULATIONS

ARTICLE XXIII. UNIVERSAL BLOOD LEAD LEVEL TESTING

Section 1. AUTHORITY, PURPOSE, AND SCOPE.

Pursuant to the authority granted to the Allegheny County Health Department under the Pennsylvania Local Health Administration Law, 16 P.S. §§ 12010(f) and 12011(c), this regulation has been promulgated to improve the health of the children of Allegheny County. Universal blood lead level testing will facilitate early detection and referral for treatment of lead poisoning; will reduce the incidence, impact and cost of lead poisoning; will inform parents and guardians of their children's lead exposure; and will enable countywide surveillance of childhood lead poisoning. The regulation applies to all residents and schools of Allegheny County.

Section 2. DEFINITIONS.

Blood Lead Level. A measure of lead in the blood, measured in micrograms of lead per deciliter of whole blood (µg/dL).

Child. A natural person under 72 months of age who is a resident of Allegheny County.

Department. Allegheny County Health Department.

Director. The Director of the Allegheny County Health Department.

Health Care Practitioner. An individual who is authorized to practice some component of the healing arts by a license, permit, certificate or registration issued by a Pennsylvania licensing agency or board.

Record of Blood Lead Level Testing. Any written or electronic document acceptable to the Director showing the date of blood lead level testing, including, but not limited to health care practitioner records, school health records, and other similar documents or history.

Blood Lead Level Testing. A blood sample obtained either by venipuncture or finger stick capillary blood collection from a child not known to be lead poisoned or to have an elevated blood lead level in order to identify the child's risk of lead poisoning or elevated blood lead level.

Section 3. BLOOD LEAD LEVEL TESTING REQUIREMENTS.

A. *General Rule*. Blood lead level testing shall be performed in accordance with the following:

1. Children shall receive a blood lead level testing in accordance with the following schedule:

    a. Each child shall be tested between approximately 9 months to 12 months of age and again at approximately 24 months of age.
    b. All children designated as high risk, as determined by a health care practitioner and based on the child's exposure to lead and any other factors indicating high risk, should receive subsequent blood lead level testing as deemed appropriate by a health care practitioner.
    c. Blood lead level testing may be delayed if the health care practitioner is not able to collect a sufficient blood sample for testing.
    d. If a child has not had their blood lead level tested between approximately 9 months to 12 months of age and at approximately 24 months of age, then that child shall have their blood lead level tested as soon as possible after 24 months but before 72 months of age or entry into kindergarten, whichever is sooner.

B. *Testing Methods*. Health care practitioners shall ensure that blood lead level testing is conducted either by venipuncture or by capillary blood sampling in accordance with current best practices. Capillary blood sample testing results of 5 µg/dL or greater shall be confirmed with a venipuncture test.

C. *Exception*. If the parent or guardian of a child objects on the grounds enumerated in Section 4, below, then the testing required by Subsection A, above, may not be performed.

Section 4. EXCEPTIONS.

A. *Medical Exemption*. Children need not have a blood lead level testing according to the schedule enumerated in Section 3, above, if a health care practitioner or his/her designee provides a written statement that blood lead level testing may be detrimental to the health of the child. When the health care practitioner determines that blood lead level testing is no longer detrimental to the health of the child, the child should have their blood lead level tested according to Section 3, above.

B. *Religious Exemption*. Children need not have a blood lead level testing according to the schedule enumerated in Section 3, above, if the parent, guardian, or emancipated child objects in writing to the blood lead level testing on religious grounds or on the basis of a strong moral or ethical conviction similar to a religious belief.

Section 5. RESPONSIBILITIES OF SCHOOLS AND SCHOOL ADMINISTRATORS.

A. The administrator in charge of every school shall appoint a knowledgeable person to perform the following:

1. Inform the parent or guardian at registration or prior to registration, if possible, of the requirements of this regulation.

2. Ascertain the blood lead level testing status of every child prior to admission to kindergarten at the school.

B. The parent or guardian of a child who has not had their blood lead level tested in accordance with Section 3 (relating to blood lead level testing requirements) shall be informed of the blood lead level testing requirement and advised to go to his/her usual source of care, or to the nearest Allegheny County Health Department location offering blood lead level testing, to obtain a blood lead level test.

C. Each school shall maintain on file a Record of Blood Lead Level Testing for every child enrolled in kindergarten at the school.

D. Failure to have or document the blood lead level testing required by Section 3, above, shall not prevent a child's attendance at school.

Section 6. SCHOOL REPORTING.

A. Every public, private, parochial or nonpublic school, including intermediate units and special education, cyber and charter schools, in Allegheny County shall, after a child's entry to kindergarten and using forms provided by the Department, report blood lead level testing data to the Department by October 15 of each year.

B. The school administrator or his/her designee shall forward the blood lead level testing data reports to the Department's Bureau of Assessment, Statistics & Epidemiology, or as otherwise designated by the Department.

C. The content of the annual blood lead level testing data report shall include, at minimum, the following information:

1. The identification of the school including the name of the school, the school district, the intermediate unit, and the type of school.

2. The month, day, and year of report.

3. The number of children entering kindergarten at the school.

4. The number of children entering kindergarten at the school who have had their blood lead level tested.

5. The number of children entering kindergarten at the school who did not have their blood lead level tested due to medical exemptions.

6. The number of children entering kindergarten at the school who did not have their blood lead level tested due to medical exemptions or exemptions on religious grounds or on the basis of a strong moral or ethical conviction similar to a religious belief.

7. Other information as required by the Department.

Section 7. RESPONSIBILITES OF THE DEPARTMENT.

A. The Department will provide the blood lead level testing data reporting forms to schools.

B. The Department will monitor school districts for compliance with this regulation and will have access to school blood lead level testing data.

Section 8. RESPONSIBILITIES OF HEALTH CARE PRACTIONERS.

A. Health care practitioners shall perform blood lead level testing on children in accordance with the provisions of this Article.

B. Health care practitioners shall report the results of blood lead level testing administered in accordance with applicable Pennsylvania law or regulation.

Section 9. SEVERABILITY CLAUSE.

The provisions of these Rules and Regulations are severable. Should any section, paragraph, sentence, clause, or phrase of these Rules and Regulations be declared unconstitutional or invalid for any reason, the remainder of said Rules and Regulations shall not be affected thereby.

Section 10. EFFECTIVE DATE.

The provisions of these Rules and Regulations shall become effective on January 1, 2018.

Attachment 28

ALLEGHENY COUNTY

Blood Lead Level Testing

Allegheny County requires all children be tested for lead exposure at approximately 9-12 months old and then again at approximately 24 months old.

Children who have not had their blood tested at either of those required intervals must be tested as soon as possible before age 6 or prior to entering kindergarten, whichever comes first.

The universal lead testing regulation went into effect on January 1, 2018. You can find the regulation text here: Article XXIII. If you have questions about the regulation, please check out our testing FAQ here in English or Spanish.

If you are a pediatric provider, please visit our Healthcare Provider page.

If you work in a school or as a daycare provider, please see our School and Daycare page.

Testing Exemptions

How Will My Child be Tested?

Where Can I Have My Child Tested?

What Do the Test Results Mean?

Your child's test results represent the amount of lead found in their blood sample. The amount of lead found in a child's blood is called the blood lead level (BLL). Blood lead tests tell how many micrograms (millionth of a gram) of lead are in each deciliter (tenth of a liter) of a child's blood (µg/dL).

If the result is below 5 µg/dL:

- Your child's blood level is not elevated at this time. It is below the CDC's reference value, which is 5 µg/dL.
- Your child does not need a follow-up test now.
- If your child is younger than 2 years old, s/he will need another test when s/he is approximately 24 months old.
- Your child may need another test if s/he moves to a different home, daycare, school, etc. that was built before 1978.
- Go to our Prevention page to see how to keep your child safe from lead exposure.

If the result is at or above 5 µg/dL:

- Your child's blood level is elevated.
- If the test was a capillary test (in which blood is drawn from a finger stick) it needs to be confirmed with a venous test, in which blood is drawn from the arm. Capillary samples are easier to contaminate and sometimes the result is not accurate.
- Confirmatory tests need to be prescribed by your child's doctor. If your child is under- or uninsured, please see ACHD's Guide for Under and Uninsured Residents for a list of pediatric healthcare resources in Allegheny County that can help.
- Check the table below to see when your child should get a confirmatory test:

Recommended Schedule for Obtaining a Confirmatory Venous Sample

BLL (µg/dL)	Time to confirmation testing
<5	No confirmation required
5-9	1 week - 1 month[a]
10-44	1 week - 1 month[a]
45-59	48 hours
60-69	24 hours
≥70	Urgently as emergency test

[a] The higher the BLL on the screening test, the more urgent the need for confirmatory testing.

If the venous test confirms result at or above 5ug/dl, get more information on next steps by visiting My Child Has an Elevated Blood Lead Level.

Post-Testing and School Enrollment Information

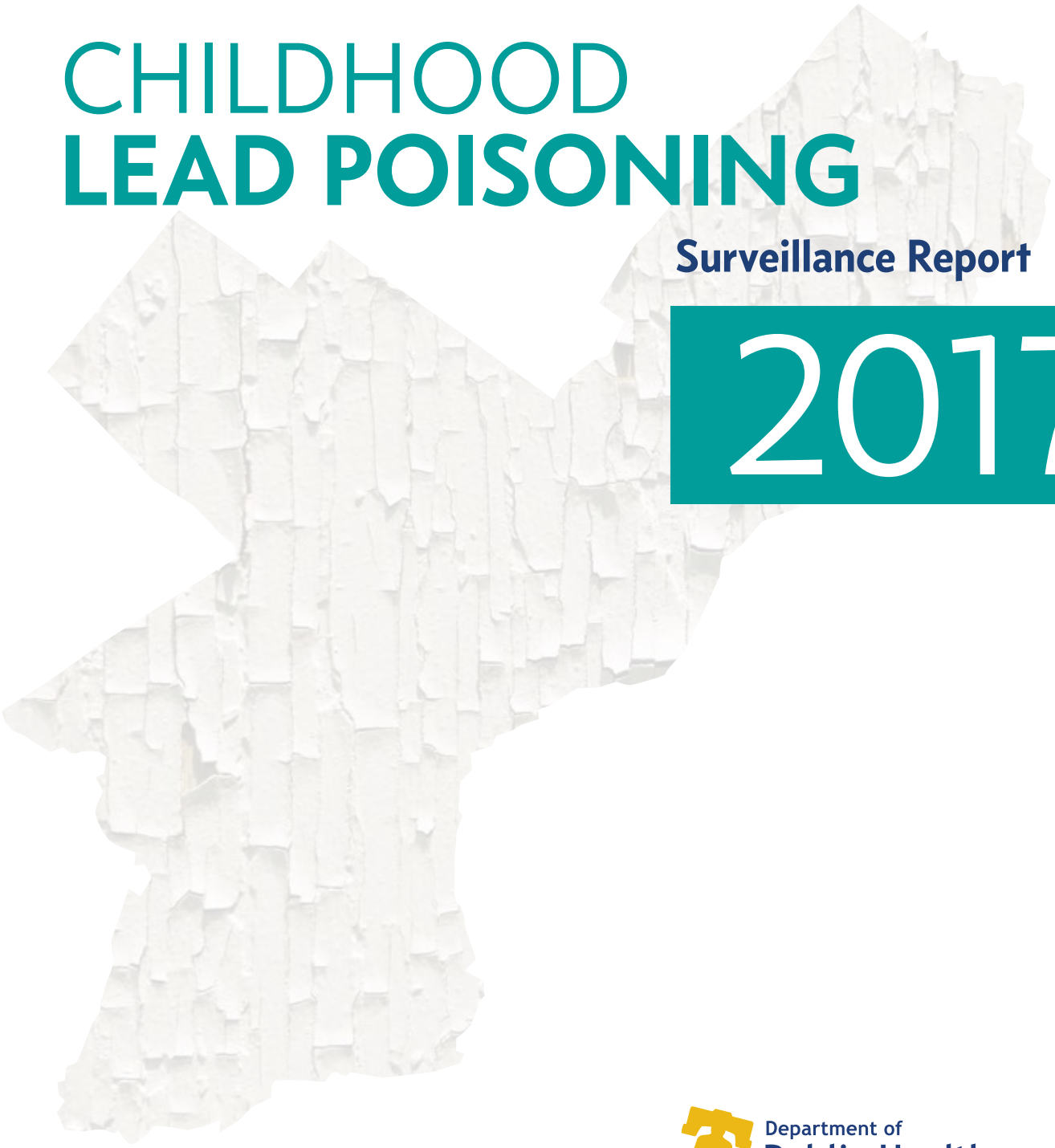
Attachment 29

Philadelphia Department of Public Health
Environmental Health Services
Lead and Healthy Homes Program

CHILDHOOD LEAD POISONING

Surveillance Report

2017



Department of Public Health
CITY OF PHILADELPHIA

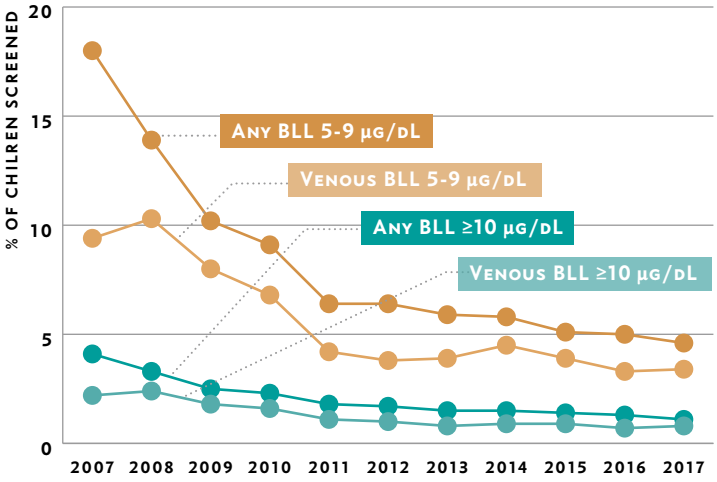
Contents

NUMBERS AT A GLANCE

Among Philadelphia children under the age of 6 years old in 2017, there was a decrease in newly identified children with venous blood lead levels ≥10 µg/dL from 2.2% of children screened for lead poisoning in 2007 to 0.8% in 2017.

FIGURE 1.

Trend of lead exposure by venous and any blood specimen type among children <6 years old living in Philadelphia, 2007-2017.*



*5-9 & ≥10 µg/dL categories are mutually exclusive

INTRODUCTION

LEAD POISONING

Even small amounts of lead can cause very serious harm to the brain and other parts of the nervous system. Lead in a child's body can:

- Slow down growth and development
- Damage hearing and speech
- Cause behavior problems
- Make it hard to pay attention and learn

Due to their increased hand-to-mouth activity and developing neurological and digestive systems, children under the age of 72 months are at an increased risk of the effects of lead exposure.

Some of the health problems caused by lead exposure may never go away. The best response to the problem is to prevent a child from becoming lead poisoned in the first place.

By far the major source of childhood lead exposure in Philadelphia is lead paint and the dust it produces. Many homes in Philadelphia built before 1978 have lead paint on the inside and outside of the building. When old paint cracks and peels, or when it is ground between surfaces such as around windows, it makes lead dust. Children can be exposed to lead from ingesting flakes of paint or paint dust that gets on their hands and toys. Some examples of other sources of lead exposure include contaminated water or soil, folk medicines, certain kinds of cosmetics and jewelry, and imported spices.

PDPH LEAD AND HEALTHY HOMES PROGRAM

The Philadelphia Department of Public Health's (PDPH) Lead and Healthy Homes Program (LHHP), formerly known as Childhood Lead Poisoning Prevention Program, addresses conditions that cause childhood lead poisoning and educates social service and childcare providers, clinicians, families and children about the importance of preventing lead exposure and performing lead screening.

For more information about LHHP and access to educational materials, please visit:

phila.gov/health/ChildhoodLead/index.html

These activities include:

- Providing education and outreach to families and healthcare providers
- Offering private in-home services to eligible families, including home inspections and remediation to reduce lead hazards
- Enforcing lead laws and regulations in collaboration with the Philadelphia Department of Licenses and Inspections and the Law Department
- Conducting surveillance on childhood lead exposure to monitor trends and identify high-risk populations

TRACKING LEAD EXPOSURE, RISK FACTORS, AND OUTCOMES

In situations where a child is already exposed to lead, LHHP works to prevent further exposure by educating families, inspecting homes, and providing remediation services when applicable.

LHHP staff members regularly monitor laboratory tests to identify children with high BLLs. When LHHP becomes aware of a child with a BLL ≥10µg/dL who has not already been identified, LHHP contacts the child's parents or guardian and initiates services. If a child has a BLL between 5-9 µg/dL, LHHP offers education services to help educate the parent or guardian about how they can ensure the child is not further exposed to lead.

In this report, we have added a new section called "PDPH Services Provided to Children with a Newly Identified High BLL in 2017", which reports on the outcomes for children with a newly identified BLL ≥10µg/dL in 2016.

It is also important to determine how the trends of lead exposure are changing over time in Philadelphia as a whole, among certain demographic groups, or within specific geographical areas. Therefore, LHHP routinely analyses data to monitor characteristics of children with higher BLLs and which areas of Philadelphia are most affected.

EXPLANATION OF THE DATA

Childhood lead exposure in the State of Pennsylvania is a reportable condition, which means that healthcare practitioners, laboratories, and healthcare facilities must report the health concern to Pennsylvania Department of Health (PA DOH). PA DOH receives reports of all blood tests for lead, even those with no lead detectable.

Blood lead tests are reported individually. Therefore, one child may have multiple test reports. This document summarizes data for each child rather than by tests. For example, if one child had multiple lead tests with results ≥10 µg/dL within a calendar year, that child would only be counted once for that year.

The most reliable way to test for lead is with a venous blood specimen, that is, blood that is taken from a vein. Blood tests using capillary blood specimens (taken by finger stick) may falsely identify tests as being elevated. Therefore, capillary blood specimens are not considered as reliable as venous blood specimens. For some tests, PDPH does not receive information about the source of blood specimens, so they are classified as unknown specimen type. In this report, we present data in two ways - venous samples only and all samples - in order to show the range of potential childhood lead exposure.

DEFINITIONS

For this report we use the following definitions:

Blood lead level (BLL):

Micrograms per deciliter of lead from a blood specimen. Elevated BLLs (EBLLs) in this report are classified as either 5-9 µg/dL or ≥10 µg/dL.

Screening rate:

Screening rate is calculated by dividing the number of children under the age of 72 months (6 years) who were screened by the total number of children under the age of 72 months living in Philadelphia, multiplied by 100.

Newly identified case rate:

This rate is calculated by dividing the number of children under the age of 72 months with a newly identified EBLL by the total number of children under the age of 72 months who were screened, multiplied by 100.

$$\frac{\text{\# children with a newly identified EBLL}}{\text{\# children screened for lead exposure}} \times 100$$

Rates with newly identified children with EBLLs, rather than all current EBLLs (prevalence, as described below) provides a more precise estimation of how lead exposure is changing from year to year. Most EBLL rates in this document will be reported as newly identified case rates.

Existing cases:

Numbers listed using this term means we are presenting all children under the age of 72 months with an existing EBLL. Rather than showing the newly identified cases, existing cases includes children who were first identified with an EBLL is previous years, but still had a higher test result in the year measured. We use this measure to present the distribution of the amount of lead detected in blood overtime.

Birth cohort:

A birth cohort is defined as children born during specific calendar year in Philadelphia. These children are followed to track rates of screening. For example, children born from January 1st, 2012 through December 31st, 2012 are included in the 2012 birth cohort.

SCREENING RECOMMENDATIONS

PDPH recommends that all children be screened for lead exposure between the **ages of 8 to 12 months**, and **again at the age of 24 months**. It is recommended to use venous blood specimens when conducting lead screening for better accuracy in detecting lead in the blood.

If a child's blood lead level is elevated, PDPH recommends that the child should receive a follow-up test within the following time frames:

Result (µg/dL)	Time to Initiate Follow-up Test
5-9	3 months
10-14	3 months
15-19	1 to 3 months
20-24	1 to 3 months
25 or higher	Seek medical attention as soon as possible

PHILADELPHIA LEAD PAINT DISCLOSURE & CERTIFICATION LAW

Despite years of progress, each year significant numbers of children in Philadelphia suffer harm from exposure to deteriorated lead paint and lead dust in their homes. More than half of these children live in rental units.

The Philadelphia Lead Paint Disclosure & Certification Law (Philadelphia Code Section 6-800) is designed to prevent lead exposure to children by requiring landlords to certify that a property occupied by young children is "lead safe" or "lead free".

For more information about this law, please visit:

phila.gov/health/ChildhoodLead/LeadPaintLaw.html

SCREENING RATES FOR LEAD EXPOSURE REMAIN HIGH

More than 90% of Philadelphia children receive at least one lead screening test before they turn 6 years old. In addition, 76% of children born in 2015 received at least one test before they turned 2 years old, compared to 58% of children born in 2005. However, only 28% of children born in 2015 were tested fully in accordance with PDPH's recommendations (i.e., at age 1 and again at age 2).

FIGURE 2.

Children <6 years old screened by year, 2007-2016.

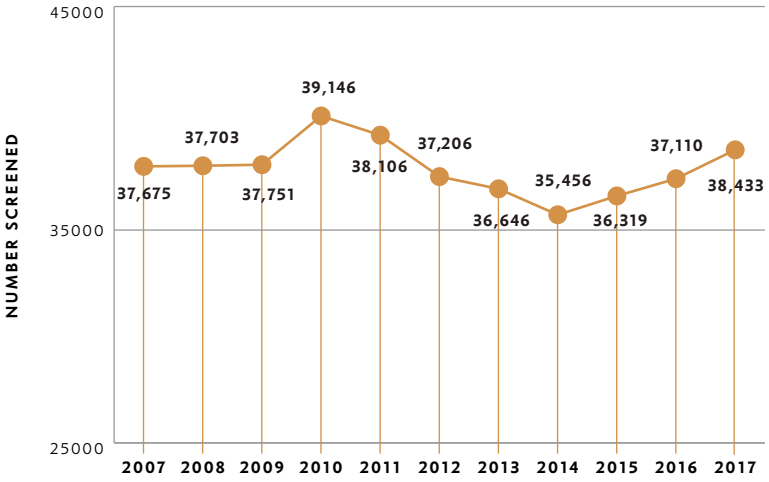


TABLE 1.

Screening rates among children born in 2005 through 2015.

Year of Birth	% Screened by 2 Years Old (<24 months)	% Screened at 1 & Again at 2	% Screened by 3 Years Old (<36 months)	% Screened Twice by 3 Years Old (<36 months)	% Screened by 6 Years Old (<72 months)
2005	57.5	15.0	72.5	30.9	86.4
2006	70.6	18.2	80.3	36.6	91.8
2007	72.0	19.1	80.9	37.4	91.4
2008	72.3	20.7	81.8	38.1	91.5
2009	73.6	21.4	83.1	39.9	91.9
2010	73.1	21.6	82.4	39.7	91.8
2011	70.4	22.3	81.1	38.8	91.0
2012	71.9	23.4	82.3	38.2	--
2013	72.0	24.9	82.4	38.3	--
2014	74.2	28.7	83.9	45.0	--
2015	76.5	27.9	--	--	--

Notes:

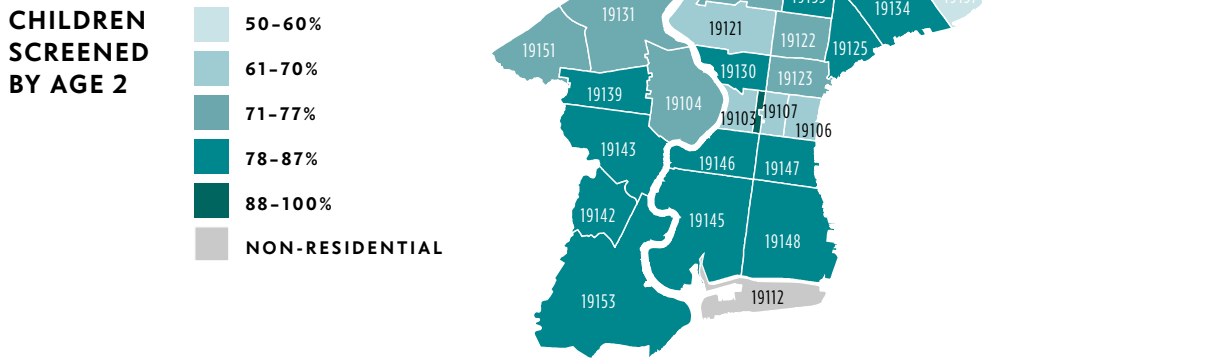
Screening rates are shown by birth cohort (i.e. children born in a given year). The number of children born during 2005 through 2015 is based on PDPH's 2015 Vital Statistics Report, Vital Status Events by Zip Code – Supplemental Tables.

Medicaid and PDPH recommend that children get screening at age 1 and again at age 2.

Various screening parameters were chosen to determine at what ages and how often children are getting screened for lead exposure, and how screening is changing over time. In the table above, we defined screening at age 1 as those with a test between ages 9-15 months, and at age 2 as those with a test between ages 21-27 months. This varies slightly from children being tested twice by the age of 3.

FIGURE 3.

Percentage of children born in 2015 tested for lead at least once by the age of 2 by zip code.



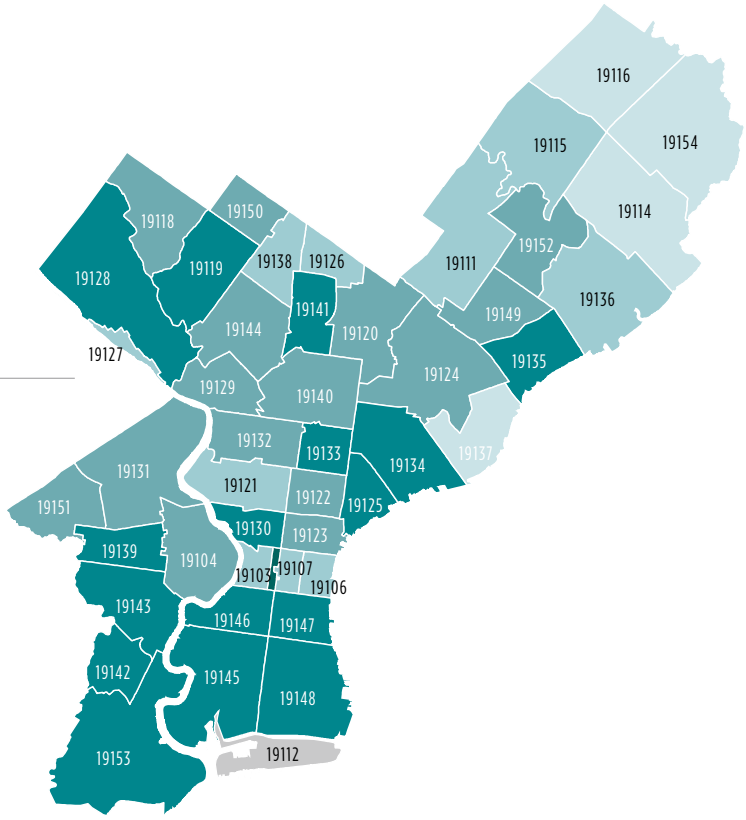
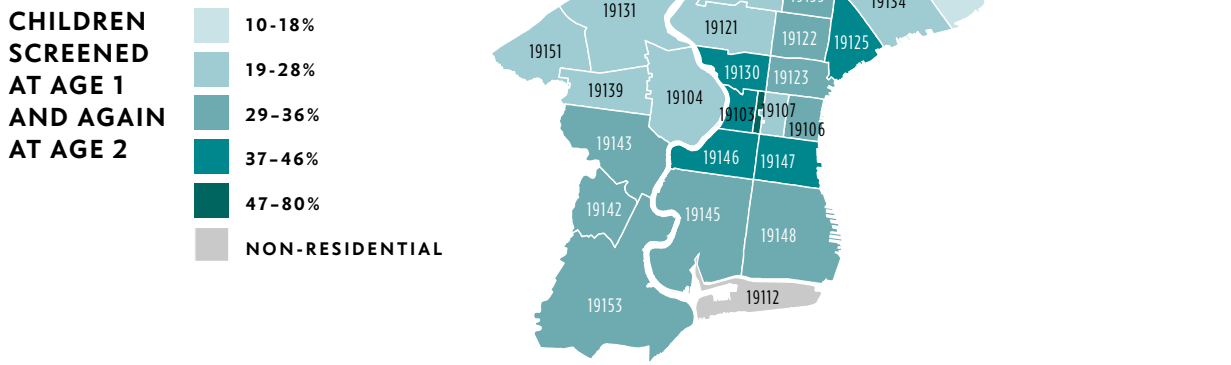
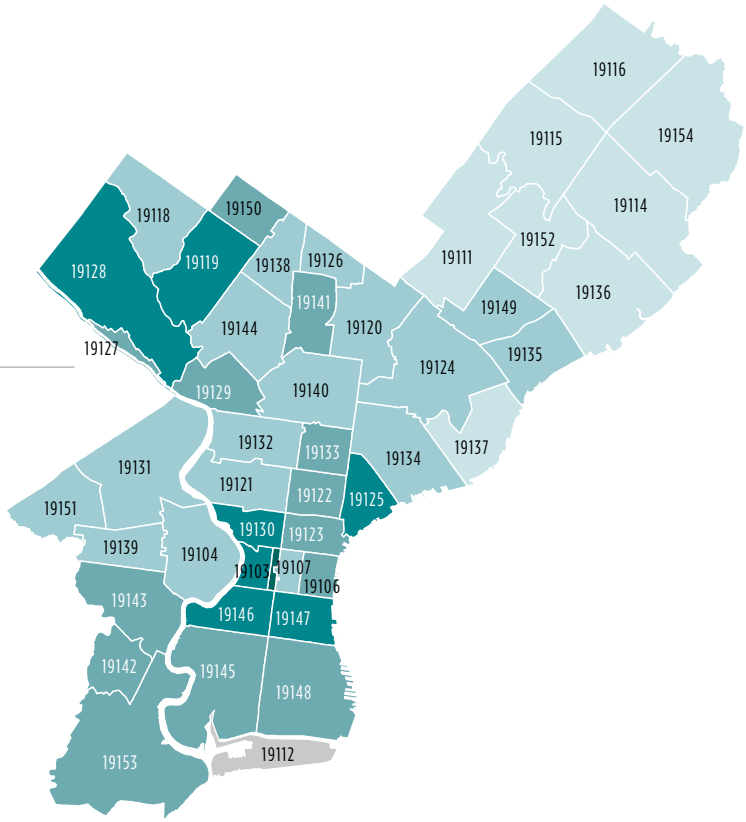


FIGURE 4.

Percentage of children born in 2015 tested for lead at the age of 1 year old and again at the age of 2 by zip code.





LEAD EXPOSURE IS OCCURRING IN FEWER CHILDREN EACH YEAR, BUT REMAINS A CONCERN

Rates of lead exposure among all blood specimen sources continued to decline in 2017. There was a slight increase in venous EBLLs from 2016 to 2017. However, there was no increase in EBLLs of any specimen type during the same time (see section "Lead Exposure Identified through All Types of Blood Specimens"). This information combined with further investigation of the data suggest that increases in venous BLLs are associated with changes in laboratory reporting.

Nonetheless, certain areas of the city–particularly North Philadelphia and some parts of the West and Southwest Philadelphia–experience higher rates than the rest of the city.

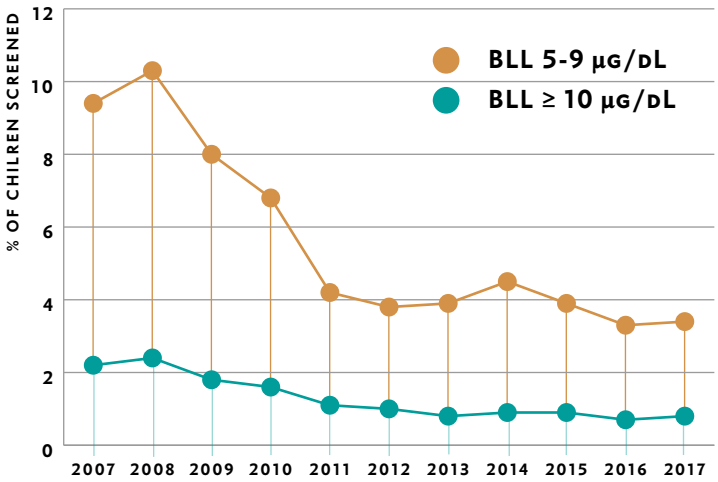
In the following tables and figures, numbers associated with lead exposure are reported by either those identified through a test using venous blood specimens or any type of blood specimens (i.e., venous, capillary, or unknown). Using venous blood tests to calculate rates of lead exposure gives us a more precise estimate. However, by including children identified through any type of blood specimen in overall numbers, PDPH's Lead and Healthy Homes Program can target prevention efforts to all children possibly affected by lead exposure.

LEAD EXPOSURE IDENTIFIED THROUGH VENOUS BLOOD SPECIMENS

The following tables and figures show BLLs among blood specimens derived from the vein, the most reliable measure of lead exposure in the blood.

FIGURE 5.

Trend of newly identified EBLLs using venous blood specimens among children <6 years old, 2007-2017.



*5-9 & ≥10 µg/dL categories mutually exlcusive

TABLE 2.

Number and percentage of newly identified BLLs using venous blood specimens among children <6 years old, 2007-2017.

Year	Number of Children Screened	Number of Children with BLL 5-9 µg/dL	Number of Children with BLL ≥ 10 µg/dL	Percent of Children with BLL 5-9 µg/dL	Percent of Children with BLL ≥10 µg/dL	Geometric Mean in µg/dL
2007	37,675	3,536	843	9.4	2.2	3.8
2008	37,703	3,894	914	10.3	2.4	3.4
2009	37,751	3,007	693	8.0	1.8	3.3
2010	39,146	2,655	634	6.8	1.6	3.1
2011	38,106	1,601	407	4.2	1.1	2.5
2012	37,206	1,426	363	3.8	1.0	2.2
2013	36,646	1,431	295	3.9	0.8	2.1
2014	35,456	1,608	331	4.5	0.9	2.6
2015	36,319	1,430	328	3.9	0.9	2.6
2016	37,110	1,235	272	3.3	0.7	2.5
2017	38,433	1,305	318	3.4	0.8	2.1

Notes:

Calculated using the highest venous blood lead level a child had in a given year.

Geometric mean is an average that is often used to measure BLLs because it may be more accurate. It uses calculation slightly different from the traditional (arithmetic) mean to adjust for outliers. The geometric mean is based on BLLs with detectible amounts of lead in their blood. Therefore, this number represents the average BLL among those with any detectible amount of lead exposure.

TABLE 3.

Distribution of existing BLL levels (venous) by category, 2013-2017.

BLL Category	2013	2014	2015	2016	2017
<5	23,766	24,002	25,253	24,117	26,422
5-9	1,838	2,056	1,816	1,625	1,564
10-14	195	230	216	174	199
15-24	81	83	88	84	100
25-44	22	26	21	21	21
45+	7	<6	6	<6	8

Notes:

For each child, their highest prevalent (any existing, not restricted to new) BLL in a given year was identified and categorized.

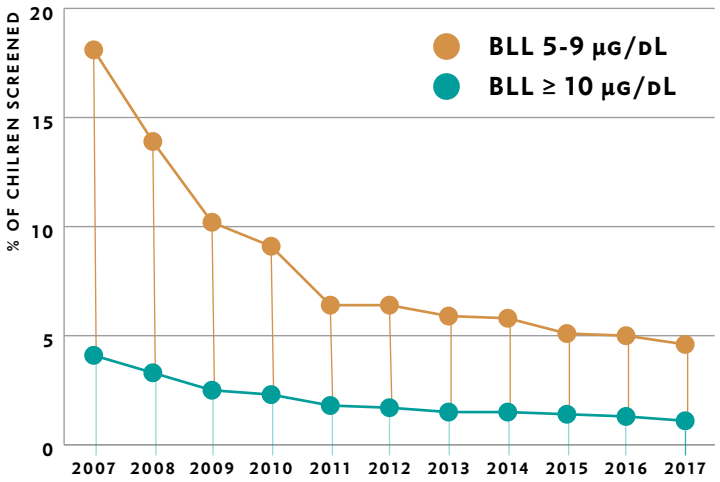
These numbers do not necessarily represent newly identified BLLs. Some children may have had a newly identified BLL in a previous year, but continued to get tested in the following years for monitoring purposes. Please see the section titled "Explanation of Data" for more information.

LEAD EXPOSURE IDENTIFIED THROUGH ALL TYPES OF BLOOD SPECIMENS

The following tables and figures show BLLs among blood specimens derived from any source (i.e. venous, capillary, or unknown blood specimen type).

FIGURE 6.

Trend of newly identified BLLs using any type of blood specimens among children <6 years old, 2007-2017.



*5-9 & ≥10 µg/dL categories mutually exlcusive

TABLE 4.

Number and percentage of newly identified BLLs using all types of blood specimens among children <6 years old, 2007-2017.

Year	Number of Children Screened	Number of Children with BLL 5-9 µg/dL	Number of Children with BLL ≥ 10 µg/dL	Percent of Children with BLL 5-9 µg/dL	Percent of Children with BLL ≥10 µg/dL	Geometric Mean in µg/dL
2007	37,675	6,827	1,544	18.1	4.1	3.8
2008	37,703	5,250	1,251	13.9	3.3	3.4
2009	37,751	3,833	957	10.2	2.5	3.3
2010	39,146	3,560	900	9.1	2.3	3.2
2011	38,106	2,454	679	6.4	1.8	2.6
2012	37,206	2,388	632	6.4	1.7	2.4
2013	36,646	2,173	560	5.9	1.5	2.2
2014	35,456	2,050	537	5.8	1.5	2.5
2015	36,319	1,845	494	5.1	1.4	2.4
2016	37,110	1,850	475	5.0	1.3	2.3
2017	38,433	1,771	435	4.6	1.1	2.1

Notes:

Calculated using the highest venous blood lead level a child had in a given year.

Geometric mean is an average that is often used to measure BLLs because it may be more accurate. It uses calculation slightly different from the traditional (arithmetic) mean to adjust for outliers. The geometric mean is based on BLLs with detectible amounts of lead in their blood. Therefore, this number represents the average BLL among those with any detectible amount of lead exposure.

TABLE 5.

Distribution of existing BLL levels (all specimen types) by category, 2013-2017.

BLL Category	2013	2014	2015	2016	2017
<5	33,237	32,223	33,443	34,208	35,818
5-9	2,828	2,666	2,373	2,413	2,160
10-14	381	369	326	299	275
15-24	143	142	134	148	139
25-44	39	44	35	35	30
45+	7	<6	7	7	11

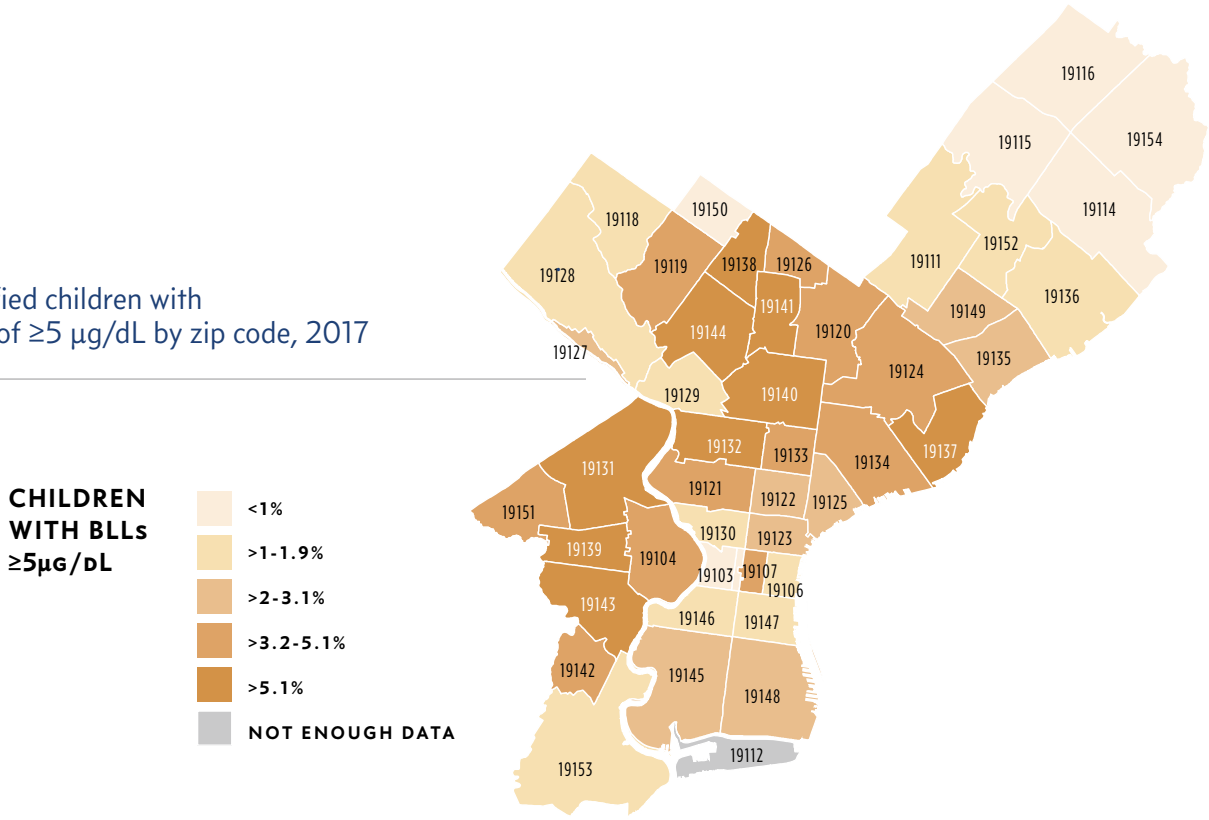
Notes:

For each child, their highest recorded BLL in a given year was identified and categorized.

These numbers do not necessarily represent newly identified BLLs. Some children may have had a newly identified BLL in a previous year, but continued to get tested in the following years for monitoring purposes. Please see the section titled "Explanation of Data" for more information.

FIGURE 7.

Newly identified children with venous BLLs of ≥5 µg/dL by zip code, 2017



SERVICES PROVIDED TO CHILDREN WITH ELEVATED BLL

TABLE 6.

Services provided by the Department of Public Health to children with newly identified elevated BLLs ≥10 µg/dL in 2017.

Services Type	Number of Children	Percent (%)
Educational visit	317	72.9
Inspection	246	56.6
Remediation	160	36.8
Proceeded to Lead Court	74	17.0
No PDPH services provided	122	25.7

Notes:

Total count (N=435) includes children with newly identified BLLs by venous or unknown specimen types. For case management purposes, these cases are considered eligible for PDPH services.

Services such as educational visit, inspection, remediation, and Lead Court are not mutually exclusive.

Reasons for no services are mutually exclusive.

POVERTY AND AGE OF HOUSING ARE ASSOCIATED WITH ELEVATED BLOOD LEAD LEVELS IN CHILDREN

Risk factors for lead exposure are presented by zip code in the figures below.

FIGURE 8.

Poverty vs. elevated BLL by zip code.

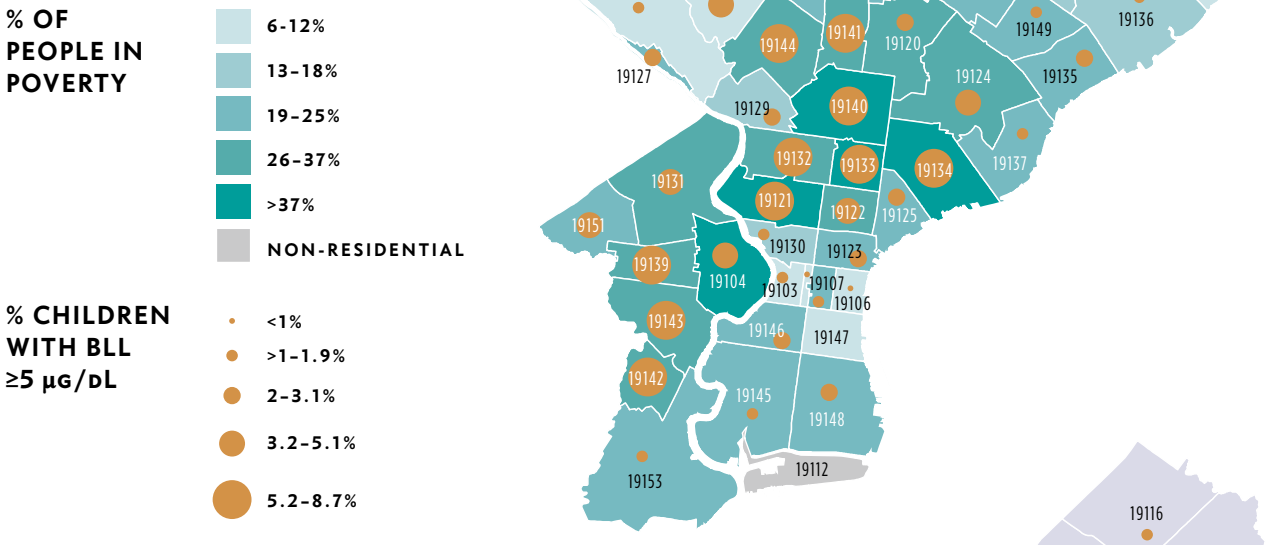
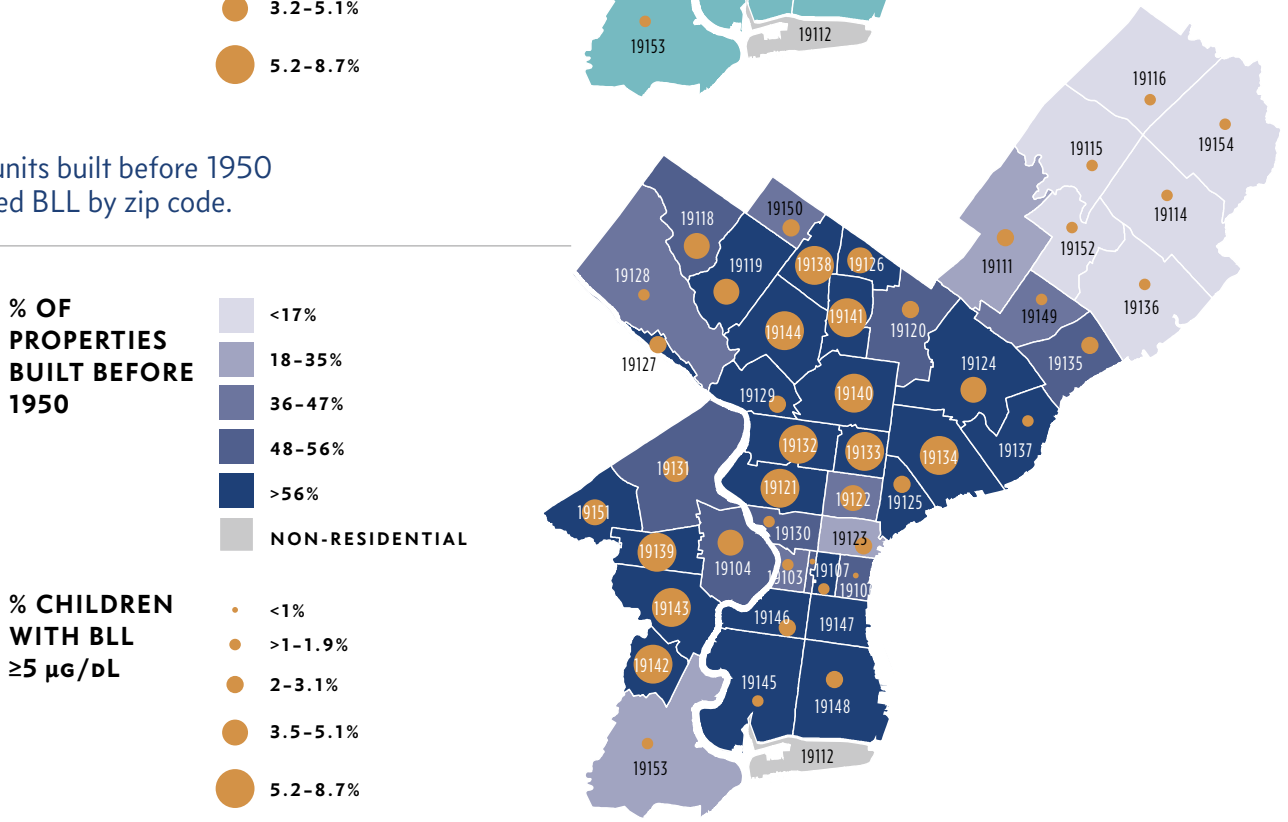


FIGURE 9.

Housing units built before 1950 vs. elevated BLL by zip code.



Department of
Public Health
CITY OF PHILADELPHIA

For more information, please contact:

Lead and Healthy Homes Program
Philadelphia Department of Public Health
2100 West Girard Avenue, Building #3
Philadelphia, PA 19130-1400
Tel: 215-685-2788

Attachment 30

JOINT STATE GOVERNMENT COMMISSION

General Assembly of the Commonwealth of Pennsylvania

LEAD EXPOSURE RISKS AND RESPONSES IN PENNSYLVANIA

Report of the Advisory Committee and Task Force on Lead Exposure

April 2019

Serving the General Assembly of the Commonwealth of Pennsylvania Since 1937

FINDINGS AND RECOMMENDATIONS

Significant Findings

Much of Pennsylvania's housing, school buildings and drinking water supply systems were originally constructed before the potential health hazards of lead exposure were widely recognized, and before bans and restrictions on the use of lead in plumbing materials and paint were implemented.

Given the age of Pennsylvania's infrastructure and history as an industrial center, it is safe to assume that there is a potential for lead exposure in all areas of the Commonwealth.

Exposure to lead-based paint is the primary cause of lead poisoning and a much wider-spread area of risk than public drinking water systems.

While the harmful effects of ingesting or breathing lead-contaminated air, water, soil, and paint are well-known and recognized, there is no known "safe harbor" level of lead in the bloodstream that can be considered acceptable.

Children are at the greatest risk of lead poisoning, which can cause neurological damage, organ damage and death, but adults and the elderly can also suffer heath concerns from lead exposure.

Specific inquiries used in risk assessments vary among health care providers, and may lead to a false assumption of the level of risk based on the socio-economic status of the child's family and the geographic location of the child's home, and may not identify all locales where the child spends a large amount of time. Thus determination as to which children are tested can be arbitrary, yet the Pennsylvania Department of Health has concluded that all of Pennsylvania is "at risk" for lead exposure.

Drinking water supply systems are responsible for water lines from the source to the property line of a home or business. The service lines from the "curb to the meter" and the plumbing and fixtures are owned by and the responsibility of the property owner. It is estimated that at least 160,000 of these service lines made of lead exist in Pennsylvania, connecting to homes, schools and daycare facilities.

Many schools do not have their own private drinking water sources and receive their drinking water from public community water systems. Once the water leaves the public system, it can be exposed to lead via older service lines to the building, and interior plumbing and fixtures that may have been in place since the building was constructed.

Older school buildings, particularly those constructed before 1960, have a substantial risk of containing internal lead drinking water distribution systems and lead paint.

Not all plumbing supplies are required to be lead-free and consumers sometimes inadvertently purchase products containing lead for use in their personal residences.

Private wells are not subject to state regulation, and few municipalities have guidelines for safe construction and connection of water lines to the home or business.

Regulations governing child care facilities address lead-paint activities as they occur in such facilities, but do not require lead inspections or certification in order to obtain or maintain licensure.

Prevention of lead exposure and poisoning should be addressed from multiple perspectives.

Legislative Recommendations

Recommendation #1: Require universal blood screenings for children.

Testing of infants and toddlers at approximately one and two years of age should assist in identifying those persons who are most vulnerable to the long-term effects of lead exposure at the earliest possible point in time. In addition, if children have not been tested previously, testing at the time of enrollment in school will help identify children who have elevated blood levels to prevent further damage from previously undetected exposure. Data collected from screenings can be used to help guide state and local lead policies. At some time in the future, when the epidemiology of lead exposure is better understood, universal screening may be reevaluated by the Department of Health to determine its future practicality. *See* Proposed Legislation, 35 Pa.C.S. Ch. 32, *infra* p. 21.

Recommendation #2: Mandate inspections/certifications of child-care facilities and facilities with vulnerable populations.

Facilities that provide services to young children and persons with medical vulnerabilities should be inspected for lead-based paint and lead in the drinking water in order to protect them from exposure. Facilities constructed in 1990 or later, facilities that have been certified as lead free, or facilities have been certified as lead safe in the previous 36 months are exempt from this inspection requirement. *See* Proposed Legislation, 35 Pa.C.S. § 3301, *infra* p. 26.

Recommendation #3: Ensure safe housing is available to families with young children.

Residential rental properties constructed prior to 1978 should be certified as lead safe or lead free from lead paint, and residential rental properties constructed prior to 1990 should be certified as lead safe for drinking water. The proposed legislation accompanying this recommendation mandates that any housing where children under the age of six reside must be so certified. To address concerns that residential rental property owners may try to circumvent these provisions by refusing to rent to anyone whose household includes a young child, a presumption is created that any residential rental property with an occupancy limit of more than two people is intended as housing for children under the age of six. See Proposed Legislation, 35 Pa.C.S. § 3404, infra p. 32.

Recommendation #4: Establish a statewide rental housing registry.

In order to allow potential tenants to verify if housing they are considering will be safe for their children, a statewide registry of housing that has been certified as lead free or lead safe should be established. *See* Proposed Legislation, 35 Pa.C.S. Chapter 34, Subchapter A, *infra* p. 30.

Recommendation #5: Establish a lead abatement grant program to assist property owners in conducting lead abatement.

This program would be administered by the committee to be established under recommendation #6 and would be funded, in part, by a surcharge on paint sold in the Commonwealth. *See* Proposed Legislation, 35 Pa.C.S. Chapter 34, Subchapter B, *infra* p. 39.

Recommendation #6: Establish an interagency council to coordinate implementation of lead prevention programs and policies among the relevant state agencies.

The Intergovernmental Lead Poisoning Prevention Committee, composed of the Secretaries of Education, Human Services, Health, Environmental Protection, and Community and Economic Development would also administer lead abatement grants and make an annual report to the General Assembly and Governor on prevention of lead exposure and poisoning. *See* Proposed Legislation, 35 Pa.C.S. § 3103, *infra* p. 15.

Recommendation #7: Require all school drinking water systems to be inspected and certified.

Water outlets in schools that are used for drinking and preparing food should inspected and certified every three years to protect school-age children from lead exposure. *See* Proposed Legislation, 35 Pa.C.S. § 3302, *infra* p. 27.

Recommendation #8: Clarify plumbing system lead ban.

DEP's existing Lead Ban Surveillance Program provides outreach and education to retailers who sell plumbing components and supplies. This recommendation would provide for signage in retail stores that provide information to consumers about the lead plumbing ban to assist them in purchasing approved materials for home drinking water system repairs. *See* Proposed Legislation, 35 Pa.C.S. § 3104(b), *infra* p. 16.

Recommendation #9: Permit municipal authorities operating public drinking water systems to replace lateral lead service lines.

Municipal authorities should have the same ability to replace privately owned lead lateral service lines that drinking water systems owned by public investors have under 66 Pa.C.S. § 1311.

Recommendation #10: Require lead service line replacements and restrict partial lead water service line replacements.

Lead service lines are one of the biggest sources of lead contamination in drinking water. Lead service lines are owned partially by the community drinking water system, but only to the curb at the homeowner's property line. The service from the curb to the house and other buildings is owned by the homeowner. Research has shown that partial lead service line replacements can result in increased levels of lead in drinking water. Federal and state regulations provide procedures to be followed to apprise homeowners of the risk of partial line replacements, and follow-up testing protocols to ensure the water is safe to drink. The advisory committee recommends that the General Assembly further restrict the installation of partial lead service line replacements and provide additional guidance to water companies in obtaining homeowner consent to full lead service line replacements.

Other Recommendations

Recommendation 11: Adopt the Uniform Property Maintenance Code.

Amending the Pennsylvania Construction Code is a complicated process involving the General Assembly and Uniform Construction Code Review and Advisory Council (RAC). Revisions and amendments to the Code, to include some of the UCC revisions released in 2015, were recently adopted, and were effective October 1, 2018. However, Pennsylvania has yet to adopt the Uniform Property Maintenance Code. The Advisory Committee recommends that the General Assembly direct RAC to review and adopt, as appropriate for Pennsylvania, the provisions of the Property Maintenance Code.

Recommendation #12: Provide guidance on private wells.

Pennsylvania is one of the few states that does not provide a statewide law regarding the construction of private wells. The Advisory Committee recommends that the General Assembly adopt a statewide law on the siting of private wells in order to protect groundwater from potential contamination. While not directly related to lead exposure, this recommendation is meant to encourage protection of drinking water supplies in general.

LEAD EXPOSURE AS A PUBLIC HEALTH RISK

Lead toxicity is not a new phenomenon. Records of the effects of acute lead poisoning among workers who came in regular contact with the metal exist from the Roman Empire and later.[6] "Epidemiological studies and clinical observations provide evidence of a progression of adverse effects of lead in humans in association with" blood lead levels (BLLs) greater than 10µg/dL and less than 60µg/dL. Adults with blood lead levels in this range have experienced neurological effects, thyroid hormone alterations, decreased fertility, increased blood pressure, depressed kidney functions and anemia.[7] Recognition of acute lead poisoning in children and the link to lead paint in their environment was known in the medical community since the beginning of the 20th century.[8] Lead poisoning in children can result in vomiting, constipation, colic, and abdominal pain, symptoms that are found in a number of childhood diseases and were often misidentified. More severe cases were diagnosed as meningitis and encephalitis of unknown origin.[9]

With the phaseout of leaded gasoline in the early 1970s, the ban on residential lead paint in 1978, and the 1990 ban on lead in drinking water systems, blood lead levels nationwide declined. With increasingly sophisticated and refined testing methods, blood lead level testing has become more accurate at increasingly lower levels of exposure. These improvements in diagnostic abilities have coincided with the Centers for Disease Control (CDC) finding that there is no safe level of lead, especially for children, who are most susceptible to its toxic effects. As of 2018, data from the CDC has indicated that there are approximately half a million U.S. children ages one to five with BLLs above 5µ/dL, the reference level at which the CDC recommends public health actions be initiated.[10]

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[6] Sven Hernberg, MD, PhD. "Lead Poisoning in a Historical Perspective." *American Journal of Industrial Medicine.* 38:244-254 (2000), at 244-245.

[7] U.S. Department Of Health And Human Services. Public Health Service. Agency for Toxic Substances and Disease Registry. "Toxicological Profile for Lead." 2005, at pp. 31-32. https://www.atsdr.cdc.gov/toxprofiles/tp13.pdf.

[8] Richard Rabin, MSPH. "Warnings Unheeded: A History of Child Lead Poisoning." *American Journal of Public Health.* Vol. 79, No.12, 1668-1674. (1989)

[9] *Id.*, at p. 1669.

[10] Centers for Disease Control and Prevention, Lead, (Oct. 10, 2018), https://www.cdc.gov/nceh/lead/default.htm.

Lead Poisoning

Acute, higher level lead poisoning presents itself in a variety of physical symptoms in adults and children. Almost all adult blood lead levels higher than 25µg/dL are the result of occupational exposure.[11] Principal occupations include battery manufacturing, lead and zinc ore mining, and painting and paper hanging industries. Health effects can include impaired cardiovascular and kidney functions, cognitive impairment, and decreased reproductive functioning.[12] Of the 28 states reporting blood lead levels of greater than or equal to 10µg/dL to the CDC under its Adult Blood Lead Epidemiology and Surveillance (ABLES) programs in 2013, Pennsylvania had the third highest prevalence rate at 49.1 per 100,000 employed adults aged 16 or older. This is more than twice the average of 20.4. Pennsylvania had the highest prevalence rate for blood lead levels greater than or equal to 25µg/dL at 25.7. The average rate at this blood lead level was 5.2. Recent studies have "found decreased renal function associated with BLLs at <5µg/dL and increased risk of hypertension and essential tremor at BLLs <10µg/dL."[13] While the bulk of the recommendations in this report address the needs of children, it is important to remember that preventing lead exposure and poisoning of adults is also necessary.

Intensive medical studies have found that young children are particularly vulnerable to the toxic effects of lead and can suffer profound and permanent adverse health effects, most notably affecting the development of a child's brain and nervous system. A child with a high level of exposure to lead can suffer severe damage to the brain and nervous system, resulting in coma, convulsions, and even death. It is believed that young children are particularly vulnerable to lead because they absorb four to five times as much ingested lead as adults from a given source. It is further believed that this can be partially attributed to a child's innate curiosity and their age-appropriate hand-to-mouth behavior which is often occasioned with their mouthing and swallowing of lead containing or coated objects. According to the World Health Organization, this common route of exposure is magnified in children with persistent and compulsive cravings to eat non-food items, who may pick away at, and eat leaded paint in the form of flakes from walls, door frames and even furniture. [14]

The most common effects of unsafe childhood exposure to lead is its subclinical impact on the central nervous system leading to both biological and neurological damage.[15] The biological and neurological damage linked to cognitive and behavioral impairment in young children from high lead exposure is supported by numerous scientific and medical studies. Some studies have shown a significant association between lead exposure and

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[11] Walter A. Alarcon, MD; State Adult Blood Lead Epidemiology and Surveillance (ABLES) Program Investigators. "Elevated Blood Lead Levels Among Employed Adults – United States, 1994-2013." *Morbidity and Mortality Weekly Report,* 2016; 63:59–65. DOI: http://dx.doi.org/10.15585/mmwr.mm6355a

[12] CDC, The National Institute for Occupational Safety and Health. Adult Blood Lead Epidemiology and Surveillance (ABLES). https://www.cdc.gov/niosh/topics/ables/default.html. Accessed February 1, 2019.

[13] *Supra* n. 9.

[14] "Lead poising and health," World Health Organization, (Feb. 9, 2018), p. 1.

[15] "Lead poising and health," World Health Organization, (Feb. 9, 2018), p. 2.

children's IQ.[16] Specifically, data from an early nineties meta-analysis revealed that an increase in blood lead from 10μ/dL to 20μ/dL was associated with a decrease in 2.6 IQ points.[17] According to Joel Schwartz of the Harvard School of Public Health, such decrease is likely due to lead binding and interfering with neural pathways within the brain that are believed to be critical for learning processes.[18] Similar results regarding IQ levels and behavioral changes have been found by scientists in China.[19]

To further determine the detrimental effects on small children from lead exposure, a study was conducted in Detroit, Michigan public elementary and middle schools between 2008 and 2010. The study was conducted by doctors within the Biostatistics and Epidemiology Departments of both the University of South Florida and the University of Michigan, along with other professionals within the Detroit's Department of Health and Wellness. The stated objective of the study was to assess the long-term effect of early childhood lead exposure on academic achievement in mathematics, science, and reading among elementary and junior high school children. To achieve this stated objective, the study reviewed early childhood blood lead testing surveillance data against academic achievement. The study population consisted of students in public schools in Detroit who had taken at least one of the three tests in mathematics, science, and reading from the Michigan Educational Assessment Program (MEAP) in 2008, 2009, and 2010, and who had had a venous blood lead test between the ages of birth and six years. [20]

The results of the study revealed that there is a significant association between early childhood lead exposure and academic achievement within the Detroit Public Schools, as measured by the MEAP tests for students in grades 3, 5, and 8. The study suggests that the higher a student's BLL in early childhood was, the more likely the student would perform worse on the tests. Moreover, the odds of scoring less than proficient for those whose BLLs were greater than 10μ/dL were more than twice the odds for those whose BLLs were less than 1μ/dL after adjustment for potential confounding circumstances. [21]

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[16] Joel Schwartz, "Low-Level Lead Exposure and Children's IQ: A Meta-analysis and Search for a Threshold," Environmental Research, Environmental Epidemiology Program, Dep't of Environmental Health, Harvard School of Public Health, (Dec. 10, 1992), pp. 42-54.
[17] *Id.* at p. 42.
[18] *Id.* at p. 53.
[19] Shuangxing Hou, Lianfang Yuan, Pengpeng Jin, Bojun Ding, Na Qin, Li Li, Xuedong Liu, Zhongliang Wu, Gang Zhao, and Yanchun Deng. "A Clinical study of the effects of lead poisoning on the intelligence and neurobehavioral abilities of children." *Theoretical Biology and Medical Modeling.* 2013, 10:13. http?www.tbiomed.com/content/10/1/13.
[20] Nanhua Zhang, Harolyn W. Baker, Margaret Tufts, Randall E. Raymond, Hamisu Salihu, Michael R. Elliot, "Early Childhood Lead Exposure and Academic Achievement: Evidence From Detroit Public Schools, 2008-2010," *American Journal of Public Health* 103, no. 3 (March 1, 2013); pp e72-e77. DOI:10.2105/AJPH.2012.301164
[21] *Id.* at p. 9.

Risks of Low Level Exposure to Children

While there is substantial evidence that high levels of lead are dangerous to young children, recent research has indicated that even smaller levels of lead can pose life-altering threats to cognitive ability. According to the CDC, permanent neurological damage and behavioral disorders have been found to be associated with lead exposure at BLLs at or below 5µ/dL.[22] The American Academy of Pediatrics as well has recognized that low level elevated blood lead levels (less than 5µg/dL) can effect cognitive function and academic performance in children.[23]

A recent study out of Australia in 2016 examining the impact of low-level lead exposure on IQ for children ages seven to eight years found that BLLs below 5µ/dL can still have a detrimental impact on children's cognitive abilities.[24] In this study, data were collected from 147 families in Port Pirie and Broken Hill; two Australian communities with present-day and historical links with the lead smelting and mining industries respectively. In addition, blood lead data was obtained from 127 children ranging from seven to eight years of age.[25]

Blood samples were collected from each child with an instrument calibrated to cover a range of 0-4.83 µmol lead per litre of blood.[26] The results of the blood samples were measured against each child's Full-Scale IQ (FSIQ). According to the data produced, there was a significant inverse association between FSIQ and blood lead levels at blood lead levels lower than 5µg/dL.[27] The study's data also explained that a change in lead from 1 to 10µg/dL is predicted to reduce FSIQ by 13.5 points.[28] The authors of the study ultimately concluded that there is a significant negative correlation between lead concentration and IQ in children aged seven to eight years; a time period critical to cognitive development.[29] Such results were confirmed even after controlling for relevant socioeconomic, environmental, and familial variables.[30]

In addition to persistent and damaging effects on cognitive abilities, lead exposure can also lead to behavioral disorders of young children. The CDC notes that behavioral disorders have often been associated with lead exposure at detectable BLLs at or below the reference level of 5µg/dL.[31] National studies have indicated that lead exposure can result

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[22] *Supra,* n. 8.
[23] American Academy of Pediatrics. Council on Environmental Health. "Prevention of Childhood Lead Toxicity." *Pediatrics* 2016:138 (2016). DOI: 10.1542/peds2016-1493.
[24] Rachel Earl, Nicholas Burns, Ted Nettelbeck, and Peter Baghurst, "Low-level environmental lead exposure still negatively associated with children's cognitive abilities," Australian Journal of Psychology 2016, (Apr. 3, 2015), pp. 98-106.
[25] *Id.* at p. 99.
[26] *Id.* at p. 100.
[27] *Id.* at p. 104.
[28] *Id.* at p. 103, Table 2.
[29] *Id.* at p. 104.
[30] *Id.*
[31] Jaime Raymond, Mary Jean Brown, "Blood Lead Levels in Children Aged < 5 Years – United States, 2007 – 2013," CDC, (Oct. 14, 2016), pp. 66-72.

in what psychologists call externalizing behavior problems, such as aggressiveness and bullying, which in turn, may also lead to truancy and even incarceration as children get older.[32] However, a cohort study of 553 New Zealanders has concluded that childhood lead exposure does not correlate to later criminal behavior. The study followed a group of individuals born between April 1, 1972 and March 31, 1973. They were tested for BLLs at age 11, and their self-reported criminal offending was monitored until they reached age 38. A key aspect of the study was that no there was no association between BLL and childhood socioeconomic status. The study concluded that prior studies associating EBLLs and criminal activity were the result of the greater risk of exposure to lead of those living in poverty.[33] Children with higher BLLs have also been identified as having internalizing problems, such as anxiety and depression.

What Happened in Flint

What happened in Flint, Michigan tells a cautionary tale for older communities nationwide. Flint, a city once renowned for being an industrial engine of the U.S. automotive industry, is located roughly 70 miles northwest of Detroit. As the domestic auto industry collapsed in and around Flint, the city fell into years of economic distress. Fiscal recklessness, mismanagement of the city's water supply and treatment system, and alleged criminal malfeasance coalesced around a drinking water system that contained 4,376 known lead service lines and plunged Flint into a public health crisis that first surfaced in August 2014.[34]

In 2013, during the tenure of a state-appointed emergency manager for Flint, the city entered into a contract with the Karegnondi Water Authority (KWA) to supply the city with water from Lake Huron.[35] The contract was signed April 16, 2014, at a time when Flint had been under contract to purchase its water from the Detroit Water and Sewerage

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[32] U.S. Department of Health and Human Services. National Institutes of Health. News Release. "Lead in kids' blood linked with behavioral and emotional problems," June 30, 2014, https://www.nih.gov/news-events/news-releases/lead-kids-blood-linked-behavioral-emotional-problems; J Liu, X Liu, Wang W, L McCauley, J Pinto-Martin , Y Wang, L Li, C Yan, WJ Rogan, "Blood lead levels and children's behavioral and emotional problems: a cohort study," (2014), Pediatrics; doi:10.1001/jamapediatrics.2014.332.

[33] Beckley AL, Caspi A, Broadbent J, et al. "Association of Childhood Blood Lead Levels With Criminal Offending." *JAMA Pediaticsr.* 2018;172(2):166–173. doi:10.1001/jamapediatrics.2017.4005.

[34] Jacob Abernethy, Alex Chojnacki, Arya Rarahi, Eric Scwartz, and Jared Webb. "ActiveRemediation: The Search for Lead Pipes in Flint, Michigan." In *KDD'18: The 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, August 19-23, London, United Kingdom.* ACM, New York, NY, USA, Article 4. 10 pages. https://doi.org/10.1145/3219819. *See also,* University of Michigan. Press Release. https://news.umich.edu/getting-the-lead-out-data-science-and-flint-pipes/. Another 4,000 lead service lines are estimated to exist, based in part on the age of housing in the city. Records could not be found for another 11,000 residential service lines, some of which are likely to also have lead service lines.

[35] Letter of Andy Dillon, State Treasurer, to Edward Kurtz, City of Flint Emergency Manager (April 11, 2013).

Department (DWSD).[36] Following failed negotiations between Flint and DWSD to have Flint reconsider its decision to contract with KWA, on April 17, 2014 DWSD informed Flint that it would no longer provide water to the city and terminated the contract. Since KWA estimated that construction of the new water system would take approximately 30 months, Flint found itself without a water supply.

Consequently, the city began using water from the Flint River as a temporary source until the KWA project could be completed.[37] Both the Michigan Department of Environmental Quality ("DEQ") and The Flint River Watershed Coalition verified that the quality of the water met applicable drinking water standards and would be safe to drink.[38] However, subsequent treatment measures (or the lack thereof) created a chemical imbalance between bacterial contaminant control measures and corrosion control efforts that were not easily stabilized and which caused the drinking water to become unsafe for an extended period of time.

Shortly after switching to Flint River water, the DEQ began receiving complaints that the water looked, smelled, and tasted different, and made cleaning laundry and dishes more difficult. [39] Eventually, more serious problems became known. From August 2014 to June 2015, tests showed the water was in violation of a number of national primary drinking water regulations, including maximum contaminant level (MCL) violations for acute and non-acute coliform and trihalomethanes.[40]

Water tests revealed the presence of lead in February 2015 and again in a retest done in March 2015.[41] In September 2015, further testing showed that 40 percent of households had first draw samples with lead at a concentration in excess of 5 parts per billion. Flint's 90th percentile lead value was discovered to be 25 parts per billion, in excess of the Lead and Copper Rule's 15 parts per billion "action level." Several samples exceeded 100 parts per billion and one sample exceeded 1000 parts per billion.[42]

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[36] Jason Cooper, "Flint Officially Begins Using Flint River Water as Temporary Primary Water Source," *1470 WFNT*, April 25, 2014. http://wfnt.com/flint-officially-begins-using-flint-river-water-as-temporary-primary-water-source/.

[37] *Id.*

[38] *Id.*

[39] Ron Fonger, "State Says Flint River Water Meets All Standards But More Than Twice the Hardness of Lake Water," *MLive*, May 23, 2014.
https://www.mlive.com/news/flint/index.ssf/2014/05/state_says_flint_river_water_m.html.

[40] United States Environmental Protection Agency, "Transmittal of Final Report – High Lead at Three Residences in Flint, Michigan," at p. 3 November 4, 2015. https://www.epa.gov/sites/production/files/2015-11/documents/transmittal_of_final_redacted_report_to_mdeq.pdf.

[41] *Id.*

[42] Dr. Marc Edwards, "Our Sampling of 252 Homes Demonstrates a High Lead in Water Risk: Flint Should be Failing to Meet the EPA's Lead and Copper Rule," September 8, 2015.
http://flintwaterstudy.org/2015/09/our-sampling-of-252-homes-demonstrates-a-high-lead-in-water-risk-flint-should-be-failing-to-meet-the-epa-lead-and-copper-rule/.

Upon investigation by the EPA, it was discovered that Flint failed to use corrosion control treatment as required by the federal Lead and Copper Rule and had changed other treatment chemicals. These chemical changes increased corrosiveness of the water, which in turn caused protective scale coatings in the pipes to disintegrate and allow lead to leach from service lines.[43]

Despite a January 2015 offer from DWSD to provide Flint's water, the city did not reconnect to DWSD until October 2015, approximately 17 months after water quality problems were first documented in August 2014.

In 2016, a medical team led by Dr. Mona Hanna-Attisha, a pediatrician at Hurley Children's Hospital in Flint, published a study based on data showing that the number of children in Flint with elevated blood lead levels increased since the water change from 2.4 percent to 4.9 percent. Some neighborhoods experienced larger increases in elevated blood lead levels.[44]

As of 2018, Flint's water is returning to its normal relatively lead-free state. According to the EPA, from January 2016 to November 2016 there was a 260 percent increase in lead samples from Flint homes of less than 1 part per billion, and a 65 percent decrease in lead samples of greater than 15 parts per billion. Lead levels have substantially decreased and orthophosphate continues to improve the passivation coating inside the pipes. The renewed orthophosphate layer inside the water mains also allows the water to keep chlorine in the distribution system.[45] The EPA maintains an aggressive water monitoring campaign in Flint, testing for chlorine on a biweekly basis and collecting samples for lead analysis on a bimonthly basis. Additionally, the EPA is also testing for trihalomethanes and other disinfectant byproducts.[46]

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[43] *Id.; see also* Terese M. Olson et al., "Forensic Estimates of Lead Release from Lead Service Lines During the Water Crisis in Flint, Michigan," *Environmental Science and Technology Letters*, vol. 4 no. 9 (July 19, 2017): 356-361. doi:10.1021/acs.estlett.7b00226. *See also,* Kelsey J. Peiper, Min Tang, and Marc A Edwards. "Flint Water Crisis Caused by Interrupted Corrosion Control: Investigation 'Ground Zero' Home." *Environmental Science and Technology.* 2017, 51 (4), pp. 2007-2014. DOI: 1o.1031/acs.est.6B04034.

[44] Mona Hanna-Attisha MD et al., "Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response," *American Journal of Public Health*, vol. 106 no. 2 (Feb. 2016): 283-290. doi: 10.2105/AJPH.2015.303003.

[45] United States Environmental Protection Agency, "Update on Water Quality." https://www.epa.gov/flint.

[46] United States Environmental Protection Agency, "Flint Water Sampling Objectives." https://www.epa.gov/flint/flint-water-sampling-objectives.

Attachment 7

(Attachments 31-33 to
Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

Attachment 31

United States
Environmental Protection
Agency

Technical Review
Workgroup
for Lead

FINAL (December 1996)
EPA-540-R-03-001
January 2003

Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Preface

This report was updated in 2003 to add two appendices and remove "interim" from the title. The change in the title reflects publication of the TRW's Adult Lead Model Review Report. **With the exception of the following, the guidance is unchanged from the December 1996 publication.** The report now includes an appendix showing the format for the spreadsheet form of the model (Appendix B) and an explanation of how the guidance is to be applied (Appendix C). The NHANES Report (March 2002) should be used in conjunction with this report. Based on the TRW's analysis of the data collected in the completed NHANES III survey (Phases 1 and 2), updated ranges for the baseline adult PbB and GSDi adult parameters should be in the EPA ALM spreadsheet. Although the use of these updated ranges in the EPA ALM spreadsheet would not appreciably change PRGs calculated with the methodology, it is recommended that data from both phases of NHANES III be used in all PbB analyses; this is consistent with CDC recommendations. **The results of the NHANES III Report are not included in this document except by reference**.

U.S. Environmental Protection Agency

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1. INTRODUCTION

This report describes a methodology for assessing risks associated with non-residential adult exposures to lead in soil. The methodology focuses on estimating fetal blood lead concentration in women exposed to lead contaminated soils. This approach also provides tools that can be used for evaluating risks of elevated blood lead concentrations among exposed adults. The methodology is the product of extensive evaluations by the Technical Review Workgroup for Lead (TRW) which began considering methodologies to evaluate nonresidential adult exposure in 1994 (Balbus-Kornfeld, 1994; U.S. EPA, 1994a). In 1995, the TRW reviewed a methodology developed by EPA Region 8 for deriving risk-based remediation goals (RBRGs) for nonresidential soil at the California Gulch NPL site (U.S. EPA, 1995). A TRW committee on adult lead risk assessment was formed in January, 1996 to further develop the ideas and information gathered as part of these previous efforts into a generic methodology that could be adapted for use in site-specific assessments.

This report provides technical recommendations of the TRW for the assessment of adult lead risks using this methodology. An overriding objective in the development of this methodology was the immediate need for a scientifically defensible approach for assessing adult lead risks associated with nonresidential exposure scenarios. The TRW recognizes that other adult lead models may provide useful information. In particular, models providing more detailed representations of lead kinetics may be useful in supporting more detailed predictions about the time course of blood lead concentrations among individuals who receive brief acute exposures to lead or whose exposures otherwise change markedly with time. The methodology presented here uses a simplified representation of lead biokinetics to predict quasi-steady state blood lead concentrations among adults who have relatively steady patterns of site exposures (as described in this report). The TRW believes that this approach will prove useful for assessing most sites where places of employment are (or will be) situated on lead contaminated soils. This information is expected to promote consistency in assessments of adult lead risks. The methodology described in this report is an approach that is recommended for use pending further development and evaluation of integrated exposure biokinetic models for adults. The TRW is undertaking review of other models and will provide reviews on other approaches as appropriate. The Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children (U.S. EPA, 1994b,c) is the recommended approach for assessing residential lead risks.

The recommended approach for assessing nonresidential adult risks utilizes a methodology to relate soil lead intake to blood lead concentrations in women of child-bearing age. It is conceptually similar to a slope factor approach for deriving RBRGs that had been proposed by Bowers et al. (1994) and which was adapted for use at the California Gulch NPL site in Region 8 (U.S. EPA, 1995). This report describes the basic algorithms that are used in the methodology and provides a set of default parameter values that can be used in cases where high quality data are not available to support site-specific estimates. The rationale for each parameter default value is provided in the Appendix.

2. OVERVIEW OF THE APPROACH

The methodology described in this report relates soil lead concentrations to blood lead concentrations in the exposed population according to the algorithms described below. Note that the algorithms may consist of variables that include superscripts and/or subscripts. The convention adopted in this report is to use superscripts as exponents (i.e., a mathematical operation), whereas subscripts represent key words that provide additional information to distinguish between similar variables. The basis for the calculation of the blood lead concentration in women of child-bearing age is the algorithm given by Equation 1:

$$PbB_{adult,central} = PbB_{adult,0} + \frac{PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S}{AT} \qquad \text{(Equation 1)}$$

where:

$PbB_{adult, central}$ = Central estimate of blood lead concentrations (µg/dL) in adults (i.e., women of child-bearing age) that have site exposures to soil lead at concentration, PbS.

$PbB_{adult, 0}$ = Typical blood lead concentration (µg/dL) in adults (i.e., women of child-bearing age) in the absence of exposures to the site that is being assessed.

PbS = Soil lead concentration (µg/g) (appropriate average concentration for individual).

BKSF = Biokinetic slope factor relating (quasi-steady state) increase in typical adult blood lead concentration to average daily lead uptake (µg/dL blood lead increase per µg/day lead uptake).

IR_S = Intake rate of soil, including both outdoor soil and indoor soil-derived dust (g/day).

AF_S = Absolute gastrointestinal absorption fraction for ingested lead in soil and lead in dust derived from soil (dimensionless).

EF_S = Exposure frequency for contact with assessed soils and/or dust derived in part from these soils (days of exposure during the averaging period); may be taken as days per year for continuing, long term exposure.

AT = Averaging time; the total period during which soil contact may occur; 365 days/year for continuing long term exposures.

The basis for the RBRG calculation is the relationship between the soil lead concentration and the blood lead concentration in the developing fetus of adult women that have site exposures. As a health-based goal, EPA has sought to limit the risk to young children of having elevated blood lead concentrations. Current Office of Solid Waste and Emergency Response (OSWER) guidance calls

for the establishment of cleanup goals to limit childhood risk of exceeding 10 µg/dL to 5% (U.S. EPA, 1994a). Equation 2 describes the estimated relationship between the blood lead concentration in adult women and the corresponding 95th percentile fetal blood lead concentration ($PbB_{fetal, 0.95}$), assuming that $PbB_{adult, central}$ reflects the geometric mean of a lognormal distribution of blood lead concentrations in women of child-bearing age. If a similar 95th percentile goal is applied to the protection of fetuses carried by women who experience nonresidential exposures, Equation 2 can be rearranged to reflect a risk-based goal for the central estimate of blood lead concentrations in adult women using Equation 3:

$$PbB_{fetal,0.95} = PbB_{adult,central} \cdot GSD_{i,adult}^{1.645} \cdot R_{fetal/maternal} \qquad \text{(Equation 2)}$$

$$PbB_{adult,central,goal} = \frac{PbB_{fetal,0.95,goal}}{GSD_{i,adult}^{1.645} \cdot R_{fetal/maternal}} \qquad \text{(Equation 3)}$$

where:

$PbB_{adult, central, goal}$ = Goal for central estimate of blood lead concentration (µg/dL) in adults (i.e., women of child-bearing age) that have site exposures. The goal is intended to ensure that $PbB_{fetal, 0.95, goal}$ does not exceed 10 µg/dL.

$PbB_{fetal, 0.95, goal}$ = Goal for the 95th percentile blood lead concentration (µg/dL) among fetuses born to women having exposures to the specified site soil concentration. This is interpreted to mean that there is a 95% likelihood that a fetus, in a woman who experiences such exposures, would have a blood lead concentration no greater than $PbB_{fetal, 0.95, goal}$ (i.e., the likelihood of a blood lead concentration greater than 10 µg/dL would be less than 5%,for the approach described in this report).

$GSD_{i, adult}$ = Estimated value of the individual geometric standard deviation (dimensionless); the GSD among adults (i.e., women of child-bearing age) that have exposures to similar on-site lead concentrations, but that have non-uniform response (intake, biokinetics) to site lead and non-uniform off-site lead exposures. The exponent, 1.645, is the value of the standard normal deviate used to calculate the 95th percentile from a lognormal distribution of blood lead concentration.

$R_{fetal/maternal}$ = Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (dimensionless).

The soil lead concentration associated with a given exposure scenario and $PbB_{adult, central, goal}$ can be calculated by rearranging Equation 1 and substituting $PbB_{adult, central, goal}$ for $PbB_{adult, central}$:

$$RBRG = PbS = \frac{(PbB_{adult,central,goal} - PbB_{adult,0}) \cdot AT}{(BKSF \cdot IR_S \cdot AF_S \cdot EF_S)} \quad \text{(Equation 4)}$$

It is this form of the algorithm that can be used to calculate a RBRG where the RBRG represents the soil lead concentration (PbS) that would be expected to result in a specified adult blood lead concentration ($PbB_{adult, central, goal}$) and corresponding 95th percentile fetal blood lead concentration ($PbB_{fetal, 0.95, goal}$).

Equations 1-4 are based on the following assumptions:

1. Blood lead concentrations for exposed adults can be estimated as the sum of an expected starting blood lead concentration in the absence of site exposure ($PbB_{adult, 0}$) and an expected site-related increase.

2. The site-related increase in blood lead concentrations can be estimated using a linear biokinetic slope factor (BKSF) which is multiplied by the estimated lead uptake.

3. Lead uptake can be related to soil lead levels using the estimated soil lead concentration (PbS), the overall rate of daily soil ingestion (IR_S), and the estimated fractional absorption of ingested lead (AF_S). The term "soil" is used throughout this document to refer to that portion of the soil to which adults are most likely to be exposed. In most cases, exposure is assumed to be predominantly to the top layers of the soil which gives rise to transportable soil-derived dust. Exposure to soil-derived dust occurs both in outdoor and indoor environments, the latter occurring where soil-derived dust has been transported indoors. Other types of dust, in addition to soil-derived dust, can contribute to adult lead exposure and may even predominate in the occupational setting; these include dust generated from manufacturing processes (e.g., grinding, milling, packaging of lead-containing material), road dust, pavement dust, and paint dust. This methodology, as represented in Equations 1 and 4, does not specifically account for site exposure to dusts that are not derived from soil. However, the methodology can be modified to include separate variables that represent exposure to lead in various types of dust. This approach is discussed in greater detail in the Appendix.

4. As noted above, exposure to lead in soil may occur by ingesting soil-derived dust in the outdoor and/or indoor environments. The default value recommended for IR_S (0.05 g/day) is intended for occupational exposures that occur predominantly indoors. More intensive soil contact would be expected for predominantly outdoor activities such as construction, excavation, yard work, and gardening.

5. A lognormal model can be used to estimate the inter-individual variability in blood lead concentrations (i.e., the distribution of blood lead concentrations in a population of individuals who contact similar environmental lead levels).

6. Expected fetal blood lead concentrations are proportional to maternal blood lead concentrations.

The primary basis for using Equation 4 to calculate a RBRG is that fetuses and neonates are a highly sensitive population with respect to the adverse effects of lead on development and that 10 µg/dL is considered to be a blood lead level of concern from the standpoint of protecting the health of sensitive populations (U.S. EPA, 1986, 1990; NRC, 1993). Therefore, risk to the fetus can be estimated from the probability distribution of fetal blood lead concentrations (i.e., the probability of exceeding 10 µg/dL), as has been the approach taken for estimating risks to children (U.S. EPA, 1994a,c). Equation 4 can be used to estimate the soil lead concentration at which the probability of blood lead concentrations exceeding a given value (e.g., 10 µg/dL) in fetuses of women exposed to environmental lead is no greater than a specified value (e.g., 0.05).

The methodology can be modified to accommodate different assumptions or to estimate RBRGs for different risk categories. For example, a RBRG could be estimated for risks to adults (e.g., hypertension) by substituting an appropriate adult blood lead concentration benchmark. Similarly, other exposure scenarios can be incorporated into the assessment. Alternative methods for estimating soil lead risk by partitioning soil into outdoor soil and indoor dust components are discussed in the Appendix.

Recommended default values for each of the parameters in Equations 1 - 4 are presented in Table 1. These defaults should not be casually replaced with other values unless the alternatives are supported by high quality site-specific data to which appropriate statistical analyses have been applied and that have undergone thorough scientific review. Examples of the output from the methodology are presented in Figures 1 and 2, which show plots of the calculated $PbB_{fetal,\ 0.95}$ as a function of PbS when different combinations of default parameter values are used. The rationale for each default value listed in Table 1 is summarized in the Appendix.

Table 1. Summary of Default Parameter Values for the Risk Estimation Algorithm (Equations 1 - 4)

Parameter	Unit	Value	Comment
$PbB_{fetal,\ 0.95,goal}$	µg/dL	10	For estimating RBRGs based on risk to the developing fetus.
$GSD_{i,adult}$	--	1.8 2.1	Value of 1.8 is recommended for a homogeneous population while 2.1 is recommended for a more heterogeneous population.
$R_{fetal/maternal}$	--	0.9	Based on Goyer (1990) and Graziano et al. (1990).
$PbB_{adult,0}$	µg/dL	1.7-2.2	Plausible range based on NHANES III phase 1 for Mexican American and non-Hispanic black, and white women of child bearing age (Brody et al. 1994). Point estimate should be selected based on site-specific demographics.
BKSF	µg/dL per µg/day	0.4	Based on analysis of Pocock et al. (1983) and Sherlock et al. (1984) data.
IR_S	g/day	0.05	Predominantly occupational exposures to indoor soil-derived dust rather than outdoor soil; (0.05 g/day = 50 mg/day).
EF_S	day/yr	219	Based on U.S. EPA (1993) guidance for average time spent at work by both full-time and part-time workers (see Appendix for recommendations on minimum exposure frequency and duration).
AF_S	--	0.12	Based on an absorption factor for soluble lead of 0.20 and a relative bioavailability of 0.6 (soil/soluble).

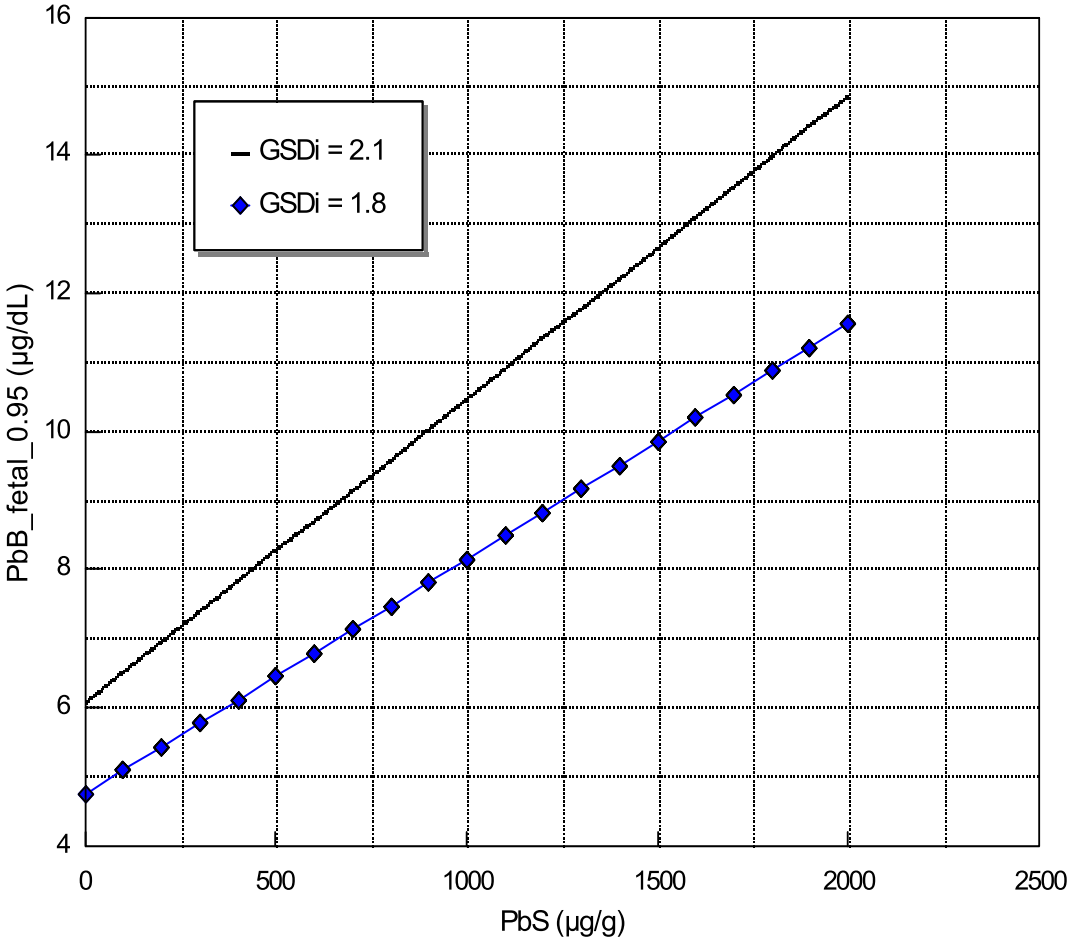

Figure 1. Example output of risk estimation algorithm (Equation 4) assuming a $PbB_{adult,\ 0}$ of 2.0 µg/dL (mixed racial) and a $GSD_{i,\ adult}$ of either 1.8 (homogeneous population) or 2.1 (heterogeneous urban population).

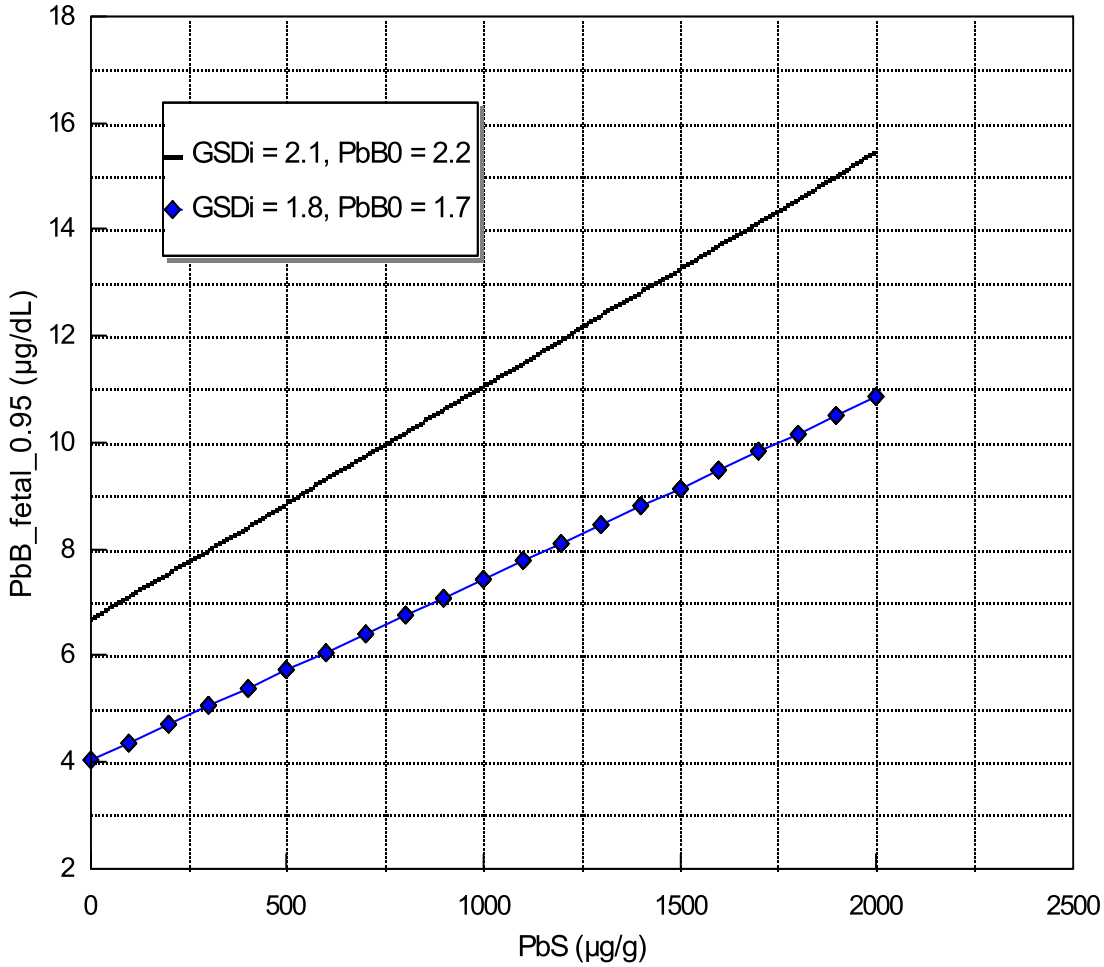

Figure 2. Example output of risk estimation algorithm (Equation 4) assuming plausible default minimum and maximum values of $PbB_{adult,\,0}$ (1.7 and 2.2 µg/dL) and $GSD_{i,\,adult}$ (1.8 and 2.1).

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APPENDIX A

Equations and Rationale for Default Values Assigned to Parameters in the Slope Factor Approach and Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil

Equations and Rationale for Default Values Assigned to Parameters in the Slope Factor Approach and Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil

1. Equations for the Adult Lead Model

The format of the equations used in the adult lead methodology follows the approach used in the IEUBK Model for Lead in Children (IEUBK Model). Note that the equations may consist of variables that include superscripts and/or subscripts. The convention adopted in this report is to use superscripts as exponents (i.e., a mathematical operation), whereas subscripts represent key words that provide additional information to distinguish between similar variables. The term "soil" refers to that portion of the soil to which adults are most likely to be exposed. In most cases, exposure is assumed to be predominantly to the top layers of the soil which gives rise to transportable soil-derived dust. Exposure to soil-derived dust occurs both in outdoor and indoor environments, the latter occurring where soil-derived dust has been transported indoors. Other types of dust, in addition to soil-derived dust, can contribute to adult lead exposure and may even predominate in some occupational settings; these include dust generated from manufacturing processes (e.g., grinding, milling, packaging of lead-containing material), road dust, pavement dust, and paint dust.

Exposure to lead from soil (direct and through indoor soil-derived dust) and lead intake:

$$INTAKE = \frac{PbS \cdot IR_S \cdot EF_S}{AT} \qquad \text{(Equation A-1)}$$

INTAKE = Daily average intake (ingestion) of lead from soil taken over averaging time AT (μg/day).

PbS = Soil lead concentration (μg/g) (appropriate average concentration for individual).

IR_S = Intake rate of soil, including outdoor soil and indoor soil-derived dust (g/day).

EF_S = Exposure frequency for contact with assessed soils and/or dust derived in part from these soils (days of exposure during the averaging period); may be taken as days per year for continuing, long term exposures.

AT = Averaging time; the total period during which soil contact may occur; 365 days/year for continuing long term exposures.

Lead uptake:

$$UPTAKE = AF_S \cdot INTAKE \qquad \text{(Equation A-2)}$$

UPTAKE = Daily average uptake of lead from the gastrointestinal tract into the systemic circulation (μg/day).

AF_S = Absolute gastrointestinal absorption fraction for ingested lead in soil and lead in dust derived from soil (dimensionless).

Central estimate of adult blood lead concentration:

$$PbB_{adult,central} = PbB_{adult,0} + BKSF \cdot UPTAKE \qquad \text{(Equation A-3)}$$

$PbB_{adult,central}$ = Central estimate of blood lead concentrations (μg/dL) in adults (i.e., women of child-bearing age) that have site exposures to soil lead at concentration, PbS.

$PbB_{adult,0}$ = Typical blood lead concentration (μg/dL) in adults (i.e., women of child-bearing age) in the absence of exposures to the site that is being assessed.

BKSF = Biokinetic slope factor relating (quasi-steady state) increase in typical adult blood lead concentration to average daily lead uptake (μg/dL blood lead increase per μg/day lead uptake).

Distributional model for adult blood lead:

In this methodology, variability in blood lead concentrations among a population is mathematically described by a lognormal distribution defined by two parameters, the geometric mean (GM) and the geometric standard deviation (GSD):

$$PbB_{adult} \sim Lognormal(GM, GSD)$$

PbB_{adult} = Adult blood lead concentration (which is a variable quantity having the specified probability distribution).

GM = Geometric mean blood lead concentration (μg/dL) for adults having site exposure. The central estimate of adult blood lead, $PbB_{adult,central}$, constructed in Equation A-3 is treated as a plausible estimate of the geometric mean.

GSD = Geometric standard deviation for blood lead concentrations among adults having exposures to similar on-site lead concentrations, but having non-uniform response (intake, biokinetics) to site lead and non-uniform off-site lead exposures. The individual blood lead concentration geometric standard deviation, GSD_i, is

substituted for GSD. As described below (Section 2 of the Appendix), GSD_i is assumed to address sources of variability in blood lead concentrations among the exposed population.

Parameter estimates for the geometric mean (GM) and geometric standard deviation (GSD) of the lognormal distribution are described below. Note that blood lead concentrations for site exposures can be quantified at any percentile of the population using these parameters. For example, the 95th percentile blood lead concentration can be calculated by Equation A-4:

$$PbB_{adult,0.95} = PbB_{adult,central} \cdot GSD_i^{1.645} \qquad \text{(Equation A-4)}$$

$PbB_{adult,\ 0.95}$ = 95th percentile blood lead concentration (µg/dL) among individuals having exposures to the specified site soil lead concentrations. This is interpreted to mean that there is a 95% likelihood that an adult exposed to the specified soil lead concentrations would have a blood lead concentration less than or equal to $PbB_{adult,0.95}$.

Distributional model for fetal blood lead:

$$PbB_{fetal} = R_{fetal/maternal} \cdot PbB_{adult} \qquad \text{(Equation A-5)}$$

PbB_{fetal} = Fetal blood lead concentration (µg/dL) (which, like PbB_{adult}, is a variable quantity having the specified probability distribution).

$R_{fetal/maternal}$ = Constant of proportionality between fetal and maternal blood lead concentrations.

PbB_{adult} = Adult blood lead concentration (µg/dL), estimated with parameters appropriate to women of child bearing age.

Note that this relationship implies a deterministic (non-random) relationship between maternal and fetal blood lead concentrations. This assumption omits a source of variability (varying individual-specific ratios of fetal to maternal blood lead) that would tend to increase the variance of fetal blood lead concentrations. The assumption of proportionality implies that fetal blood lead concentrations also are lognormally distributed:

$$PbB_{fetal} \sim Lognormal(GM, GSD)$$

GM = Geometric mean blood lead concentration (µg/dL) for fetuses, equal to $R_{fetal/maternal}$ multiplied by $PbB_{adult,central}$.

GSD = Geometric standard deviation of blood lead concentration among adults, GSD_i (Section 2 of the Appendix).

Similarly, percentiles of the fetal blood lead distribution can be estimated (for fetuses carried by women exposed to the specified concentration of lead at the assessed site). For example:

$$PbB_{fetal,0.95} = R_{fetal/maternal} \cdot PbB_{adult,central} \cdot GSD_{i,adult}^{1.645} \quad \text{(Equation A-6)}$$

$PbB_{fetal,0.95}$ = 95th percentile blood lead concentration (µg/dL) among fetuses born to women having exposures to the specified site soil lead concentrations. This is interpreted to mean that there is a 95% likelihood that a fetus born, in a woman who experiences such exposures, would have a blood lead concentration no greater than $PbB_{fetal,0.95}$.

Note that when the expressions for $PbB_{adult,central}$, INTAKE, and UPTAKE (Equations A-1, A-2 and A-3) are substituted into Equation A-6, we obtain the complete expression for $PbB_{fetal,0.95}$ that is presented in the fact sheet (Overview of the Approach, Equations 1 and 2):

$$PbB_{fetal,0.95} = R_{fetal/maternal} \cdot GSD_i^{1.645} \cdot \left[\frac{(PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S)}{AT} + PbB_{adult,0} \right] \quad \text{(Equation A-7)}$$

Equation A-7 represents variability in blood lead concentration arising from two main factors: 1) exposure variables, including inter-individual variability in activity-weighted ingestion rates, and 2) inter-individual variability in physiology, including factors affecting lead biokinetics.

2. Individual Blood Lead Geometric Standard Deviation (GSD_i)

The GSD_i is a measure of the inter-individual variability in blood lead concentrations in a population whose members are exposed to the same nonresidential environmental lead levels. Ideally, the value(s) for GSD_i used in the methodology should be estimated in the population of concern at the site. This requires data on blood lead concentration and exposure in a representative sample of sufficient size to yield statistically meaningful estimates of GSD in subsamples stratified by nonresidential exposure level. In the absence of high quality data for the site, GSD_i may be extrapolated from estimates for other surrogate populations. In making such extrapolations, factors that might contribute to higher or lower variability in the surrogate population than among similarly exposed individuals in the population of concern, should be evaluated. These factors include variability in exposure (level and pathways), and biokinetics (see Section 6 of Appendix), socioeconomic and ethnic characteristics, degree of urbanization and geographical location. Such

extrapolations, therefore, are site-specific and are a potentially important source of uncertainty in the methodology.

GSD values measured in populations (GSD_p) reflect the combined effect of 1) variability in environmental concentration levels; and 2) activity-weighted exposures and lead biokinetics. Thus, estimates of GSD_p can be considered a surrogate for estimating the GSD_i. Site data on blood lead concentrations collected from populations of varying homogeneity may be useful for establishing a plausible range of values of GSD_i , provided that the data are of adequate quality and can be stratified by nonresidential exposure level. The lowest values of GSD_p are expected among homogeneous populations (e.g., individuals with similar socioeconomic and ethnic characteristics living within a relatively small geographic area) exposed to a single, dominant source of lead (e.g., lead mining or smelter sites). For example, a GSD_p of 1.8 was recently calculated among adult women living in Leadville, CO (U.S. EPA, 1995). This relatively low GSD is consistent with an analysis of blood lead concentration data in mining communities in the United States and Canada, which suggest that GSD_p ranges from 1.6 - 1.8 at active mining sites where blood lead concentrations are less than 15 μg/dL (U.S. EPA, 1992). By contrast, higher values of GSD_p might be expected from a national survey. Although lead exposures among the general population are likely to be more greatly impacted by diet than soil (e.g., compared with populations exposed at a waste site), the national population is very heterogeneous, in that it includes individuals with different socioeconomic and ethnic characteristics living in distinct geographic areas.

The TRW has conducted a preliminary analysis of blood lead concentration data collected in NHANES III Phase 1 from 1988 to 1991 and found that the GSD_p for women ages 17 to 45 years may range from 1.9 - 2.1 (Table A-1). Because of the complex survey design used in NHANES III (e.g., large oversampling of young children, older persons, black persons, and Mexican-Americans), this analysis used sampling weights included in the NHANES III Phase 1 data file to produce population estimates for blood lead concentration. The weighting factor “WTPEXMH1" was used to reflect the non-random sampling of individuals in both the mobile examination units (MEC) and the home examinations. The analysis did not account for the design effects associated with the selection of strata and primary sampling units (PSUs), which may result in an underestimation of sampling variance. Since this bias is not likely to greatly impact the GSD_p (Brody, personal communication), the amount of underestimation of the GSD_p by the values given in Table A-1 is likely to be small. Geometric mean blood lead concentrations listed in Table A-1 are within 0.2 μg/dL of these reported in Brody et al. (1994).

The TRW estimates that 1.8 - 2.1 is a plausible range for GSD_i, based on an evaluation of available blood lead concentration data for different types of populations. In cases where site-specific data are not available, a value within this range should be selected based on an assessment as to whether the population at the site would be expected to be more or less heterogeneous than the U.S. population with respect to racial, ethnic, cultural and socioeconomic factors that may affect exposure.

Table A-1. NHANES III Phase 1 Summary Statistics for Blood Lead Concentration Among U.S. Women by Age and Ethnic/Racial Characteristics[a].

Age Group	Non-Hispanic White			Non-Hispanic Black			Mexican American		
(years)	No.	GM	GSD	No.	GM	GSD	No.	GM	GSD
20 - 49	728	1.9	1.90	622	2.3	2.01	729	2.1	2.10
50 - 69	476	3.2	1.88	256	4.2	1.80	255	3.3	2.12
> 69	562	3.5	1.82	135	4.1	1.86	75	2.9	2.03
20 +	1,766	2.4	2.01	1,013	2.7	2.07	1,059	2.3	2.14
17 - 45	**742**	**1.7**	**1.89**	**658**	**2.1**	**1.98**	**763**	**2.0**	**2.10**

[a]Analysis of data weighted by MEC and home weighting factor (WTPEXMH1), excluding samples missing data on blood lead concentration or age. GM PbB (μg/dL) = $\exp(\mu_{ln})$; GSD PbB = $\exp(\sigma_{ln})$.

3. Fetal/Maternal Blood Lead Concentration Ratio ($R_{fetal/maternal}$)

The TRW recommends a default value of 0.9 based on studies that have explored the relationship between umbilical cord and maternal blood lead concentrations (Goyer, 1990; Graziano et al., 1990). The Goyer (1990) estimate of an average fetal/maternal blood lead concentration ratio of 0.9 is supported by a large body of data that has been summarized in Agency documents (U.S. EPA, 1986, 1990). Graziano et al. (1990) compared maternal and umbilical cord blood lead concentrations at delivery in 888 mother-infant pairs who were between 28 and 44 weeks of gestation. The relationship was linear with a slope of 0.93 μg/dL cord blood per μg/dL maternal blood; the correlation coefficient was 0.92. The slope of 0.93 from the Graziano et al. (1990) study supports 0.9 as a point estimate for $R_{fetal/maternal}$.

Although average fetal/maternal blood lead concentration ratios, as reflected in cord blood, tend to show consistent trends (Goyer, 1990; Graziano et al., 1990), the trends may not reflect significant inter-individual variability in maternal and possibly fetal blood lead concentrations due to physiological changes associated with pregnancy. For example, mobilization of bone lead stores during pregnancy may be more substantial in some women, and iron and calcium deficiency associated with poor nutritional status, as well as pregnancy, may enhance gastrointestinal absorption of lead (U.S. EPA, 1990; Franklin et al., 1995). Conversely, maternal blood lead concentration may decrease during the later stages of pregnancy because of the dilution effect associated with a 30% rise in plasma volume, as well as an increased rate of transfer of lead to the placenta or to fetal tissues (Alexander and Delves, 1981). These changes may give rise to fetal/maternal blood lead concentration ratios that are different from 0.9.

4. Baseline Blood Lead Concentration ($PbB_{adult,0}$)

The baseline blood lead concentration ($PbB_{adult,0}$) is intended to represent the best estimate of a reasonable central value of blood lead concentration in women of child-bearing age who are not exposed to lead-contaminated nonresidential soil or dust at the site. In this analysis, geometric mean blood lead concentrations are used for this purpose. Ideally, the value(s) for $PbB_{adult,0}$ used in the

methodology should be estimated in the population of concern at the site. This requires data on blood lead concentrations in a representative sample of adult women who are not exposed to nonresidential soil or soil-derived dust at the site, but who may experience exposures to other environmental sources of lead that are similar in magnitude to exposures experienced by the population of concern. This would include exposure to lead in food and drinking water as well as residential soil and dust (dust derived from soil and all other non-site related sources). The sample must be of sufficient size to yield statistically meaningful estimates of $PbB_{adult,0}$.

In the absence of high quality data for the site, $PbB_{adult,0}$ may be extrapolated from estimates for other surrogate populations that would be expected to have a similar $PbB_{adult,0}$ distribution as that of the population of concern. In making such extrapolations, factors that might contribute to differences between the geometric mean $PbB_{adult,0}$ in the surrogate population and population of concern should be evaluated. These factors include differences in the residential exposure (level and pathways), socioeconomic, ethnic and racial demographics, housing stock, degree of urbanization, and geographical location. Such extrapolations, therefore, are site-specific.

In cases where site-specific extrapolations from surrogate populations are not feasible, the TRW recommends 1.7 - 2.2 μg/dL as a plausible range, based on the results of Phase 1 of the NHANES III as reported by Brody et al. (1994). Table A-2 summarizes the analysis of blood lead concentrations from a sample of 2,083 women ages 20 - 49, and stratified into the three ethnic and racial categories.

Table A-2. NHANES III Phase 1 Summary Statistics for Blood Lead Concentration Among Different Populations of U.S. Women Ages 20 - 49 (Brody et al., 1994).

Population	No.	GM (95% CI)
Mexican American women	732	2.0 (1.7 - 2.5)
non-Hispanic black women	623	2.2 (2.0 - 2.5)
non-Hispanic white women	728	1.7 (1.6 - 1.9)
Total	2,083	

The TRW recommends that the estimates from Table A-2 be used in combination with data on the ethnic and racial demographics of the population of concern to select the most appropriate point estimate from within the plausible range of 1.7 - 2.2 μg/dL. For example, if the population at the site was predominantly Mexican American, 2.0 μg/dL might be selected as the point estimate. The plausible range is based on surveys of large samples of the national population and may not encompass central tendencies estimated from smaller regional or site-specific surveys, either because of bias associated with the smaller sample or because of real differences between the surveyed population and the national population. This needs to be evaluated in deciding whether or not to use data from small surveys that yield point estimates for $PbB_{adult,0}$ that fall outside of the plausible range.

5. Biokinetic Slope Factor (BKSF)

The BKSF parameter relates the blood lead concentration (µg Pb/dL) to lead uptake (µg Pb/day). The TRW recommends a default value of 0.4 µg Pb/dL blood per µg Pb absorbed/day for the BKSF parameter based on data reported by Pocock et al. (1983) on the relationship between tap water lead concentrations and blood lead concentrations for a sample of adult males, and on estimates of the bioavailability of lead in tap water (see Section 6 of the Appendix).

Pocock et al. (1983) analyzed data on lead concentrations in first draw tap water and blood lead concentrations in a population of 910 adult males. A linear model imposed on the data yielded a slope of 0.06 (µg/dL per µg/L first draw water) for water lead concentrations equal to or less than 100 µg/L (a lower slope was applied to the data for higher water concentrations). Pocock et al. (1983) also obtained data on lead concentrations in flushed water (and "random daytime") samples, in addition to first draw samples. Given the following assumptions, it is possible to derive a slope factor for ingested water lead (INGSF) from the Pocock et al. (1983) data:

- The lead concentration of flushed water was 25% of the concentration of first draw water ($C_{f/1st} = 0.25$) (U.S. EPA, 1995).
- Daily water intake consisted of 30% first draw and 70% flushed ($F_{1st} = 0.3$, $F_f = 0.7$) (U.S. EPA, 1992).
- Daily water ingestion (including tap water and beverages made with tap water) was 1.4 L/day ($IR_W = 1.4$) (U.S. EPA, 1989).

Based on the above assumptions, a INGSF of 0.09 µg/dL per µg intake/day is estimated as follows:

$$INGSF = \frac{0.06}{IR_W \cdot (F_{1st} + (C_{f/1st} \cdot F_f))} \qquad \text{(Equation A-8)}$$

$$INGSF = \frac{0.06}{1.4 \cdot (0.3 + (0.25 \cdot 0.7))}$$

$$INGSF = 0.09$$

This suggests that the product of the BKSF, reflecting the slope for absorbed rather than ingested lead, and the absorption factor for lead in drinking water (AF_w) should be approximately 0.09 if it is to match the estimate of INGSF based on the Pocock et al. (1983) study:

$$INGSF = BKSF \cdot AF_w \qquad \text{(Equation A-9)}$$

Values of AF_w within the range 0.20 - 0.25 would correspond to a range for BKSF of 0.36 - 0.45, or approximately 0.4 µg/dL per µg/day (rounded to one significant figure). A range of 0.20 - 0.25 for AF_w is supported by data from numerous lead bioavailability studies (see Section 6 of the Appendix for a more detailed discussion of these studies).

The above estimate of 0.4 µg/dL per µg/day for the BKSF can be compared with the approach described by Bowers et al. (1994), who used the same data set along with different assumptions and arrived at essentially the same estimate of the BKSF, 0.375 or approximately 0.4 µg/dL per µg/day. Bowers et al. (1994) assumed a daily tap water intake of 2 L/day and 8% absorption of lead ingested in tap water; and did not make adjustments for a mixture of first draw and flushed water intake in the Pocock et al. (1983) study.

Several uncertainties should be considered in applying the default value of 0.4 µg/dL per µg/day to any specific population. Since it is based on the Pocock et al. (1983) data, it represents an extrapolation from adult men to women of child bearing age. Physiological changes associated with pregnancy may affect the value of the BKSF (see Section 6 of the Appendix); therefore, some uncertainty is associated with applying the default value to populations of pregnant women.

An additional uncertainty concerns the assumption of linearity of the relationship between lead intake and blood lead concentration. The Pocock et al. (1983) study provides data on a large sample population of adult men whose members were exposed to relatively low drinking water lead levels; 898 subjects (97%) were exposed to first draw water lead concentrations less than 100 µg/L and 473 (52%) to 6 µg/L or less. A smaller study of adult women exposed to higher concentrations was reported by Sherlock et al. (1982, 1984); out of 114 subjects, 32 (28%) had flush drinking water lead concentrations less than 100 µg/L and only 13 (11%) less than 10 µg/L. Sherlock et al. (1982, 1984) used a cube root regression model, rather than a linear model, to describe the relationship between drinking water and blood lead concentration. Given the much larger sample size in the Pocock et al. (1983) study, particularly towards the low end of the distribution for water lead concentration, greater confidence can be placed in the estimated slope of the linear regression model from the Pocock et al. (1983) study than in the cube root regression model of Sherlock et al. (1982, 1984). Nevertheless, it is useful to compare the output of the two models because they were applied to the different sexes and because they differ so fundamentally in the treatment of the blood lead - water lead slope; the slope is constant in the linear model and decreases in the cube root model as water lead concentration increases. Figure A-1 compares the output of the two models and shows the output of a linear regression of the unweighted output of the Sherlock et al. (1984) model. Three observations can be made from this comparison that are relevant to the BKSF:

1. Both the Pocock et al. (1983) and Sherlock et al. (1984) models predict higher blood lead concentrations than would be expected in the average U.S. population today as suggested from NHANES III. This is indicative of higher lead intakes in the study populations which may have contributed to the apparent nonlinearities observed (e.g. above 100 µg/L in Pocock et al.(1983) and at lower concentrations in Sherlock et al. (1984).

2. The cube root regression model of Sherlock et al. (1984) predicts lower blood lead concentrations than the linear model of Pocock et al. (1983). This may reflect

greater lead intakes from sources other than drinking water in the Pocock et al. (1983) population (see Section 6 of the Appendix for further discussion).

3. The linear approximation of the Sherlock et al. (1984) and the linear model from Pocock et al. (1983) have similar slopes; 0.08 and 0.06 μg/dL per μg/L, respectively. Thus, although the Sherlock et al. (1984) study casts some degree of uncertainty on the assumption of linearity of the blood lead - drinking water lead relationship both at low (<10 μg/L) and high (> 100 μg/L) tap water lead concentrations, a linear model with a constant slope of 0.06 μg/dL per μg/L appears to approximate the output of the nonlinear model of Sherlock et al. (1984) reasonably well for water lead concentrations less than100 μg/L.

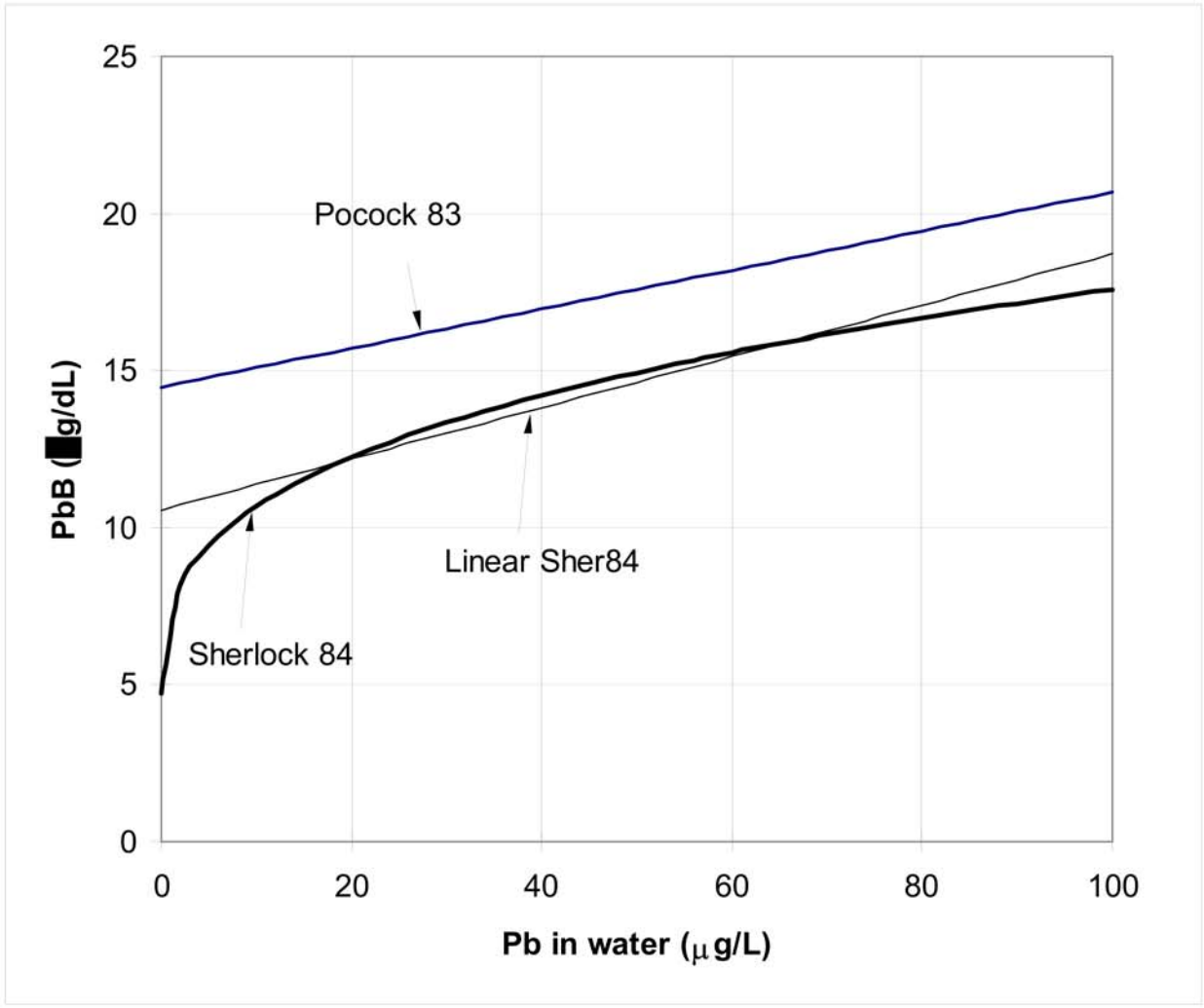

Figure A-1. Comparison of linear model of Pocock et al. (1983) with cube root model of Sherlock et al. (1984) and a linear model imposed on the unweighted output of the Sherlock model over the water lead range 0 - 100 µg/L (linear Sher84). The slope of the linear Sher84 model is 0.08 µg/dL per µg/L. The slope of the Pocock et al. (1983) model is 0.06 µg/dL per µg/L.

Experimental data on the pharmacokinetics of lead in adult humans support the default value of 0.4 (μg/dL per μg/day absorbed lead) for BKSF estimated from Pocock et al. (1983). Several distinct kinetic pools of lead are evident from observations of the rate of change of blood lead isotope with time after a period of daily dosing in which lead is abruptly terminated (Rabinowitz et al., 1976). A rapid exchange pool, denoted pool 1, includes the blood and a portion of the extracellular fluid, and is the physiological pool from which urinary and hepatobiliary excretion of blood lead occurs. Several estimates of the size of pool 1 (V_1) and the residence times for lead in pool 1 (T_1) have been derived from experiments in which human subjects were administered tracer doses of stable isotopes of lead from which pool 1 clearances (C_1) have been estimated; these estimates are summarized in Table A-3.

Table A-3. Summary of Experimental Studies with Humans to Assess Clearance Rates of Lead from Blood and Extracellular Fluid.

Subject	V_1[a] (dL)	T_1[b] (day)	$T_{½}$[c] (day)	C_1[d] (dL/day)	Reference
A	77	34	24	2.3	Rabinowitz et al., 1974
B	115	50	35	2.3	
A	74	34	24	2.2	Rabinowitz et al., 1976
B	100	40	28	2.5	
C	101	37	26	2.7	
D	99	40	28	2.5	
E	113	27	19	4.2	
ACC	70[e]	29	20	2.4	Chamberlain et al., 1978
DN	94[e]	39	27	2.4	
PL	85[e]	40	28	2.1	
ACW	94[e]	48	33	2.0	
MJH	97[e]	41	28	2.4	
ANB	95[e]	40	28	2.4	
Mean ± SD	93 ± 14	38 ± 6	27 ± 4	2.5 ± 0.5	

[a]The reported volume of pool 1, which refers to blood and rapidly exchangeable extracellular fluid compartment.
[b] The reported residence time for lead in pool 1.
[c]The half life of lead in pool 1; $T_{½} = (T_1) \times \ln(2)$.
[d]Clearance of lead from pool 1; $C_1 = V_1/T_1$.
[e]Estimated assuming $V_1 = V_{blood} \times 1.7$ (Rabinowitz et al., 1976).

The above experiments support a value for C_1 of 2.5 dL/day. At steady state, the clearance is equivalent to the rate of uptake of lead into pool 1 per unit of blood lead concentration (µg/day per µg/dL). Theoretically, this should correspond to a slope factor of 0.40 µg/dL per µg/day absorbed lead (i.e., the reciprocal of the clearance estimate). Thus, the default value for the BKSF parameter of 0.4 µg/dL per µg/day absorbed lead derived from the population survey data of Pocock et al. (1983) is consistent with the clearance estimates from experimental studies.

6. Soil Lead Absorption Factor (AF_S)

The AF_S parameter is the fraction of lead in soil ingested daily that is absorbed from the gastrointestinal tract. The TRW recommends a default value of 0.12 based on the assumption that the absorption factor for soluble lead ($AF_{soluble}$) is 0.2 and that the relative bioavailability of lead in soil compared to soluble lead ($RBF_{soil/soluble}$) is 0.6:

$$AF_S = AF_{soluble} \cdot RBF_{soil/soluble} \qquad \text{(Equation A-10)}$$

$$AF_S = 0.2 \cdot 0.6 = 0.12$$

The default value of 0.2 for $AF_{soluble}$ in adults represents a weight of evidence determination based on experimental estimates of the bioavailability of ingested lead in adult humans with consideration of three major sources of variability that are likely to be present in populations, but are not always represented in experimental studies; these are variability in food intake, lead intake, and lead form and particle size.

Effect of food on lead bioavailability. The bioavailability of ingested soluble lead in adults has been found to vary from less than 10% when ingested with a meal to 60 - 80% when ingested after a fast (Blake, 1976; Blake et al., 1983; Blake and Mann, 1983; Graziano et al., 1995; Heard and Chamberlain, 1982; James et al., 1985; Rabinowitz et al., 1976, 1980). The general consensus is that constituents of food in the gastrointestinal tract decrease absorption of ingested lead, although the exact mechanisms by which this occurs are not entirely understood. Lead intake within a population would be expected to occur at various times with respect to meals. Therefore, the central tendency for lead absorption would be expected to reflect, in part, meal patterns within the population and to have a value between the experimentally determined estimate for fasted and fed subjects.

An estimate of a "meal-weighted" $AF_{soluble}$ can be obtained from the data reported by James et al. (1985) and certain simplifying assumptions. James et al. (1985) assessed the effects of food on lead bioavailability by measuring the fraction retained in the whole body of adult subjects 7 days after they ingested a dose of radioactive lead either after a fast or at various times before or after a meal. The total lead dose was approximately 50 µg (fasted) - 100 µg (with food). Lead retention was 61 ± 8.2 (SD)% when lead was ingested on the 12th hour of a 19-hour fast and decreased to 4% - 16% when lead was ingested between 0 and 3 hours after a meal; retention was further reduced (3.5 ± 2.9%) when lead was ingested with a meal (breakfast) (the bioavailability may have been more than these retention estimates since some absorbed lead would have been excreted during the 7 day

interval between dosing and measurement of whole-body lead). Since ingested material may be retained in the human stomach or at least 1 hour (Hunt and Spurrel, 1951; Davenport, 1971), lead bioavailability also may be reduced when lead is ingested 1 hour before a meal. The average "meal-weighted" bioavailability can be estimated based on the average number of waking hours during the day, the number of meals eaten, the bioavailability of lead ingested within 1 hour before a meal, the bioavailability of lead ingested within 0 to 3 hours after a meal, and the bioavailability of lead at other times during the day. For example, if it is assumed that people eat three meals each day and, based on the James et al. (1985) study, the bioavailability of lead ingested within 1 hour before a meal or 0 to 3 hours after a meal is approximately 0.1, and the bioavailability of lead ingested at all other times in a 16 hour day is 0.6, then the average "meal-weighted" bioavailability during a 16 hour day is approximately 0.2:

$$\frac{(0.1 \cdot 12\ hrs) + (0.6 \cdot 4\ hrs)}{16\ hrs} = 0.23$$

This example suggests that the use of 0.2 as a default value for $AF_{soluble}$ is plausible for populations in which soil lead intake occurs throughout the day, interspersed with meals. This may not apply to all members of a population. For example, the average bioavailability would be higher if less than three meals were consumed each day (e.g., using a similar calculation it can be shown that the average bioavailability for one meal each day would be 0.5). Average bioavailability also may be greater than 0.2 if lead intake was to occur predominantly in the early morning, before the first meal of the day.

Although lead bioavailability may be lower in individuals whose soil lead ingestion coincides with meals, the TRW cautions against the use of a value less than 0.2 for several reasons. Iron and calcium deficiency associated with poor nutritional status may enhance absorption (U.S. EPA, 1990). In addition, numerous factors may affect the absorption, distribution, excretion, and mobilization of lead during pregnancy: increased plasma volume (i.e., hemodilution); decreased hematocrit; previous exposure history of the mother (i.e., bone lead sequestration); changes in nutritional status; significant loss of body weight or depletion of fat stores; hormonal modulation; age; race; administration of drugs; and illness (Silbergeld, 1991). There is likely to be significant inter-individual variability in these factors, and studies of women at different stages of pregnancy have not shown clear trends in effects on blood lead concentration (Gershanik et al., 1974; Alexander and Delves, 1981; Baghurst et al., 1987; Silbergeld, 1991). While there is evidence to support 0.2 as a reasonable estimate of $AF_{soluble}$ for women of child-bearing age, there is still some basis for concern regarding potentially elevated absorption during pregnancy. However, a potential increase in lead absorption during pregnancy would be expected to occur dynamically with changes in bone mobilization, blood volume and glomerular filtration rate. Thus, the TRW cautions against adjusting the value for $AF_{soluble}$ (or BKSF) based on assumptions regarding the effects of pregnancy on blood lead concentration.

Nonlinearity in blood lead concentration. Another reason for caution in adopting values for $AF_{soluble}$ less than 0.2 derives from uncertainty about the relationship between blood lead concentration, lead intake, and lead absorption. Several studies have shown that the relationship between environmental lead levels (e.g., drinking water lead concentration) and blood lead

concentration is nonlinear and suggest the possibility that fractional absorption of ingested lead is dose-dependent, and decreases as lead intake (and blood lead concentration) increases. Pocock et al. (1983) reported a nonlinear relationship between blood lead concentration and water lead that could be approximated by two linear equations: a slope of 0.06 μg/dL per μg/L was estimated for water lead concentrations equal to or less than 100 μg/L and a slope of 0.01 was estimated for water lead concentrations above 100 μg/L. Sherlock et al. (1982, 1984) used a cube root regression model to relate blood and water lead concentrations; however, over the range of water lead concentrations of 100 μg/L or less, the slope of 0.06 μg/dL per μg/L water lead from Pocock et al. (1983) approximates the relationship observed in the Sherlock et al. (1982, 1984) study (Figure A-1). The linear relationship between water lead and blood lead in the Pocock et al. (1983) study extends from a blood lead concentration range of 14 to 20 μg/dL. Based on these data, the value of $AF_{soluble}$ of 0.2 may be considered a reasonable default estimate if applied to exposure scenarios in which the estimates of blood lead concentration do not exceed 20 μg/dL. At blood lead concentrations greater than this, absorption of soluble lead may be less than the default value.

An appropriate value of $AF_{soluble}$ also can be supported by estimating the range of daily lead intake that is likely to result in a linear relationship between intake and blood lead concentration. Data represented in Figure A-1 suggest that if water lead concentrations are less than 100 μg/L, the blood lead - water lead relationship is approximately linear. If assumptions regarding the magnitude of first draw and flushed water intakes and lead concentrations are applied (see Equations A-8 and A-9 and discussion of BKSF), a first draw water lead concentration of 100 μg/L in the Pocock et al. (1983) study represents a water lead intake of approximately 70 μg/day:

$$100 \cdot 1.4 \cdot (0.3 + (0.25 \cdot 0.7)) \approx 70$$

We do not know with certainty the total lead intake in the Pocock et al. (1983) population, although we can be certain that it exceeded the above estimated intake from drinking water since intake from diet and other sources, including occupational, would have occurred; this is consistent with the higher blood lead concentrations that were observed in the male population. Sherlock et al. (1982) estimated that, in their study population of adult women, the dietary contribution to total lead intake was equal to that from drinking water when the water lead concentration was 100 μg/L, and that the contribution of lead from sources other than diet and water was very small. If the same assumption is applied to the Pocock et al. (1983) study, it is likely that total lead intake in the male population was at least 140 μg/day (70 μg/day from drinking water and 70 μg/day from diet; the Pocock et al., 1983 study included 40 households from the Sherlock et al., 1982 study site), and may have been higher because of occupational exposure in the male population. A crude estimate of the relative magnitudes of the non-water lead intakes in the two studies can be obtained by comparing the predicted water lead concentration required to achieve the same blood lead concentration in the two populations. For example, a water lead concentration of 100 μg/L corresponded to a predicted blood lead concentration of approximately 18 μg/dL in the female population (Sherlock et al., 1984); the same blood lead concentration corresponded to a water lead concentration of 50 μg/L in the male population (Pocock et al., 1983). Therefore, the non-water lead intakes in the male population may have been twice that in the female population. If it is assumed that drinking water and diet contributed equally to lead intake in both studies, then a drinking water lead concentration of 100 μg/L in the Pocock et al. (1983) study translates to a total lead intake of approximately 300 μg/day:

$$I_{total} = I_{water} + I_{diet} + I_{other} \quad \text{(Equation A-11)}$$

$$I_{total} = 70 + 70 + 140 \approx 300\ \mu g/day$$

Thus, the departure from linearity observed in the Pocock et al. (1983) study may have occurred at lead intakes at or above 300 μg/day. In the various experimental assessments of lead bioavailability, subjects ingested lead in amounts that varied among the studies but were all within the range 100 - 300 μg (Blake, 1976; Blake et al., 1983; Blake and Mann, 1983; Graziano et al., 1995; Heard and Chamberlain, 1982; James et al., 1985; Rabinowitz et al., 1976, 1980), which is within the approximate linear range, if the extrapolation from the Pocock et al. (1983) and Sherlock et al. (1982) studies is reasonable. Based on these considerations, the value of $AF_{soluble}$ of 0.2 is considered to be a reasonable default value if applied to exposure scenarios in which lead intakes are less than 300 μg/day. At intakes greater than this, absorption of soluble lead may be less than the default value; however, it can be similarly argued that, based on the Sherlock et al. (1984) regression model, the default $AF_{soluble}$ may underestimate absorption by some degree at low exposures.

Effect of lead form and particle size on lead bioavailability. The default value of 0.2 for $AF_{soluble}$ applies to soluble forms of lead in drinking water and food and would be expected to overestimate absorption of less soluble forms of lead in soil. Experimental studies have shown that the bioavailability of lead in soil tends to be less than that of soluble lead. Weis et al. (1994) assessed the relative bioavailability of lead in soil compared to water soluble lead (acetate) in immature swine and estimated that the relative bioavailability of lead in soil from Leadville, CO was 0.6 to 0.8. Ruby et al. (1996) reported estimates of the relative bioavailability of lead in a variety of soils from mining sites and smelters as assessed in the Sprague-Dawley rat; the estimates ranged from 0.09 to 0.4. Maddaloni et al. (1996) reported preliminary data from a study in which 6 fasted human subjects were administered a single dose of lead-contaminated soil. The dose was 250 μg lead normalized to a 70 kg body weight; the concentration of lead in the soil was 2850 μg/g and the amount of soil administered to each subject was generally a little less than 100 mg. The average estimate of lead absorption in the six subjects was 26%. If the absorption factor for soluble lead in fasted adults is assumed to be 0.6 (James et al., 1985), then the Maddaloni et al. (1996) estimate suggests a relative bioavailability of 0.5 (i.e., 0.3/0.6) for lead in soil.

Based on the above evidence, the TRW considers 0.6 to be a plausible default point estimate for the relative bioavailability of lead in soil compared to soluble lead ($RBF_{soil/soluble}$) when site-specific data are not available. Such data are highly desirable as variation in relative bioavailability is expected for different species of lead and different particle sizes (Barltrop and Meek, 1975, 1979), both of which may vary from site to site. For example, the bioavailability of metallic lead has been shown to decrease with increasing particle size (Barltrop and Meek, 1979), therefore, the default value for $RBF_{soil/soluble}$ may overestimate absorption of lead if applied to soils contaminated with large lead particles such as firing range debris or mine tailings. Here again, the TRW cautions against the use of a lower value for the $RBF_{soil/soluble}$, unless it can be supported by experimental assessments of relative bioavailability.

The default value of 0.6 for $RBF_{soil/soluble}$, coupled with the default value of 0.2 for $AF_{soluble}$, yields a default value of 0.12 for AF_S (0.6 · 0.2). The TRW considers 0.12 to be a plausible point estimate for the absorbed fraction of ingested soil lead for use in assessments in which site-specific data on lead bioavailability are not available. The default value of 0.12 takes into account uncertainties regarding the possible nonlinearity in the relationship between lead intake and absorption and should be adequately protective in scenarios in which predicted blood lead concentrations are less than 20 μg/dL. The use of the default value for populations that have substantially higher blood lead concentrations may result in an overestimate of lead uptake, and conversely, lead uptake may be underestimated at lower exposures.

7. Daily Soil Ingestion Rate (IR_S)

The TRW recommends a default value of 0.05 g/day as a plausible point estimate of the central tendency for daily soil intake from all occupational sources, including soil in indoor dust, resulting from non-contact intensive activities. This would include exposures that are predominantly indoors. More intensive soil contact would be expected for predominantly outdoor activities such as construction, excavation, yard work, and gardening (Hawley, 1985). Site-specific data on soil contact intensity, including potential seasonal variations, should be considered in evaluating whether or not the default value is applicable to the population of concern and, if not, activity-weighted estimates of IR_S that more accurately reflect the site can be developed.

In adopting the single IR_S parameter to describe all sources of ingested soil, the methodology remains consistent with recommendations of the Superfund program and their implementation for risk assessment; specifically, the 0.05 g/day value used for adult soil ingestion addresses all occupational soil intake by the individual, whether directly from soil or indirectly through contact with dust (U.S. EPA, 1993). This value specifically applies to the assessment of soil lead risk, and not risks associated with non-soil sources of lead in dust. In making soil ingestion exposure estimates under the Risk Assessment Guidelines for Superfund (RAGS) framework, no specific assumptions are needed about the fraction of soil intake that occurs through dust.

An alternative approach was needed in the IEUBK Model because childhood lead exposures are often strongly influenced by indoor sources of lead in dust (e.g., indoor paint) (U.S. EPA, 1994b). In a situation where indoor sources of dust contamination are important, an exposure estimate that addresses only soil exposures (including the soil component of dust) would be incomplete. The IEUBK Model assigns separate values to outdoor soil and total indoor dust ingestion and partitions the indoor dust into soil-derived and non-soil-derived sources. At a minimum, paired soil and indoor dust samples should be collected to adequately characterize exposure to lead where indoor sources of dust lead may be significant.

Alternate method for calculating soil and dust ingestion as separate exposure pathways. In this alternate approach, separate estimates are made of lead intake from the direct ingestion of outdoor soil and from the ingestion of indoor dust (which may contain lead from soil and as well as from indoor sources such as deteriorated lead based paint). Exposure to lead from soil (outdoor

contact) can be calculated using Equation A-12, while exposure to lead from indoor dust can be calculated using Equation A-13.

$$INTAKE_{S,outdoors} = \frac{PbS \cdot IR_{S,outdoors} \cdot EF_{Site}}{AT} \qquad \text{(Equation A-12)}$$

$$INTAKE_{D,indoors} = \frac{PbD \cdot IR_{D,indoors} \cdot EF_{Site}}{AT} \qquad \text{(Equation A-13)}$$

$INTAKE_{S, outdoors}$	=	Daily average intake (ingestion) of lead from soil ingested outdoors (µg/day).
$INTAKE_{D, indoors}$	=	Daily average intake (ingestion) of lead from dust ingested indoors (µg/day).
PbS	=	Soil lead concentration (µg/g) (average concentration in assessed individual exposure area).
PbD	=	Indoor dust lead concentration (µg/g).
$IR_{S, outdoors}$	=	Intake rate (ingestion) of outdoor soil (g/day).
$IR_{D, indoors}$	=	Intake rate (ingestion) of indoor dust (g/day).
EF_{Site}	=	Exposure frequency at site (days of exposure during the averaging period); may be taken as days per year for continuing, long term exposures.
AT	=	Averaging time, the total period during which the assessed exposures (from all sources) occur (days). May be taken as 365 days per year for continuing, long term exposures.

Note that, in Equations A-12 and A-13, exposure frequency refers to the number of days that an individual is present at the site and does not partition between periods of indoor and outdoor exposures. The intake rate is a long term average value appropriate for that media and is influenced by both the duration of outdoor (or indoor) exposures and the intensity of those exposures.

Calculation of $IR_{S, outdoors}$ and $IR_{D, indoors}$ from total intake of soil and dust (IR_{S+D}). Intermediary calculations may be needed to generate estimates of the parameters in the intake equations. An estimate of the total intake of soil and dust materials (IR_{S+D}) serves as a starting point. Note that IR_{S+D} differs from $IR_{S,}$ which was discussed above, because IR_{S+D} includes not only the total mass of soil ingested (both directly and as a component of indoor dust), but also the ingested

mass of non-soil derived dust components including various materials of indoor origin. Since a substantial fraction of the mass of indoor dust comes from sources other than outdoor soils, an estimate of IR_{S+D} will be higher than the corresponding estimate of $IR_{S.}$ Secondly, an estimate of the fraction the total soil and dust intake that is ingested directly as soil is needed ($Weighting_{soil}$). This estimate needs to take into account the intensity and duration of the outdoor soil intake and the indoor dust intake. Equations A-14 and A-15 can be used to derive media-specific ingestion rates from IR_{S+D} and $Weighting_{soil}$.

$$IR_{S,outdoors} = Weighting_{soil} \cdot IR_{S+D} \qquad \text{(Equation A-14)}$$

$$IR_{D,indoors} = (1 - Weighting_{soil}) \cdot IR_{S+D} \qquad \text{(Equation A-15)}$$

$Weighting_{soil}$ = Fraction of total soil and dust intake that is directly ingested as soil (dimensionless).

IR_{S+D} = Total daily average intake of outdoor soil and indoor dust (all dust components) (g/day).

Data are needed to generate separate estimates of the concentrations of lead in outdoor soil and in indoor dust. A site assessment using this alternate methodology would generally be based on direct measurement data for both soil and dust at the facilities of concern. For comparison with exposure estimates based on total soil ingestion (the primary approach presented in this paper), Equation A-16 may be utilized to estimate the ratio of dust lead concentration to soil lead concentration.

$$PbD = PbS \cdot K_{SD} \qquad \text{(Equation A-16)}$$

K_{SD} = Ratio of indoor dust lead concentration to soil lead concentration (dimensionless).

Assuming that the same absorption fraction is applicable to both soil and dust, Equation A-17 may be used to estimate the uptake of lead from these two sources.

$$UPTAKE = AF_{S,D} \cdot (INTAKE_{S,outdoors} + INTAKE_{D,indoors}) \qquad \text{(Equation A-17)}$$

UPTAKE = Daily average uptake of lead from the gastrotintestinal tract into the systemic circulation; soil and dust sources (µg/day).

$AF_{S,D}$ = Absolute gastrointestinal absorption fraction for ingested lead in soil and dust (dimensionless).

Comparison of lead intake estimated from principal and alternate approaches. It is helpful to compare exposure estimates derived using our principal approach based on total soil intake (including soil present in ingested dust) with the results of the disaggregated pathway analysis for soil and dust. We will consider the case in which there are not important indoor sources of lead in dust. We can then compare the total lead intake estimates from the two approaches.

Under the model based on total soil ingestion (which we re-label as $IR_{S,total}$ for clarity):

$$INTAKE = \frac{PbS \cdot IR_{S,total} \cdot EF_{Site}}{AT} \qquad \text{(Equation A-18)}$$

By contrast, using the disaggregated soil and dust model, Equations A-14, A-15, A-16, and A-18 may be combined to give Equation A-19:

$$INTAKE = \frac{PbS \cdot IR_{S+D} \cdot (Weighting_{soil} + K_{SD} \cdot (1 - Weighting_{soil})) \cdot EF_{Site}}{AT} \qquad \text{(Equation A-19)}$$

When applied to the same exposure assessment problem, the two approaches should give equivalent estimates of lead intake. The estimates will be equivalent when:

$$IR_{S+D} \cdot (Weighting_{soil} + K_{SD} \cdot (1 - Weighting_{soil})) = IR_{S,total}$$

8. Exposure Frequency (EF_S)

The TRW recommends a default value of 219 days/year. This is the same as the central tendency occupational exposure frequency recommended by U.S. EPA (1993) Superfund guidance, which is based on 1991 data from the Bureau of Labor Statistics. This estimate corresponds to the average time spent at work by both full-time and part-time workers engaged in non-contact intensive activities (U.S. EPA, 1993). Site-specific data on exposure frequency should be considered in evaluating whether or not the default value is applicable to the population of concern. In evaluating site-specific data, it should be kept in mind that exposure frequency and daily soil ingestion rate (IR_S) may be interdependent variables, particularly in contact-intensive scenarios; therefore, the assignment of a site-specific value to EF_S should prompt an evaluation of the applicability of the default value for IR_S to the population of concern (see Section 7 of the Appendix for further discussion).

Nonresidential exposure scenarios in which exposure frequency would be substantially less than 219 days/year are frequently encountered. Examples include trespassing and recreational use of a site. Important methodology constraints on exposure frequency and duration must be considered in assigning values to EF_S that would represent infrequent contact with the site; these constraints relate to the steady state assumptions that underlie the BKSF. The BKSF derived from the Pocock et al. (1983) data applies to exposures that result in a quasi-steady state for blood lead concentration; that is, an intake over a sufficient duration for the blood lead concentration to become nearly constant over time. Based on estimates of the first order elimination half-time for lead in blood of approximately 30 days for adults (Rabinowitz, et al., 1974, 1976; Chamberlain et al., 1978), a constant lead intake rate over a duration of 90 days would be expected to achieve a blood lead concentration that is sufficiently close the quasi-steady state. This is the minimum exposure duration to which this methodology should be applied.

Infrequent exposures (i.e., less than 1 day per week) over a minimum duration of 90 days would be expected to produce oscillations in blood lead concentrations associated with the absorption and subsequent clearance of lead from the blood between each exposure event. Based on the above assumptions about the elimination half-time lead in blood, the TRW recommends that this methodology should not be applied to scenarios in which EF_S is less than 1 day/week.

9. Applying Monte Carlo Analysis to the Adult Lead Methodology

Recent EPA guidance (Browner, 1995) recommends that risk assessments include a clear and transparent discussion of variability and uncertainty. The lead risk assessment methodology presented here develops explicit estimates of the variability of blood lead levels among adults who are exposed to specified concentrations of environmental lead. This analysis relies on data from a large number of studies (baseline blood lead levels, variability of blood lead levels, contact rates with environmental media, lead bioavailability, and lead biokinetics) to support a predictive probabilistic (lognormal) model for adult and fetal blood lead concentrations. Important issues regarding the uncertainty in parameter inputs and the mathematical form of the model are discussed in the sections of this Appendix. The TRW recognizes that there is considerable scientific interest in the different analytical approaches that may be applied to aid in the analysis of variability and uncertainty in risk assessments. In particular, under appropriate circumstances, Monte Carlo methods may provide a useful approach for developing quantitative estimates of the variability, uncertainty (or both) in risk predictions.

The TRW chose not to pursue application of Monte Carlo or other stochastic simulation methods in this effort addressing adult lead risk assessment. Several factors went into this decision. First, the TRW understood the needs of EPA Regions for a risk model that could be developed relatively rapidly and which Regional lead risk assessors could apply easily with limited need for additional study or training. These considerations made it advantageous to focus on models that are conceptually similar to the IEUBK model for children in terms of applying a parametric lognormal modeling approach to address distributions for blood lead levels. Secondly, the TRW recognized that there would be substantial scientific issues associated with developing widely applicable stochastic simulation models for adult lead risk assessment. These difficulties primarily relate to the absence of reliable distributional data for a variety of important variables in the assessment. As

one example, very limited data are available on soil ingestion rates in adults and a distributional choice for this key parameter would depend heavily on individual judgement with little Agency precedent for support. Additionally, in a stochastic assessment, a greater complexity would arise due to likely correlations among the variables in the adult lead risk assessment. Stochastic analyses need to explicitly account for important correlations among variables if the simulations are to provide realistic distributions of risk. As an example, dependence is likely to exist between the starting (non-site related) blood lead concentrations for individuals and their site-related increases in blood lead. This dependence may result from individual patterns of behavior and from biological factors associated with lead pharmacokinetics. However, data on this dependence are sparse or absent, and the necessary statistical estimates of the correlation strength would depend heavily on personal judgement.

The TRW does encourage further efforts to better define the distributional data on which stochastic simulations of lead risks might rest. Further attention to these data can provide useful insights for lead risk assessment. The TRW also recognizes that Regions may be presented with lead risk assessments based on Monte Carlo modeling. In order to facilitate review of Monte Carlo analyses, some EPA Regions have found it important to establish requirements for the orderly development and review of these assessments. Borrowing on this approach, the TRW recommends that:

- A plan for the use of Monte Carlo analysis in a lead risk assessment should be submitted to responsible Regional personnel and accepted by them before the Monte Carlo analysis is undertaken.

- In general, it is expected that site-specific exposure related parameters that are supported with site-specific information will provide the basis for proposed Monte Carlo simulations.

- Scientific review is needed to determine that the risk assessment conformed to the plan and to evaluate the reliability of the results.

These recommendations are designed to ensure that assessments can provide meaningful results that can be understood and evaluated. If analyses are submitted in a format that is difficult to understand, the utility of the analysis will be diminished. We recommend that Regional staff seek advice from the TRW as a resource in this process.

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APPENDIX B

Calculations of Preliminary Remediation Goals (PRGs)

Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 8/14/01

Exposure Variable	PRG Equation[1]		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
	1*	2**			GSDi = 1.9	GSDi = 2.3	GSDi = 1.9	GSDi = 2.3
$PbB_{fetal, 0.95}$	X	X	95th percentile PbB in fetus	ug/dL	10	10	10	10
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	1.9	2.3	1.9	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.4	1.8	1.4	1.8
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PRG	**Preliminary Remediation Goal**			**ppm**	**1,712**	**710**	**1,712**	**710**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}). When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same PRG.

***Equation 1, based on Eq. 4 in U.S. EPA (1996)**

$$PRG = \frac{([PbB_{95}\ fetal/(R*(GSD_i^{1.645})])-PbB_0)*AT_{S,D}}{BKSF*(IR_{S+D}*AF_{S,D}*EF_{S,D})}$$

****Equation 2, alternate approach based on Eq. 4 and Eq. A-19 in U.S. EPA (1996)**

$$PRG = \frac{([PbB_{fetal,0.95}/(R*(GSD_i^{1.645})])-PbB_0)*AT_{S,D}}{BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])}$$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

APPENDIX C

Memorandum April 7, 1999

MEMORANDUM

DATE: April 7, 1999

SUBJECT: Use of the TRW Interim Adult Lead Methodology in Risk Assessment

TO: Mark Maddaloni, Chair
TRW Adult Lead Subgroup

FROM: Pat Van Leeuwen
Region 5 Superfund Program

Paul White
ORD/NCEA

The December 1996 TRW report "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" presents tools that can be used in a risk assessment to provide an evaluation of risk relevant to the adult population. This report, referred to as the interim Adult Lead Methodology (ALM), focuses on the estimation of the blood lead concentrations in fetuses carried by women exposed to lead contaminated soils. However, the presentation in that document emphasizes the calculation of cleanup goals for soil and it has become apparent that there is some confusion among risk assessors regarding how to apply this methodology in a "forward" manner to predict baseline risks resulting from measured soil concentrations. This memorandum presents equations for calculation of fetal risks from adult exposures to specified levels of soil lead contamination. This approach will support EPA's goal of limiting the risk of elevated fetal blood lead concentrations due to lead exposures to women of child-bearing age. We have prepared this memorandum so that it may be included as an Appendix to the interim ALM to provide the needed clarification to risk assessors and others who use the ALM to support an evaluation of risk.

The risk assessment methodology in the ALM is based on a lognormal probability model for blood levels in adult women exposed to lead contaminated soils, coupled with an estimated constant of proportionality between fetal and maternal blood lead levels. These relationships specify that the distribution of fetal blood lead levels also follows a lognormal distribution:

$$PbB_{fetal} \sim Lognormal(GM, GSD)$$

Estimation of the probability that fetal blood lead levels will exceed the EPA blood lead level of concern of 10 ug/dL is a two step process:

(1) Calculate the geometric mean (central) fetal blood lead concentration ($PbB_{fetal,GM}$). Equation A-3 in the ALM Appendix provides an estimate of the central tendency adult blood lead level which is used to provide a plausible estimate of the geometric mean in the lognormal model for blood lead. When the expressions for lead UPTAKE (ALM Equations A-1 and A-2) are substituted into ALM Equation A-3 the following relationship is obtained:

$$PbB_{adult,central} = PbB_{adult,0} + \frac{PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S}{AT} \quad \text{(ALM Equation 1)}$$

A second equation provides the constant of proportionality between fetal and adult blood lead levels:

$$PbB_{fetal} = R_{fetal/maternal} \cdot PbB_{adult} \quad \text{(ALM Equation A-5)}$$

Combining these two relationships, the resulting equation for the fetal geometric mean blood lead level has the following form:

$$PbB_{fetal,GM} = R_{fetal/maternal} \cdot \left[PbB_{adult,0} + \frac{PbS \cdot BKSF \cdot IR_S \cdot AF_S \cdot EF_S}{AT}\right] \quad \text{(Equation 1)}$$

Where:

$PbB_{fetal,GM}$ = Central estimate of blood lead concentrations (µg/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.

$R_{fetal/maternal}$ = Constant of proportionality between fetal and maternal blood lead concentrations.

$PbB_{adult,0}$ = Typical blood lead concentration (µg/dL) in adults (i.e., women of child-bearing age) in the absence of exposures to the site that is being assessed.

PbS = Soil lead concentration (µg/g) (appropriate average concentration for individual).

BKSF = Biokinetic slope factor relating the (quasi-steady state) increase in typical adult blood lead concentration to average daily lead uptake (µg/dL blood lead increase per µg/day lead uptake).

IR_S = Intake rate of soil, including both outdoor soil and the soil-derived component of indoor dust (g/day).

AF_S = Absolute gastrointestinal absorption fraction for ingested lead in soil and lead in dust derived from soil (dimensionless).

EF_S = Exposure frequency for contact with assessed soils and/or dust derived in part from these soils (days of exposure during the averaging period); may be taken as days per year for continuing, long term exposures.

AT = Averaging time; the total period during which soil contact may occur; 365 days/year for continuing long term exposures.

(2) Determine the probability that the blood lead level for a fetus carried by a woman exposed to lead at a site exceeds 10 ug/dL. This calculation uses the fetal geometric mean (GM) blood lead from Equation 1 and the geometric standard deviation (GSD) value appropriate for the risk assessment. Note that because of the assumption of proportionality between fetal and maternal blood lead levels, the adult GSD and the fetal GSD are equal. If the assessor is using a spreadsheet or statistical program that provides a function to calculate lognormal probabilities, the GM and GSD values may directly used to calculate the exceedence probabilities. (Care must be taken to determine the exact form of the inputs needed by the statistical function, e. g., whether log scale inputs are required.) Alternatively, the following formula and table provide the needed tools for the probability calculation.

Recall that the logarithm of a lognormal variable follows a normal probability distribution. Exceedence probabilities for the lognormal model can be determined from standard normal model statistical tables after the GM, GSD, and exceedence criterion are converted to log scale values and a "standard normal deviate" or "z-value" is calculated:

$$z = \frac{\ln(10) - \ln(GM)}{\ln(GSD)} \quad \text{(Equation 2)}$$

In this equation, ln( ) represents the natural logarithm function (log base e) which is applied in the definition of the lognormal distribution. Note, however, that calculations using base 10 logarithms would also yield the same numerical result.

A statistical program or a normal probability table can then be used to determine the exceedence probability. The attached standard normal table displays both positive and negative values of z for ease of reference. The table gives the probability, p, that a standard normal variable has a value less than z. The probability that the fetal blood lead level exceeds 10 ug/dL is obtained by from the expression 1-p.

EXAMPLE:

Assume that the risk calculation (Equation 1) gives a GM fetal blood lead level of 7.0 ug/dL, and the appropriate GSD is 1.8.

Then:

$$z = \frac{\ln(10) - \ln(7.0)}{\ln(1.8)} = \frac{2.303 - 1.946}{0.588} = 0.607$$

Under the normal distribution, the probability that z is less than 0.607 is p = 0.728 (obtained from a statistical program). From the attached normal table the probability may be adequately approximated by rounding 0.607 to 0.61 to get a probability of 0.729, or approximately 0.73.[1]

The probability that the fetal blood lead level exceeds 10 ug/dL is estimated as 1 - p = 1 - 0.73 = 0.27, or approximately 27%.

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[1]The precision of values obtained from the table can be increased, when necessary, by using linear interpolation between the table entries. For this example, interpolation using the values of z = 0.60 and z = 0.61 can be applied to calculate a probability, p = 0.728, as shown in the following equation:

$0.72575 + (0.72907 - 0.72575) \cdot \frac{(0.607 - 0.600)}{(0.610 - 0.600)} = 0.728$. In general, to interpolate the probability, p, associated with z, find the z-values bracketing z in the normal table; i. e., find the z_1 and z_2 in adjoining rows of the table so that $z_1 < z < z_2$. Next find the values p_1 and p_2 in the table corresponding to z_1 and z_2, respectively. The linearly interpolated value for p is then: $p = p_1 + (p_2 - p_1) \cdot \frac{(z - z_1)}{(z_2 - z_1)}$.

Normal Probability Table

z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)
-3.50	0.00023	-3.00	.00135	-2.50	0.00621	-2.00	0.02275	-1.50	0.06681
-3.49	0.00024	-2.99	0.00139	-2.49	0.00639	-1.99	0.02330	-1.49	0.06811
-3.48	0.00025	-2.98	0.00144	-2.48	0.00657	-1.98	0.02385	-1.48	0.06944
-3.47	0.00026	-2.97	0.00149	-2.47	0.00676	-1.97	0.02442	-1.47	0.07078
-3.46	0.00027	-2.96	0.00154	-2.46	0.00695	-1.96	0.02500	-1.46	0.07215
-3.45	0.00028	-2.95	0.00159	-2.45	0.00714	-1.95	0.02559	-1.45	0.07353
-3.44	0.00029	-2.94	0.00164	-2.44	0.00734	-1.94	0.02619	-1.44	0.07493
-3.43	0.00030	-2.93	0.00169	-2.43	0.00755	-1.93	0.02680	-1.43	0.07636
-3.42	0.00031	-2.92	0.00175	-2.42	0.00776	-1.92	0.02743	-1.42	0.07780
-3.41	0.00032	-2.91	0.00181	-2.41	0.00798	-1.91	0.02807	-1.41	0.07927
-3.40	0.00034	-2.90	0.00187	-2.40	0.00820	-1.90	0.02872	-1.40	0.08076
-3.39	0.00035	-2.89	0.00193	-2.39	0.00842	-1.89	0.02938	-1.39	0.08226
-3.38	0.00036	-2.88	0.00199	-2.38	0.00866	-1.88	0.03005	-1.38	0.08379
-3.37	0.00038	-2.87	0.00205	-2.37	0.00889	-1.87	0.03074	-1.37	0.08534
-3.36	0.00039	-2.86	0.00212	-2.36	0.00914	-1.86	0.03144	-1.36	0.08691
-3.35	0.00040	-2.85	0.00219	-2.35	0.00939	-1.85	0.03216	-1.35	0.08851
-3.34	0.00042	-2.84	0.00226	-2.34	0.00964	-1.84	0.03288	-1.34	0.09012
-3.33	0.00043	-2.83	0.00233	-2.33	0.00990	-1.83	0.03362	-1.33	0.09176
-3.32	0.00045	-2.82	0.00240	-2.32	0.01017	-1.82	0.03438	-1.32	0.09342
-3.31	0.00047	-2.81	0.00248	-2.31	0.01044	-1.81	0.03515	-1.31	0.09510
-3.30	0.00048	-2.80	0.00256	-2.30	0.01072	-1.80	0.03593	-1.30	0.09680
-3.29	0.00050	-2.79	0.00264	-2.29	0.01101	-1.79	0.03673	-1.29	0.09853
-3.28	0.00052	-2.78	0.00272	-2.28	0.01130	-1.78	0.03754	-1.28	0.10027
-3.27	0.00054	-2.77	0.00280	-2.27	0.01160	-1.77	0.03836	-1.27	0.10204
-3.26	0.00056	-2.76	0.00289	-2.26	0.01191	-1.76	0.03920	-1.26	0.10383
-3.25	0.00058	-2.75	0.00298	-2.25	0.01222	-1.75	0.04006	-1.25	0.10565
-3.24	0.00060	-2.74	0.00307	-2.24	0.01255	-1.74	0.04093	-1.24	0.10749
-3.23	0.00062	-2.73	0.00317	-2.23	0.01287	-1.73	0.04182	-1.23	0.10935
-3.22	0.00064	-2.72	0.00326	-2.22	0.01321	-1.72	0.04272	-1.22	0.11123
-3.21	0.00066	-2.71	0.00336	-2.21	0.01355	-1.71	0.04363	-1.21	0.11314
-3.20	0.00069	-2.70	0.00347	-2.20	0.01390	-1.70	0.04457	-1.20	0.11507
-3.19	0.00071	-2.69	0.00357	-2.19	0.01426	-1.69	0.04551	-1.19	0.11702
-3.18	0.00074	-2.68	0.00368	-2.18	0.01463	-1.68	0.04648	-1.18	0.11900
-3.17	0.00076	-2.67	0.00379	-2.17	0.01500	-1.67	0.04746	-1.17	0.12100
-3.16	0.00079	-2.66	0.00391	-2.16	0.01539	-1.66	0.04846	-1.16	0.12302
-3.15	0.00082	-2.65	0.00402	-2.15	0.01578	-1.65	0.04947	-1.15	0.12507
-3.14	0.00084	-2.64	0.00415	-2.14	0.01618	-1.64	0.05050	-1.14	0.12714
-3.13	0.00087	-2.63	0.00427	-2.13	0.01659	-1.63	0.05155	-1.13	0.12924
-3.12	0.00090	-2.62	0.00440	-2.12	0.01700	-1.62	0.05262	-1.12	0.13136
-3.11	0.00094	-2.61	0.00453	-2.11	0.01743	-1.61	0.05370	-1.11	0.13350
-3.10	0.00097	-2.60	0.00466	-2.10	0.01786	-1.60	0.05480	-1.10	0.13567
-3.09	0.00100	-2.59	0.00480	-2.09	0.01831	-1.59	0.05592	-1.09	0.13786
-3.08	0.00104	-2.58	0.00494	-2.08	0.01876	-1.58	0.05705	-1.08	0.14007
-3.07	0.00107	-2.57	0.00508	-2.07	0.01923	-1.57	0.05821	-1.07	0.14231
-3.06	0.00111	-2.56	0.00523	-2.06	0.01970	-1.56	0.05938	-1.06	0.14457
-3.05	0.00114	-2.55	0.00539	-2.05	0.02018	-1.55	0.06057	-1.05	0.14686
-3.04	0.00118	-2.54	0.00554	-2.04	0.02068	-1.54	0.06178	-1.04	0.14917
-3.03	0.00122	-2.53	0.00570	-2.03	0.02118	-1.53	0.06301	-1.03	0.15151
-3.02	0.00126	-2.52	0.00587	-2.02	0.02169	-1.52	0.06426	-1.02	0.15386
-3.01	0.00131	-2.51	0.00604	-2.01	0.02222	-1.51	0.06552	-1.01	0.15625

Normal Probability Table

z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)
-1.00	0.15866	-0.50	0.30854	0.00	0.50000	0.50	0.69146	1.00	0.84134
-0.99	0.16109	-0.49	0.31207	0.01	0.50399	0.51	0.69497	1.01	0.84375
-0.98	0.16354	-0.48	0.31561	0.02	0.50798	0.52	0.69847	1.02	0.84614
-0.97	0.16602	-0.47	0.31918	0.03	0.51197	0.53	0.70194	1.03	0.84849
-0.96	0.16853	-0.46	0.32276	0.04	0.51595	0.54	0.70540	1.04	0.85083
-0.95	0.17106	-0.45	0.32636	0.05	0.51994	0.55	0.70884	1.05	0.85314
-0.94	0.17361	-0.44	0.32997	0.06	0.52392	0.56	0.71226	1.06	0.85543
-0.93	0.17619	-0.43	0.33360	0.07	0.52790	0.57	0.71566	1.07	0.85769
-0.92	0.17879	-0.42	0.33724	0.08	0.53188	0.58	0.71904	1.08	0.85993
-0.91	0.18141	-0.41	0.34090	0.09	0.53586	0.59	0.72240	1.09	0.86214
-0.90	0.18406	-0.40	0.34458	0.10	0.53983	0.60	0.72575	1.10	0.86433
-0.89	0.18673	-0.39	0.34827	0.11	0.54380	0.61	0.72907	1.11	0.86650
-0.88	0.18943	-0.38	0.35197	0.12	0.54776	0.62	0.73237	1.12	0.86864
-0.87	0.19215	-0.37	0.35569	0.13	0.55172	0.63	0.73565	1.13	0.87076
-0.86	0.19489	-0.36	0.35942	0.14	0.55567	0.64	0.73891	1.14	0.87286
-0.85	0.19766	-0.35	0.36317	0.15	0.55962	0.65	0.74215	1.15	0.87493
-0.84	0.20045	-0.34	0.36693	0.16	0.56356	0.66	0.74537	1.16	0.87698
-0.83	0.20327	-0.33	0.37070	0.17	0.56749	0.67	0.74857	1.17	0.87900
-0.82	0.20611	-0.32	0.37448	0.18	0.57142	0.68	0.75175	1.18	0.88100
-0.81	0.20897	-0.31	0.37828	0.19	0.57535	0.69	0.75490	1.19	0.88298
-0.80	0.21186	-0.30	0.38209	0.20	0.57926	0.70	0.75804	1.20	0.88493
-0.79	0.21476	-0.29	0.38591	0.21	0.58317	0.71	0.76115	1.21	0.88686
-0.78	0.21770	-0.28	0.38974	0.22	0.58706	0.72	0.76424	1.22	0.88877
-0.77	0.22065	-0.27	0.39358	0.23	0.59095	0.73	0.76730	1.23	0.89065
-0.76	0.22363	-0.26	0.39743	0.24	0.59483	0.74	0.77035	1.24	0.89251
-0.75	0.22663	-0.25	0.40129	0.25	0.59871	0.75	0.77337	1.25	0.89435
-0.74	0.22965	-0.24	0.40517	0.26	0.60257	0.76	0.77637	1.26	0.89617
-0.73	0.23270	-0.23	0.40905	0.27	0.60642	0.77	0.77935	1.27	0.89796
-0.72	0.23576	-0.22	0.41294	0.28	0.61026	0.78	0.78230	1.28	0.89973
-0.71	0.23885	-0.21	0.41683	0.29	0.61409	0.79	0.78524	1.29	0.90147
-0.70	0.24196	-0.20	0.42074	0.30	0.61791	0.80	0.78814	1.30	0.90320
-0.69	0.24510	-0.19	0.42465	0.31	0.62172	0.81	0.79103	1.31	0.90490
-0.68	0.24825	-0.18	0.42858	0.32	0.62552	0.82	0.79389	1.32	0.90658
-0.67	0.25143	-0.17	0.43251	0.33	0.62930	0.83	0.79673	1.33	0.90824
-0.66	0.25463	-0.16	0.43644	0.34	0.63307	0.84	0.79955	1.34	0.90988
-0.65	0.25785	-0.15	0.44038	0.35	0.63683	0.85	0.80234	1.35	0.91149
-0.64	0.26109	-0.14	0.44433	0.36	0.64058	0.86	0.80511	1.36	0.91309
-0.63	0.26435	-0.13	0.44828	0.37	0.64431	0.87	0.80785	1.37	0.91466
-0.62	0.26763	-0.12	0.45224	0.38	0.64803	0.88	0.81057	1.38	0.91621
-0.61	0.27093	-0.11	0.45620	0.39	0.65173	0.89	0.81327	1.39	0.91774
-0.60	0.27425	-0.10	0.46017	0.40	0.65542	0.90	0.81594	1.40	0.91924
-0.59	0.27760	-0.09	0.46414	0.41	0.65910	0.91	0.81859	1.41	0.92073
-0.58	0.28096	-0.08	0.46812	0.42	0.66276	0.92	0.82121	1.42	0.92220
-0.57	0.28434	-0.07	0.47210	0.43	0.66640	0.93	0.82381	1.43	0.92364
-0.56	0.28774	-0.06	0.47608	0.44	0.67003	0.94	0.82639	1.44	0.92507
-0.55	0.29116	-0.05	0.48006	0.45	0.67364	0.95	0.82894	1.45	0.92647
-0.54	0.29460	-0.04	0.48405	0.46	0.67724	0.96	0.83147	1.46	0.92785
-0.53	0.29806	-0.03	0.48803	0.47	0.68082	0.97	0.83398	1.47	0.92922
-0.52	0.30153	-0.02	0.49202	0.48	0.68439	0.98	0.83646	1.48	0.93056
-0.51	0.30503	-0.01	0.49601	0.49	0.68793	0.99	0.83891	1.49	0.93189

Normal Probability Table

z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)	z-value	p (prob. of lesser value)
1.50	0.93319	2.00	0.97725	2.50	0.99379	3.00	0.99865		
1.51	0.93448	2.01	0.97778	2.51	0.99396	3.01	0.99869		
1.52	0.93574	2.02	0.97831	2.52	0.99413	3.02	0.99874		
1.53	0.93699	2.03	0.97882	2.53	0.99430	3.03	0.99878		
1.54	0.93822	2.04	0.97932	2.54	0.99446	3.04	0.99882		
1.55	0.93943	2.05	0.97982	2.55	0.99461	3.05	0.99886		
1.56	0.94062	2.06	0.98030	2.56	0.99477	3.06	0.99889		
1.57	0.94179	2.07	0.98077	2.57	0.99492	3.07	0.99893		
1.58	0.94295	2.08	0.98124	2.58	0.99506	3.08	0.99896		
1.59	0.94408	2.09	0.98169	2.59	0.99520	3.09	0.99900		
1.60	0.94520	2.10	0.98214	2.60	0.99534	3.10	0.99903		
1.61	0.94630	2.11	0.98257	2.61	0.99547	3.11	0.99906		
1.62	0.94738	2.12	0.98300	2.62	0.99560	3.12	0.99910		
1.63	0.94845	2.13	0.98341	2.63	0.99573	3.13	0.99913		
1.64	0.94950	2.14	0.98382	2.64	0.99585	3.14	0.99916		
1.65	0.95053	2.15	0.98422	2.65	0.99598	3.15	0.99918		
1.66	0.95154	2.16	0.98461	2.66	0.99609	3.16	0.99921		
1.67	0.95254	2.17	0.98500	2.67	0.99621	3.17	0.99924		
1.68	0.95352	2.18	0.98537	2.68	0.99632	3.18	0.99926		
1.69	0.95449	2.19	0.98574	2.69	0.99643	3.19	0.99929		
1.70	0.95543	2.20	0.98610	2.70	0.99653	3.20	0.99931		
1.71	0.95637	2.21	0.98645	2.71	0.99664	3.21	0.99934		
1.72	0.95728	2.22	0.98679	2.72	0.99674	3.22	0.99936		
1.73	0.95818	2.23	0.98713	2.73	0.99683	3.23	0.99938		
1.74	0.95907	2.24	0.98745	2.74	0.99693	3.24	0.99940		
1.75	0.95994	2.25	0.98778	2.75	0.99702	3.25	0.99942		
1.76	0.96080	2.26	0.98809	2.76	0.99711	3.26	0.99944		
1.77	0.96164	2.27	0.98840	2.77	0.99720	3.27	0.99946		
1.78	0.96246	2.28	0.98870	2.78	0.99728	3.28	0.99948		
1.79	0.96327	2.29	0.98899	2.79	0.99736	3.29	0.99950		
1.80	0.96407	2.30	0.98928	2.80	0.99744	3.30	0.99952		
1.81	0.96485	2.31	0.98956	2.81	0.99752	3.31	0.99953		
1.82	0.96562	2.32	0.98983	2.82	0.99760	3.32	0.99955		
1.83	0.96638	2.33	0.99010	2.83	0.99767	3.33	0.99957		
1.84	0.96712	2.34	0.99036	2.84	0.99774	3.34	0.99958		
1.85	0.96784	2.35	0.99061	2.85	0.99781	3.35	0.99960		
1.86	0.96856	2.36	0.99086	2.86	0.99788	3.36	0.99961		
1.87	0.96926	2.37	0.99111	2.87	0.99795	3.37	0.99962		
1.88	0.96995	2.38	0.99134	2.88	0.99801	3.38	0.99964		
1.89	0.97062	2.39	0.99158	2.89	0.99807	3.39	0.99965		
1.90	0.97128	2.40	0.99180	2.90	0.99813	3.40	0.99966		
1.91	0.97193	2.41	0.99202	2.91	0.99819	3.41	0.99968		
1.92	0.97257	2.42	0.99224	2.92	0.99825	3.42	0.99969		
1.93	0.97320	2.43	0.99245	2.93	0.99831	3.43	0.99970		
1.94	0.97381	2.44	0.99266	2.94	0.99836	3.44	0.99971		
1.95	0.97441	2.45	0.99286	2.95	0.99841	3.45	0.99972		
1.96	0.97500	2.46	0.99305	2.96	0.99846	3.46	0.99973		
1.97	0.97558	2.47	0.99324	2.97	0.99851	3.47	0.99974		
1.98	0.97615	2.48	0.99343	2.98	0.99856	3.48	0.99975		
1.99	0.97670	2.49	0.99361	2.99	0.99861	3.49	0.99976		

Attachment 32

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
LAND AND EMERGENCY
MANAGEMENT

formerly
OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

MAY 17 2017

MEMORANDUM: OLEM Directive 9285.6-56

SUBJECT: Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters

FROM: Schatzi Fitz-James, Acting Director
Assessment and Remediation Division
Office of Superfund Remediation and Technology Innovation

TO: Superfund National Policy Mangers, Regions 1-10

The purpose of this memorandum is to transmit the document, *Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable.* The recommendations in this document provide the technical basis for updating the default baseline blood lead concentration and default geometric standard deviation input parameters of the Adult Lead Methodology and maternal blood lead concentration in the Integrated Exposure Uptake Biokinetic Model. This document is primarily intended for Regional risk assessors and others involved in assessing risk to lead at residential and non-residential sites.

The Adult Lead Methodology (ALM) is used to assess lead risks from the soil for non-residential Superfund site scenarios. The Integrated Exposure Uptake Biokinetic Model (IEUBK) is used to assess lead risks from soil at residential Superfund site scenarios. The baseline blood lead concentration input parameter of the ALM represents the geometric mean blood lead concentration in women of child-bearing age and the geometric standard deviation (GSD) input parameter is a measure of the inter-individual variability in these concentrations. The *Mother's Blood Lead Concentration at Childbirth* (MatPb) allows the user to consider the impact of lead transferred from the mother to the fetus *in utero*.

Default values for these input parameters were originally derived from an analysis of blood lead data for U.S. women 17-45 years of age, from Phase I (1988 to 1991) of the Third National Health and Nutrition Examination Survey (NHANES III) as well as consideration of available site-specific data on blood lead concentrations and GSD values. EPA prepared updated estimates for these two parameters in 2002 (using data from NHANES 1988 to 1994) in 2009 (using data from NHANES 1999 to 2004) and again in 2016 (using data from NHANES 2007 – 2012). The

proposed updated estimates for the ALM and IEUBK are based on the most recent six years of PbB data (using data from NHANES 2009-2014).

This document and other efforts related to addressing lead in soil can be found on the Internet at https://www.epa.gov/superfund/lead-superfund-sites-guidance. If you have any questions, please contact me or have your staff contact Michele Burgess (Burgess.Michele@epa.gov).

Attachment

1. "Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters and the Integrated Exposure Uptake Biokinetic Model's Default Maternal Blood Lead Concentration at Birth Variable"

cc:

Barry N. Breen, OLEM
Nigel Simon, OLEM
Patrick Davis, OLEM
Reggie Cheatham, OLEM/OEM
Barnes Johnson, OLEM/ORCR
David Lloyd, OLEM/OBLR
Charlotte Bertrand, OLEM/FFRRO
Carolyn Hoskinson, OLEM/OUST
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Sally Dalzell, OECA/FFEO
John Michaud, OGC
OSRTI Managers
Jill Lowe, Superfund Lead Region Coordinator, Region 3
NARPM Co-Chairs
TRW Committee Members

FAQ:

Concerning appropriate use of the new NHANES values (May 2017) for the Adult Lead Methodology (ALM) and Integrated Exposure Uptake Biokinetic Model, this FAQ provides some important caveats for using the updated values.

OLEM recognizes adverse health effects at blood lead concentrations below 10 µg/dL[1]. Accordingly, OLEM is updating the soil lead strategy to incorporate this new information. However, the release date for the updated strategy is pending.

In the interim, the TRW Lead Committee is recommending the following considerations for all non-residential risk assessments where lead is a contaminant of concern:

1. The updated NHANES values are appropriate for lead risk assessments for residential and non-residential exposures both in assessing risk and in developing preliminary remediation goals (PRGs) for your site.
2. Lead risk assessments should include a discussion of the most current toxicity information and Centers for Disease Control and Prevention Reference level[1].
3. Consistent with risk management bests practices, caution should be applied when implementing cleanup levels based on the updated NHANES values for non-residential scenarios (PRGs are greater than 2000 ppm using default values). Ineffective controls or incorrect land use assumptions could have potentially greater health consequences on children who are exposed (*e.g.*, by visiting, trespassing, or tracking the material to the residence) to these high concentrations (especially given the new toxicity information).

Users are encouraged to contact the technical support hotline, TRW Lead Committee, or regional risk assessor with any questions.

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[1] See 2006 Air Quality Criteria Document for Lead (AQCD), 2012 Federal Advisory Committee on Childhood Lead Poisoning Prevention to the Centers for Disease Control and Prevention (ACCLPP), 2012 National Toxicology Program (NTP) Monograph: Health Effects of Low Level Lead, and 2013 Children's Health Protection Advisory Committee (CHPAC) Letter to Acting Administrator Perciasepe concerning Childhood Lead Poisoning Prevention

UPDATE OF THE ADULT LEAD METHODOLOGY'S DEFAULT BASELINE BLOOD LEAD CONCENTRATION AND GEOMETRIC STANDARD DEVIATION PARAMETERS AND THE INTEGRATED EXPOSURE UPTAKE BIOKINETIC MODEL'S DEFAULT MATERNAL BLOOD LEAD CONCENTRATION AT BIRTH VARIABLE

OVERVIEW

Since 1994, the Office of Land and Emergency Management (OLEM) (formerly known as the Office of Solid Waste and Emergency Response) has recommended the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK model) as a risk assessment tool to support environmental cleanup decisions at residential sites. The IEUBK model uses data from a variety of scientific studies of lead biokinetics, contact rates of children with contaminated media, and data on the presence and behavior of environmental lead to predict a plausible distribution or geometric mean (GM) of blood lead (PbB) for a hypothetical child or population of children. From this distribution, the IEUBK model estimates the risk (*i.e.*, probability) that the PbB concentration of an individual child or a population of children will exceed a specified blood lead level.

Studies have demonstrated that there is no significant placental/fetal barrier for lead, since fetal blood lead values are either equal to or slightly less than maternal blood lead values (Goyer, 1990). The *Mother's Blood Lead Concentration at Childbirth* (MatPb) variable in the IEUBK model allows the user to consider the impact of Pb transferred from the mother to the fetus *in utero*. The Pb that is stored in the tissues of the newborn child in the IEUBK model is calculated by entering the maternal PbB value at the time of birth.

In 1996, the Technical Review Workgroup for Lead (TRW) recommended the use of the Adult Lead Methodology (ALM) (U.S. EPA, 1996) for assessing risks to adults from exposures to lead in soil at non-residential Superfund sites.

The background blood lead concentration (PbB_0) parameter in the ALM represents the geometric mean (GM) blood lead concentration (PbB) (µg/dL) in US women of child-bearing age[1]. The geometric standard deviation parameter (GSD_i) is a measure of the inter-individual variability in blood lead concentrations in a population whose members are exposed to the same non-residential environmental lead levels. Default values for both PbB_0 and GSD_i were originally derived from an analysis of blood lead data for U.S. women 17–45 years of age, from Phase 1 (1988 to 1991) of the Third National Health and Nutrition Examination Survey

[1] The estimates do not include institutionalized women (e.g., residents of nursing homes; https://wwwn.cdc.gov/Nchs/Data/Series/sr02_162.pdf)

(NHANES), as well as consideration of available site-specific data on PbBs and GSDs (U.S. EPA, 1996). The TRW prepared updated estimates for these two parameters in 2002, 2009, and 2016 using data from Phase 1 and 2 (1988 to 1994; 1999 to 2004; 2007 to 2012) of NHANES (U.S. EPA, 2002, 2009, 2016 respectively).

The purpose of this report is to provide updated estimates for the PbB_0 and GSD_i variables in the ALM, as well as to identify an updated estimate for the MatPb variable in the IEUBK model using more recent NHANES survey data. The Centers for Disease Control (CDC) releases data from the continuous NHANES in 2-year cycles; however, it is recommended to use four or more years of data when estimating parameters for demographic sub-domains (Johnson et al., 2013). The current estimates for the ALM and IEUBK model are based on the most recent six years of PbB data (2009-2014) from the National Health and Nutrition Examination Survey (NHANES) (CDC, 2012a,b, 2014a,b) and are presented in Table 1.

Table 1. Updated estimates of the PbB_0 and GSD_i for 17-45 year old women based on NHANES (2009-2014).

Parameter[a]	Estimate	90% Confidence Interval	
		Lower Confidence Limit	Upper Confidence Limit
GM (PbB_0)	0.64	0.62	0.66
GSD (GSD_i)	1.80	1.76	1.85

[a]Forty-seven (1.3% of the sample) of the blood lead measurements were below the detection limit of 0.25 µg/dL and were assigned values of ½ the detection limit (0.125 µg/dL). The 2013-2104 data used an updated detection limit of 0.07 µg/dL and all were detections.

This document provides the technical basis for updating the PbB_0 and GSD_i parameters in the ALM and the MatPb variable in the IEUBK model. This document details how the updated estimates for the parameters were calculated. The intended audience for this document is risk assessors who are familiar with using the ALM and IEUBK model. For background and further detail on the use of the ALM or the IEUBK model in Superfund lead risk assessment, please refer to U.S. EPA (2003, 1994, respectively) or the TRW website (https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals).

TECHNICAL ANALYSIS

Information on PbB for non-institutionalized U.S. women 17–45 years of age was extracted from the NHANES database (CDC, 2012a, 2012b, 2014a, 2014b, 2017a, 2017b). Data from three 2-year cycles of the continuous NHANES (2009-2014) were used in this analysis in accordance with CDC recommendations (Johnson et al., 2013).

Estimates for MatPb, PbB_0 and GSD_i were calculated using SAS® software, Version 9.4 of the SAS System for Microsoft Windows[2]. Parameter estimates used the sample weights provided in the NHANES demographic data files (CDC, 2012b, 2014b, 2017b). Standard errors for the GM (MatPb and PbB_0) and GSD were estimated using the sample weights and the masked variance units (*i.e.*, pseudo-strata and pseudo-primary sampling units which are also provided in the NHANES demographic files). The sample weights account for the unequal probabilities of selection of survey participants, the non-response of some participants, and are adjusted to population controls. The masked-variance units account for the multistage sampling design and are necessary to estimate accurate standard errors for parameter estimates. Standard errors for the estimates of the GM were estimated using the Taylor linearization method in the *SURVEYMEANS* procedure in SAS. The standard errors for the GSD were estimated using a SAS macro[3] that implements a jackknife method.

The detection limit for the NHANES 2013-2014 survey cycle data is 0.07 µg/dL; the 2013-2014 data do not include any non-detects. The detection limit for the 2009-2012 data is 0.25 µg/dL. Results in the 2009-2012 data reported at less than the detection limit were assigned a value of ½ the detection limit (0.125 µg/dL). To evaluate the effect of the method used to handle non-detects on the estimates, the PbB_0 and GSD_i were also calculated using two alternate methods for handling non-detects: assigning non-detects (1)¼ the detection limit and, (2) the detection limit. The effect on the PbB_0 was approximately 0.005 µg/dL while the effect on the GSD_i was less than 0.05. An extensive sensitivity analysis performed with the 1999-2004 NHANES PbB data showed the estimated PbB_0 and GSD_i were not sensitive to the method that was used to treat the non-detects (U.S. EPA, 2009). Given the rate of non-detects in the 2009-2014 PbB data (1.3%) is substantially lower than the rate of non-detects in the 1999-2004 PbB data (2.2%), additional effort is not necessary to conclude that the method used to treat the non-detects will not have a substantial effect on the estimates of the PbB_0 and GSD_i.

The PbB data were reviewed for the possible presence of extreme sampling weights, which could have an undue influence on the estimates of the PbB_0 and GSD_i. The maximum sampling weight in the 2009-2014 NHANES PbB data was less than 5 multiples of the interquartile range greater than the median and less than 5 times the average sampling weight; therefore, there does not appear to be any need to truncate (trim) the sampling weights (Chowdhury et al., 2007).

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[2]SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries.

[3]Confidence limits for the GM and GSD were estimated with a SAS macro that employs the 'leave one out' jackknife method (*e.g.*, Sarndal, et al. 1991).

IMPLICATIONS FOR THE ADULT LEAD METHODOLOGY (ALM)

The PbB_0 and GSDi are estimated to be 0.6 µg/dL, and 1.8, respectively. Table 2 presents the updated estimates as well as the estimates from the previous analyses.

Table 2. Geometric mean baseline blood lead concentration (PbB_0, µg/dL) and geometric standard deviation (GSD_i) estimates and ALM calculation of Preliminary Remediation Goals (PRGs) for the 5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead level [$P(PbB_{fetal}>PbB_t)$] compared to estimates from the previous analyses.

NHANES Data (ALM)	N	Detection Limit	PbB_0 (µg/dL)	GSD_i	ALM Output	
					$P(PbB_{fetal}>PbB_t)$	Soil PRG for PbB_t = 5 µg/dL (ppm)
1988-1991 [a]	-	-	1.7-2.2 (1.95)[f]	1.8-2.1 (1.95)	5%	n/a
1988-1994 [b]	5,016	1.0	1.5	2.1	5%	97
1999-2004 [c]	4,589	0.3	1.0	1.8	5%	773
2007-2012 [d]	4,256	0.25	0.7	1.7	5%	1126
2009-2014[e]	3,683	0.07, 0.25[g]	0.6	1.8	5%	1050

[a]U.S. EPA, 1996
[b]U.S. EPA, 2003
[c]U.S. EPA, 2009
[d]U.S. EPA, 2015
[e]Current Update

[f]Values in parentheses represent the midpoint between the upper and lower values.

[g]Detection limits for 2009-2012 and 2013-2014 are 0.25 µg/dL and 0.07 µg/dL, respectively (the 2013-2014 data do not include any non-detects).

Implications for the IEUBK Model

The proposed geometric mean value for the MatPb variable is estimated to be 0.6 µg/dL. The update for the IEUBK model recommends that the IEUBK model be used for the 12-71 month age range, so changes to the MatPb variable have little impact on results.

Uncertainty

As blood lead levels continue to decline in the U.S. population, the number of non-detects in the NHANES data has the potential to become an important source of uncertainty in estimates of PbB and GSD. However, the detection limit for measuring lead concentration in blood has also decreased from 1.0 µg/dL (1988–1994 NHANES) to 0.3 µg/dL (1999-2004 NHANES) and to the current levels of 0.25 µg/dL and 0.07 µg/dL (2007-2012 and 2013-2014 NHANES, respectively). In addition, the rate of non-detects in the 2007-2012 NHANES data (1.1%) and the 100% detection rate in the 2013-2014 NHANES are much lower than the rate of non-detects in the 1999-2004 and 1988–1994 NHANES data (~2 and ~21%, respectively). The lower detection limit and lower-rates of non-detects removes a considerable source of uncertainty that was present in previous estimates of the GM (U.S. EPA, 2009).

RECOMMENDATIONS FOR THE ALM

Consistent with U.S. EPA (2009), estimates of the PbBo and GSDi are provided for the population of non-institutionalized U.S. women 17–45 years of age. Like the earlier analysis, the TRW Lead Committee continues to recommend using a single national estimate. Based on the analysis of the NHANES 2009-2014 data, the updated values for the PbB_0 and GSD_i parameters, 0.6 µg/dL and 1.8, respectively, are recommended for all applications of the ALM where current and future use scenarios are assessed (see Table 3).

Table 3. Current and previous PbB_0 and GSD_i parameter values shown in the ALM *PRG calculation* tab of the ALM spreadsheet. Calculations of PRGs 5% probability that a fetus' blood lead level will not exceed a 5 µg/dL blood lead target level.

Variable	Description of Variable	Units	Current	Previous
			GSDi and PbB_0 from Analysis of NHANES: 2009-2014	**GSDi and PbB_0 from Analysis of NHANES 1999-2004**
$PbB_{fetal,\ 0.95}$	95th percentile PbB in fetus	µg/dL	5	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.8
PbB_0	Baseline PbB	µg/dL	0.6	1.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050
$AF_{S,\ D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12
$EF_{S,\ D}$	Exposure frequency (same for soil and dust)	days/yr	219	219
$AT_{S,\ D}$	Averaging time (same for soil and dust)	days/yr	365	365
PRG	**Preliminary Remediation Goal Soil Lead Concentration where PbB_t = 5 µg/dL**	**ppm**	**1050**	**773**

RECOMMENDATIONS FOR THE IEUBK MODEL

Based on the analysis of the NHANES 2009-2014 data, 0.6 µg/dL is recommended as the updated value for the *Mother's Blood Lead Concentration at Childbirth* (MatPb) variable. This default value is appropriate for all applications of the IEUBK model where current and future residential scenarios are being assessed (see Figure 1). The TRW Lead Committee does not recommend changing this value unless representative site-specific information is available that meet the Data Quality Objectives of the site.

The empirical validation effort for the IEUBK model did not include data specific to the disposition of maternally supplied lead in a young child, and the IEUBK model predictions during the first few months of life related to this should be interpreted with caution.

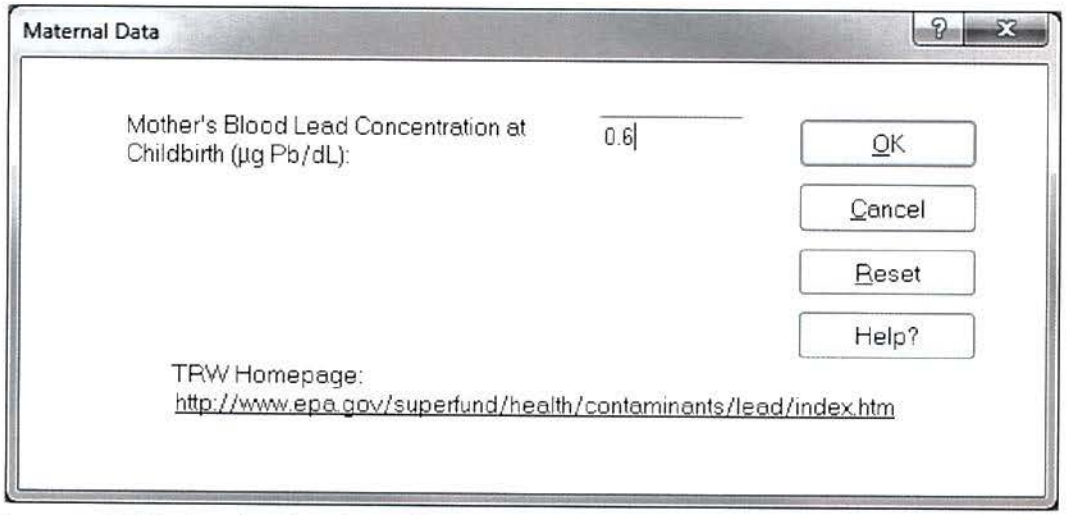

Figure 1. Proposed *Mother's Blood Lead Concentration at Childbirth* (MatPb) default value for the IEUBK model.

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Attachment 33

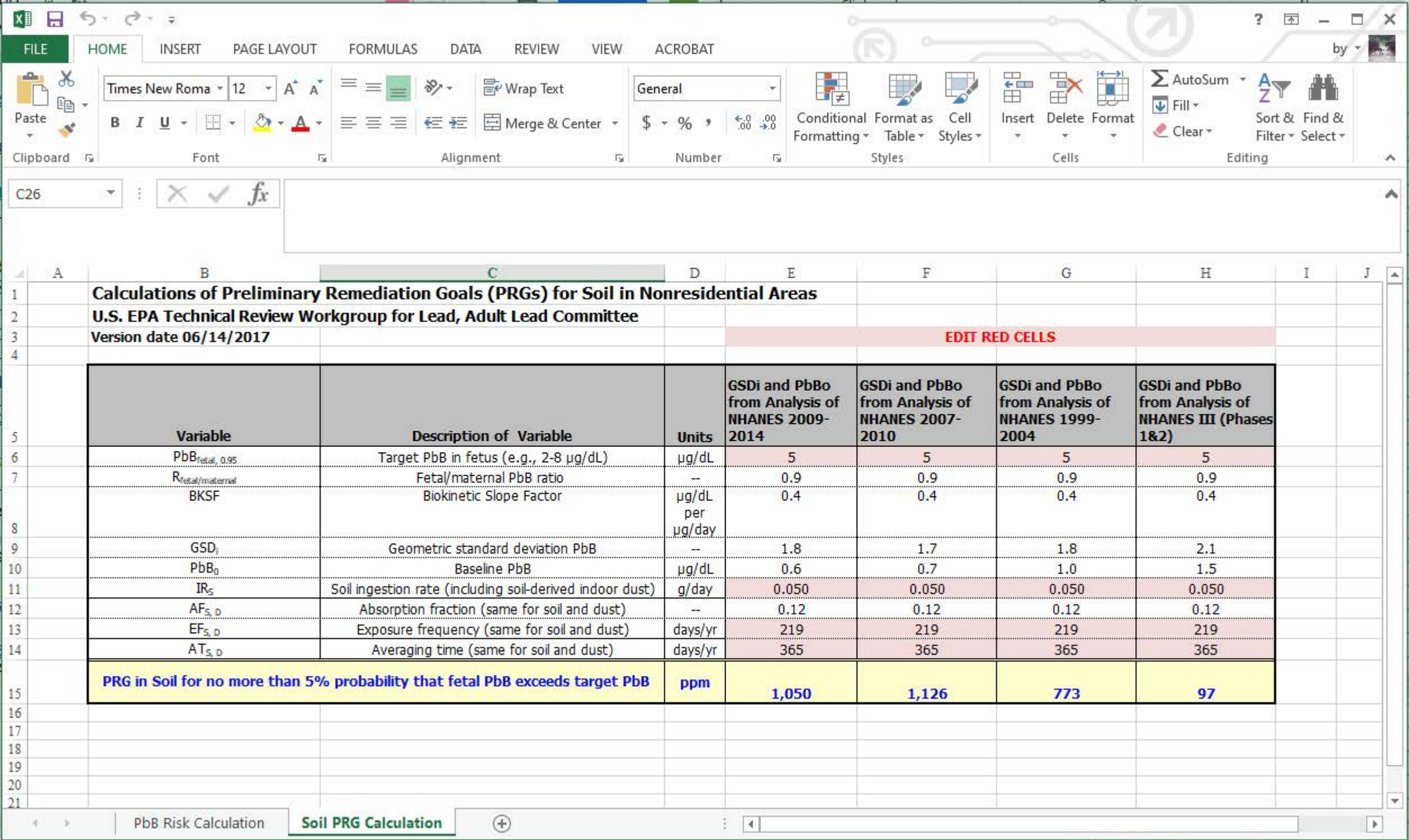
Calculations of Blood Lead Concentrations (PbBs) and Risk in Nonresidential Areas

U.S. EPA Technical Review Workgroup for Lead

Version date 06/14/2017

Edit Red Cells

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014	GSDi and PbBo from Analysis of NHANES 2007-2010	GSDi and PbBo from Analysis of NHANES 2004-2007	GSDi and PbBo from Analysis of NHANES III (Phases 1&2)
PbS	Soil lead concentration	µg/g or ppm	1054	1129	776	100
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.7	1.8	2.1
PbB_0	Baseline PbB	µg/dL	0.6	0.7	1.0	1.5
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	0.050	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--	--
$AF_{S,D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	PbB of adult worker, geometric mean	µg/dL	2.1	2.3	2.1	1.6
$PbB_{fetal,\ 0.95}$	95th percentile PbB among fetuses of adult workers	µg/dL	5.0	5.0	5.0	5.0
PbB_t	Target PbB level of concern (e.g., 2-8 ug/dL)	µg/dL	**5.0**	**5.0**	**5.0**	**5.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB exceeds target PbB, assuming lognormal distribution**	**%**	**5.0%**	**5.0%**	**5.0%**	**5.0%**



Calculations of Preliminary Remediation Goals (PRGs) for Soil in Nonresidential Areas

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 06/14/2017

EDIT RED CELLS

Variable	Description of Variable	Units	GSDi and PbBo from Analysis of NHANES 2009-2014	GSDi and PbBo from Analysis of NHANES 2007-2010	GSDi and PbBo from Analysis of NHANES 1999-2004	GSDi and PbBo from Analysis of NHANES III (Phases 1&2)
$PbB_{fetal,\ 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5	5	5	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	1.8	1.7	1.8	2.1
PbB_0	Baseline PbB	µg/dL	0.6	0.7	1.0	1.5
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	0.050	0.050
$AF_{S,\ D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,\ D}$	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,\ D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB		**ppm**	**1,050**	**1,126**	**773**	**97**

PbB Risk Calculation | Soil PRG Calculation

READY

Attachment 8

(Attachments 34-53 to
Clean Air Council Comments on
Proposed Act 2 Rulemaking, dated April 30, 2020)

Attachment 34

Date: April 1, 2020 at 3:20:31 PM EDT
To: Peter Winslow <pjwinslow@gmail.com>
Cc: James Mullison <jamesmul@vt.edu>, Patrick O'Neill <Patrick.ONeill@phila.gov>, PhillyThrive #RightToBreathe <phillythrive@gmail.com>, Shawmar Pitts <shawmarpitts73@gmail.com>, Dennis Yuen <Dennis.Yuen@phila.gov>, "Glass, Brian" <briaglass@pa.gov>, Kevin Bilash <Bilash.Kevin@epa.gov>, Tiffani Doerr <TLDOERR@evergreenresmgt.com>, Christine Knapp <Christine.Knapp@phila.gov>, "Cain, Virginia" <vicain@pa.gov>, "Fogel, Robert" <rofogel@pa.gov>, "Dula, Justin" <jdula@pa.gov>, "colleen.costello@ghd.com" <colleen.costello@ghd.com>, Kevin Dunleavy <KDUNLEAVY@evergreenresmgt.com>, Mike Ewall <mike@energyjustice.net>, "Gotthold, Paul" <gotthold.paul@epa.gov>

Peter,

Sorry for the delayed response to your email.

I've taken a look at the tables in the proposed regulations to answer your question. Chromium VI, copper, and manganese had changes to their toxicological parameters that are used to calculate the standards. The toxicological information generally comes from EPA databases, so those changes reflect the current scientific understanding of the affects those substances have on human health.

The thallium change (an increase of 2 to 2.2 mg/kg) appears to be a correction, as we should use two significant figures in our standards but it had been published with only one significant figure previously.

None of these substances are of significant concern for the refinery; they aren't attributable to petroleum refining. I've attached the contaminant of concern list that has been followed by Sunoco and Evergreen and agreed to by DEP and EPA. In some cases, Sunoco/Evergreen have analyzed for other substances, but I'm not aware of data at the Philadelphia Refinery for the four metals you listed. We don't see a need for them to be investigated there.

As I noted a couple months ago, the revisions to the lead standards result from using updated calculation methodologies. I don't have anything to add to that issue.

Let me know if you have further questions.

-David

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Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
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From: Peter Winslow <pjwinslow@gmail.com>
Sent: Thursday, February 27, 2020 1:37 PM
To: Brown, C David <cdbrown@pa.gov>
Cc: James Mullison <jamesmul@vt.edu>; Patrick O'Neill <Patrick.ONeill@phila.gov>; PhillyThrive #RightToBreathe <phillythrive@gmail.com>; Shawmar Pitts <shawmarpitts73@gmail.com>; Dennis Yuen <Dennis.Yuen@phila.gov>; Glass, Brian <briaglass@pa.gov>; Kevin Bilash <Bilash.Kevin@epa.gov>; Tiffani Doerr <TLDOERR@evergreenresmgt.com>; Christine Knapp <Christine.Knapp@phila.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Dula, Justin <jdula@pa.gov>; colleen.costello@ghd.com; Kevin Dunleavy <KDUNLEAVY@evergreenresmgt.com>; Mike Ewall <mike@energyjustice.net>; Gotthold, Paul <gotthold.paul@epa.gov>
Subject: Re: [External] Touching Base

David,

In addition to increasing the permissible levels of lead in soil for nonresidential sites, I note that the DEP has proposed changes to MSCs for Chromium VI, Copper, Manganese, and Thallium as per the attached schedule. Can you help us understand the reasoning for these changes - in particular, lowering residential standards while raising nonresidential standards for Lead and the reverse for Chromium VI - and, specifically, the implications for remediation at the PES site? Thank you.

Peter

<image001.png>

On Jan 3, 2020, at 6:56 PM, Peter Winslow <pjwinslow@gmail.com> wrote:

David,

Happy New Year.

Thank you for providing additional information, all of which is very helpful and greatly appreciated. I note the comment "EPA's guidance for the ALM cautions that the values calculated using this new model are high and may not be protective of all receptors." So, I will be trying to gain a sense of how these standards should most appropriately be applied to the specific circumstances at the PES site. I hope you will continue to be patient as I ascend my learning curve.

Peter

> On Jan 3, 2020, at 4:20 PM, Brown, C David <cdbrown@pa.gov> wrote:
>
> Peter,
>
> Below is some additional information on DEP's proposed lead standards. I've included the previous attachments also.
>
> The staff in headquarters indicated that the methodologies for calculating both the residential and nonresidential standards have changed since the current MSCs were published. The models are complex, and there are significant differences in the input values between them. A comparison summary provided at DEP's February 2019 Scientific Advisory Board meeting is attached.
>
> DEP is using EPA's lead methodologies, generally with EPA's default values. We didn't develop the models, and more detailed information can be found on EPA's lead pages:
>
> https://www.epa.gov/superfund/lead-superfund-sites
>
> ---
>
> **From:** Brown, C David
> **Sent:** Friday, December 20, 2019 5:03 PM
> **To:** Peter Winslow <pjwinslow@gmail.com>
> **Cc:** James Mullison <jamesmul@vt.edu>; Patrick O'Neill <Patrick.ONeill@phila.gov>; PhillyThrive #RightToBreathe <phillythrive@gmail.com>; Shawmar Pitts <shawmarpitts73@gmail.com>; Dennis Yuen <Dennis.Yuen@phila.gov>; Glass, Brian <briaglass@pa.gov>; Kevin Bilash <Bilash.Kevin@epa.gov>; Tiffani Doerr <TLDOERR@evergreenresmgt.com>; Christine Knapp <Christine.Knapp@phila.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Dula, Justin <jdula@pa.gov>; Gotthold, Paul <gotthold.paul@epa.gov>; colleen.costello@ghd.com; Kevin Dunleavy <KDUNLEAVY@evergreenresmgt.com>; Mike Ewall <mike@energyjustice.net>
> **Subject:** RE: [External] Touching Base
>
> Peter,
>
> I've asked our headquarters, which develops the cleanup standards, to answer your question about why the proposed nonresidential MSC is increasing while the proposed residential MSC is decreasing. I expect to have a response after the holidays.
>
> The answers to your first two listed questions are in the remedial investigation reports on Evergreen's website. I believe that each of these reports includes a figure showing locations where the lead standard is exceeded in soil; I've attached one example from the 2017 AOI 4 report. Other figures and data tables in the report have more detailed information on all the sample results.

To my knowledge, lead contamination identified in the reports that's attributable to refinery operations is confined to the facility property and doesn't extend onto other properties.

Your other listed questions are pertinent to the future cleanup plan, and many are not answerable at this time. Typical remedial options for soil lead contamination are excavation with disposal at a permitted facility (landfill) and capping in place with a suitable barrier (i.e., a layer of clean soil, pavement, and/or buildings).

Your questions and concerns are reasonable issues to raise during the Act 2 public comment period for the past remedial investigation reports and the lead risk assessment report, and later for the cleanup plan when it's submitted.

C. David Brown P.G. | Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5792 | Fax: 484.250.5961
www.dep.pa.gov

From: Peter Winslow <pjwinslow@gmail.com>
Sent: Thursday, December 19, 2019 4:49 PM
To: Brown, C David <cdbrown@pa.gov>
Cc: James Mullison <jamesmul@vt.edu>; Patrick O'Neill <Patrick.ONeill@phila.gov>; PhillyThrive #RightToBreathe <phillythrive@gmail.com>; Shawmar Pitts <shawmarpitts73@gmail.com>; Dennis Yuen <Dennis.Yuen@phila.gov>; Glass, Brian <briaglass@pa.gov>; Kevin Bilash <Bilash.Kevin@epa.gov>; Tiffani Doerr <TLDOERR@evergreenresmgt.com>; Christine Knapp <Christine.Knapp@phila.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Dula, Justin <jdula@pa.gov>; Gotthold, Paul <gotthold.paul@epa.gov>;colleen.costello@ghd.com; Kevin Dunleavy <KDUNLEAVY@evergreenresmgt.com>; Mike Ewall <mike@energyjustice.net>
Subject: Re: [External] Touching Base

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Thank you for your quick response to my question Monday concerning the lead standards that have been approved by the DEP for the refinery remediation. This question is of prominent concern to the environmental justice community for several reasons:

- The standard for lead is the only standard for a contaminating substance at the refinery that has been approved to date by the DEP. Because 2240 mg/kg is 2.24 times the current nonresidential statewide standard (and 4.48 times the residential statewide standard), we are concerned about the adequacy of the site specific standard for lead - and by implication for other contaminants - to be achieved by the refinery remediation.
- The public has become alarmed about vectors for lead contamination - paint, toys, drinking water - and is aware that lead was formerly added to gasoline (as an anti-knocking agent). Because the refinery operated for such a long period of time, we suspect that substantial amounts of lead are present in the soil and groundwater at the refinery.
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Why, when the DEP is decreasing proposed residential standards by 16% (from 500 to 420 ppm), are the nonresidential standards increasing 250% (from 1000 to 2500 ppm)?

We appreciate that the DEP is looking forward in setting standards that are most appropriate based on best and most current scientific evidence. Nevertheless, as the

public witnesses erosion of environmental protections under the Trump administration, we are skeptical of changes that, on their surface at least, weaken environmental protections. We are particularly sensitive to the application of lowered standards in an environmental justice zone such as the vicinity of the refinery.

Although I have taken issue with the adequacy of EPA methodology and/or the way it has been applied in other contexts (specifically, use of the CHP calculator in relation to SEPTA's Nicetown power plant), I haven't formed an opinion concerning the health-based methodology being used. Please point me in the direction of research reports and otherwise help us better understand the basis and the implications of the DEP decision to allow 2240 ppm lead contamination in soil at the refinery site.

Furthermore, to better understand the implications of 2240 ppm in post-remediation soil at the refinery, we would like to know the following:

1. Where is it? Where are the hot spots and other areas of lead contamination located?
2. How bad is it? How much lead is currently present in total amount and in ppm?
3. What can be done? What methods are available to remediate the site? What will each alternative cost? How effective would each method be?
4. What will be done? What methods does/will Evergreen propose? What criteria will DEP/EPA use to evaluate Evergreen's plans?
5. When will it be done? What remediation has been done so far (since 2012)? When will what additional remediation be done? When will remediation be completed?
6. What will the results be? What levels of lead will remain where? How much additional remediation would be required to bring the property to residential standards, and at what cost? What will the effects of climate disruption have on conditions on- and off-site?

We will also be asking these or similar questions with respect to contaminants other than lead. We believe meaningful "Public Involvement" in the remediation process is impossible without an understanding by citizen representatives and their technical advisors sufficient to answer the common sense questions of ordinary people. Such understanding relies upon transparency and accountability from Evergreen and its regulators.

With respect to the lead standards, we know what DEP has approved. Next, we want to know why the 2240 ppm level is appropriate and what the implications are for the future of the refinery site.

Peter

> On Dec 19, 2019, at 11:54 AM, Brown, C David <cdbrown@pa.gov> wrote:
>
> Peter,
>
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>
> In 2015 DEP approved a nonresidential site-specific soil lead standard of 2240 mg/kg for the refinery. Evergreen used the same EPA health-based methodology to derive this value as DEP is using in the proposed rulemaking. However, Evergreen used somewhat different inputs that give a slightly lower (i.e., more protective) standard than what DEP has proposed.
>
> Please let me know of any questions.

Lead Soil Standards	Current MSC (mg/kg)	Proposed MSC (mg/kg)
Soil-to-groundwater	450	450
Residential direct contact, 0–15’	500	420
Nonresidential direct contact, 0–2’	1000	2500
Nonresidential direct contact, 2–15’	190,000	190,000

1 mg/kg = 1 ppm

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Department of Environmental Protection | Southeast Regional Office
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www.dep.pa.gov

From: James Mullison <jamesmul@vt.edu>
Sent: Friday, December 13, 2019 8:57 PM
To: Patrick ONeill <Patrick.ONeill@phila.gov>
Cc: Brown, C David <cdbrown@pa.gov>; PhillyThrive #RightToBreathe <phillythrive@gmail.com>; shawmarpitts73@gmail.com; Dennis Yuen <Dennis.Yuen@phila.gov>; Glass, Brian <briaglass@pa.gov>; Bilash, Kevin <Bilash.Kevin@epa.gov>; DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com>; Christine Knapp <Christine.Knapp@phila.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Dula, Justin <jdula@pa.gov>; Gotthold, Paul <gotthold.paul@epa.gov>; colleen.costello@ghd.com; DUNLEAVY, KEVIN R <KDUNLEAVY@evergreenresmgt.com>; Mike Ewall <mike@energyjustice.net>
Subject: [External] Re: Touching Base

Good Evening Mr. O'Neill, et al.,

The attached letter addresses your questions regarding attendance and a concise agenda for Monday's meeting. I expect that the majority of our time will be spent discussing the concerns and demands contained herein, and the ways that we can address them. We look forward to our discussion.

Thank you,
James
<Draft 250.306(e).pdf><Table 7.pdf>

<Draft 250.306(e).pdf><Table 7.pdf><lead model comparison handout.pdf>

<Refinery COCs.pdf>

--
Christopher D. Ahlers
Staff Attorney
Clean Air Council
135 S.19th Street, Suite 300

Attachment 35

From: Maddigan, Michael
Sent: Friday, December 20, 2019 3:39 PM
To: Brown, C David
Subject: RE: public question on proposed lead MSCs
Attachments: lead model comparison handout.docx; Table 7.doc

David,

The difference between the models used to calculate the current lead values and the proposed lead values can be found in the "Lead Model Comparison" document we provided to the CSSAB at the February 13, 2019 meeting (attached). Also, there are some major differences between the default exposure parameters used in the SEGH model and the ALM which are illustrated in a comparison of the current Table 7 and the proposed Table 7 (attached).

I'm assuming the ALM was used to calculate the non-residential site-specific lead standard at the Philadelphia Refinery which resulted in a value of 2,240 mg/kg. When we calculated the non-residential direct contact value for the proposed rulemaking using the ALM default exposure factors we ended up with a very similar number of 2,500 mg/kg. Thus, it is probably safe to say that the differences in the default exposure factors from the SEGH model and the ALM resulted in the difference between the current non-residential direct contact lead value and the site-specific value calculated for the Philadelphia Refinery.

Keep in mind that the non-residential direct contact numeric value will never be the MSC because it is higher than the generic soil to groundwater numeric value of 450 mg/kg. So in cases where the SHS is being used, the soil MSC for lead will always be 450 mg/kg. For site-specific analyses, such as the Philadelphia Refinery, the ALM is almost always used which results in a value closer to our proposed direct contact non-residential soil lead value.

If you need me to pinpoint more specifically what caused the differences in the numbers let me know and I can work through it.

Mike

From: Brown, C David <cdbrown@pa.gov>
Sent: Friday, December 20, 2019 1:39 PM
To: Maddigan, Michael <mmaddigan@pa.gov>
Subject: public question on proposed lead MSCs

Mike,

At the Philadelphia Refinery, we approved a site-specific lead standard of 2240 mg/kg. This has raised some questions with the public scrutiny of the Act 2 work.

Would you be able to prepare a brief response to the question below?

> Why, when the DEP is decreasing proposed residential standards by 16% (from 500 to 420 ppm), are the nonresidential standards increasing 250% (from 1000 to 2500 ppm)?

I'll let him know that we won't have an answer until after the holidays.

Thanks for your help.

-David

From: Peter Winslow <pjwinslow@gmail.com>
Sent: Thursday, December 19, 2019 4:49 PM
To: Brown, C David <cdbrown@pa.gov>
Cc: James Mullison <jamesmul@vt.edu>; Patrick O'Neill <Patrick.ONeill@phila.gov>; PhillyThrive #RightToBreathe <phillythrive@gmail.com>; Shawmar Pitts <shawmarpitts73@gmail.com>; Dennis Yuen <Dennis.Yuen@phila.gov>; Glass, Brian <briaglass@pa.gov>; Kevin Bilash <Bilash.Kevin@epa.gov>; Tiffani Doerr <TLDOERR@evergreenresmgt.com>; Christine Knapp <Christine.Knapp@phila.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Dula, Justin <jdula@pa.gov>; Gotthold, Paul <gotthold.paul@epa.gov>; colleen.costello@ghd.com; Kevin Dunleavy <KDUNLEAVY@evergreenresmgt.com>; Mike Ewall <mike@energyjustice.net>
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Please let me know of any questions.

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<Draft 250.306(e).pdf><Table 7.pdf>

Attachment 36

HUMAN HEALTH RISK ASSESSMENT REPORT

PHILADELPHIA ENERGY SOLUTIONS Refining & Marketing, LLC
PHILADELPHIA REFINERY
PHILADELPHIA, PENNSYLVANIA
and
SUNOCO PARTNERS Marketing & Terminals, LP
BELMONT TERMINAL
PHILADELPHIA, PENNSYLVANIA
and
MARCUS HOOK INDUSTRIAL COMPLEX
MARCUS HOOK, PENNSYLVANIA

EXCERPTED BY
CLEAN AIR COUNCIL

Prepared for:
Evergreen Resources Group, LLC
2 Righter Parkway, Suite 200,
Wilmington, Delaware 19803

Prepared by:
Langan Engineering & Environmental Services, Inc.
30 South 17th Street
Suite 1300
Philadelphia, Pennsylvania 19103

February 24, 2015

2574601

LANGAN

HUMAN HEALTH RISK ASSESSMENT REPORT

PHILADELPHIA ENERGY SOLUTIONS Refining & Marketing, LLC
PHILADELPHIA REFINERY
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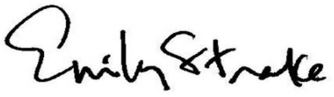
MARCUS HOOK, PENNSYLVANIA

Prepared by:
Langan Engineering & Environmental Services, Inc.
30 South 17th Street
Suite 1300
Philadelphia, Pennsylvania 19103



Emily Strake
Project Risk Assessor
Langan Engineering and Environmental Services, Inc.

Kevin J. McKeever, PE, PG
Senior Project Manager
Langan Engineering and Environmental Services, Inc.

February 24, 2015

2574601

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ACRONYMNS

AOC	Area of Concern
AT	Non-carcinogenic Averaging Time
bgs	Below Ground Surface
CSM	Conceptual Site Model
EF	Exposure Frequency
HHRA	Human Health Risk Assessment
IR	Intake Rate
MHIC	Marcus Hook Industrial Complex
MSC	Medium-Specific Concentration
PADEP	Pennsylvania Department of Environmental Protection
PES	Philadelphia Energy Solutions
PRG	Preliminary Remediation Goal
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RME	Reasonable Maximum Exposure
SEGH	Society for Environmental Geochemistry and Health
SHS	Statewide Health Standard
SSS	Site-Specific Standard
TRW	Technical Review Workgroup for Lead
USEPA	United States Environmental Protection Agency

1.0 EXECUTIVE SUMMARY

On behalf of the Philadelphia Refinery Operations and Marcus Hook Refinery Operations, series of Evergreen Resources Group, LLC (Evergreen), Langan Engineering and Environmental Services, Inc. (Langan) has prepared this Human Health Risk Assessment (HHRA) report for the Philadelphia Energy Solutions Refining & Marketing, LLC Philadelphia Refinery (PES Refinery), the Sunoco Partners Marketing & Terminals, LP Belmont Terminal (Belmont Terminal) and the Sunoco Partners Marketing & Terminals, LP Marcus Hook Industrial Complex (MHIC).

The objectives of this study are to: 1) evaluate potential human health risks posed by residual concentrations of lead in soil under a non-residential-use scenario for the PES Refinery, Belmont Terminal and the MHIC, and 2) calculate a site-specific risk-based standard that is protective of this scenario. Although a variety of human receptor populations are potentially exposed to soil at each facility under site-specific exposure conditions, the United States Environmental Protection Agency (USEPA) default assumptions for assessing non-residential adult risks from lead exposure are adopted to provide a conservative assessment and develop a site-specific soil screening level applicable to both sites.

The rationale for application of the USEPA default non-residential exposure scenario is to support the future use of each property for non-residential purposes and for attaining Act 2 closure under the Non-Residential Site Specific Standard (SSS) for lead. This HHRA was performed in accordance with the requirements and technical guidance of the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2) and the regulations promulgated by the Pennsylvania Department of Environmental Protection (PADEP) as Title 25, Chapter 250 of the Pennsylvania Code. In addition, technical guidance related to risk assessment from the USEPA was applied, as appropriate.

The technical approach for the HHRA consisted of the following basic steps: identification of chemicals of potential concern, exposure assessment, toxicity assessment, risk characterization, and uncertainty analysis. The exposure assessment, toxicity assessment, and risk characterization sections of the HHRA evaluated potential risk from direct and/or indirect exposure to soil. The primary assumption in the USEPA's Adult Lead Model (ALM) is that the most sensitive receptor in the workplace is the developing fetus of a female worker.

Based on the results of this HHRA, Langan has concluded that no unacceptable risks are posed to generic non-residential populations potentially exposed to soil concentrations equivalent to 2,240 milligrams per kilogram (mg/kg). Evaluation of the generic exposure scenario is protective of all receptors identified at each site.

2.0 INTRODUCTION

On behalf of Philadelphia Refinery Operations and Marcus Hook Refinery Operations, series of Evergreen Resources Group, LLC (Evergreen), Langan Engineering and Environmental Services, Inc. (Langan) has prepared this Human Health Risk Assessment (HHRA) report for the Philadelphia Energy Solutions Refining & Marketing, LLC (PES) Philadelphia Refinery, the Sunoco Partners Marketing & Terminals, LP Belmont Terminal (Belmont Terminal) and the Sunoco Partners Marketing & Terminals, LP Marcus Hook Industrial Complex (MHIC).

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The rationale for this exposure scenario is to support the continued use of the PES Philadelphia Refinery as a refining complex and the Belmont Terminal as an active fueling terminal and the industrial redevelopment of MHIC under the Act 2 Site-Specific Standard (SSS).

This HHRA was performed in accordance with the requirements and technical guidance of the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2) and the regulations promulgated by the Pennsylvania Department of Environmental Protection (PADEP) as Title 25, Chapter 250 of the Pennsylvania Code. In addition, technical guidance related to risk assessment from the United States Environmental Protection Agency (USEPA) was also used, where applicable.

In accordance with Act 2, Langan, on behalf of Evergreen, has prepared the required public and municipal notices as part of this report submittal. Appendix A includes copies of each facility notice of intent to remediate (NIR), as well as the Act 2 report notices and their proof of receipt/publication for this report.

2.1 PES Philadelphia Refinery Current Site Conditions

The PES Philadelphia Refinery is located on approximately 1,295 acres in southwest Philadelphia (Figure 1). The PES Philadelphia Refinery is a Resource Conservation and Recovery Act (RCRA)-permitted facility that is actively managed. The refinery is zoned for heavy industrial use and is expected to remain so in perpetuity. The refining complex produces a wide range of fuels for markets in the United States. Among PES' various products are gasoline, low-sulfur diesel, jet fuel, kerosene, butane, propane,

home heating oil and the petrochemical cumene. PES currently processes approximately 330,000 barrels of crude oil per day.

2.2 Belmont Terminal Current Site Conditions

The Belmont Terminal is located on approximately 100 acres in southwest Philadelphia (Figure 2). The Belmont Terminal is comprised of primarily gasoline and diesel loading racks. The area is utilized for blending gasoline and additives, as well as wholesale distribution through the terminal. There are numerous underground process lines at the terminal. The Belmont Terminal is owned by Sunoco Partners Marketing and Terminals, LP.

2.3 MHIC Current Site Conditions

The MHIC is a RCRA-permitted facility that is actively managed. The MHIC is zoned for heavy industrial use and is expected to remain so in perpetuity. The MHIC is primarily located in Marcus Hook, Delaware County, Pennsylvania (Figure 3). A section of the southwest portion of the facility is located in New Castle County, Delaware. As of April 1, 2014, the MHIC is owned by Sunoco Partners Marketing and Terminals L.P. (SXL). On December 1, 2011, Sunoco Inc. (R&M) announced the indefinite idling of the main processing units at the former refinery due to deteriorating refining market conditions. Since the idling of processing units, select demolition and deconstruction has occurred. In 2013, SXL began redevelopment of the former Lube Service Center for the processing, storage, and distribution of ethane and propane. The future use of the remainder of the facility is uncertain; however, the future use will be non-residential.

2.4 Act 2 Context

Evergreen and Langan will prepare a Final Act 2 Closure Report for Areas of Interest (AOI) at each site in accordance with the existing Work Plan for Sitewide Approach Under the One Cleanup Program (Sunoco 2011). The purpose of the Final Act 2 Reports is to document the framework for attaining Act 2 closure and to receive a release of liability from the PADEP for lead detected in soil. Specifically, Evergreen will demonstrate attainment of the Non-Residential Statewide Health Standards for site chemicals of concern (COCs) and Site-Specific Standard for soil in the Final Reports. For lead, soil concentration data will be compared to the SSS derived in this HHRA to evaluate the attainability of Act 2 Standards.

3.0 DATA ANALYSIS

Maximum concentrations of lead detected in soil samples collected at the PES Philadelphia Refinery, the Belmont Terminal and the MHIC were compared to Pennsylvania's Act 2 Non-Residential Direct Contact Medium-Specific Concentration (MSC) for soil of 1,000 milligrams per kilogram (mg/kg) to establish lead as a constituent of potential concern at each facility. The SSS for lead is independent of the cumulative risks and hazards that will be evaluated in subsequent risk assessment reports submitted for the PES Refinery, the Belmont Terminal and the MHIC. Therefore, this HHRA does not consider chemical data for other site-related COCs.

4.0 APPLICABILITY OF THE ADULT LEAD MODEL

The PADEP published a Non-Residential MSC for lead calculated on the basis of soil ingestion as presented in 25 Pa. Code § 250.306(e), Appendix A, Table 7. The Non-Residential MSC was derived using the Society for Environmental Geochemistry and Health (SEGH) model, which was developed by the SEGH "Lead in Soil" Task Force (Wixson, 1991). In the SEGH model, a blood lead concentration (PbB) is equated to a baseline level plus an increment resulting from exposure to lead in soil or dust. The slope of the blood lead/environmental lead relationship used in calculating the increase in PbB over the baseline value, and, hence the soil screening level, can vary depending on a multitude of factors. The SEGH model permits adjustment of the target blood lead concentration (T), geometric mean background blood lead concentration (B), and geometric standard deviation (GSD) of blood lead distribution in consideration of site-specific conditions, but precludes adjustments on the basis of exposure and lead bioavailability.

The PADEP has endorsed the use of alternative uptake biokinetic models for the evaluation of lead toxicity (PADEP, 2013). Given that the Integrated Exposure Uptake Biokinetic (IEUBK) Model does not apply to adult exposure in nonresidential scenarios, the PADEP maintains:

> "For adult exposure in either the residential or nonresidential scenario… other models, such as the Bower [sic] model (Bowers *et al.*, 1994), or the physiologically-based pharmacokinetic model (O'Flaherty, 1995, 1997) developed to determine the effects of lead on adults may be used to determine site-specific cleanup numbers."

In response to the need for a scientifically defensible approach for assessing soil-borne human health lead risks at non-residential hazardous waste sites, the USEPA adapted the Bowers *et al.* model to develop the Adult Lead Model (ALM) using the same basic algorithms. The ALM is a widely-accepted approach to risk characterization for commercial and industrial adult worker exposure scenarios. In 2001, the USEPA conducted a review of six biokinetic adult lead models for assessing human health risk associated with non-residential exposure. The study concluded

that no single model, including the O'Flaherty model, represented a significant improvement to the ALM. Consequently, USEPA recommended continued use of the ALM (EPA, 2001).

5.0 CONCEPTUAL SITE MODEL

Current and known or potential future land use plays a significant role in the development of the Conceptual Site Model (CSM). The land use must also be assessed before receptor populations can be identified.

For this analysis, non-residential use was assumed to be the only probable future use based on the industrial setting and current zoning in the vicinity of each facility. Based on an evaluation of the current and likely future use of each facility, a list of receptor populations was identified for evaluation in human health risk assessments (Langan, 2014a and 2014b).

In general, risk assessments should be based upon realistic exposure scenarios. Site-specific information on exposure pathways, receptors and exposure factors, including actual data, should be used to the maximum extent possible (PADEP, 2013). However, not all exposure parameters need to be site-specific. Overall, it is important to consider whether using default exposure scenario assumptions will result in the calculation of a SSS that reflects the receptors and exposure pathways that are both currently occurring and that could reasonably occur in the future.

Given that the default exposure assumptions developed by USEPA for the ALM are not entirely inconsistent with the receptors and exposure pathways identified at the PES Philadelphia Refinery, the Belmont Terminal and the MHIC, application of site-specific alternatives to the default assumptions was not necessary to develop a SSS for lead. The ALM uses biokinetic slope factor to represent lead biokinetics and a relatively simplistic exposure model in which all exposure pathways, other than soil ingestion, are represented by a background blood lead concentration. For the purposes of the CSM, potentially complete exposure pathways associated with lead in soil include incidental ingestion of soil, dermal contact with soil, and inhalation of indoor and outdoor dust.

Each site was identified as a single unit of exposure that may be accessed by future non-residential receptors. A summary of the receptors, exposure media, and potentially complete exposure pathways assessed in this HHRA are provided below:

Receptor	Exposure Media	Potentially Complete Soil Exposure Pathways
Generic Non-Residential Worker	Surface soil 0-2 feet below ground surface (bgs)	Incidental ingestion, dermal contact, and inhalation of indoor and outdoor dust

6.0 EXPOSURE ASSESSMENT

This section presents the framework used by Langan to derive the potential exposures from lead for the default non-residential worker evaluated in this HHRA. Specifically, this framework was used to assess an exposure pathway, which is the course a chemical takes from its source to the exposed receptor. In order for an exposure pathway to be complete, it must contain a source, a transport medium (e.g., soil, air), a point of contact (receptor), and an exposure route (e.g., ingestion, dermal, or inhalation). If any of these elements is missing, an exposure pathway is deemed incomplete and can be excluded from the quantitative evaluation of risk (USEPA 1989).

6.1 Intake Calculations

Chemical exposure/intake is expressed as the amount of the agent at the exchange boundaries of an organism (e.g., skin, lungs, and intestinal tract) that is available for systemic absorption. The term "soil" refers to that portion of the soil to which adults are most likely to be exposed. Exposure to soil-derived dust occurs both in outdoor and indoor environments, the latter occurring where soil-derived dust has been transported indoors. Other types of dust, in addition to soil-derived dust, can contribute to adult lead exposure.

The general equation for exposure to lead from soil (direct and through indoor soil-derived dust) as defined by USEPA (2003):

$$Intake\ \left(\frac{ug}{day}\right) = \frac{PbS\ \times IR\ \times EF}{AT}$$

where:

Intake = Daily average intake (ingestion) of lead from soil taken over the averaging time in micrograms per day (µg/day)

PbS = Soil lead concentration in micrograms per gram (μg/g) (appropriate average concentration for individual)

IR = Intake rate of soil, including outdoor soil and indoor soil-derived dust in grams per day (g/day)

EF = Exposure frequency for contact with assessed soils and/or dust derived in part from these soils in days per year (days/year)

AT = Averaging time in days (the total period during which soil contact may occur)

Lead uptake is the daily average uptake of lead from the gastrointestinal tract into systemic circulation (μg/day) and is derived by multiplying intake by the dimensionless absolute gastrointestinal absorption fraction (AF) for ingested lead in soil and lead in dust derived from soil.

6.2 Exposure Frequency

The exposure frequency (EF) describes the number of times per year an event is likely to occur. Variables such as weather, vacations, and institutional controls are considered when determining reasonable and realistic exposure frequencies. The USEPA's Technical Workgroup for Lead (TRW) recommends a default value of 219 days/year. This is the same as the central tendency occupational exposure frequency recommended by USEPA, which is based on data from the Bureau of Labor Statistics. This estimate corresponds to the average time spent at work by both full-time and part-time workers. The default central tendency EF represents reasonable maximum exposure (RME) at the PES Philadelphia Refinery, the Belmont Terminal and MHIC.

6.3 Averaging Time

The AT parameter is the period over which exposure is averaged. For non-carcinogenic effects, AT is used in calculating an average daily exposure, and is 365 days/year for continuing, long-term exposures.

6.4 Daily Soil Ingestion Rate

The ingestion rate (IR) is the soil ingestion rate for oral exposures to soils. The USEPA's TRW recommends a default value of 0.05 g/day as a plausible point estimate of the central tendency for daily soil intake from all occupational sources, including soil in indoor dust resulting from non-contact intensive activities. In adopting the single IR parameter to describe all sources of ingested soil, the methodology is consistent with

the recommendations of the Superfund program and the default PADEP adult non-residential soil ingestion rate.

7.0 TOXICITY ASSESSMENT

This section presents the toxicity assessment for the PES Refinery, the Belmont Terminal and MHIC site-wide lead HHRA. The toxicity assessment provides a summary of the critical toxicity values (CTVs) that have been developed by USEPA to evaluate potential adverse health effects associated with chemical exposure.

The non-carcinogenic CTV is known as the reference dose (RfD). RfDs used to evaluate non-cancer effects are based on the premise that non-carcinogenic (i.e., toxic) effects exhibit a threshold. As long as the chronic daily intake of a chemical is less than the reference dose, exposure is unlikely to result in any adverse non-carcinogenic health effect. Reference doses are developed using human and animal studies, and incorporate safety factors to ensure health protection in the most sensitive population.

Inorganic lead does not currently have an RfD. Instead the potential health hazard from exposure to environmental lead can be estimated based on predicted blood lead levels in sensitive populations. The epidemiological investigations of the health effects of lead were discussed in the *Air Quality Criteria for Lead Volumes I-IV* (USEPA, 1986a) and the 1990 Addendum (USEPA, 1990). Based on an assessment of these studies, the USEPA concluded that fetal lead exposure could have undesirable effects on infant mental development, length of gestation, and possibly other aspects of fetal development, specifically neurobehavioral deficits. In particular, the USEPA determined that, "All of these studies taken together suggest that neurobehavioral deficits, including declines in Bayley Mental Development Index scores and other assessments of neurobehavioral function, are associated with prenatal blood lead exposure levels on the order of 10 to 15 micrograms per deciliter (μg/dl)" (USEPA, 1986b).

The USEPA's TRW has developed an interim guidance for assessing lead risks and establishing action levels for lead that are protective of both adults and the fetus of a pregnant adult. Action levels and target blood lead levels are estimated using USEPA's ALM (USEPA, 2003). The primary assumption in the ALM methodology is that the most sensitive receptor in the workplace is the developing fetus of a worker exposed in the workplace, since the USEPA identified the developing fetus as part of the sensitive U.S. population. For the PES Refinery, the Belmont Terminal and MHIC, this would be defined as a commercial/industrial worker that becomes pregnant at some point during the work year. The lead model does not assume that a pregnant worker is present at the site for the entire pregnancy, rather, that the worker has

worked at the site long enough to result in an elevated blood lead level to which the fetus could be subsequently exposed.

The ALM methodology is designed to estimate an average soil lead concentration that is not expected to result in a greater than 5% probability that the fetus of a female worker of child-bearing age has a blood lead level exceeding the level of concern of 10 µg/dL of blood (USEPA, 2003). This represents a conservative approach, as the PADEP applies a target blood lead level of 20 µg/dL as the default value in deriving the MSC for lead (PADEP, 1997).

8.0 RISK CHARACTERIZATION

This section presents the risk characterization for lead in soil at the PES Philadelphia Refinery, the Belmont Terminal and MHIC. The objective of the risk characterization is to calculate a generic SSS protective of all receptors by combining the results of the exposure and toxicity assessments.

The approach used to calculate a SSS for lead is presented below. In order to ensure that the SSS for both sites is adequately protective, the lead soil standard presented in this risk assessment was calculated using the default values and assumptions recommended by USEPA. The ALM methodology relates site lead concentrations to blood lead concentration in the mother and developing fetus based on the following additional assumptions:

- Fetal blood lead levels are proportional to maternal blood lead levels;
- Maternal blood lead levels can be predicted based on starting blood lead concentrations and an expected site-related increase;
- The site-related increase in maternal blood lead concentrations can be estimated using a linear biokinetic slope factor (BKSF) which is multiplied by the estimated lead uptake;
- Lead uptake can be estimated based on site concentrations of lead and assumptions regarding adult ingestion rates and the estimated AF of ingested lead; and
- A log-normal model can be used to estimate the distribution of blood lead concentrations in a population of individuals who contact similar environmental lead levels.

The basis for the calculation of the blood lead concentration for women of child-bearing age is given by:

$$PbB_{adult,central,goal} = PbB_{adult,0} + \frac{PbS * BKSF * IR * AF * EF}{AT}$$

where:

$PbB_{adult,\ central,\ goal}$ = Goal for central estimate of blood lead concentration

$PbB_{adult,0}$ = Typical blood lead concentration

PbS = Soil lead concentration (appropriate average concentration for individual)

BKSF = Biokinetic slope factor

IR = Intake rate of soil

AF = Absolute gastrointestinal absorption fraction

EF = Exposure frequency

AT = Averaging time

Given that the effects of lead are well understood, and the mean PbB is recognized as an acceptable predictor of the potential health effects associated with lead exposure, the approach outlined in the ALM derives a soil lead concentration that is considered protective of all employees. The foundation for the SSS calculation is the relationship between the mean soil lead concentration and the blood lead concentration in the developing fetus expressed by the following equation:

$$PRG = \frac{(PbB_{adult,central,goal} - PbB_{adult,0}) * AT}{BKSF * IR * AF * EF}$$

where:

PRG = Preliminary Remediation Goal, implemented as the SSS

Consistent with the USEPA's 2009 *Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters* (USEPA 2009), the most current background blood lead level and geometric standard deviation parameter made available from the 1999-2004 National Health and Nutrition Examination Survey (Center for Disease Control, 2005) is utilized in the ALM. An action level of 2,240 µg/g (ppm) lead in soil for the generic non-residential site worker was estimated using Equations 1 and 2 and parameter values as shown below:

Exposure Variable	Description of Exposure Variable	Units	Value	Rationale/Source
$PbB_{fetal,\ 0.95}$	95th percentile fetal blood lead concentration	µg/dL	10	USEPA 2003
$R_{fetal/maternal}$	Fetal/maternal blood lead concentration	--	0.9	USEPA 2003

Exposure Variable	Description of Exposure Variable	Units	Value	Rationale/Source
BKSF	Biokinetic slope factor	µg/dL per µg/day	0.4	USEPA 2003
GSD_i	Geometric standard deviation blood lead concentration	--	1.8	Updated from analysis of NHANES
$PbB_{adult,0}$	Adult baseline blood lead concentration	µg/dL	1.0	Updated from analysis of NHANES
IR	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.05	PADEP 2013, EPA 2003
AF	Oral absorption of lead in soil	--	0.12	Based on absorption factor of soluble lead of 0.2 and soil matrix effect of 0.6 (USEPA 2003)
EF	Exposure frequency	days/yr	219	USEPA 2003
AT	Averaging time	days/yr	365	USEPA 2003

Based on the parameters used, the USEPA model predicts that exposure to lead in soil at a concentration of 2,240 mg/kg (2,240 µg/g * 1,000 g/kg * 1 mg/1,000 µg = 2,240 mg/kg) would result in a typical developing fetus of a site worker exposed at either facility having an estimated risk of approximately 5 percent of exceeding the 10 µg/dL blood lead level of concern. This is the target fetal blood lead distribution identified in USEPA guidance as posing an acceptable level of risk (USEPA, 2003).

The SSS for lead in soil at the PES Philadelphia Refinery, the Belmont Terminal and MHIC is shown in the following table and attached as Table 1:

Medium	Receptor	SSS	Units	Basis
Soil	Generic Non-residential Receptor	2,240	mg/kg	ALM

8.1 Uncertainty

Although the methods used to calculate the SSS for lead in soil at the PES Philadelphia Refinery, the Belmont Terminal and the MHIC comply with USEPA and PADEP standards, there are uncertainties associated with the procedures discussed above. This section discusses the following sources of uncertainties in the HHRA for the lead SSS:

- Data collection and evaluation;
- Exposure assessment;
- Bioavailability; and
- Risk characterization.

In the HHRA, it is assumed that samples collected will be representative of the area to which human populations will be exposed. However, the samples may not be completely representative due to biases in sampling and to random variability of samples. Soils are not homogenously distributed in the environment; therefore, characterization and delineation of soil to the SSS lead standard may result in an over- or under-estimation of actual concentrations and, thus, site risks.

The exposure assessment relied on a number of assumptions regarding the RME scenario used to provide an upper bound estimate of risk. Use of the USEPA's default exposure assumptions for exposure frequency and ingestion rate is highly likely to over-estimate potential risks. Uncertainty is also compounded with regard to assumptions about scenario settings and availability of contaminated soil for contact. For example the derivation of a SSS does not take into account that walkways, parking areas, and other structures preclude contact with contaminated soil, thus potentially resulting in an incomplete exposure pathway.

The default AF parameter is based, in part, on the assumption that the relative bioavailability of lead in soil compared to soluble lead is 0.6. The default AF represents a weight of evidence determination based on experimental estimates of the bioavailability of ingested lead in adult humans with consideration of three major sources of variability that are likely to be present in populations, but are not always represented in experimental studies. These include: variability in food intake, lead intake, and the lead form and particle size. The TRW considers 0.6 to be a plausible default point estimate for the relative bioavailability of lead in soil when site-specific data are not available.

Because there are uncertainties in each step in the derivation of a SSS, these uncertainties are often magnified in the final risk characterization. Because of the

conservative approaches used in each step, the overall SSS may be significantly lower, and thus overly conservative, than actual conditions at each facility would support.

9.0 SUMMARY AND CONCLUSIONS

Based on the results of this HHRA, Langan has concluded that a SSS for lead in soil of 2,240 mg/kg is protective of all receptor populations at the PES Philadelphia Refinery, the Belmont Terminal and MHIC. This derived value will be utilized for future reports submitted by Evergreen under the One Cleanup Program and/or the PADEP Act 2 program for the above referenced facilities.

10.0 REFERENCES

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USEPA. 2003. *Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil.* EPA-540-R-03-001. Technical Review Workgroup for Lead. Washington, DC. January 2003.

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PADEP. 2013. *Land Recycling Program Technical Guidance Manual, General Guidance*. December, 2013.

Langan. 2014a . *Receptor Evaluation for the PES Philadelphia Refinery.*

Langan. 2014b. *Receptor Evaluation for the Marcus Hook Industrial Complex.*

Attachment 37

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

MEMO

TO Stephan Sinding
Regional Manager, Environmental Cleanup and Brownfields

FROM C. David Brown, P.G. CDB
Licensed Professional Geologist

THROUGH Walter Payne, P.G.
Professional Geologist Manager

DATE April 30, 2015

RE ECB: Land Recycling Program and Tanks Program
Act 2 and Corrective Action Technical Memo Summary
Philadelphia Refinery, Belmont Terminal, and Marcus Hook Industrial Complex
Risk Assessment Report—Lead in Soil

Site Identification and Property Owner Name and Address:

Philadelphia Refinery	**Belmont Terminal**	**Marcus Hook Industrial Complex**
eFACTS PF No. 780190 Tank Facility IDs 51-11554, 51-36558, 51-19781, 51-11557 3144 West Passyunk Avenue City of Philadelphia Philadelphia County **Property Owner:** Philadelphia Energy Solutions Refining and Marketing LLC 3144 Passyunk Ave. Philadelphia, PA 19145 **Location:** 39.9142°N, 75.2005°W	eFACTS PF No. 780561 Tank Facility ID 51-03525 2700 West Passyunk Avenue City of Philadelphia Philadelphia County **Property Owner:** Sunoco Partners Marketing & Terminals 4041 Market St. Aston, PA 19014 **Location:** 39.9205°N, 75.1931°W	eFACTS PF No. 780192 Tank Facility ID 23-14224 100 Green Street Marcus Hook Borough Delaware County **Property Owner:** Sunoco Partners Marketing & Terminals 4041 Market St. Aston, PA 19014 **Location:** 39.8150°N, 75.4230°W

Remediator Name and Address:
Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Act 2 Standard(s) Sought:
Soil—nonresidential site-specific standard

Site Size:

Philadelphia Refinery	~1295 acres
Belmont Terminal	~100 acres
Marcus Hook Industrial Complex	~590 acres

Project Site History:
Petroleum refining began at the Philadelphia Refinery circa 1870. The facility consisted of two refineries, Point Breeze operated by Atlantic Petroleum Corporation (formerly ARCO) and Girard Point by Chevron (formerly Gulf). Sunoco purchased these two refineries in 1988 and 1994 and consolidated them into a single facility. In 2012 Sunoco sold the refinery to the Carlyle Group and entered a joint venture to operate it as Philadelphia Energy Solutions (PES). Sunoco, Inc. is now a subsidiary of Energy Transfer Partners, L.P.

The Philadelphia Refinery can process up to 330,000 barrels a day of crude oil. It produces gasoline, diesel, jet fuel, kerosene, home heating oil, and other petroleum liquids. The facility consists of multiple process units, above-ground storage tanks, pipelines, as well as truck, railcar, and barge transfer equipment. Truck loading of fuel is performed adjacent to the refinery at the Belmont Terminal which is owned and operated by Sunoco Logistics Partners L.P.

Sunoco constructed and began operating the Marcus Hook Refinery in 1902. For over 100 years it produced gasoline, diesel, heating oil, and other petroleum fuels as well as chemicals. The facility was shut down in December 2011. Sunoco Logistics acquired the property in May 2013 and renamed it the Marcus Hook Industrial Complex. They are constructing ethane and propane storage, processing, and transfer equipment.

Site Findings:
Soil investigations at the sites have identified lead exceedences of DEP's nonresidential direct contact MSC of 1000 mg/kg for surface soil (0–2′). This standard was derived using a method described in §250.306(e). Evergreen has chosen to develop a site-specific numerical standard for lead in soil using a more recent formulation, EPA's Adult Lead Methodology (ALM). Unlike most other environmental contaminants, the human health risk from lead is quantified by the blood lead concentration, and cumulative risks are not evaluated.

The ALM accounts for ingestion of lead-contaminated soil-derived dust, whether indoors or outdoors. The target blood lead concentration is 10 µg/dL, which is considered to be a level in a pregnant worker above which fetal neurological damage could occur. The methodology estimates an average soil lead concentration not expected to result in a greater than 5% probability of the blood lead concentration exceeding 10 µg/dL in a female worker of child-bearing age. As this is the most sensitive population, the soil standard should be protective of all other workers.

Langan calculated a site-specific lead soil standard using the ALM with EPA's default input parameters. This included the 2009 updates to the baseline blood lead concentration and geometric standard deviation. The ALM result is 2240 mg/kg.

Langan assessed uncertainties in the methodology, including the representativeness of the soil data to be compared to the standard, the exposure assessment, and the bioavailability of lead. They concluded that the approach is conservative, and therefore the site-specific standard should be protective.

Site Cleanup History:

NIR Received Date	
Philadelphia Refinery	November 17, 2014
Belmont Terminal	October 6, 2014
Marcus Hook Industrial Complex	January 15, 2015
RAR Received Date	February 26, 2015

The three sites are being remediated by Evergreen, a subsidiary of Sunoco. The original NIR for the Philadelphia Refinery was received in October 2006, and the original NIR for the MHIC was received in October 2011. Both facilities are in the One Cleanup Program for joint RCRA and Act 2 actions. Reports are submitted to satisfy both Act 2 and Act 32 obligations. Remedial investigations are in progress for all areas of the sites, and reports have been submitted describing these activities and active remediation systems.

Discussion of Cleanup Involved and Demonstration of Attainment:
Site characterization of soil at the facilities is ongoing. The calculation of a site-specific numerical standard for lead is not dependent on knowledge of the distributions and concentrations of lead at the sites because the ALM utilizes a target blood lead concentration. Data will be compared to the site-specific standard. Evergreen intends to remediate exceedences or eliminate complete exposure pathways. These actions will be proposed in future cleanup plans.

DEP Final Action Approval/Disapproval Letter:
I recommend approving the risk assessment report for a nonresidential site-specific numerical standard of **2240 mg/kg lead** in surface soil.

DEP Contact:	C. David Brown	**Phone:**	484.250.5796
Site Contact:	Jim Oppenheim, Evergreen	**Phone:**	302.477.0192
	Chuck Barksdale, PES		215.339.2074
	Brad Fish, Sunoco Logistics		610.859.5412
Site Consultant:	Kevin McKeever, Langan Engineering & Environmental Services	**Phone:**	215.491-6518

Attachment 38

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

May 6, 2015

Mr. James Oppenheim
Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Re: Approval of Risk Assessment Report
Site-Specific Standard for Lead in Soil
Philadelphia Refinery
eFACTS PF No. 780190
3144 West Passyunk Avenue
City and County of Philadelphia

Dear Mr. Oppenheim:

The Department of Environmental Protection (DEP) has reviewed the February 24, 2015, document titled "Human Health Risk Assessment Report" for the Philadelphia Energy Solutions Refining & Marketing, LLC facility located at 3144 West Passyunk Avenue, Philadelphia. The report was prepared by Langan Engineering and Environmental Services, Inc., and submitted to DEP in accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2) and it constitutes a Risk Assessment Report as defined in Chapter 3.

DEP hereby approves the Risk Assessment Report in accordance with the provisions of Act 2. The report establishes a nonresidential direct contact site-specific numerical standard for lead in soil of 2240 mg/kg.

Please feel free to contact Mr. C. David Brown, P.G., at 484.250.5796 with any questions or if further clarification is needed regarding this matter.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa. C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800.654.5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period.

Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

If you want to challenge this action, your appeal must reach the board within 30 days. You do not need a lawyer to file an appeal with the board.

Important legal rights are at stake, however, so you should show this document to a lawyer at once. If you cannot afford a lawyer, you may qualify for free pro bono representation. Call the secretary to the board (717.787.3483) for more information.

Sincerely,

Stephan Sinding
Regional Manager
Environmental Cleanup and Brownfields

cc: Mr. Barksdale, Philadelphia Energy Solutions
Mr. McKeever, Langan Engineering and Environmental Services
Mr. Bilash, U.S. EPA Region 3
Mr. Brown, P.G.
Ms. Warren
Ms. Bass
City of Philadelphia Department of Public Health
Regional File
(eh15ecb)126-2

Attachment 39

STATE OF MARYLAND

DEPARTMENT OF THE ENVIRONMENT

CLEANUP STANDARDS FOR SOIL AND GROUNDWATER

OCTOBER 2018

INTERIM FINAL GUIDANCE

(UPDATE No. 3)

TABLE 1 - GENERIC NUMERIC CLEANUP STANDARDS FOR GROUNDWATER AND SOILS

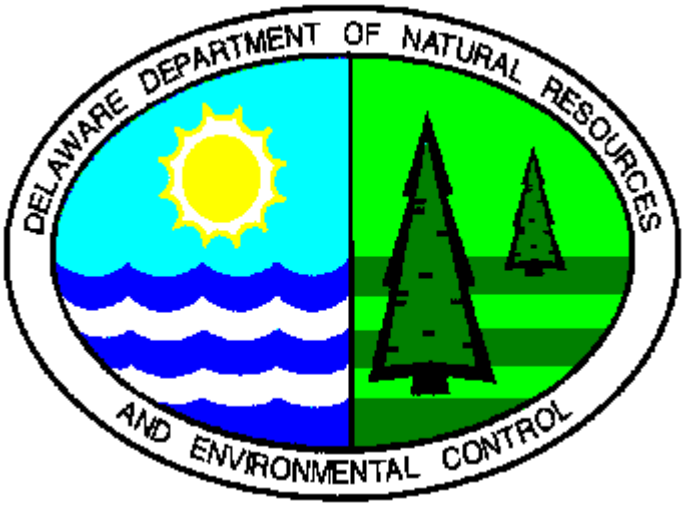
Chemical (RSL Name)		CAS Number	Groundwater Standards Type I and II Aquifers (ug/L)	Soil Standards Residential Clean-up Standard (mg/Kg)	Soil Standards Non-Residential Clean-up Standard (mg/Kg)	Protection of Groundwater (a) (mg/Kg)
Inorganic Compounds						
Aluminum		7429-90-5	2000	7700	110000	60000
Antimony (metallic)		7440-36-0	6.0	3.1	47	0.07
Arsenic, Inorganic		7440-38-2	10	0.68	3.0	0.03
Barium		7440-39-3	2000	1500	22000	320
Beryllium and compounds		7440-41-7	4.0	16	230	38
Cadmium (Water& diet)		7440-43-9	5.0	7.1	98	1.4
Chromium (III), Insoluble Salts		16065-83-1	2200	12000	180000	80000000
Chromium(VI)	(e)	18540-29-9	0.035	0.3	6.3	0.013
Chromium, Total		7440-47-3	100			
Copper		7440-50-8	1300	310	4700	56
Cyanide (CN-)		57-12-5	200	2.3	15	0.030
Iron		7439-89-6	1400	5500	82000	700
Lead and Compounds		7439-92-1	15	400	800	
Manganese (Non-diet)		7439-96-5	43	180	2600	560
Mercuric Chloride		7487-94-7	2.0	2.3	35	
Mercury (elemental)	(d)	7439-97-6	2.0	1.1	4.6	0.066
Methyl Mercury		22967-92-6	0.2	0.78	12	
Nickel Soluble Salts		7440-02-0	39	150	2200	52
Perchlorate and perchlorate salts		14797-73-0	15	5.5	82	
Selenium		7782-49-2	50	39	580	1.04

TABLE 1 - GENERIC NUMERIC CLEANUP STANDARDS FOR GROUNDWATER AND SOILS

Chemical (RSL Name)	CAS Number	Groundwater Standards Type I and II Aquifers (ug/L)	Soil Standards Residential Clean-up Standard (mg/Kg)	Soil Standards Non-Residential Clean-up Standard (mg/Kg)	Protection of Groundwater (a) (mg/Kg)
Inorganic Compounds					
Silver	7440-22-4	9.4	39	580	1.6
Thallium (Soluble Salts)	7440-28-0	2.0	0.078	1.2	0.028
Tin	7440-31-5	1200	4700	70000	6000
Vanadium and Compounds	7440-62-2	8.6	39	580	17
Zinc and Compounds	7440-66-6	600	2300	35000	740
Petroleum Hydrocarbon (TPH)					
Diesel Range Organics (DRO)		47	230	620	
Gasoline Range Organics (GRO)		47	230	620	

Attachment 40

REMEDIATION STANDARDS GUIDANCE UNDER THE DELAWARE HAZARDOUS SUBSTANCE CLEANUP ACT



Revised
DECEMBER 1999

4.0 UNIFORM-RISK BASED STANDARD

The uniform risk standard approach is useful for sites where it is not possible to achieve background standards because of the volume of the contamination or a site-specific risk assessment was not performed (i.e., a simplified evaluation of site-specific risks is more appropriate and cost effective than a baseline risk assessment). Attainment of the uniform risk standard will provide a limited level of liability release. This may include complete release of liability on a case-by-case basis for cleanups attaining the unrestricted use URS. Also, the Department will not require any deed notice or restriction for cleanups attaining the unrestricted use URS.

Uniform-risk based standards have been developed for the protection of human health and the environment -- separate standards have been developed for each. The URS approach is intended to be a generic conservative approach to the protection of human health and the environment, and as such, does not take into consideration site-specific elements which change the assumptions used to derive the URS values. Site-specific elements are considered in the site-specific standard approach methodologies discussed later in this document.

The URS are also intended to replace the Interim Guidance on Screening Levels for Hazardous Substances Discovered during Site Assessments Under the Delaware Hazardous Substance Cleanup Act (last revised March 1996) as a site assessment screening tool. It is recommended that any substance detected at concentrations in exceedance of the applicable URS be reported to the Department's Site Investigation and Restoration Branch as soon as practicable, and that interested parties participate in the Department's Voluntary Cleanup Program (VCP) to determine if further investigation and action is warranted.

4.1 DEFINITIONS

Definitions which are important to, and **exclusively applicable to the implementation of the URS** follow:

Restricted Use Setting: A restricted use setting is any setting where current or future use will be restricted in some way (either through deed restriction, risk management or engineering control measures) to ensure the protection of human health. A restricted use setting will have, at a minimum, a land-use which provides a human health exposure scenario that is consistent with the exposure scenario assumed by EPA to derive the human health RBC values for industrial soil ingestion, which are the basis for a portion of the URS (see April 1999 RBC Table Background Information for description of exposure scenario). Restricted use settings would typically include any setting on which commercial, industrial, manufacturing, agriculture, or any other activity is done to further either the development, manufacturing, or distribution of goods and services, intermediate and final products, including but not limited to: administration of business activities, research and development, warehousing, shipping, transport, remanufacturing, stockpiling of raw materials, storage, repair and maintenance of commercial machinery and equipment, and solid waste management.

Unrestricted Use Setting: An unrestricted use setting is any setting where current or future use will not be restricted in any way to ensure the protection of human health. An unrestricted use setting will have a land-use which provides a human health exposure scenario that is consistent with the exposure scenario assumed by EPA to derive the human health RBC values for residential soil ingestion, which are the basis for a portion of the URS (see April 1999 RBC Table Background Information for description of exposure scenario). Unrestricted use settings would typically include residential landuses, as well as landuses where there is potential for more extensive soil ingestion, such as playgrounds, recreational areas, parks, etc. Unrestricted use settings could also include agricultural landuse associated with the propagation of vegetation or livestock under certain conditions.

Surface Soil: Surface soil is all soil between the land surface and a depth of 2 feet below grade.

Subsurface Soil: Subsurface soil is all unsaturated soil between 2 feet below grade and the seasonally-low water table surface, bedrock, or 15 feet below grade, whichever is less.

Critical Water Resource Area: A critical water resource area is:

- Any area within a designated New Castle County Water Resource Protection Area (WRPA) or other areas in New Castle County within any delineated wellhead or ground-water protection area;
- Any area in Kent or Sussex County within any delineated wellhead or ground-water protection area as mapped by DNREC or other state or local government entity;
- Any area within 500 feet of a public or private water supply well; and
- Any area within 500 feet of a public or private surface water supply source.

Non-Critical Water Resource Area: By default, a non-critical water resource area is any setting that does not meet the definition of a critical water resource area.

Ecologically Sensitive Areas: An ecologically sensitive area is an area that has been identified to be of some ecological importance. The following are considered ecologically sensitive areas:

1. Critical Habitat, including breeding areas, migratory areas, and wintering areas for State or Federal designated endangered or threatened species, or habitat known to be used by designated, proposed, or under review endangered or threatened species.
2. Federal or State Park, Preserve, Forest, Wildlife Refuge or other Federal or State administered natural or recreational area, as well as other recognized parklands, open space, or other mapped natural areas managed by local government, non-profit organizations, or others.
3. Coastal Barrier, both developed and undeveloped, including private and public beaches
4. Spawning, migration, and feeding areas critical for the maintenance of anadromous fish/shellfish species within river, lake, or coastal tidal waters
5. Wetlands and waterways, including associated floodplains and riparian zones
6. Recognized critical habitats for State listed species having the Delaware Natural Heritage Program Ranking of S1, S2, S3, S4, SU, SH, SX, and SE.
7. Woodlands/forest in excess of 20 acres in size

A listing of references/sources that are available to assist in the identification of these sensitive areas is included in Attachment 2.

ATTACHMENT 3

REMEDIATION STANDARDS

DEFAULT BACKGROUND REMEDIATION STANDARDS
UNIFORM RISK-BASED REMEDIATION STANDARDS

LEGEND

C = Carcinogenic/ N= Non-Carcinogenic
CALA - Ground-Water Standard x 100
CALB - Derived from Soil to Ground-Water Equation
EPA - EPA recommendation/guidance
HAL - EPA Health Advisory Level
MAG - Massachusetts Guidance for TPH (no RBC data)
MAX - Maximum Ceiling Value is 1000 mg/kg for unrestricted use and 5000 mg/kg for restricted use - actual RBC, RBM values are higher than ceiling.
MCL - EPA Maximum Contaminant Level
PAG - Pennsylvania Guidance (no RBC data)
PQL - Practical Quantitation Level - value presented is RBC, RBM, or calculated value (CALA, or CALB) which may be at, or below, the most applicable PQL. PQL may be used for demonstrating attainment . See Attachment 5 for applicable PQLs. PQL designation applied to URS <0.1 ug/l or <0.5 mk/kg.
RBC - EPA Risk-Based Concentration Table Value, April 1999 RBC values equal to risk of 10E-6
RBM - Modified RBC Value equal to a Hazard Index of 0.1
SMCL - EPA Secondary Maximum Contaminant Level
SSLI - EPA SSL Guidance Inhalation Value
(a) Some analytes have two ground water URS values presented (e.g., 2 /1); the lowest value is to be used for screening purposes.

All surface and subsurface soil values are dry weight basis/ground water values are total or dissolved concentration, depending on application

				URS for Protection of Human-Health															
					Critical Water Resource Area						Non-Critical Water Resource Area								
					Unrestricted Use				Restricted Use				Unrestricted Use				Restricted Use		
			VOC	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Isopropyl methyl phosphonic acid	N	1832548		370 RBM	37	CALA	37	CALA	37	CALA	37	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Lead	N	7439921		15 EPA	400	EPA	400	EPA	1000	EPA	1000	EPA	400	EPA	400	EPA	1000	EPA	1000	EPA
Lithium	N	7439932		73 RBM	7	CALA	7	CALA	7	CALA	7	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Malathion	N	121755		200 HAL	67	CALB	67	CALB	67	CALB	67	CALB	160	RBM	160	RBM	4100	RBM	4100	RBM
Maleic anhydride	N	108316		370 RBM	37	CALA	37	CALA	37	CALA	37	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Manganese and compounds	N	7439965		50 SMCL	160	RBM	160	RBM	4100	RBM	4100	RBM	160	RBM	160	RBM	4100	RBM	4100	RBM
Mephosfolan	N	950107		0.3 RBM	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	1	RBM	1	RBM	18	RBM	18	RBM
Mepiquat chloride	N	24307264		110 RBM	11	CALA	11	CALA	11	CALA	11	CALA	230	RBM	230	RBM	5000	MAX	5000	MAX
Mercuric chloride	N	7487947		1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	2	RBM	2	RBM	61	RBM	61	RBM
Mercury (inorganic)	N	7439976		2 MCL	10	CALB	10	CALB	10	CALB	10	CALB	10	SSLI	10	SSLI	610	RBC	610	RBC
Mercury (methyl)	N	22967926		0.4 RBM	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	1	RBM	1	RBM	20	RBM	20	RBM
Methacrylonitrile	N	126987	☒	0.1 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.8	RBM	0.8	RBM	20	RBM	20	RBM
Methanol	N	67561		1800 RBM	180	CALA	180	CALA	180	CALA	180	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methidathion	N	950378		4 RBM	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Methoxychlor	N	72435		40 MCL	39	RBM	39	RBM	630	CALB	630	CALB	39	RBM	39	RBM	1000	RBM	1000	RBM
Methyl acetate	N	79209	☒	610 RBM	61	CALA	61	CALA	61	CALA	61	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methyl acrylate	N	96333	☒	18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	230	RBM	230	RBM	5000	MAX	5000	MAX
2-Methylaniline	C	95534		0.3 RBC	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	3	RBC	3	RBC	24	RBC	24	RBC
4-(2-Methyl-4-chlorophenoxy) butyric acid	N	94815		37 RBM	4	CALA	4	CALA	4	CALA	4	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
2-Methyl-4-chlorophenoxyacetic acid	N	94746		2 RBM	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	4	RBM	4	RBM	100	RBM	100	RBM
2-(2-Methyl-14-chlorophenoxy)propionic ac	N	93652		4 RBM	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Methylene bromide	N	74953	☒	6 RBM	1	CALA	1	CALA	1	CALA	1	CALA	10	SSLI	10	SSLI	5000	MAX	5000	MAX
Methylene chloride	C	75092	☒	5 /4 MCL	0.5	CALA	0.5	CALA	0.5	CALA	0.5	CALA	13	SSLI	13	SSLI	760	RBC	760	RBC
4,4'-Methylene bis(2-chloroaniline)	C	101144		0.5 RBC	0.05	PQL	0.05	PQL	0.05	PQL	0.05	PQL	5	RBC	5	RBC	44	RBC	44	RBC
4,4'-Methylene bis(N,N'-dimethyl)aniline	C	101611		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	14	RBC	14	RBC	120	RBC	120	RBC
Methyl ethyl ketone	N	78933	☒	190 RBM	19	CALA	19	CALA	19	CALA	19	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methyl hydrazine	C	60344		0.06 PQL	0.006	PQL	0.006	PQL	0.006	PQL	0.006	PQL	0.6	RBC	0.6	RBC	5	RBC	5	RBC
Methyl isobutyl ketone	N	108101	☒	14 RBM	1	CALA	1	CALA	1	CALA	1	CALA	630	RBM	630	RBM	5000	MAX	5000	MAX
Methyl methacrylate	N	80626	☒	140 RBM	14	CALA	14	CALA	14	CALA	14	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
2-Methyl-5-nitroaniline	C	99558		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	19	RBC	19	RBC	170	RBC	170	RBC
Methyl parathion	N	298000		2 HAL	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	2	RBM	2	RBM	51	RBM	51	RBM
2-Methylphenol (o-cresol)	N	95487		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX

Attachment 41

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
DIVISION OF WASTE AND HAZARDOUS SUBSTANCES
Site Investigation & Restoration Section

EXCERPTED BY
CLEAN AIR COUNCIL

Guidance for Human Health Risk Assessments (HHRA) under the Hazardous Substance Cleanup Act (HSCA)

October 2017

3.2 Exposure Assessment

The purpose of the exposure assessment is to estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. This is specific to the environmental medium and receptor for each exposure unit. When fate and transport models are used to estimate exposure, the text of the report shall present pertinent information needed to verify the model and to recreate the output. Required information includes, but not limited to, input parameters and assumptions. The model should be submitted as well.

Risk assessments performed under HSCA shall retain the default RAIS exposure assumptions. However, DNREC-SIRS will review requests to substitute site-specific assumptions. Variations to the default assumptions should be submitted for approval within the CSM-SAP. Also, any changes to previously approved risk calculators should be reviewed and approved by DNREC-SIRS prior to its use and on a site by site basis.

3.2.1 Exposure Point Concentrations

The Exposure Point Concentrations (EPCs) are the concentrations of the COPCs in the environmental media at the point of human exposure. DNREC-SIRS recommends the use of EPA's most current version of the ProUCL software to calculate the EPC of COPCs due to its wide availability, ease of use, and the regular updates provided by US EPA. Statistical software other than ProUCL should be preapproved by DNREC-SIRS prior to their use and on a site by site basis. ProUCL is available as a free download from the US EPA. The ProUCL output pages shall be included in the appendices of the report. The ProUCL input files shall be submitted in electronic format with descriptive file names. Selection of the EPCs should be summarized in Table C: Exposure Point Concentration (EPC). The RAIS output file includes all of the factors included in the risk calculation. Therefore, DNREC-SIRS does not require separate tables for this purpose as does RAGS. However, the RAIS output file is not labeled. Therefore, the RAIS output file should be manually labeled with the site name, exposure unit, exposure scenario and risk scenario. The labeled output shall be included in an appendix to the risk assessment report.

3.2.2 Exposure Point Concentrations for Soil

The EPCs to be used in risk calculations for soil should be the 95% UCL of the mean of the COPC analytical data set. The ProUCL software takes into account non-detects and calculates the 95% UCL using various methods and recommends the most appropriate UCL to use based on the data. DNREC-SIRS requires the number of soil samples collected and analyzed to be based on the Data Quality Objectives (DQOs). A minimum of 10 soil samples is recommended to calculate a more reliable UCL but the minimum number of samples may vary depending on site conditions and as determined by DNREC-SIRS. The ProUCL guidance recommends the use of the detection limit (DL) for non-detects and use of an indicator column with a value of 0 for all non-detects and 1 for all detects. Using certain statistical methods, ProUCL calculates a UCL for data sets with non-detects. If ProUCL recommends an EPC that is above the MOC, then the MOC should be used or other alternatives such as resampling or hot spot elimination can be used with DNREC-SIRS pre-approval.

Confirmatory results from a fixed laboratory should be used in estimating EPCs. However, on a case by case basis, and in consultation with DNREC-SIRS prior to use, analytical screening results from the DNREC-SIRS laboratory may be incorporated in the calculation of the EPCs. Please note that if the calculated 95% UCL is greater than the MOC, then the MOC should be used as the EPC. However, DNREC-SIRS may allow other statistical results to be used as EPCs on a site specific basis and with pre-approval.

Lead shall be evaluated separately from other analytes and does not affect the cumulative cancer risk or the Hazard Index. Therefore, lead should not be evaluated in RAIS. Lead should be retained as a COPC if the average is greater than 400 mg/kg. The screening level for restricted use sites shall be 800 mg/kg. For the evaluation of lead in the base line risk assessment, the EPC for lead shall be determined by calculating an average or other approved methods. Remediation for lead will normally be required if the EPC is greater than 400 mg/kg (or 800 mg/kg for restricted use sites). DNREC-SIRS does not anticipate that the child or adult Integrated Exposure Uptake Biokinetic Model (IEUBK) models will be routinely used to evaluate risks due to lead. The models are most useful when the input parameters (in addition to lead in soil concentration) can be established for the exposed population. However, DNREC-SIRS may allow the use of the IEUBK model on a site specific basis with pre-approval from DNREC-SIRS. Additionally, at its discretion, DNREC-SIRS may require modeling lead exposures if conditions, such as knowledge of elevated lead in drinking water, warrant it.

A special procedure can apply to aluminum, arsenic, chromium, cobalt, iron, manganese and vanadium in soil. Please refer to Appendix 1.3 “Two Sample Hypothesis Testing” for more specific information.

In June 2016, RAIS modified the assumptions for chromium. As a result, the assessment of chromium within the soil risk assessment has changed as well. Unless a site has a history of chromium use, total chromium results in soil should be evaluated as Chrome III, insoluble salts in the risk assessment. If a site has a history of chromium use and the concentration to be used in the human health risk evaluation is above the DNREC-SIRS developed background screening value, valent-specific data should be collected and used for risk assessment.

3.2.3 Alternative Methods for Calculating Exposure Point Concentrations-Soil

DNREC-SIRS will accept alternative methods of calculating EPCs for soil provided that DNREC-SIRS determines that the approach is relevant and appropriate for the Site conditions and is pre-approved by the DNREC-SIRS.

3.2.4 Exposure Point Concentrations for Sediment

The EPCs for sediment are based on the MOC observed in the samples representing loading from the site and not from an upstream location. The MOC is then inputted into the risk calculator to determine if the contaminant poses a risk to human health. However, if adequate sample results are available to calculate 95% UCL then it can be used for EPC. For both the recreator and trespasser exposure scenario, the sediment and soil sample results can be combined to determine the EPCs for risk evaluation except for site specific concerns. Impact of the

Attachment 42

N.J.A.C. 7:26D
REMEDIATION STANDARDS

Statutory authority
N.J.S.A. 13:1D-1 et seq., 58:10-23.11a et seq., 58:10A-1 et seq. and 58:10B-1 et seq.

Date last amended
September 18, 2017

For the regulatory history and effective dates see the Administrative Code

Rule expiration date
April 27, 2022

Contaminant	CAS No.	Ingestion-Dermal Health Based Criterion	Inhalation Health Based Criterion	Soil PQL	Non-Residential Direct Contact Soil Remediation Standard
Endosulfan sulfate	1031-07-8	6,800	NA	0.003	6,800
Endrin	72-20-8	340	120,000	0.003	340
Ethyl benzene	100-41-4	110,000	NA	0.005	110,000
Fluoranthene	206-44-0	24,000	300,000	0.2	24,000
Fluorene	86-73-7	24,000	300,000	0.2	24,000
alpha-HCH (alpha-BHC)	319-84-6	0.5	2	0.002	0.5
beta-HCH (beta-BHC)	319-85-7	2	620	0.002	2
Heptachlor	76-44-8	0.7	18	0.002	0.7
Heptachlor epoxide	1024-57-3	0.3	13	0.002	0.3
Hexachlorobenzene	118-74-1	1	4	0.2	1
Hexachloro-1,3-butadiene	87-68-3	25	35	0.2	25
Hexachlorocyclopentadiene	77-47-4	4,100	110	0.2	110
Hexachloroethane	67-72-1	48	NA	0.2	48
Indeno(1,2,3-cd)pyrene	193-39-5	17	5,500	0.2	17
Isophorone	78-59-1	2,000	NA	0.2	2,000
Lead	7439-92-1	800	12,000	1	800
Lindane (gamma-HCH) (gamma-BHC)	58-89-9	2	10	0.002	2
Manganese	7439-96-5	160,000	5,900	2	5,900
Mercury	7439-97-6	340	65	0.1	65
Methoxychlor	72-43-5	5,700	NA	0.02	5,700
Methyl acetate	79-20-9	NA	NA	0.005	NA
Methylene chloride (Dichloromethane)	75-09-2	230	NA	0.005	230
2-Methylnaphthalene	91-57-6	2,400	300,000	0.17	2,400
2-Methylphenol (o-Creosol)	95-48-7	3,400	NA	0.2	3,400
4-Methylphenol (p-Creosol)	106-44-5	340	NA	0.2	340
Methyl tert-butyl ether	1634-04-4	11,000	320	0.005	320
Naphthalene	91-20-3	25,000	17	0.2	17
Nickel (Soluble salts)	7440-02-0	23,000	23,000	4	23,000
2-Nitroaniline	88-74-4	NA	23,000	0.3	23,000
Nitrobenzene	98-95-3	1,400	14	0.2	14
N-Nitrosodimethylamine	62-75-9	0.06	0.05	0.7	0.7
N-Nitrosodi-n-proplyamine	621-64-7	0.3	0.5	0.2	0.3
N-Nitrosodiphenylamine	86-30-6	390	130,000	0.2	390
Pentachlorophenol	87-86-5	3	1,700	0.3	3
Phenanthrene	85-01-8	NA	300,000	0.2	300,000
Phenol	108-95-2	210,000	NA	0.2	210,000
Polychlorinated biphenyls (PCBs)	1336-36-3	1	57	0.03	1
Pyrene	129-00-0	18,000	300,000	0.2	18,000
Selenium	7782-49-2	5,700	NA	4	5,700
Silver	7440-22-4	5,700	NA	1	5,700

Attachment 43

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. If you are working with our staff on a current project and you know the name of the employee you are working with, email them at firstname.lastname@epa.ohio.gov or call them directly. The Agency website has contact information for every district, division, and office. In order to reach us, please contact Ohio EPA's main phone line at (614) 644-3020 or the main line for the division or office you are trying to reach.

After March 23, our district offices and Central Office will be temporarily closed and will have increasingly limited ability to receive deliveries, plans, etc. All entities are encouraged to submit plans, permit applications, etc., electronically where there are existing avenues to do so, such as the eBusiness Center (eBiz). Please refer to the list of available services on the main eBiz webpage. We encourage you to make use of all that apply, even if you have not used eBiz in the past. Plans under 25 MB can be emailed. For large plans over 25 MB, entities should work with the reviewer/division to upload via LiquidFiles. Directions for submitting docs via LiquidFiles is available on YouTube. We apologize for the inconvenience and thank you in advance for your understanding.

To report a spill or environmental emergency, contact the spill hotline (800) 282-9378 or (614) 224-0946.

Rules and Laws Governing the Voluntary Action Program

Please see the** Effective Rules **tab for the most current rules for the Voluntary Action Program.

- VAP Rules Effective May 26, 2016 through October 16, 2019
- VAP Rules Effective August 1, 2014 through May 25, 2016
- VAP Rules Effective April 18, 2013 through July 31, 2014
- VAP Rules Effective April 23, 2012 through April 17, 2013
- VAP Rules Effective March 1, 2009 through April 22, 2012
- VAP Rules Effective October 14, 2006 through March 1, 2009
- VAP Rules Effective July 1, 2006 through October 14, 2006
- VAP Rules Effective April 19, 2006 through July 1, 2006
- VAP Rules Effective October 21, 2002 through April 19, 2006
- VAP Rules Effective March 4, 2002 through October 21, 2002
- VAP Rules Effective December 16, 1996 through March 4, 2002

Voluntary Action Program (VAP) Rules

In accordance with Ohio Revised Code Chapter 3746, Ohio EPA developed the necessary rules with considerable input from a steering committee and technical subcommittees representing diverse interests, such as environmental advocacy groups, manufacturers, environmental consultants, cities and counties, bankers and medical professionals.

Within the Effective Rules tab, you may click on any rule number and view the entire text of the rule on your computer screen. Like all other directly viewable Web documents, you may also print out the entire rule text or save files to your PC hard drive while you are still logged into the web page.

If you have questions about VAP rules, email **Lisa Shook** or call (614) 644-2295.

Announcements | Early Stakeholder Outreach | Interested Party Review | Proposed Rules | Effective Rules | Additional Information

For Past Effective Rules, See** Additional Information **Tab

VAP RULES EFFECTIVE OCTOBER 17, 2019

- OAC 3745-300-01 Definitions – voluntary action program
- OAC 3745-300-02 Eligibility for participation in the voluntary action program
- OAC 3745-300-03 Voluntary action program fees
- OAC 3745-300-04 Certified laboratories
- OAC 3745-300-05 Certified professionals
- OAC 3745-300-06 Phase I property assessments for the voluntary action program
- OAC 3745-300-07 Phase II property assessments for the voluntary action program
- OAC 3745-300-08 Generic numerical standards
- OAC 3745-300-08 Appendix A
- OAC 3745-300-08 Appendix B
- OAC 3745-300-09 Property-specific risk assessment procedures
- OAC 3745-300-10 Ground water classification and potable use response requirements, and urban setting designations
- OAC 3745-300-11 Remediation
- OAC 3745-300-12 Variances and case-by-case determinations
- OAC 3745-300-13 No further action letter content and procedures
- OAC 3745-300-14 Audits
- OAC 3745-300-15 Incorporated by reference - voluntary action program

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Appendix A to rule 3745-300-08 of the Administrative Code

In this appendix, mg/kg means milligrams per kilogram, NA means not applicable, $\mu g/m^3$ means micrograms per cubic meter, and µg/L means micrograms per liter.

Table I: Generic numerical direct-contact soil standards (residential land use category)

Table I Chemical of Concern	Chemical Abstract Service Number (CAS #)	Standard for a Single Chemical Non-Carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Soil Saturation (mg/kg)	Generic Direct-Contact Soil Standard for a Single Chemical (mg/kg)
Acenaphthene	83-32-9	7,200	NA	NA	7,200
Acetaldehyde	75-07-0	210	280	110,000	210
Acetone	67-64-1	120,000	NA	110,000	110,000
Acetonitrile	75-05-8	2,000	NA	130,000	2,000
Acetophenone	98-86-2	16,000	NA	2,500	2,500
Acetylaminofluorene, 2-	53-96-3	NA	2.9	NA	2.9
Acrolein	107-02-8	0.36	NA	23,000	0.36
Acrylamide	79-06-1	250	4.9	NA	4.9
Acrylic acid	79-10-7	250	NA	110,000	250
Acrylonitrile	107-13-1	40	6.1	11,000	6.1
Alachlor	15972-60-8	1,300	190	NA	190
Aldicarb	116-06-3	130	NA	NA	130
Aldicarb Sulfone	1646-88-4	130	NA	NA	130
Aldrin	309-00-2	3.8	0.62	NA	0.62
Allyl Alcohol	107-18-6	630	NA	110,000	630
Allyl Chloride	107-05-1	4.1	18	1,400	4.1
Aluminum Phosphide	20859-73-8	63	NA	NA	63
Aminobiphenyl, 4-	92-67-1	NA	0.52	NA	0.52

Table III Chemical of Concern	Chemical Abstract Service Number (CAS #)	Standard for a Single Chemical Non-Carcinogen (mg/kg)	Standard for a Single Chemical Carcinogen (mg/kg)	Soil Saturation (mg/kg)	Generic Direct-Contact Soil Standard for a Single Chemical (mg/kg)
Hexane, N-	110-54-3	6,400	NA	140	140
Hexanedioic Acid	124-04-9	1,000,000	NA	NA	1,000,000
Hydrazine	302-01-2	250,000	44	NA	44
Hydrogen Chloride	7647-01-0	1,000,000	NA	NA	1,000,000
Hydrogen Cyanide	74-90-8	400	NA	1,000,000	400
Hydrogen Fluoride	7664-39-3	190,000	NA	NA	190,000
Hydrogen Sulfide	7783-06-4	1,000,000	NA	NA	1,000,000
Hydroquinone	123-31-9	100,000	1,200	NA	1,200
Indeno[1,2,3-cd]pyrene	193-39-5	NA	620	NA	620
Isobutyl Alcohol	78-83-1	760,000	NA	10,000	10,000
Isophorone	78-59-1	510,000	75,000	NA	75,000
Kerb	23950-58-5	190,000	NA	NA	190,000
Lead Acetate	301-04-2	NA	8,300	NA	8,300
Lead and Compounds *	7439-92-1	NA	NA	NA	800
Lead Phosphate	7446-27-7	NA	15,000	NA	15,000
Lead Subacetate	1335-32-6	NA	8,300	NA	8,300
Malathion	121-75-5	51,000	NA	NA	51,000
Maleic Anhydride	108-31-6	240,000	NA	NA	240,000
Maleic Hydrazide	123-33-1	1,000,000	NA	NA	1,000,000
Malononitrile	109-77-3	250	NA	NA	250
Manganese Compounds	7439-96-5	88,000	NA	NA	88,000
Mercury and Compounds	7439-97-6	92	NA	3.1	3.1
Methacrylonitrile	126-98-7	390	NA	4,600	390

Attachment 44

Brownfields Assistance Program
UECA-LUST Program
Voluntary Remediation Program
Licensed Remediation Specialist Program
Technical Guidance and Templates

Technical Guidance and Templates

Laws and Regulations

- Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22)
- Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3)
- Uniform Environmental Covenants Act (W. Va. Code § 22-22B)

Technical Guidance

- De Minimis Table (effective 06/01/2017)
- De Minimis and Relevant Benchmarks
- Receptor Exposure Assumptions
- Uniform Environmental Covenant Act (UECA) Process Flow Chart
- Voluntary Remediation Program Guidance Manual
- Voluntary Remediation Program Process Flow Chart
- Voluntary Remediation Program Process Outline
- WV Soil Background Table
- WVDEP/DLR/OER Quality Assurance Program Plan (QAPP)

Reference Materials

- A Guide to Land Use Covenants in West Virginia
- Licensed Remediation Specialist Program Guide

Templates

(To access templates, right click on desired document and choose "Save target as...")

UECA-LUST Program

1. UECA-LUST Notice of Intent to Enter Program
2. UECA-LUST Agreement
3. UECA-LUST Agreement Modification
4. Land Use Covenant

- Land Use Covenant Instructions
- Land Use Covenant Inspection Form
- Land Use Covenant Inspection Form Instructions

5. Public Notice

Voluntary Remediation Program

1. Voluntary Remediation Program Application
2. Voluntary Remediation Agreements:
   - Standard Agreement
   - No Further Action (NFA) Investigation Activities Agreement
   - Brownfields Revolving Fund (BRF) Applicant Agreement
3. Voluntary Remediation Agreement Modification
4. Public Notice
5. Land Use Covenant
   - Land Use Covenant Instructions
   - Land Use Covenant Inspection Form
   - Land Use Covenant Inspection Form Instructions
6. Certificate of Completion

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NOTICE OF FINAL FILING AND ADOPTION OF A LEGISLATIVE RULE AUTHORIZED BY THE WEST VIRGINIA LEGISLATURE

AGENCY: Environmental Protection Secretarys Office TITLE-SERIES: 60-03

RULE TYPE: Legislative Amendment to Existing Rule: Yes Repeal of existing rule: No

RULE NAME: Voluntary Remediation and Redevelopment Rule

CITE STATUTORY AUTHORITY: W. Va. Code § 22-22-3

The above rule has been authorized by the West Virginia Legislature.

Authorization is cited in (house or senate bill number) Senate Bill 163

Section §64-3-1. Department of Environmental Protection. Passed On 2/16/2018 12:00:00 AM

This rule is filed with the Secretary of State. This rule becomes effective on the following date:

April 1, 2018

This rule shall terminate and have no further force or effect from the following date:

00/00/0000

TITLE 60
LEGISLATIVE RULE
DEPARTMENT OF ENVIRONMENTAL PROTECTION, SECRETARY'S OFFICE

SERIES 3
VOLUNTARY REMEDIATION AND REDEVELOPMENT RULE

§60-3-1. General.

1.1. Scope. -- This Legislative rule establishes the eligibility, procedures, standards, and legal documents required for voluntary remediation activities and brownfield revitalization.

1.2. Authority. -- W. Va. Code §§ 22-22-3 and 22-22-4(c).

1.3. Filing Date. -- March 20, 2018.

1.4. Effective Date. -- April 1, 2018.

§60-3-2. Definitions.

Unless the context clearly requires a different meaning, the definitions contained in W. Va. Code §§ 22-22-2 and 22-22B-2 apply to this rule, in addition to those definitions set forth below:

2.1. "Act" means the Voluntary Remediation and Redevelopment Act, W. Va. Code § 22-22-1, et seq.

2.2. "Anthropogenic background" means concentrations of chemicals that are present in the environment due to human activities unrelated to operation at the site.

2.3. "Applicant" means a person who is applying or has applied to participate in the Voluntary Remediation Program.

2.4. "Brownfields Revolving Fund applicant" means a person who is applying or has applied to participate in the Voluntary Remediation Program for a brownfield property and who is seeking or has obtained site assessment or remediation moneys from the Brownfields Revolving Fund.

2.5. "Carcinogen" means any substance which can cause cancer.

2.6. "Cumulative site risk" means the summation of risks to a human receptor or ecological receptor from one or more contaminants released at the site over a period of time.

2.7. "Day" means the 24-hour period between 12:00 A.M. - 12:00 A.M.

2.8. "De minimis risks" means those risks that are so trivial that they would not require remediation under this rule.

2.9. "Ecological receptors of concern" means specific ecological communities, populations, or individual organisms protected by federal, State, or local laws and regulations or those local populations which provide important natural or economic resources, functions, and values.

2.10. "Ecosystem" means an integrated, self-functioning system consisting of interactions among both the biotic community and abiotic environment within a specified location in space and time. Sizes of ecosystems may vary considerably.

2.11. "Endangered or threatened species" means any plant or animal species identified as endangered or threatened pursuant to federal, State, or local laws.

2.12. "Exposure" means contact by an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

2.13. "Exposure factors" means values used to estimate exposure in risk assessment, such as the number of days per week that a person may expect exposure or the amount of contaminated media that a person might incidentally ingest per day.

2.14. "Exposure pathway" means the physical course a chemical or pollutant takes from its source to the organism exposed.

2.15. "Exposure route" means the way a chemical or physical agent comes in contact with a receptor (e.g., by eating [ingestion], breathing [inhalation], or touching [dermal contact]).

2.16. "Fate and transport" means the behavior and movement of a chemical through an environmental medium.

2.17. "Free product" means regulated substance that is present as a nonaqueous phase liquid (e.g., liquid not dissolved in water). These substances include liquid petroleum products such as gasoline, kerosene, diesel fuel, or oil, and any hazardous substance either listed in § 101(14) of CERCLA or defined in § 1004 of RCRA. For petroleum hydrocarbons, the term nonaqueous phase liquid includes both liquid phase and residual phase hydrocarbons. Liquid phase product is capable of flowing downward and/or laterally into wells or excavations. Typically, free product exists as a pool or mound floating on the water table or resting on an impermeable soil layer. Residual phase product does not generally flow as a liquid; it occurs as globules within fractures or pores of soil or bedrock.

2.18. "Gross remediation costs" means the direct costs associated with remediation of a site and paid by the remediator. Gross remediation costs include the fees paid to the licensed remediation specialist and contractors, equipment expenses and rental, disposal costs, permit fees, remediation site personnel costs, and all other expenses directly related to achieving applicable standards at the site.

2.19. "Habitat" means the area or type of environment in which an organism or biological population naturally lives or is found.

2.20. "Hazard index" means the sum of the hazard quotients for multiple substances and/or multiple exposure pathways.

2.21. "Hazard quotient" means the value which quantifies noncarcinogenic risk for one chemical for one receptor population over a specified exposure period. The hazard quotient is equal to the ratio of a chemical-specific intake to the reference dose.

2.22. "Hourly rate" means the gross annual salary plus fringe benefits paid to an employee, plus the indirect cost rate calculated as a percentage of salary (as negotiated and established with the Federal

Government through the U.S. Department of the Interior, National Business Center, in accordance with 2 C.F.R. § 225), divided by 2080.

2.23. "Implementability" means the technical and administrative feasibility of an action, as well as the availability of needed goods and services.

2.24. "Industrial land use" means land used for commercial establishments, manufacturing plants, public utilities, mining, distribution of goods or services, administration of business activities, research and development facilities, warehousing, shipping, transporting, remanufacturing, stockpiling of raw materials, storage, repair and maintenance of commercial machinery or equipment, and waste management.

2.25. "Leaching potential" means the potential for soluble constituents to be dissolved and filter through the soil by a percolating fluid.

2.26. "Lowest Observed Adverse Effect Level or LOAEL" means the lowest concentration or dose evaluated in a test that causes statistically significant adverse effects in experimental trials.

2.27. "Natural background" means ambient concentrations of chemicals that are present in the environment and have not been influenced by humans (e.g., iron, manganese).

2.28. "New information" means any information the Department obtains directly or indirectly from any person after the Secretary issues a Certificate of Completion, but does not include information the Department received in the application for participation in the Voluntary Remediation Program, including any site assessment during the execution of the Voluntary Remediation Agreement or any work plan developed under such an agreement, or other information available to the Department under the Voluntary Remediation Program prior to the execution of the Certificate of Completion. The Secretary may consider information that does not qualify as new information along with new information, if necessary, to determine whether any of the conditions for reopening set out in section 16 of this rule have occurred.

2.29. "No further action" means a site is eligible to receive a Certificate of Completion on the basis of site assessment sampling or sampling data developed under a Voluntary Remediation Agreement which demonstrates that the site meets all applicable standards.

2.30. "No Observed Adverse Effect Level or NOAEL" means the highest concentration or dose evaluated in a test that does not cause statistically significant adverse effects in experimental trials.

2.31. "Primary employee" means a voluntary remediation project manager, engineer, or scientist employed by the Secretary in negotiating, facilitating, overseeing, or confirming a voluntary remediation project. The term does not include secretaries, paralegals, clerks, technicians, or others who serve to support the activities of the primary employee.

2.32. "Probabilistic risk assessment" means a risk assessment performed using a mathematical technique that produces a distribution of values for a calculated term by solving for that term in successive iterations. Each successive iteration requires the selection of a single input value from defined distribution(s) for each of the terms used to derive the calculated term.

2.33. "Readily apparent harm" means visual evidence of stressed biota attributable to the release at the site, including, but not limited to, fish kills or abiotic conditions, or the visible presence of oil, tar, or other non-aqueous phase contaminant in soil over an area equal to or greater than two acres, or over an area equal to or greater than 1,000 square feet in sediment.

2.34. "Reasonably anticipated future use" means potential future land and water uses which have a credible chance of occurrence.

2.35. "Reasonable potential" means a scenario with a credible chance of occurrence without considering extreme or highly unlikely circumstances.

2.36. "Receptors (human)" means humans potentially exposed to contaminants released from the site.

2.37. "Reopener" means one or more of the grounds for setting aside some or all of a Certificate of Completion and reopening a Voluntary Remediation Agreement that is specified in section 16 of this rule.

2.38. "Residential land use" means any real property or portion thereof which is used for housing human beings. This term includes property used for schools, day care centers, nursing homes, or other residential-style facilities or recreational areas.

2.39. "Risk-based concentrations" means concentration levels developed by the Secretary for individual chemicals that correspond to a specific incremental cancer risk level of $1x10^{-5}$ for residential land use and $1x10^{-5}$ for industrial land use or a hazard quotient of 1. These concentrations are to be used as de minimis standards.

2.40. "Saturation concentration" means the maximum possible quantity of a substance that can dissolve in a standard volume of a specific solvent (e.g., water) under standard conditions of temperature and pressure.

2.41. "Site assessment" means characterization of a site through an evaluation of its physical and environmental characteristics (e.g., subsurface geology, soil properties and structures, hydrology, and surface characteristics) to determine if a release has occurred; the levels of the chemical(s) of concern in environmental media; and the likely physical distribution of the chemical(s) of concern. The site assessment involves the collection of data as needed on groundwater and surface water quality, land and resource use, and potential receptors, which information is used to support remedial action decisions.

2.42. "Site assessment costs" means costs incurred in connection with site assessment activities including, but not limited to: waste disposal costs, professional fees and expenses of those evaluating contamination, the cost of identifying a site history and prior land use, the cost of archaeological investigations, and attorneys' fees incurred in evaluating a site or negotiating a Voluntary Remediation Agreement.

2.43. "Systemic toxicant" means a harmful substance or agent that may enter the body and injure an organ or organ system and have an effect other than causing cancer. Most chemicals that produce systemic toxicity do not cause a similar degree of toxicity in all organs, but usually demonstrate major toxicity to one or two organs.

2.44. "Total dissolved solids" means all material that passes through the standard glass fiber filter as provided in the current edition of Standard Methods for the Examination of Water and Wastewater.

2.45. "Trade secrets" means any information protected from disclosure pursuant to the West Virginia Freedom of Information Act, W. Va. Code § 29B-1-4(a)(1).

2.46. "Voluntary Remediation Program" means the program for the voluntary assessment and remediation of sites under the Act.

Table 60-3B

CONTAMINANT	CAS No.	Residential Soil[1,4] (mg/kg)	Value Basis[5]	Industrial Soil[1,4] (mg/kg)	Value Basis[5]	Ground Water[2,4] (ug/L)	Value Basis[5]	Migration to Water[3,4] (mg/kg)
Acetaldehyde	75-07-0	1.2E+01	c	3.7E+02	nc	2.6E+00	c	5.2E-04
Acetochlor	34256-82-1	1.3E+03	nc	2.5E+04	nc	3.5E+02	nc	2.6E-01
Acetone	67-64-1	6.1E+04	nc	1.1E+05	Csat	1.4E+04	nc	2.9E+00
Acetonitrile	75-05-8	6.7E+02	nc	3.7E+03	nc	1.3E+02	nc	2.6E-02
Acetophenone	98-86-2	2.5E+03	Csat	2.5E+03	Csat	1.9E+03	nc	5.8E-01
Acrolein	107-02-8	1.5E-01	nc	6.5E-01	nc	4.2E-02	nc	8.4E-06
Acrylamide	79-06-1	2.4E-01	c	7.1E+01	c	5.0E-02	c	1.1E-05
Acrylonitrile	107-13-1	2.7E-01	c	1.3E+01	c	5.2E-02	c	1.1E-05
Alachlor	15972-60-8	9.7E+00	c	6.3E+02	c	2.0E+00	gws	1.6E-03
Alar	1596-84-5	3.0E+01	c	2.0E+03	c	4.3E+00	c	9.5E-04
Aldicarb	116-06-3	6.3E+01	nc	1.3E+03	nc	3.0E+00	gws	7.5E-04
Aldicarb sulfone	1646-88-4	6.3E+01	nc	1.3E+03	nc	2.0E+00	gws	4.4E-04
Aldrin	309-00-2	3.9E-02	c	3.6E+00	c	9.2E-04	c	1.5E-04
Aluminum	7429-90-5	7.7E+04	nc	1.0E+06	max	2.0E+04	nc	3.0E+04
Aniline	62-53-3	9.5E+01	c	6.2E+03	c	1.3E+01	c	4.6E-03
Antimony and compounds	7440-36-0	3.1E+01	nc	8.3E+02	nc	7.8E+00	nc	3.5E-01
Arsenic	7440-38-2	4.3E-01	c	3.5E+01	c	1.0E+01	gws	2.9E-01
Assure	76578-14-8	5.7E+02	nc	1.1E+04	nc	1.2E+02	nc	1.9E+00
Atrazine	1912-24-9	2.4E+00	c	1.5E+02	c	3.0E+00	gws	2.0E-03
Azobenzene	103-33-3	5.6E+00	c	4.7E+02	c	1.2E-01	c	9.3E-04
Barium and compounds	7440-39-3	1.5E+04	nc	4.0E+05	nc	2.0E+03	gws	8.2E+01
Baygon	114-26-1	2.5E+02	nc	5.1E+03	nc	7.8E+01	nc	2.5E-02
Baythroid	68359-37-5	1.6E+03	nc	3.2E+04	nc	1.2E+02	nc	3.1E+01
Bentazon	25057-89-0	1.9E+03	nc	3.8E+04	nc	5.7E+02	nc	1.2E-01
Benzaldehyde	100-52-7	1.2E+03	Csat	1.2E+03	Csat	1.9E+03	nc	4.3E-01

CONTAMINANT	CAS No.	Residential Soil[1,4] (mg/kg)	Value Basis[5]	Industrial Soil[1,4] (mg/kg)	Value Basis[5]	Ground Water[2,4] (ug/L)	Value Basis[5]	Migration to Water[3,4] (mg/kg)
n-Hexane	110-54-3	1.4E+02	Csat	1.4E+02	Csat	1.5E+03	nc	1.0E+01
Hexazinone	51235-04-2	2.1E+03	nc	4.2E+04	nc	6.4E+02	nc	2.9E-01
HMX	2691-41-0	3.9E+03	nc	1.1E+05	nc	1.0E+03	nc	1.3E+00
Hydrazine	302-01-2	2.3E-01	c	2.2E+01	c	1.1E-03	c	
Hydrogen sulfide	7783-06-4	1.0E+06	max	1.0E+06	max	4.2E+00	nc	
p-Hydroquinone	123-31-9	9.0E+00	c	5.9E+02	c	1.3E+00	c	8.8E-04
Iron	7439-89-6	5.5E+04	nc	1.0E+05	max	1.4E+04	nc	3.5E+02
Isobutanol	78-83-1	1.0E+04	Csat	1.0E+04	Csat	1.7E+03	nc	3.4E-01
Isophorone	78-59-1	5.7E+02	c	3.7E+04	c	7.8E+01	c	2.6E-02
Isopropalin	33820-53-0	1.1E+03	nc	2.6E+04	nc	2.9E+01	nc	6.7E-01
Isopropylbenzene (Cumene)	98-82-8	2.7E+02	Csat	2.7E+02	Csat	4.5E+02	nc	7.4E-01
Isopropyl methyl phosphonic acid	1832-54-8	6.3E+03	nc	1.3E+05	nc	2.0E+03	nc	4.3E-01
Lead*	7439-92-1	4.0E+02	nc	1.0E+03	nc	1.5E+01	gws	1.4E+01
Lead (tetraethyl)	78-00-2	7.8E-03	nc	2.3E-01	nc	1.3E-03	nc	4.7E-06
Lithium	7439-93-2	1.6E+02	nc	4.7E+03	nc	4.0E+01	nc	1.2E+01
Malathion	121-75-5	1.3E+03	nc	2.5E+04	nc	3.9E+02	nc	1.0E-01
Maleic anhydride	108-31-6	6.3E+03	nc	1.2E+05	nc	1.9E+03	nc	3.8E-01
Manganese (non-food)	7439-96-5	3.5E+03	nc	8.0E+04	nc	8.5E+02	nc	5.5E+01
Mephosfolan	950-10-7	5.7E+00	nc	1.1E+02	nc	1.8E+00	nc	2.6E-03
Mepiquat	24307-26-4	1.9E+03	nc	3.8E+04	nc	6.0E+02	nc	2.0E-01
Mercury (elemental and inorganic)	7439-97-6	3.1E+00	Csat	3.1E+00	Csat	2.0E+00	gws	1.0E-01
Mercury (methyl)	22967-92-6	7.8E+00	nc	2.3E+02	nc	2.0E+00	nc	
Methacrylonitrile	126-98-7	7.6E+00	nc	1.9E+02	nc	1.9E+00	nc	4.3E-04
Methanol	67-56-1	1.1E+05	Csat	1.1E+05	Csat	2.0E+04	nc	4.1E+00
Methidathion	950-37-8	6.3E+01	nc	1.3E+03	nc	1.9E+01	nc	4.7E-03
Methoxychlor	72-43-5	3.2E+02	nc	6.3E+03	nc	4.0E+01	gws	2.2E+00
Methyl acetate	79-20-9	2.3E+04	nc	2.9E+04	Csat	5.3E+03	nc	1.1E+00

CONTAMINANT	CAS No.	Residential Soil[1,4] (mg/kg)	Value Basis[5]	Industrial Soil[1,4] (mg/kg)	Value Basis[5]	Ground Water[2,4] (ug/L)	Value Basis[5]	Migration to Water[3,4] (mg/kg)
Vanadium and compounds	7440-62-2	5.5E+00	nc	1.6E+02	nc	1.2E+00	nc	1.2E+00
Vinclozolin	50471-44-8	1.8E+03	nc	3.2E+04	nc	4.4E+02	nc	3.4E-01
Vinyl acetate	108-05-4	9.7E+02	nc	2.7E+03	Csat	4.1E+02	nc	8.7E-02
Vinyl bromide	593-60-2	1.3E-01	c	5.6E+00	c	1.8E-01	c	5.1E-05
Vinyl chloride (lifetime)	75-01-4	5.7E-02	c			2.0E+00	gws	6.9E-04
Vinyl chloride (adult)	75-01-4			2.2E+01	c	2.0E+00	gws	6.9E-04
Warfarin	81-81-2	1.9E+01	nc	3.8E+02	nc	5.6E+00	nc	5.9E-03
Xylenes	1330-20-7	2.6E+02	Csat	2.6E+02	Csat	1.0E+04	gws	9.9E+00
Zinc and Compounds	7440-66-6	2.3E+04	nc	7.0E+05	nc	6.0E+03	nc	3.7E+02
Zinc phosphide	1314-84-7	2.3E+01	nc	7.0E+02	nc	5.9E+00	nc	
Zineb	12122-67-7	3.2E+03	nc	6.3E+04	nc	9.9E+02	nc	2.9E+00

Notes.

[1]Where appropriate, the residential and industrial soil values consider ingestion and dermal exposure to soil and inhalation exposure to contaminants moving from soil to ambient air.

[2]Groundwater standards promulgated under 47CSR12 are provided, where available. Standards that are unavailable under 47CSR12 are based on a risk-based methodology that considers ingestion, dermal, and inhalation exposure arising from the domestic use of groundwater.

[3]The migration from soil to groundwater values shall be applied unless it is shown to the satisfaction of the Secretary that migration of soil contaminants to groundwater will not result in an exceedance of the De Minimis Groundwater Standards.

[4]The concentrations in this table shall be applied where the exposure pathways described in footnotes 1, 2, and 3 are the major contributors to risks identified in the site assessment. If other exposure pathways are identified, the acceptable contractions shall be determined only in consultation with the Secretary, considering all exposure pathways, and all other requirements of the regulations.

[5]Basis of standard. c – cancer effect; nc – noncancer effect; max – calculated risk-based concentration exceeds maximum possible contaminant level of $1x10^6$ mg/kg; Csat – calculated risk-based concentration exceeds residual saturation level; gws – West Virginia Groundwater Quality Standards from 47CSR12.

*Lead – Residential soil based on Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (July 1994), U.S. EPA OSWER Directive 9355.4-12. Industrial soil based on the U.S. EPA documents Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soils (December 1996) and Frequently Asked Questions (FAQs) on the Adult Lead Model (April 1999).

Attachment 45

Department of Environmental Conservation

Division of Environmental Remediation

6 NYCRR PART 375

Environmental Remediation Programs

Subparts 375-1 to 375- 4 & 375-6

EXCERPTED BY
CLEAN AIR COUNCIL

Effective December 14, 2006

New York State Department of Environmental Conservation

(b) Restricted use soil cleanup objectives.

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

Attachment 46

New York State Brownfield Cleanup Program

Development of Soil Cleanup Objectives

Technical Support Document

Prepared By:

New York State Department of Environmental Conservation

and

New York State Department of Health

September 2006

These default relationships assume the same absorption fraction by both exposure routes. In cases where the relative absorption fraction by the oral and inhalation routes is known, an additional factor is applied to account for absorption differences between the two routes.

In cases where adequate chemical-specific toxicity data and adequate data for a route-to-route extrapolation were both unavailable, toxicity data from structurally related chemicals were considered as the basis for a toxicity value. The structure of a chemical largely determines its pharmacokinetics in the body, and therefore is an important determinant of its toxicity. Chemicals with very similar structures often have similar toxic properties. In cases where toxicity information for a chemical was unavailable, but toxicity data from a structurally similar chemical was available and satisfied the general selection criteria described above, the surrogate toxicity data were considered for use as the toxicity value in lieu of chemical-specific data.

5.1.1.8 Toxicity Values for Inorganic Lead

Non-Cancer

Lead and inorganic lead compounds cause a variety of health effects in humans, and can damage the nervous, cardiovascular, gastrointestinal, hematopoietic, and reproductive systems. The database on lead toxicity is unusual because it contains a large amount of data on dose-response relationships in humans (ATSDR, 1999). Consequently, the degree of uncertainty about the non-cancer human health effects of lead is relatively low compared to almost all other contaminants (US EPA, 2005c). In most studies, however, the measure of dose is an internal one (most commonly, blood lead level or PbB). In addition, most studies cannot attribute blood lead levels to one single route, pathway, or source of exposures or exposures during a limited, defined time. This is because lead can accumulate in the human body, and blood lead at any given time is dependent on current and past exposures to lead. Current exposures (e.g., food, water, air, and soil) are important because absorbed lead goes into the blood before distributing to other parts of the body. Past exposures are important because the body stores absorbed accumulated lead in bones. The lead in bones can be released into the blood under certain circumstances. Thus,

blood lead is considered the most reliable measure of a person's risk of non-cancer health effects from lead.

Experimental studies of the toxicity of lead in animals provide support for observations in humans. Current knowledge of lead pharmacokinetics indicates that toxicity values derived by the application of default risk assessment procedures (e.g., using administered, ingested, or inhaled dose) to animal dose-response data might not accurately estimate the potential risk (US EPA, 2005c). This stems from concerns that an adequate animal model for lead toxicity in humans is not available and because of the difficulty in accounting for pre-existing body burdens of lead (US EPA, 2005c). Moreover, an animal-based analysis would overlook the significant body of toxicological literature on human toxicity and blood lead levels (ATSDR, 1999). Thus, animal data on lead toxicity have not been used by the ATSDR (1999), US EPA (2001, 2005c), or other public health agencies to evaluate the potential human non-cancer health effects of lead exposures. Neither ATSDR (1999), nor the US EPA (2005c), nor other authoritative bodies have proposed or developed a lead reference dose or reference concentration based on animal data.

Public health agencies recognize that the primary population, dose measure, and health concern associated with environmental exposures to lead are children, blood lead levels, and neurotoxicity, respectively (e.g., ATSDR, 1999; FL DEP, 2004; NJ DEP, 2004; MN PCA, 1999; US EPA, 2001; WHO, 1996). Young children are especially vulnerable to the toxic effects of lead for at least two reasons:

(1) Increased Exposures Relative to Adults. Children are likely to be exposed to environmental lead in many more ways than are adults (e.g., more hand-to-mouth activity, more contact with dirt, more mouthing/ingestion of non-food items). Children also have greater food, water, and inhalation rates per unit body weights than do adults. In addition, young children absorb a greater percentage of ingested lead than do adults, and might absorb a greater percentage of inhaled lead than do adults (ATSDR, 1999).

(2) Increased Sensitivity Relative to Adults. For many effects, the lead blood levels that cause toxicity in children are lower than the levels that cause effects in adults, and the effects may be

more severe than those in adults (ATSDR, 1999). This suggests that children are more sensitive to the toxic effects of absorbed lead than adults. The toxicological data on the effects of lead on young children support concern for the increased sensitivity of fetuses, neonates, and infants to the toxicological effects of elevated blood lead levels (ATSDR, 1999). Much of the concern over lead exposure in women of child-bearing age stems from concerns that the exposures could lead to elevated blood lead levels in the fetus (US EPA, 2003).

Many environmental guidelines or standards for lead are based on children as the sensitive population (e.g., CA EPA, 1997; Health Canada, 1992; RIVM, 2001; US EPA, 2000a, 2001; WHO, 1996). The derivations of these guidelines, however, are different from the derivation of guidelines for most contaminants. The guidelines are not based directly on a daily intake of lead from one route of exposure (for example, a reference dose for oral intake or a reference concentration for air intake), but are based on a blood lead level. The blood lead level is typically 10 mcg/dL (micrograms of lead per deciliter of blood), which is the Centers for Disease Control and Prevention (CDC) level of concern for blood lead in young children (ATSDR, 1999; CDC, 1991). In most cases, the guidelines are derived so that the blood levels of almost all children exposed at the guideline would be below 10 mcg/dL. This is the approach taken in the derivation of the SCOs for lead (see Section 5.3.4 Chronic Lead SCOs). Thus, toxicity values (reference dose or reference concentration) for the non-cancer effects of lead are not proposed.

Cancer

The National Toxicology Program (NTP, 2005) classifies lead and lead compounds as "reasonably anticipated to be human carcinogens" based on limited evidence from studies in humans and sufficient evidence from studies in experimental animals. Similarly, the International Agency for Research on Cancer (IARC, 2004) classifies inorganic lead compounds as "probably carcinogenic to humans (Group 2A)" based on limited evidence for the carcinogenicity to humans and sufficient evidence for the carcinogenicity to experimental animals.

According to the NTP (2003, 2005) reviews, lead exposure has been associated with increased risks of lung, stomach, and bladder cancer in human populations. The epidemiological evidence is strongest for lung and stomach cancer. The evidence is not conclusive because most of the studies have limitations. These include poor exposure assessment and failure to control for confounders (other factors that could increase the risk of cancer, including lifestyle factors and concurrent occupational exposure to other carcinogens). In addition, they did not demonstrate relationships between the amount of exposure (e.g., concentration or duration) and the magnitude of cancer risk. Thus, the epidemiological data on lead are inadequate to develop cancer toxicity values (i.e., oral cancer potency factor or inhalation unit risk) for lead.

Long-term exposures to soluble (lead acetate and lead subacetate) or insoluble (lead phosphate, lead chromate) inorganic lead compounds have caused cancer in laboratory animals (NTP, 2003, 2005). Kidney tumors were most frequently associated with lead exposure, but tumors of the brain, hematopoietic system, and lung were reported in some studies. However, only two lead compounds (lead acetate and lead subacetate) have caused cancer in animals after oral exposures. Other lead compounds have caused cancer in animals after subcutaneous injection (lead phosphate or lead chromate), subcutaneous injection followed by intraperitoneal injection (lead phosphate), or intramuscular injection (lead chromate). The possibility that the carcinogenicity of lead chromate is caused by exposure to hexavalent chromium (chromate), which is an animal carcinogen, cannot be excluded. Lead naphthenate (dermal exposures), lead carbonate (diet), lead arsenate (diet), lead nitrate (drinking water), and metallic lead, as lead powder) (intramuscular or gavage) did not significantly increase tumor incidences in experimental animals. Studies of the carcinogenicity of inhaled lead were not found.

Only one of the authoritative bodies reviewed, the CA EPA, has derived oral cancer potency factors and inhalation unit risks for inorganic lead compounds (CA EPA, 1992, 1997, 2002, 2004). Most recently, the oral potency factor for lead was restricted to lead acetate, one of the two lead compounds shown to cause cancer via the oral route (CA EPA, 2005). In contrast, the US EPA (2005c) lead database for risk assessment in the Integrated Risk Assessment System, which is the peer-reviewed source for US EPA toxicity values for chemicals, contains the following statement:

> Quantifying lead's cancer risk involves many uncertainties, some of which may be unique to lead. Age, health, nutritional state, body burden, and exposure duration influence the absorption, release, and excretion of lead. In addition, current knowledge of lead pharmacokinetics indicates that an estimate derived by standard procedures would not truly describe the potential risk. Thus, the Carcinogen Assessment Group recommends that a numerical estimate not be used.
>
> Given the problems associated with extrapolating animal data on lead to humans, animal-based oral cancer potency factors and inhalation unit risks for lead are not proposed.

5.1.1.9 Summary

Toxicity values (i.e., reference dose, reference concentration, cancer potency factor, and air unit risk) for evaluating chronic exposures were selected for priority list contaminants (Table 5.1.1-2). These values will be used to derive contaminant-specific SCOs based on chronic toxicity data and chronic exposure scenarios (see Section 5.3 Calculation of Chronic Human Health-based Soil Cleanup Objectives).

Attachment 47

03/16/2020

Public Hearings on Proposal to Add PFAS to Environmental Cleanup Regulations Canceled to Mitigate COVID-19 Spread

Harrisburg, PA – To prevent the possible spread of COVID-19, the Pennsylvania Department of Environmental Protection (DEP) has canceled three public hearings to gather public input on proposed rulemaking that would amend state regulation to establish groundwater and soil cleanup standards for per- and polyfluoroalkyl substances (PFAS) at contaminated properties. The hearings had been advertised in the Pennsylvania Bulletin, but to date, DEP had only received one attendee registration.

Interested individuals are invited to instead submit written comments, suggestions, support, or objections regarding this proposed rulemaking to the board, which must be received by April 30, 2020 11:59 PM. Written comments should be mailed to the Environmental Quality Board, P.O. Box 8477, Harrisburg, PA 17105-8477. Express mail should be sent to the Environmental Quality Board, Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17101-2301. Comments may also be submitted online at http://www.ahs.dep.pa.gov/eComment or via email at RegComments@pa.gov (a subject heading of this proposed rulemaking and a return name and address must be included).

The proposed rulemaking amends Title 25, Chapter 250 (Administration of the Land Recycling Program) of the Pennsylvania Code, which encourages the voluntary cleanup and reuse of contaminated commercial and industrial sites, to add soil and groundwater medium specific concentrations (MSC) for three PFAS compounds – PFBS, PFOS and PFOA. The proposal would use the federal Environmental Protection Agency (EPA) Health Advisory Level of 70 ppt for PFOS and PFOA as groundwater MSCs and would use data and calculations developed by EPA for PFOS and PFOA to calculate soils MSCs.

This proposal was included as a recommendation by the PFAS Action Team, which was established by Governor Tom Wolf through an executive order to comprehensively address this emerging environmental issue. These manmade chemicals, which are resistant to heat, water and oil, persist in the environment and the human body. They can be found in common items like cookware, carpets, fabrics and more, as well as firefighting foams.

The proposed rulemaking also changes the direct contact MSCs for lead in soil at both residential and non-residential properties. As a result of these changes, the residential statewide health standard in soil will decrease from 450 parts per million (ppm) to 420 ppm. The non-residential statewide health standard of 450 ppm will remain unchanged.

Attachment 48

TABLE OF CONTENTS

xi) Signatures

If any portions of the submitted report were prepared or reviewed by or under the responsible charge of a registered professional geologist or engineer, the professional geologist or engineer in charge must sign and seal the report.

2. Statewide Health Standard

a) Introduction

The SHS is established by Sections 301 and 303 of Act 2 (35 P.S. §§ 6026.301 and 6026.303) and includes MSCs that must be attained to achieve the liability protection provided for in the Act. The MSCs are calculated in accordance with the methodologies in § 250.304 through 250.310 of the regulations.

The numerical MSCs are contained in Appendix A to Chapter 250, Tables 1 through 6. Cleanup liability protection provided under Act 2 is contingent upon the attainment of the appropriate MSCs determined using the procedure described in Section II.B.2(c) below.

This guidance presents the procedures to be used in assessing site contamination and demonstrating attainment of the SHS. Use of this guidance and data submission formats should simplify reporting on the site and reduce delays in obtaining final report approval by the Department. This guidance is designed to aid in understanding and meeting the requirements of the SHS under Act 2 and the regulations in Chapter 250. ECB staff in the Regional Office are a valuable resource and will assist as requested in answering questions on the SHS.

Failure to demonstrate attainment of the SHS may result in the Department requiring additional remediation measures to be taken to meet the SHS; or the remediator may elect to attain one of the other standards.

b) Process Checklist for Remediations Under the Statewide Health Standard

☐ Review the historical information and present use of regulated substances at the property.

☐ Begin site investigation/characterization and gather information about the area on and around the property.

☐ Optional: Begin using the completeness list (see LRP webpage) to help verify that all requirements have been met.

☐ Optional: Determine if the property/site is affected by regulated substances not from the property to determine if the background standard may be appropriate. Contact DEP Regional Office for information.

☐ Submit an NIR for the SHS. Also, provide notice to the municipality, publish a notice in a local newspaper, and obtain reasonable proof of submittal for inclusion with the final report. Procedures for submittal of notifications are contained in Section II.A.3 of this manual.

☐ Continue with the site characterization and required activities, including vapor intrusion evaluation (see Section IV of this manual), needed to complete the final report.

☐ Remediate the site to the SHS.

☐ Demonstrate attainment of the SHS. Methods for demonstrating attainment are described in 25 Pa. Code § 250.707(b) and in Section III.B of this manual.

☐ Calculate the mass of contaminants remediated using the procedure in Section III.D of this manual.

☐ Complete the Final Report Summary electronically in accordance with the instructions on the LRP webpage.

☐ Prepare and submit final report, along with the optional completeness list (if used), to the Department. Reporting requirements are established by 25 Pa. Code § 250.312 and are described in Section II.B.2(f) of this manual.

☐ A postremediation care program must be implemented and documented in the final report including the information required by § 250.204(g) of the regulations if: (1) engineering controls are needed to attain or maintain the SHS; (2 institutional controls are needed to maintain the standard; (3) the fate and transport analysis indicates that the remediation standard, including the solubility limitation, may be exceeded at the POC in the future; (4) the remediation relies on natural attenuation; (5) a postremedy use is relied upon but is not implemented to eliminate complete exposure pathways to ecological receptors; or, (6) mitigative measures are used.

☐ Submit an environmental covenant, if applicable, to the Department.

☐ Receive approval of the final report from the Department, if the final report documents that the person has demonstrated compliance with the substantive and procedural requirements of the SHS (which automatically confers the Act 2 liability protection as set forth in Chapter 5 of Act 2).

☐ Except for the special case of a nonuse aquifer standard (See Section II.B.4(c), when the SHS can be maintained without engineering controls operating, document this to the Department and receive approval to terminate the postremediation care program.

c) Selection of MSCs

The appropriate MSC for each regulated substance present at a site is determined for each environmental medium, particularly groundwater and soil. The decision tree in Figure II-11 illustrates the thought process that goes into the selection of the appropriate MSCs for groundwater and soil. If values for the compounds on a given site cannot be found in Tables 1 through 4, please check Table 6: Threshold of Regulation Compounds.

The values shown in the MSC tables are generally rounded to two significant figures. Due to rounding the numeric values for placement in the tables, the remediator is also permitted to round the concentrations reported by the laboratory to two significant figures for comparison to the MSC values.

For example: The chosen MSC value for a certain compound is 2.6 µg/L. If the laboratory reports a result of 2.629 µg/L, the remediator is permitted to round the laboratory's reported value to 2.6 µg/L and thus is able to attain the standard. However, if the laboratory's reported concentration is 2.678 µg/L, rounding to two significant figures results in a concentration of 2.7 µg/L and thus exceeds the MSC and is not able to attain the standard.

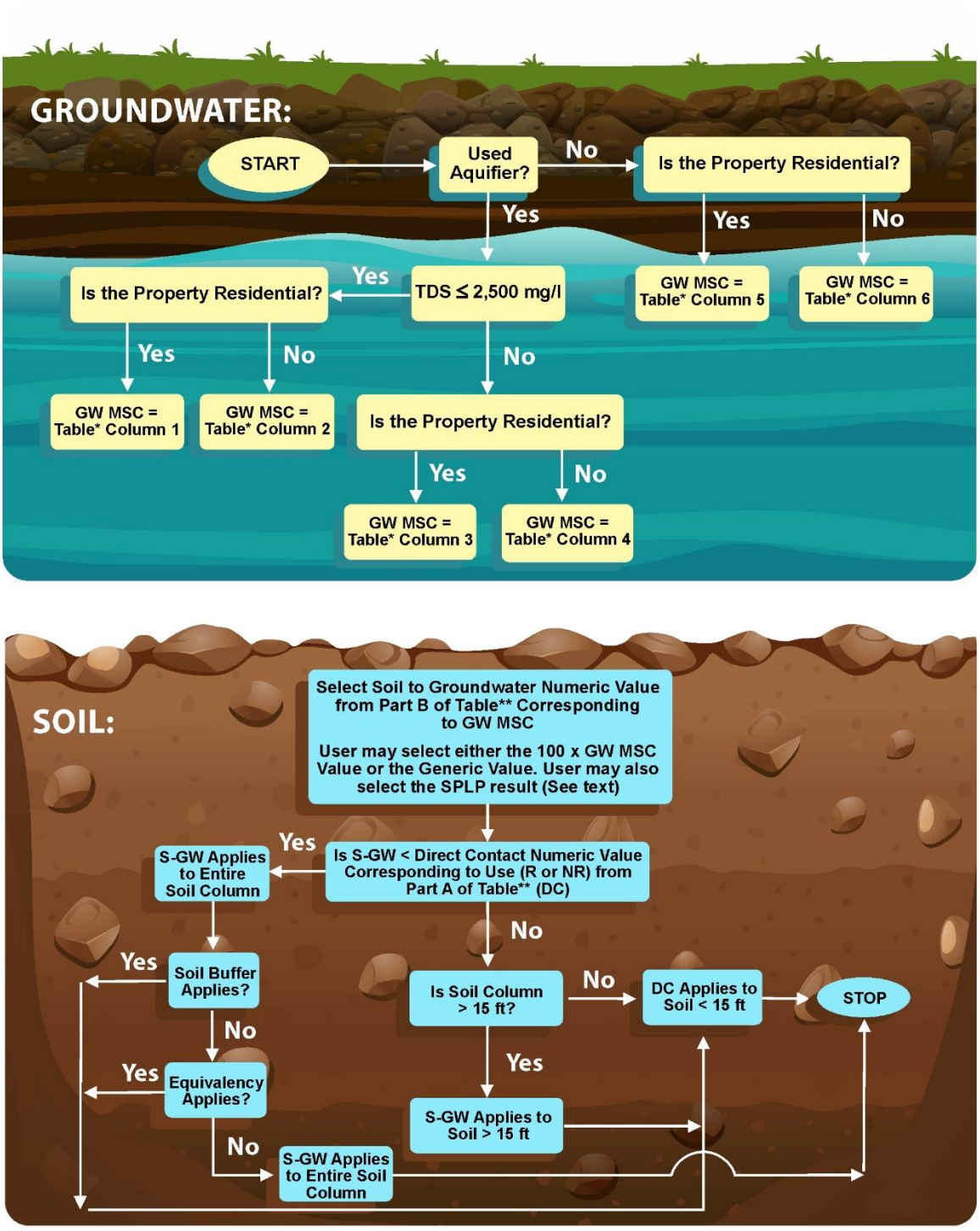
i) Determining Groundwater MSCs

MSCs for regulated substances in groundwater are found in Appendix A to Chapter 250, Table 1 for organic substances, and Table 2 for inorganic substances. To use the tables, the remediator needs to know the use status of the aquifer under the site, the naturally occurring level of Total Dissolved Solids (TDS) in the aquifer, and the land use of the site.

ii) Determining Soil MSCs

In determining the applicable soil standard, the remediator must compare the appropriate soil-to-groundwater numeric value to the direct contact numeric value for the corresponding depth interval within 15 feet from the ground surface. The lower of these two values is the applicable MSC for soil. If either the soil buffer distance (described in 25 Pa. Code § 250.308(b) and (c)) or the equivalency demonstration (described in 25 Pa. Code § 250.308(d)) is met, the soil-to-groundwater numeric value will be deemed to be satisfied, and the soil MSC will be the direct contact numeric value. The soil-to-groundwater numeric value is the MSC for soil at depths below 15 feet, unless either the soil buffer distance or the equivalency demonstration is met. These values are determined in the following manner:

Figure II-11: Decision Tree for Selecting Statewide Health Standard MSCs for Groundwater and Soil



* For Organic Regulated Substances, use Table 1; Use Table 2 for Inorganic Regulated Substances
** For Organic Regulated Substances, use Table 3; Use Table 4 for Inorganic Regulated Substances

Note: Figure must be used in conjunction with the text. Reference Section II.B.2.c)

(a) Choosing the Soil-To-Groundwater Numeric Value

The remediator should begin by determining the appropriate soil-to-groundwater numeric value from Part B of Table 3 for organics or Table 4 for inorganics. The numbers in the table include both the value which is 100 times the appropriate groundwater MSC and the number resulting from application of the soil-to-groundwater equation in the regulations (the "generic value"). The remediator must determine the use status of the aquifer underlying the site, its naturally occurring TDS level, and the land use characteristics of the site. The numeric value may then be selected from the appropriate column on the table and compared to the value for the Synthetic Precipitation Leaching Procedure (SPLP), if appropriate. Since the remediator has the choice of which soil-to-groundwater numeric value to use, the remediator may choose the highest of these three values (i.e., 100x GW MSC, the generic value, or the SPLP result) as the soil-to-groundwater numeric value. The remediator must keep in mind that for periodically saturated soils, the generic value to use in this selection process is one-tenth the value listed in the table (see § 250.308(a)(2)(ii) and (a)(4)(ii) of the regulations). The intent of the one-tenth of the generic numeric value provision in the soil-to-groundwater numeric value calculation is to account for the dilution in contaminant concentrations that occurs in soils that are periodically saturated which does not occur in unsaturated soil. For permanently saturated soils, contamination becomes a groundwater contamination issue as the soil is in constant contact with the groundwater rather than being only periodically saturated.

The value for the SPLP is the concentration of a regulated substance in soil at the site that does not produce a leachate in which the concentration of the regulated substance exceeds the groundwater MSC. Values for the SPLP could not be published in the tables of MSCs in the regulations because this test must be conducted on the actual site soil. The following procedure should be used to determine the alternative soil-to-groundwater value based upon the SPLP:

- During characterization, the remediator should obtain a minimum of ten samples from within the impacted soil area. The four samples with the highest total concentration of the regulated substance should be submitted for SPLP analysis. Samples obtained will be representative of the soil type and horizon impacted by the release of the regulated substance.

- Determine the lowest total concentration (TC) that generates a failing (leachate concentration greater than the

groundwater MSC) SPLP result. The alternative soil-to-groundwater standard will be the next lowest TC.

- If all samples have a passing (leachate concentration less than the groundwater MSC) SPLP result, the alternative soil-to-groundwater standard will be the TC corresponding to the highest SPLP result. The remediator has the option of obtaining additional samples.

- If all samples have a nondetect SPLP result, the alternative soil-to-groundwater standard will be the TC corresponding to the highest concentration of each contaminant. The remediator has the option of obtaining additional samples.

- If none of the samples generates a passing SPLP, the remediator can obtain additional samples and perform concurrent TC/SPLP analyses to satisfy the above requirements for establishing an alternative soil-to-groundwater standard.

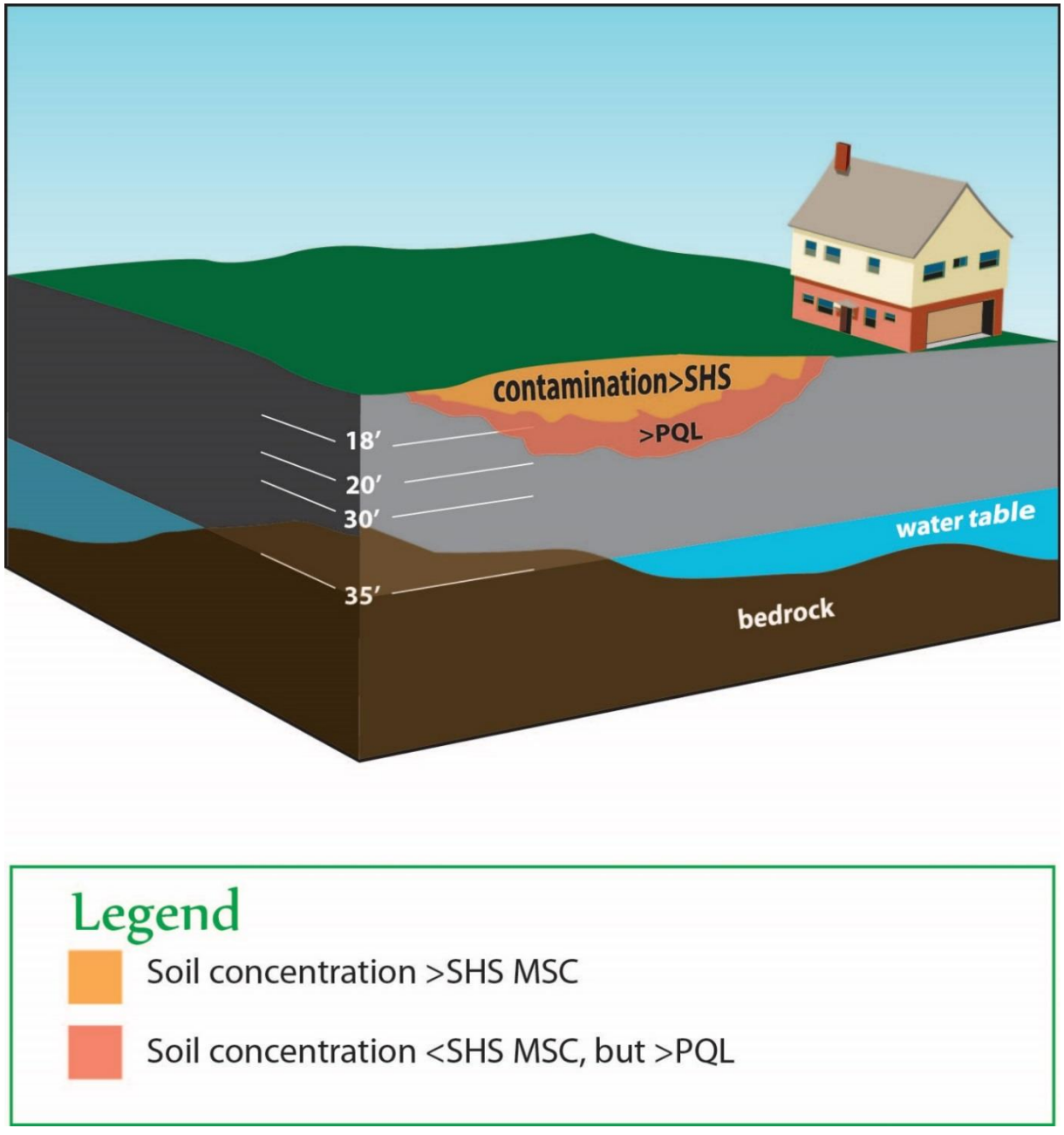
(b) Considering Direct Contact Value in Relation to the Soil-to-Groundwater Value and Soil Depth

The number selected according to the process outlined in Section II.B.3.b.i of this TGM for the soil-to-groundwater pathway numeric value must then be compared to the appropriate residential or nonresidential, surface or subsurface, direct contact numeric value from Part A of Table 3 or Table 4. The lower of the two numbers is the appropriate MSC for the regulated substance. If the soil buffer distance requirements are met or the equivalency demonstration has been made, then the soil-to-groundwater numeric value is deemed to be satisfied and the MSC is the appropriate direct contact numeric value for the regulated substance. The soil buffer approach incorporates fate and transport considerations; therefore, meeting the soil buffer requirements will not require any additional fate and transport analysis.

(c) Selecting Applicable MSCs – Example

The process for selecting the appropriate MSCs for a site is illustrated in Figure II-12. This figure represents the cross section of a nonresidential site with soil contaminated with a petroleum product. The aquifer does not qualify as a nonuse aquifer. The remediator is interested in determining and applying the soil MSCs under the SHS. This example shows the process applied to one of the regulated substances: cumene.

Figure II-12: Application of the MSC Selection Process



Details of the site determined during the site characterization are as follows (see also Figure II-12).

- Soil characterized as contaminated with regulated substances from the petroleum product, including cumene (concentration values > PQL, see Section III.G), is shown and extends to a depth of 20 feet. For this example, the remediator characterized the soil to the level of the PQL, but could have selected any concentration level between the SHS and the PQL, with the appropriate justification.

- Soil contaminated at levels greater than the applicable SHS is shown as a subset of the contaminated area and extends to a depth of 18 feet.

- Samples collected and analyzed according to the methodology in Section II.B.2(c)(ii)(a) established an alternative soil-to-groundwater value of 20 mg/kg.

- SPLP testing of site soil was established at 400 mg/kg.

- Shale bedrock is present at varying depths between 30 and 35 feet.

- The groundwater level is approximately 35 feet, but fluctuates (annual high and low) between 28 to 40 feet and the natural total dissolved solids level in the groundwater is 80 mg/L.

- The vertical distance from the bottom of the contaminated area to groundwater is h = 15 feet.

Scenario #1 - the above conditions apply, and in addition, the results of sample analysis of the groundwater show no values greater than 3,500 μg/L.

Scenario #2 - the above conditions apply, and in addition, free floating product (approximately 1 inch) is found on top of the groundwater level, and the concentration of cumene below the groundwater level is 5,000 μg/L.

The remediator takes the following steps to determine appropriate MSCs for cumene at this site.

Groundwater MSC:

1) For Scenario #1 AND Scenario #2: As a first step, turn to LRP regulations, Chapter 250, Appendix A, Table 1 - Medium-Specific Concentrations (MSCs) for Organic Substances in groundwater. The remediator looks for the row for cumene, under the headings "Used Aquifers," "TDS≤2500 mg/L," "NR" (for Nonresidential). The groundwater MSC is 3,500 μg/L.

Under Scenario #1, the remediator concludes that there is no aquifer area which exceeds the groundwater MSC (3,500 μg/L) and, therefore, no attainment demonstration is needed. Under Scenario #2, the remediator concludes that the aquifer area exceeds the groundwater MSC (3,500 μg/L) and, therefore, attainment demonstration is needed.

Soil MSC:

2) The remediator turns to Chapter 250, Appendix A, Table 3 – Medium-Specific Concentrations (MSCs) for Organic Substances in Soil, Part B, Soil to Groundwater Numeric Values. The remediator looks for the row for cumene, under the Headings "Used Aquifers," "TDS ≤ 2500 mg/L," "Nonresidential." The two values listed are:

- 100x GW MSC – 350 mg/kg
- Generic Value - 2,500 mg/kg

The remediator then looks over to the last column on the right for the soil buffer distance – 15 feet.

3) The remediator assesses the use of numeric soil-to-groundwater values. Three options exist under the regulations (§ 250.308).

- 100x GW MSC – 350 mg/kg
- Generic Value – 2,500 mg/kg
- SPLP value – 400 mg/kg (from analysis of site soil—see site characterization.

Among the three acceptable values, the generic value of 2,500 mg/kg is the highest. The remediator considers using this option, but first wants to see if the site could qualify for the remaining two options for satisfying the soil-to-groundwater numeric value, the soil buffer and groundwater equivalency options.

4) In examining the soil buffer option, the remediator checks to see if the site meets the three regulatory conditions under 25 Pa. Code § 250.308(b), which states:

(b) The soil-to-groundwater pathway soil buffer is the entire area between the bottom of the area of contamination and the groundwater or bedrock and shall meet the following criteria:

(1) The soil depths established in Appendix A, Tables 3B and 4B for each regulated substance.

(2) The concentration of the regulated substance cannot exceed the limit related to the PQL or background throughout the soil buffer.

(3) No karst carbonate formation underlies or is within 100 feet of the perimeter of the contaminated soil area. Karst carbonate formations are limestone or carbonate formations where the formations are greater than 5 feet thick and present at the topmost geologic unit. Areas mapped by the Pennsylvania Geologic Survey as underlain by carbonate formations are considered karst areas unless geologic studies demonstrate the absence of the formations underlying or within 100 feet of the perimeter of the contaminated soil area.

Scenario #1 - The remediator concludes that the site meets the conditions for use of the soil buffer alternative to satisfy the soil-to-groundwater numeric value and, therefore, only the direct contact numeric value applies and becomes the soil MSC for cumene.

Alternatively, the remediator could have considered use of the groundwater equivalency option [§ 250.308(d)], but this includes the condition that he/she monitor the groundwater for 8 quarters prior to submitting the final report. The remediator instead chooses the soil buffer option above.

Scenario #2 - The remediator concludes the site DOES NOT meet the conditions for use of the soil buffer alternative because h=0 since soil contamination extends to the water level and, therefore, there is no depth of clean soil between the bottom of contamination and the groundwater level.

The remediator then checks to see if the site meets the requirements for use of the groundwater equivalency option. (25 Pa. Code § 250.308(d) and Section II.B.6(d) of the Technical Manual). The site does NOT qualify because groundwater is contaminated above SHS and background.

Therefore, the remediator should consider BOTH the soil-to-groundwater numeric value and the direct contact (DC) value.

Chapter 250, Appendix A, Table 3A—Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil, Direct Contact Numeric Values states that the nonresidential numeric value for cumene is:

10,000 mg/kg applied to the 0'-2' zone in soil

10,000 mg/kg applied to the 2'-15' zone in soil.

The remediator chooses the soil-to-groundwater numeric value based on the generic value of 2,500 mg/kg, which applies to the zone(s) of the soil contaminated above this value:

Zone 1—0-18' (see Figure II-12)

Zone 2 – the "smear zone" in the soil column created by groundwater level movement – 28'--40.' Note that this zone also is considered saturated soil under Chapter 250.

Next, the remediator checks to see where each numeric value is applied:

	DC value	Soil-to-GW value	Resulting Soil MSC
Zone 0'-2'	10,000 mg/kg	2,500 mg/kg	2,500 mg/kg
Zone 2'-15'	10,000 mg/kg	2,500 mg/kg	2,500 mg/kg
Zone 15'-18'	NA	2,500 mg/kg	2,500 mg/kg

Zone 28’ to 40’	NA	400 mg/kg	400 mg/kg

Zone 28’ to 40’ is periodically saturated soil. The selection of the applicable soil MSC for this zone must consider the requirement that the published generic value be divided by 10. Therefore, the remediator may choose from the following values:

100x GW MSC	350 mg/kg
Generic Value	250 mg/kg (0.1 x published value)
SPLP Value	400 mg/kg

Therefore, the remediator chooses the SPLP result as the applicable soil MSC.

For both scenarios, analysis of any attainment samples (determined under Section II.B.2(f)(vii) of this manual) would be compared to the appropriate numeric value for the zone in which the sample was taken, and the attainment test (e.g., 75%/10x) would be applied to the sample set as a whole (e.g., the percentage of samples which exceeded the appropriate numeric value must be ≤ 25% and no sample may exceed the appropriate numeric value by more than 10 times [10x]).

d) Nonuse Aquifer Determinations

i) General

Section 250.303 of the regulations provides for options for requesting a nonuse aquifer determination. Anytime a person is proposing an area for nonuse aquifer determination, they must meet the notification requirements of 25 Pa. Code § 250.5, which are described in Section II.A.3, relating to public notice.

- A remediator may request from the Department approval to use alternative MSCs in groundwater at the POC when the aquifer under a site is not used or planned to be used for drinking water or agricultural purposes. This determination is to be requested by the remediator, and the Department’s concurrence must be obtained in writing before the remediation may begin. The notice requirements under the nonuse aquifer request are made separate from those under the NIR. Note that an NIR must be submitted with, or prior to, the nonuse aquifer determination request. Although not required, the Department suggests that this request be submitted in conjunction with an NIR.

Attachment 49

Regulatory Analysis Form

(Completed by Promulgating Agency)

(All Comments submitted on this regulation will appear on IRRC's website)

INDEPENDENT REGULATORY REVIEW COMMISSION

(1) Agency

Environmental Protection

(2) Agency Number:

Identification Number: 7-486

IRRC Number: **3057**

(3) PA Code Cite:

25 *Pa. Code*, Chapter 250

(4) Short Title:

Administration of the Land Recycling Program

(5) Agency Contacts (List Telephone Number and Email Address):

Primary Contact: Laura Edinger, 783-8727, ledinger@pa.gov
Secondary Contact: Patrick McDonnell, 783-8727, pmcdonnell@pa.gov

(6) Type of Rulemaking (check applicable box):

- ☐ Proposed Regulation
- ☒ Final Regulation
- ☐ Final Omitted Regulation
- ☐ Emergency Certification Regulation;
- ☐ Certification by the Governor
- ☐ Certification by the Attorney General

(7) Briefly explain the regulation in clear and nontechnical language. (100 words or less)

The Department of Environmental Protection (DEP)'s Land Recycling Program implements standards for the cleanup of soil and groundwater contamination from releases of various toxic and carcinogenic chemicals. The amendments to the Land Recycling Program regulations will update one of the three cleanup standards for many regulated substances, specifically the Statewide health cleanup standards, correct errors and omissions, and to clarify certain established program policies. Existing regulation requires that every three years DEP evaluate its standards to consider new scientific information and propose changes as necessary to the medium-specific concentrations (MSCs) that are a part of the Statewide health standards.

(8) State the statutory authority for the regulation. Include specific statutory citation.

This rulemaking is being made under the authority of Sections 104(a) and 303(a) of the Land Recycling and Remediation Standards Act (the Land Recycling Act or Act 2) (35 P. S. §§ 6026.104(a) and 6026.303(a)), and Section 1920-A of The Administrative Code of 1929 (71 P.S. § 510-20). Section 104(a) of the Land Recycling Act authorizes the Environmental Quality Board (EQB) to adopt Statewide health standards, appropriate mathematically valid statistical tests to define compliance with the Land Recycling Act and other regulations that may be needed to implement the provisions of the Land Recycling Act. Section 303(a) of the Land Recycling Act authorizes the EQB to promulgate

Statewide health standards for regulated substances for each environmental medium and methods used to calculate the standards. Section 1920-A authorizes the EQB to formulate, adopt and promulgate rules and regulations that are necessary for the proper work of DEP.

(9) Is the regulation mandated by any federal or state law or court order, or federal regulation? Are there any relevant state or federal court decisions? If yes, cite the specific law, case or regulation as well as, any deadlines for action.

Section 303(a) of the Land Recycling Act (35 P.S. § 6026.303(a)) states: "The Environmental Quality Board shall promulgate Statewide health standards for regulated substances for each environmental medium."

25 Pa. Code § 250.11 requires DEP to regularly review new scientific information that relates to the basis of the MSCs and to propose appropriate regulations to the EQB whenever necessary, but not later than 36 months from the effective date of the most recently promulgated regulations.

(10) State why the regulation is needed. Explain the compelling public interest that justifies the regulation. Describe who will benefit from the regulation. Quantify the benefits as completely as possible and approximate the number of people who will benefit.

The elimination of public health and environmental hazards on existing commercial and industrial land across the Commonwealth is vital to its use and reuse as commercial and industrial employment, housing, recreation and open-space areas. The reuse of industrial land is an important component of a sound land-use policy that will help prevent the needless development of prime farmland, open-space areas and natural areas and reduce public costs for installing new water, sewer and highway infrastructure.

The Administration of the Land Recycling Program regulations provide standards used during the cleanup of contaminated sites in Pennsylvania. These standards apply to all releases of regulated substances that are addressed under the Land Recycling Act, the Hazardous Sites Cleanup Act (35 P.S. 6020.101 et seq.), the Solid Waste Management Act (35 P.S. §§ 6018.101 et seq.), the Storage Tank and Spill Prevention Act (35 P.S. §§ 6021.101 et seq.), and the Clean Streams Law (35 P.S. § 691.1 et seq.). Releases of regulated substances not only pose a threat to the environment, but also could affect the health and welfare of the general public if they are inhaled or ingested. With new research being conducted every day, it is necessary that the residents of Pennsylvania be adequately protected with site cleanup requirements based on the most up-to-date information.

Chemical substances that can have toxic, carcinogenic, or esthetic effects as defined under Act 2 and the regulations promulgated thereunder are widespread in use, and potential contamination of soil and groundwater from accidental spills and unlawful disposal can impact almost any citizen of the Commonwealth. Examples of substances that contain toxic, carcinogenic, or esthetic properties include gasoline and petroleum products, solvents, elements used in the manufacture of metals and alloys, pesticides, herbicides, and some dielectric fluids previously contained in transformers and capacitors.

The Land Recycling Act requires the EQB to establish by regulation a uniform Statewide health standard that can be used to eliminate any substantial present or probable future risk to human health, welfare, and the environment. The original standards were promulgated in 1997 and codified in Chapter 250. Section 104(a) of the Land Recycling Act explicitly recognizes that these standards would need to be updated over time as better science became available and as the need for clarification or enhancement of the program became apparent. Updating the standards serves the public, as DEP is able to use the

most up-to-date health and scientific information to establish the cleanup standard for exposure to substances that cause cancer or have other toxic effects on human health or welfare. The Statewide health standard is expressed as a list of MSCs, which apply to either soil or groundwater contamination and to residential and non-residential exposure scenarios as authorized under the Land Recycling Act.

The changes in the MSCs in these amendments to Chapter 250 serve both the public and the regulated community as they provide clear information on what is required at contaminated sites. Having access to that information allows the public to know the acceptable level of contamination at a site based on the intended use of the property, and it provides remediators with a uniform endpoint to the remediation process. Because each site and situation is unique, it is necessary to provide different MSCs for: 1) specific constituents in groundwater at points of compliance, 2) specific constituents in soil, where there may be direct contact through ingestion or inhalation, and 3) specific constituents in soil that may leech into groundwater. Each of these MSCs is based on the physical, toxicological, and esthetic properties of a specific regulated substance, which are based on scientific sources of information.

(11) Are there any provisions that are more stringent than federal standards? If yes, identify the specific provisions and the compelling Pennsylvania interest that demands stronger regulations.

No provisions are more stringent than federal cleanup standards.

(12) How does this regulation compare with those of the other states? How will this affect Pennsylvania's ability to compete with other states?

The Chapter 250 regulations provide a uniform Statewide health standard that is not available in many other states. These states and the federal government require a site-specific risk analysis at every site to establish a numeric value that is used to determine the completion of soil and groundwater cleanup. The Land Recycling Act provides for a generic Statewide health standard that can be used as an efficient way to clean up sites, particularly where small spills and releases contaminate soil. However, the ability to conduct a risk analysis to establish a cleanup value on an individual-site basis is also available through the site-specific cleanup standard under Land Recycling Act, providing an additional option.

The regulations promote and facilitate the remediation and redevelopment of idle and underutilized commercial and industrial sites while protecting the public health, welfare, and the environment. These updates to Chapter 250 will not affect Pennsylvania's ability to compete with other states.

(13) Will the regulation affect any other regulations of the promulgating agency or other state agencies? If yes, explain and provide specific citations.

No.

(14) Describe the communications with and solicitation of input from the public, any advisory council/group, small businesses and groups representing small businesses in the development and drafting of the regulation. List the specific persons and/or groups who were involved. ("Small Business" is defined in Section 3 of the Regulatory Review Act, Act 76 of 2012.)

Members of the Cleanup Standards Scientific Advisory Board (CSSAB) typically have a background in engineering, biology, hydrogeology, statistics, medicine, chemistry, toxicology, or other related scientific disciplines or experience. Some members of the CSSAB represent small businesses and other members work as environment consultants and attorneys and represent small business clients.

The CSSAB reviewed the proposed rulemaking in May and October 2013 and reviewed the draft final rulemaking in December 2014. The draft final rulemaking was supported unanimously at the

CSSAB meeting held on December 17, 2014. The CSSAB supported all aspects of the proposal except that it questioned the groundwater MSC for Methyl Tertiary Butyl Ether (MTBE) which is based on a U.S. Environmental Protection Agency (EPA) published drinking water advisory.

The Storage Tank Advisory Committee (STAC) also reviewed the proposed rulemaking in June and December 2013 and reviewed the draft final rulemaking in March 2015. Members of STAC represent local government, Associated Petroleum Industries of Pennsylvania, the Pennsylvania Petroleum Association, the Petroleum Retailers and Auto Repair Association, the Pennsylvania Chemical Industry Council, Tank Installers of Pennsylvania, the Pennsylvania Environmental Council, a registered professional engineer, a hydrogeologist, and other members of the public. STAC is authorized by the Pennsylvania Tank Act to provide advice to DEP in regulations related to the Storage Tank and Spill Prevention Act. STAC supported the draft final rulemaking, except it questioned the groundwater MSC for MTBE, noting the same issue as the CSSAB.

IRRC requested that the advisory committees' concerns related to the MSCs for MTBE be addressed in the Preamble and the Regulatory Analysis Form of the final regulation. IRRC requested an explanation of how the MTBE standards meet the criteria established in Act 2 and how the MTBE standards adequately protect the public health, safety and welfare. It also requested an explanation of the statutory authority for a non-health-based method for calculating the MTBE MSCs be provided in the final regulation.

In the original Chapter 250 regulations published in the Pennsylvania Bulletin on August 16, 1997, the Board promulgated a groundwater MSC for MTBE of 20 µg/L based on a draft lifetime HAL published by EPA. In subsequent publications of the federal drinking water standards, EPA listed MTBE under a separate table titled "Drinking Water Advisories" with an advisory level of 20 µg/L—the one at which water would either have an odor or taste. The Board decided not to propose a change in the MSC for MTBE because drinking water advisory level reflects no change in the degree of protectiveness from the original draft HAL. EPA continues to indicate it is further evaluating MTBE for a MCL determination.

The Land Recycling Act requires federally or state promulgated groundwater MCLs to be the groundwater MSC. (35 P.S. § 6026.301(c)). Currently six regulated substances have groundwater MSCs that are federally promulgated MCLs that are solely based on secondary effects (aesthetic thresholds, e.g. taste and odor). Since the Land Recycling Act requires the use of MCLs when available, the Act therefore allows for groundwater MSCs to be based on drinking water standards that are not health based, but are aesthetic based. Therefore, the Land Recycling Act provides for groundwater MSCs that are based on taste and odor in addition to being health based. The Department has determined that taste and odor are esthetic values that are important to human welfare.

(15) Identify the types and number of persons, businesses, small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012) and organizations which will be affected by the regulation. How are they affected?

These technical amendments to the Land Recycling regulations can affect property owners of contaminated sites, operators of commercial and industrial facilities where hazardous substances are spilled onto soil or are released into groundwater, and purchasers of historically contaminated brownfield sites that are intended for redevelopment. It can also affect members of the public and the business community that may be threatened with exposure to releases and spills.

The types of businesses affected could include gasoline service stations, fuel distribution facilities, commercial facilities that use toxic or carcinogenic chemicals, commercial or industrial manufacturing operations, and redevelopers of brownfield sites. There are about 12,000 facilities in the Commonwealth that contain regulated underground and above ground storage tanks, including gasoline

stations and fuel distribution and storage facilities. Some of these facilities would include small gasoline station owners. Small businesses would also make up some of the commercial facilities that use toxic or carcinogenic substances. Because of the broad potential reach of this regulation, it is difficult for DEP to identify further specifics on the types and numbers of small businesses that would potentially be affected if they contaminate a property by releasing a regulated substance.

The amendments to the Chapter 250 regulations are not expected to increase costs or provide any significant savings for the regulated community. MSCs have been promulgated for about 390 regulated substances. Under this amendment, the numeric values in the MSC tables changed for about 190 of the substances for groundwater and 270 of the substances for soil. About 10% of the values are being lowered, indicating a more stringent cleanup is required at a site. About 90% of the values are increasing, which may indicate a less stringent cleanup at a site. Values for many commonly encountered regulated substances, including those found in gasoline and in solvents, are either not changing or are slightly increasing.

The cost impact on a given site remediation would depend on the specific regulated substances being remediated and the specific soil and groundwater conditions at the site. For example, a site with a tight clay soil profile may not allow contaminants to spread horizontally or vertically. Therefore, the amount of soil to be excavated in this situation will not significantly change to meet a lower or higher MSC value. However, it is important to note that the site remediator always has the option of using a site-specific cleanup standard.

Most small businesses that DEP can identify as possibly being affected by this regulation are owners of small gasoline stations. These amendments are unlikely to affect these businesses because the majority of the MSC values, including petroleum compounds, are increasing and therefore becoming less stringent. In addition, many of these businesses are required to participate in the Underground Storage Tank Indemnification Fund, which provides insurance coverage for the costs to clean up releases from their tanks, regardless of the MSC value used at the site. Overall, no type of person or business is expected to be adversely affected by the updates to Chapter 250.

Accordingly, the Department believes that there will be little, if any, adverse impact to small businesses.

(16) List the persons, groups or entities, including small businesses that will be required to comply with the regulation. Approximate the number that will be required to comply.

These technical amendments to the Land Recycling regulations will affect owners, operators and purchasers of properties and facilities who volunteer or are required to perform remediation of contaminated sites pursuant to Chapter 250 standards.

The types of businesses that may need to comply with the regulations include gasoline service stations, fuel distribution facilities, commercial facilities that use toxic or carcinogenic chemicals, manufacturing operations, and redevelopers. There are about 12,000 facilities in the Commonwealth that contain regulated underground and aboveground storage tanks, including gasoline stations and fuel distribution and storage facilities. Some of these facilities would include small gasoline station owners. Small businesses would also make up some of the commercial facilities that use toxic or carcinogenic substances. Not all of these facilities have releases or accidental spills that result in a cleanup obligation.

The number of remediation actions completed can vary from year to year. The number of voluntary remediation actions completed each year is usually in the range of 200 - 400. The number of required remediations (mostly regulated storage tank sites) completed each year is usually in the range of 400-600.

These amendments will affect all types of responsible parties, including individual homeowners and small businesses, implementing a remediation under Chapter 250. No type of person or business is expected to be adversely affected by these updates to Chapter 250.

Please also see the response to item (15) above.

(17) Identify the financial, economic and social impact of the regulation on individuals, small businesses, businesses and labor communities and other public and private organizations. Evaluate the benefits expected as a result of the regulation.

The amendments to the Statewide health MSCs reflect some of the latest toxicological data on human health effects when exposed to hazardous and toxic chemicals. This assures potentially affected citizens of the Commonwealth and persons interested in buying and redeveloping contaminated sites that the MSCs are protective of human health and welfare.

The amendments to the Chapter 250 regulations are not expected to increase costs or provide any significant savings for the regulated community. Under these amendments, the numeric values in the MSC tables changed for about 190 of the substances for groundwater and 270 of the substances for soil. About 10% of the values are being lowered, indicating a more stringent cleanup is required at a site. About 90% of the values are increasing, which may indicate a less stringent cleanup at a site. However, values for many commonly encountered regulated substances, including those found in gasoline and in solvents, are either not changing or are slightly increasing.

Persons conducting remediation under the Land Recycling Act can choose from three different cleanup standards: background, Statewide health or site-specific. Updating Statewide health standard MSCs will not limit cleanup options available to remediators under other cleanup standards.

The Department believes that there will be little if any adverse impact to small businesses.

(18) Explain how the benefits of the regulation outweigh any cost and adverse effects.

The amendments to the Statewide health MSCs reflect the latest toxicological data on human health effects when exposed to hazardous and toxic chemicals. This assures potentially affected citizens of the Commonwealth and persons interested in buying and redeveloping contaminated sites that the MSCs are protective of human health and welfare.

The Department believes that there will be little if any adverse effects from this regulation. Please also see the response to item (15) above.

(19) Provide a specific estimate of the costs and/or savings to the **regulated community** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

The amendments to the Chapter 250 regulations are not expected to increase costs or provide any significant savings for the regulated community. Please also see the response to item (15) above.

(20) Provide a specific estimate of the costs and/or savings to the **local governments** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

The amendments are not expected to increase or decrease costs or savings for local governments. In some cases local governments are remediators; however, as with all other types of remediators, the regulation is not expected to increase or decrease costs. Please also see the response to item (15) above.

(21) Provide a specific estimate of the costs and/or savings to the **state government** associated with the implementation of the regulation, including any legal, accounting, or consulting procedures which may be required. Explain how the dollar estimates were derived.

The amendments are not expected to impact costs or savings for state government agencies. In some cases state government agencies are remediators; however, as with all other types of remediators, the regulation is not expected to increase costs or result in significant savings. Please also see the response to item (15) above.

(22) For each of the groups and entities identified in items (19)-(21) above, submit a statement of legal, accounting or consulting procedures and additional reporting, recordkeeping or other paperwork, including copies of forms or reports, which will be required for implementation of the regulation and an explanation of measures which have been taken to minimize these requirements.

The amendments to Chapter 250 will not require any additional recordkeeping or paperwork.

(23) In the table below, provide an estimate of the fiscal savings and costs associated with implementation and compliance for the regulated community, local government, and state government for the current year and five subsequent years.

This amendment is not expected to impact costs or savings

	Current FY Year	FY +1 Year	FY +2 Year	FY +3 Year	FY +4 Year	FY +5 Year
SAVINGS:	**$**	**$**	**$**	**$**	**$**	**$**
Regulated Community	$0	$0	$0	$0	$0	$0
Local Government	$0	$0	$0	$0	$0	$0
State Government	$0	$0	$0	$0	$0	$0
Total Savings	$0	$0	$0	$0	$0	$0
COSTS:	$0	$0	$0	$0	$0	$0
Regulated Community	$0	$0	$0	$0	$0	$0
Local Government	$0	$0	$0	$0	$0	$0
State Government	$0	$0	$0	$0	$0	$0
Total Costs	$0	$0	$0	$0	$0	$0

REVENUE LOSSES:	$0	$0	$0	$0	$0	$0
Regulated Community	$0	$0	$0	$0	$0	$0
Local Government	$0	$0	$0	$0	$0	$0
State Government	$0	$0	$0	$0	$0	$0
Total Revenue Losses	$0	$0	$0	$0	$0	$0

(23a) Provide the past three year expenditure history for programs affected by the regulation.

Program	FY 3 2012-13	FY 2 2013-14	FY 1 2014-15	Current FY 2015-16
Environmental Protection Operations	$74,547,000	$75,184,000	$84,438,000	$87,172,000
Environmental Program Management	$24,965,000	$25,733,000	$28,517,000	$28,277,000
Industrial Land Recycling Fund	$189,000	$66,000	$212,000	$300,000
Hazardous Site Cleanup Fund	$23,000,000	$21,708,000	$18,546,000	$27,000,000
Storage Tank Fund	$5,842,000	$6,526,000	$6,883,000	$7,161,000

(24) For any regulation that may have an adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), provide an economic impact statement that includes the following:

(a) An identification and estimate of the number of small businesses subject to the regulation.

Please see the response to item (15) above. The types of businesses affected could include gasoline service stations, fuel distribution facilities, commercial facilities that use toxic or carcinogenic chemicals, manufacturing and industrial operations, and redevelopers. There are about 12,000 facilities in the Commonwealth that contain regulated underground and aboveground storage tanks, including gasoline stations and fuel distribution and storage facilities. Some of these facilities would include small gasoline station owners. Small businesses would also make up some of the commercial facilities that use toxic or carcinogenic substances. Due to the broad potential reach of this regulation, it is difficult for DEP to identify further specifics on the type and number of small businesses that would potentially be affected if they contaminate a property by releasing a regulated substance.

(b) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed regulation, including the type of professional skills necessary for preparation of the report or record.

The amendments to the Chapter 250 regulations do not add any new procedures, recordkeeping or compliance efforts.

(c) A statement of probable effect on impacted small businesses.

The amendments to the Chapter 250 regulations are not expected to increase costs or provide any significant savings for small businesses. MSCs have been promulgated for 390 regulated substances. Under this amendment, the numeric values in the MSC tables changed for about 190 of the substances for groundwater and 270 of the substances for soil. About 10% of the values are being lowered, indicating a more stringent cleanup is required at a site. About 90% of the values are increasing, which may indicate a less stringent cleanup at a site. However, values for many commonly encountered regulated substances, including those found in gasoline and in solvents, are either not changing or are slightly increasing. The cost impact on a given site remediation would depend on the specific regulated substances being remediated and the specific soil and groundwater conditions at the site. For example, a site with a tight clay soil profile may not allow contaminants to spread horizontally or vertically. Therefore, the amount of soil to be excavated in this situation will not significantly change to meet a lower or a higher MSC value.

Most small businesses DEP can readily identify that are impacted by these revisions will be owners of small gasoline stations. The amendments are unlikely to negatively affect these businesses because the majority of the MSC values, including petroleum compounds, are increasing and therefore becoming less stringent. In addition, many of these businesses are required to participate in the Underground Storage Tank Indemnification Fund, which provides insurance coverage for the costs to clean up releases from the storage tanks, regardless of the MSC value used at a site.

Small businesses that handle hazardous substances can use pollution prevention techniques available through various assistance programs to prevent spills that would result in contamination of soil and groundwater. In addition, background and site-specific cleanup standards are available and not affected by the updates to the Statewide health MSCs.

Small businesses may be eligible for brownfield financial assistance programs when they are not responsible for the soil and groundwater contamination.

(d) A description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation.

The Department believes that there will be little, if any, adverse effects from this regulation. The Department is unaware of any less intrusive or less costly alternative methods of achieving the purpose of the regulation, which is to update various MSCs based on current scientific information. Background and site-specific cleanup standards are available and not affected by the updates to the Statewide health MSCs.

(25) List any special provisions which have been developed to meet the particular needs of affected groups or persons including, but not limited to, minorities, the elderly, small businesses, and farmers.

The amendments to Chapter 250 do not include special provisions developed to meet the needs of any groups listed because they are not expected to adversely affect any listed group. Please see the responses to items (15), (17) and (24) above.

(26) Include a description of any alternative regulatory provisions which have been considered and rejected and a statement that the least burdensome acceptable alternative has been selected.

The Land Recycling Act and the Chapter 250 regulations require the periodic update of the Statewide health standard. Background and site-specific cleanup standards are available and are not affected by these updates to the Statewide health MSCs.

(27) In conducting a regulatory flexibility analysis, explain whether regulatory methods were considered that will minimize any adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), including:

a) The establishment of less stringent compliance or reporting requirements for small businesses;

b) The establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses;

c) The consolidation or simplification of compliance or reporting requirements for small businesses;

d) The establishment of performing standards for small businesses to replace design or operational standards required in the regulation; and

e) The exemption of small businesses from all or any part of the requirements contained in the regulation.

The amendments are not expected to have any adverse impact on small businesses; therefore, no regulatory methods were considered to minimize any adverse impact on small businesses. Background and site-specific cleanup standards are available and are not affected by the updates to the Statewide health MSCs.

(28) If data is the basis for this regulation, please provide a description of the data; explain in detail how the data was obtained, and how it meets the acceptability standard for empirical, replicable and testable data that is supported by documentation, statistics, reports, studies or research. Please submit data or supporting materials with the regulatory package. If the material exceeds 50 pages, please provide it in a searchable electronic format or provide a list of citations and internet links that, where possible, can be accessed in a searchable format in lieu of the actual material. If other data was considered but not used, please explain why that data was determined not to be acceptable.

Section 303 of the Land Recycling Act (35 P. S. §§ 6026.303) and the 25 Pa. Code 250.11 require the periodic update of the Statewide health standard which are based on nationally recognized, peer-reviewed toxicological data, including cancer slope and unit risk factors, reference dose values, and reference concentrations published under the Integrated Risk Information System (IRIS), the National Center for Environmental Assessment, Provisional Peer-Reviewed Toxicity Values (PPRTV), the Health Effects Assessment Summary Tables, Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profiles, and California EPA Cancer Potency Factors and Chronic Reference Exposure Levels.

This information is extensively published by the United States Environmental Protection Agency (www.epa.gov) and the United States Centers for Disease Control (www.cdc.gov) and is used by all state environmental and health departments in the country for conducting risk assessments for potential exposure to contaminants in soil and groundwater.

(29) Include a schedule for review of the regulation including:

A. The date by which the agency must receive public comments:	June 17, 2014
B. The date or dates on which public meetings or hearings will be held:	N/A
C. The expected date of promulgation of the proposed regulation as a final-form regulation:	Quarter 2, 2016
D. The expected effective date of the final-form regulation:	Quarter 2, 2016
E. The date by which compliance with the final-form regulation will be required:	Quarter 2, 2016
F. The date by which required permits, licenses or other approvals must be obtained:	N/A

(30) Describe the plan developed for evaluating the continuing effectiveness of the regulations after its implementation.

DEP evaluates the effectiveness of the Land Recycling Program and the Chapter 250 regulations on an ongoing basis. The efforts include ongoing tracking of remediation actions completed under the program and preparation of an annual program report. When these amendments become effective, DEP will be required to review the MSCs and update them, if necessary, within three years.

Attachment 50

Cleanup Standards Scientific Advisory Board Members

Membership List (Updated June 2018)

Secretary Appointments (5)

Annette Guiseppi-Elie, Ph.D., FAIMBE Associate Director for Exposure Science National Exposure Research Laboratory Office of Research and Development US Environmental Protection Agency 109 T.W. Alexander Drive, MD305-01 Research Triangle Park, NC 27711 Phone: 919.541.4986 Email: Guiseppi-Elie.Annette@epa.gov (mailto:Guiseppi-Elie.Annette@epa.gov)

Term Expires: 05/31/23

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Term Expires: 05/31/23

Michael M. Meloy, Esq. Partner Manko, Gold, Katcher & Fox LLP 401 City Avenue, Suite 901 Bala Cynwyd, PA 19004 Phone: 484.430.2303 Email: mmeloy@mankogold.com (mailto:mmeloy@mankogold.com)

Term Expires: 05/31/23

Bylaws	(https://www.dep.pa.gov/PublicParticipation/AdvisoryCommittees/Cleanup%20and%20Brownfields%20Advisory%20Committees/CSSABoard/Pages/Bylaws.aspx)
Meeting Dates	(https://www.dep.pa.gov/PublicParticipation/AdvisoryCommittees/Cleanup%20and%20Brownfields%20Advisory%20Committees/CSSABoard/Pages/Meeting-Dates.aspx)
Members	(https://www.dep.pa.gov/PublicParticipation/AdvisoryCommittees/Cleanup%20and%20Brownfields%20Advisory%20Committees/CSSABoard/Pages/Public-Participation.aspx)
Agendas and Handouts	(https://www.dep.pa.gov/PublicParticipation/AdvisoryCommittees/Cleanup%20and%20Brownfields%20Advisory%20Committees/CSSABoard/Pages/Agendas-and-Handouts.aspx)

Joel Bolstein, Esq. Partner Fox Rothschild LLP 2700 Kelly Road, Suite 300 Warrington, PA 18976-3624 Phone: 215.918.3555 Email: jbolstein@foxrothschild.com (mailto:jbolstein@foxrothschild.com) Term Expires: 05/31/23

M. Colleen Costello, P.G. Senior Vice PresidentSanborn Head & Associates, Inc. 500 W. Office Center Dr. Suite 400Fort Washington, PA 19034Phone: 610.984.1712 Email: ccostello@sanbornhead.com (mailto:ccostello@sanbornhead.com) Term Expires: 05/31/23

Senate Pro Tem Appointments (2)

Tina M. Serafini, D.Sc. Email: drserafini@yahoo.com (mailto:drserafini@yahoo.com) Term Expires: 09/08/19

Donald R. Wagner, Esq., P.G. Stevens & Lee 111 North Sixth St P.O. Box 679 Reading, PA 19603-5610 Phone: 610.478.2216 Email: drw@stevenslee.com (mailto:drw@stevenslee.com) Term Expires: 04/13/20

Senate Minority Appointments (2)

Mark R. Urbassik, P.E. Founding Principal KU Resources, Inc. 22 South Linden Street Duquesne, PA 15110 Phone: 412.469.9331 x13 murbassik@kuresources.com Email: (mailto:murbassik@kuresources.com) Term Expires: 07/30/16

VACANT

House Speaker Appointments (2)

James M. Connor, PG, LSRP Vice PresidentAEI Consultants20 Gibson Place, Suite 310Freehold, New Jersey 07728Phone: 732.414.2720 x1431 Email: jconnor@aeiconsultants.com (mailto:jconnor@aeiconsultants.com) Term Expires: 05/17/20

Mark T. Smith, P.G. Principal Geologist Element Environmental Solutions 61 Willow Street P.O. Box 921 Adamstown, PA 19501 Mark@e2s.us Phone: 717.484.5111 Email: (mailto:Mark@e2s.us) Term Expires: 04/12/23

House Minority Appointments (2)

VACANT

Charles D. Campbell Chairman of CSSAB Senior Project Manager/Risk Assessor Leidos, Inc. 6310 Allentown, Blvd., Suite 110 Harrisburg, PA 17112 Phone: 717.901.8830 Fax: 717.901.8101 Email: CHARLES.D.CAMPBELL@leidos.com (mailto:CHARLES.D.CAMPBELL@leidos.com) Term Expires: 12/07/2013

Attachment 51

Colleen Costello

Senior Vice President at Sanborn, Head & Associates, Inc.

Greater Philadelphia Area · 500+ connections

Sanborn, Head & Associates, Inc.

Lehigh University

About

A highly experienced environmental professional with 30 years of experience managing environmental issues across multiple industries (energy, petro-chemical, oil and gas, utility, aerospace and manufacturing). Outstanding interpersonal and communication skills along with a proven track record of providing creative business solutions based on innovative strategic approaches, technical expertise and strong team-building skills.

Selected by the EPA to help streamline the RCRA Program through the RCRA FIRST initiative and an active member on the ITRC's Remediation of Complex Sites workgroup. Member of PADEP Science Advisory Board. Member of OXY's Innovative Solutions Team.

Specific Experience in Superfund, RCRA, Brownfields, State Programs, Environmental Remediation, MNA, GW Modeling, F&T Modeling, VI Assessments, Environmental Due Diligence

Activity

With an aim to decrease the impact of COVID-19, our R&D teams are working in collaboration with government and academia to identify monoclonal...

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We've partnered with some leading labs and tech companies develop and improve remedial technologies for emerging...

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Check out this job: Senior Environmental Geologist / Scientis

Experience

Senior Vice President
Sanborn, Head & Associates, Inc.
Mar 2020 – Present · 2 months
Philadelphia, Pennsylvania, United States

Principal/Vice President
GHD
Mar 2015 – Mar 2020 · 5 years 1 month
North Wales, Pennsylvania, United States
Client Relationship Manager, Leader of the North American Contaminated Assessment and Remediation Sector and Project Director for Environmental Projects and Clients.

Director of Special Projects
Oxy
Jul 2013 – Mar 2015 · 1 year 9 months
Greater Philadelphia Area
Director of Special Projects for Glenn Springs Holdings, Inc a subsidiary of Occidential Petroleum.

Senior Principal
LANGAN
Jul 1995 – Jun 2013 · 18 years
Lead an environmental practice group, serve on executive committee, account management, strategic consulting, H&S committee, regulatory and technical strategies and negotiations.

Scientist
U.S. Geological Survey (USGS)
Sep 1993 – Jul 1995 · 1 year 11 months

Education

Lehigh University
Master of Science (MS) · Geology-geochemistry
1993 – 1995

Lehigh University
Bachelor of Science (BS) · Environmental Science
1986 – 1990

Groups

In Situ Groundwater Remediation Technology

Chief Executive Officer (TGL)

Lehigh University Alumni

Arsenic Geochemistry Group

Campaign To Block ANONYMOUS Browsers

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Technical Director of Chemistry and Chief Executive Officer at Environmental Standards Inc /\

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Eric Schleicher
Sr. Project Manager/Hydrogeologist at GHD

David Grupp
Senior National Client Manager - Environmental Due Diligence

Sean Ragain
Principal Geologist / V.P. at Geosyntec, Inc.

Rachel McCaffery, P.E.
Northeast Region Operations Leader at GHD

John Garges
Vice President at GHD

Catherine Stott
Senior Environmental Engineer and Project Manager at Burns & McDonnell

Others named **Colleen Costello**

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CEO & Co-Founder at Vital Vio, Inc. I Forbes & Inc. 30 Under 30
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Colleen Costello
Marketing Senior Associate at Grant Thornton LLP
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Client Relationship Specialist at The Madison Square Garden Company
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Colleen Costello
Senior Vice President at Sanborn, Head & Associates, Inc.

Senior Vice President at Sanborn, Head & Associates, Inc.

Lehigh University

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Attachment 52

Remedial Investigation Report

AOI 6
Girard Point Refinery
3144 Passyunk Avenue
Philadelphia Energy Solutions Complex
Philadelphia, Pennsylvania

PADEP PF ID: 769099
EPA ID: PAD 049791098

Colleen Costello, PG.
Pennsylvania Licensed Geologist No. PG-003736-G

GHD | 1140 Welsh Road Suite 120 North Wales Pennsylvania 19454

11109613 | 10 | Report No 2 | November 21, 2017

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1. Introduction

This Remedial Investigation (RI) Report (RIR) has been prepared for Area of Interest (AOI) 6, also known as Girard Point Chemicals Processing Area, at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) Philadelphia Refining Complex (facility). Sunoco Inc. (R&M) (Sunoco) transferred the facility to PES on September 8, 2012. Sunoco retained the remediation liability prior to this date. The remediation liability was transferred to Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) on December 30, 2013. The remediation program is currently being performed under a Buyer Seller Agreement signed by Sunoco, PES, and the Pennsylvania Department of Environmental Protection (PADEP) in September 2012.

Site remediation at the facility is ongoing as part of previously-established programs and the 2012 Buyer Seller Agreement. The facility has operated, and is planning to continue operating, as an oil refinery, marketing terminal, and petrochemical complex.

1.1 Facility Description

The facility is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. Portions of the facility occupy both the eastern and western Schuylkill River banks. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. The area surrounding the property is characterized by a mixture of residential, commercial, and industrial properties. Current operations at the facility consist of the production of basic petrochemicals for the chemical industry.

AOI 6, also known as the Girard Point Chemicals Processing Area, encompasses approximately 100 acres and is located on the east side of the Schuylkill River. AOI 6 is a wedge-shaped property bordered by Lanier Avenue/AOI 3 to the east, Penrose Avenue (Route 291)/Platt Memorial Bridge/AOI 5 to the south and Pennypacker Avenue/AOI 7 to the north (Figures 1 and 2). The entire western boundary of AOI 6 along the Schuylkill River is bound by a sheet pile wall. The extent of the sheet pile wall (“bulkhead”) is shown on Figure 2.

1.2 Facility Operational History and Current Use

The facility has a long history of petroleum transportation, storage, and processing. The oldest portion of the facility started petroleum related activities in the 1860s, when the Atlantic Refining Company was established as an oil distribution center. In the 1900s, crude oil processing began and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals, such as acids and ammonia, were also produced at the facility for a time. The facility has operated continuously as a refining, product distribution, and storage facility. Use of the facility has remained similar following the transfer of ownership to PES.

Historically, AOI 6 consisted of numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area.

Currently, AOI 6 consists of Udex and cumene units, reformer with associated naphtha hydrotreater, diesel hydrotreater, tankage, boiler house and associated feed water treatment, maintenance buildings, lay-down yards, control rooms, office buildings, the # 2 oil-water separator, remote Laboratory and new Scale House. On October 13, 2017, an updated building survey for AOI 6 was completed. During this survey 16 structures were identified as routinely occupied or potentially occupied. These buildings included: Building 6636, 24 Gate Building 295, Lab/Bottle Washing Building 163, Girard Point Training Building 651, Girard Point Main Office Building 650, Capital Projects Tank Group Trailers, Control Room 739, Trade Shops 178, Carpenter Shop 726, North Tank Field Blockhouse 475, WTP Control Room 745, Control Room 6627, Control Room south of Boiler House #3, Former Locker House associated with former Boiler House #2, and Office near Separator. The characteristics of several of these buildings, refinery lab/bottle washing, Capital project tank group trailers, control room south of Boiler House #3 and former Locker House near former Boiler House #2/Process Building were such that vapor intrusion is not considered a complete pathway as is further discussed in Section 7.1. The building-specific conditions are as follows:

- Refinery Lab/Bottle Washing Building 163 – broken windows visible throughout that allows outdoor air flow
- Capital Projects Tank Group Trailers – elevated trailers with perforated soffit-style skirt that allows outdoor air flow
- Control Room south of Boiler House #3 – elevated without a skirt
- Former Locker House near former Boiler House #2/Process Building – locked and inaccessible, not occupied
- Office near Separator – blast resistant building sitting on ground and fork truck holes at the surface (to facilitate relocation)
- Paint Shop Building 701 – accessible but unoccupied
- Insulation Building 265 – unoccupied building used for storage

There are two leaded tank bottom SWMUs (SWMU Nos. 92 and 95) located in AOI 6 (Figure 2) that were addressed in several previous Resource Conservation and Recovery Act (RCRA) investigations as part of the United States Environmental Protection Agency (USEPA) Corrective Action process and during the Act 2 site characterization activities.

The 27 Pump House Total Fluids Recovery System was installed in November 2001, the system included 12 total fluid recovery wells in the vicinity of the former 27 Pump House. The 27 Pump House Total Fluids Recovery system was turned off September 20, 2010 due to absence of recoverable LNAPL. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. Based on limited recoverable LNAPL in the proximal wells, passive remediation was discontinued on January 26, 2015. Groundwater gauging of select monitoring wells in AOI 6 occurs on an annual basis during the second quarter of each year by Stantec Consulting Corporation (Stantec). Annual gauging activities and results are reported to the PADEP and EPA in Quarterly Reports prepared by Evergreen.

1.3 Regulatory History/Overview

Sunoco and the PADEP entered into a Consent Order & Agreement (CO&A) in December 2003 with respect to the facility. Sunoco's Phase I Remedial Plan (Phase I Plan), dated November 2003, was included as an attachment to the CO&A. In accordance with the CO&A and Phase I Plan, a Current Conditions Report and Comprehensive Remedial Plan (CCR) was prepared by Sunoco in June 2004. The Phase I Plan and the CCR divided the facility into 11 AOIs, and presented a prioritization of the AOIs based on specific risk factors. The CCR also presented the Phase II remedial approach and schedule to characterize each of the 11 AOIs, and to conduct Phase I and II corrective action activities in accordance with the 2003 CO&A and the Phase I Plan. Since 2003, Sunoco has performed site characterization activities at all 11 AOIs in accordance with the 2003 CO&A. Sunoco has prepared and submitted a corresponding Site Characterization Report (SCR) for each AOI in accordance with the Revised Phase II Corrective Action Activities schedule that was included in the CCR.

In October 2006, Sunoco submitted a notice of intent to remediate (NIR) to the PADEP for the facility, entering the facility into the Act 2 program. This NIR was later updated and submitted to the PADEP in November 2014 in order to revise the ownership identity to PES and the remediator identity to Evergreen. In November 2011, the facility was formally entered into the PA One Cleanup Program with the USEPA Region III and PADEP. In November 2011, Sunoco submitted a revised Work Plan for Sitewide Approach under the One Cleanup Program (Work Plan for Sitewide Approach). As previously discussed, characterization and remediation work at the facility is currently being performed under the September 2012 Buyer Seller Agreement signed by Sunoco, PES, and the PADEP.

The following provides a timeline of major events and submissions for the facility and AOI 6:

2004

- The PADEP and USEPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or One-Cleanup Program)," which clarifies how sites remediated under Pennsylvania's Voluntary Cleanup Program may satisfy RCRA corrective action requirements through characterization and attainment of remediation standards established under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2).
- Langan prepared the CCR for the Philadelphia Refinery and the Sunoco Logistics Belmont Terminal.

2005

- PADEP, USEPA, and Sunoco agreed that the One Cleanup Program would benefit the project by merging the remediation obligations under the various programs into one streamlined approach which would be conducted under the existing 2003 CO&A.

2006

- Sunoco submitted an NIR to the PADEP for the Philadelphia Refinery thereby entering the facility into the Act 2 program.

- A Site Characterization Work Plan (Work Plan) for AOI 6 was submitted in February 2006 to the PADEP and the Environmental Protection Agency (EPA). This Work Plan summarized proposed activities to be completed to characterize AOI 6 in accordance with the objectives of the 2004 CCR.
- The Work Plan was implemented between March and June 2006 and the results were summarized in the Site Characterization Report that was submitted to PADEP and EPA in September 2006.

2011

- On November 8, 2011, the USEPA provided an acknowledgment letter to Sunoco formally accepting the Sunoco Facility into the One Cleanup Program.
- Sunoco submitted the Work Plan for Site Wide Approach to document the site-wide remedial approach extending beyond the requirements of the 2003 CO&A. The PADEP and USEPA reviewed and provided input to this report. Sunoco submitted a letter of commitment stating the facility would be remediated according to the Work Plan for Site Wide Approach.

2012

- Sunoco transferred the facility to PES.
- Sunoco, PES, and PADEP signed the Buyer-Seller Agreement that established the environmental remediation and management obligations of Sunoco and PES following the sale of the facility.

2013

- The legacy remediation liability for environmental impacts existing prior to the conveyance of the facility to PES was transferred from Sunoco to Evergreen.
- Sunoco prepared and submitted a SCR/RIR in September 2013 to formerly satisfy the requirements Act 2. This SCR/RIR describe site characterization work included in the 2006 AOI 6 SCR, as well site characterization work completed in 2012 to supplement the 2006 work.
- The PADEP provided Evergreen comments on the 2013 SCR/RIR.

2014

- Evergreen submitted an updated NIR to the PADEP for the facility.

2015

- Langan, on behalf of Evergreen, submitted a Human Health Risk Assessment (HHRA) Report to establish a site-specific standard (SSS) for lead in soil at the facility, the Sunoco Logistics Belmont Terminal, and the Sunoco Partners Marcus Hook Industrial Complex (Langan, 2015).
- The HHRA was approved by the PADEP in a letter dated May 6, 2015 establishing a SSS of 2,240 milligrams per kilogram (mg/kg) for lead in soil.

On February 19, 2016 the PADEP, Evergreen, Aquaterra and GHD met to discuss the Work Plan. The PADEP provided comments to the Work Plan via email on February 25, 2016. In accordance with the Work Plan for Site Wide Approach, Evergreen is submitting this RIR for AOI 6 to formally

satisfy the requirements of Act 2 as specified in 25 PA Code §250.408. This RIR describes site characterization work conducted following the last submittal (2013 SCR/RIR). Activities that have been performed in order to complete characterization as required by an RIR under Act 2 include:

- Additional characterization of surface soil (0 to 2 feet below ground surface [ft. bgs] interval) and subsurface soil (2 to 15 ft. bgs) including targeted soil investigations in potential contaminant source areas, such as historic product handling and storage locations, open storage tank incident areas, and known product releases.
- Horizontal and vertical delineation of impacts in soils.
- Additional soil sampling in areas with light non-aqueous phase liquid (LNAPL).
- Additional groundwater sampling from monitoring wells not containing light non-aqueous phase liquid LNAPL.
- Collection of groundwater samples beneath LNAPL samples.
- Delineation of LNAPL.
- Evaluation of LNAPL mobility.
- Investigation of the potential vapor intrusion to indoor air pathway at occupied buildings.
- Collection of air samples above LNAPL plumes.
- Qualitative evaluation of contaminant fate and transport.

As discussed with the PADEP, Stantec, and Evergreen during a meeting conducted in September 2015, Evergreen is in the process of developing a site-wide MODFLOW model to perform quantitative fate and transport modeling. Evergreen also intends to submit a site-wide human health risk assessment report. Following the approval of these site-wide reports and other RIRs, Evergreen intends to submit a site-wide Cleanup Plan, pursuant to 25 PA Code §250.410, which will present remedies chosen to allow attainment of the selected remediation standards in soil and groundwater.

In accordance with Act 2, the required public and municipal notices for this report have been prepared and issued. Appendix A includes a copy of the original facility NIR, the updated facility NIR, as well as the report notices and their proof of receipt/publication.

1.4 Selection of Constituents of Concern

A list of the constituents of concern (COCs) in soil and groundwater for AOI 6 is included as Table 1. This list is an updated listing of the compounds identified in the Work Plan as the COCs for the facility under Pennsylvania One Cleanup Program and will be referred to as the petroleum short list. This list includes all current constituents from the Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E of PADEP's Closure Requirements for Underground Storage Tank Systems, with the exception of the waste oil parameters. In May 2009, two additional COCs, 1,2,4- trimethylbenzene (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP. The COC listing for groundwater was also revised in 2012 to follow the soil COC listing. The additional

compounds added to the groundwater COC list included anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, and benzo(b)fluoranthene.

No additional compounds were added to Evergreen short list during the 2016 sampling events, but pH was added to the analyses for samples collected in the vicinity of a former tank (Tank 81).

1.5 Selection of Applicable Standards and Screening Levels

The media of concern for AOI 6 include soil and groundwater. The potential vapor intrusion into indoor air exposure pathway was also evaluated through the collection of the indoor air samples. The approach for attaining Act 2 remediation standards for the media of concern is described below by media. As the current and anticipated future use of the facility is industrial, standards for non-residential properties were selected for comparison.

1.5.1 Soil

All soil results were screened using a multi-step process, as described in this section. Soil results were first screened against the PADEP non-residential, used aquifer (total dissolved solids [TDS] <2,500 micrograms per liter [µg/L]) medium specific concentrations (MSCs) developed by the PADEP to implement the Statewide Health Standard (SHS). The following process was used to select the soil SHS for each COC:

- The highest value of either 100 times the groundwater MSC or the generic value MSC was selected to represent the soil to groundwater numeric value.
- The selected used aquifer, non-residential soil to groundwater (NRSGW) numeric value was then compared with the non-residential direct contact value (NRDC) (0 to 2 feet or 2 to 15 ft. bgs, as applicable).
- The more stringent of the soil to groundwater value and the direct contact value was selected as the soil MSC, otherwise referred to as the SHS, for initial comparison of soil sample results.

The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this report. In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

An exception to this soil screening process exists for lead. On February 24, 2015, Evergreen submitted a Human Health Risk Assessment Report to PADEP which presented the development of a risk-based site-specific standard (SSS) for lead in soil. In a letter dated May 6, 2015, PADEP approved the report, and a non-residential direct contact site-specific numerical standard for lead of 2,240 mg/kg was established. This SSS is used in place of the default 0 to 2 ft. bgs direct contact standard for lead.

1.5.2 Groundwater

Groundwater sample analytical results were screened against the PADEP MSCs for non-residential properties overlying used aquifers with TDS less than or equal to 2,500 µg/L (SHS). Where constituent concentrations are above the SHS, Evergreen evaluated application of the site-specific remediation standard using the pathway elimination option.

1.5.3 Potential Vapor Intrusion into Indoor Air

Indoor and ambient air sample results collected in AOI 6 were screened against the USEPA Region 3 Regional Screening Levels (RSLs) for Industrial Air Target Risk (TR)=1E-6, Target Hazard Quotient (HQ)=0.1 (updated November 2015); the PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (November 2016); and the Occupational Safety and Health Association (OSHA) Permissible Exposure Limits (PELs). The National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLVs) were used for compounds without established OSHA PELs. In accordance with the PADEP Vapor Guidance, since indoor air is the only potential exposure pathway, the results were also screened against the USEPA Region 3 Regional Screening Levels (RSLs) for Industrial Air based on the lower of the Target Risk (TR)=1E-5 and HQ = 0.1 and the PADEP SHS Indoor Air values divided by a factor of 10. These values were used as the threshold to indicate whether additional controls will be necessary to address vapor intrusion. Any such controls will be presented in the Cleanup Plan.

2. Environmental Setting

This section summarizes the geologic framework and general hydrogeologic properties of sedimentary deposits and bedrock underlying the south Philadelphia area, with emphasis near the facility. A brief discussion of historical and present-day topography and hydrology is also included. This section provides a regional context from which sedimentary deposits observed beneath AOI 6 are classified and characterized for the purposes of this RIR. Much of the information presented in this section was summarized during conceptualization of a site geologic model that is being used in the development of a numerical groundwater flow model by Stantec as presented in the AOI 1 RIR (Stantec, 2016).

In general, the groundwater resources and stratigraphic framework of the facility area have been well-documented through a variety of data sources, including previous groundwater resource investigations dating back to the early 1900s, state and federal geologic mapping projects, groundwater modeling studies, and consultant site characterization and remedial investigation reports. Those data sources are summarized herein. In large part, available well and test boring logs from previous on-site and local subsurface investigations were the most valuable resource in evaluating the local subsurface stratigraphy. As such, subsurface information from approximately 750 well and test boring logs was considered in the evaluation of regional conditions. A database of stratigraphic "picks" on interpreted vertical lithologic unit boundaries (and, where possible, geologic formations) was also developed and includes all identified records of boreholes completed to bedrock at and near the facility. The purpose of the "picks" database was to archive interpretation of

individual borehole lithologies to bedrock, so that stratigraphic profiles could be developed for this RIR and the Schreffler lithologic model (Schreffler, 2001) could be refined and updated for site-specific use at the facility (Stantec, 2016). One stratigraphic profile was developed for use in this RIR and is presented herein to support evaluation of the lithologic character, geographic extent, and thickness of each geologic unit identified. A structure contour map of the bedrock surface was also developed and used to support the discussion presented below.

2.1 Hydrology and Topography

The facility occupies a large area adjacent to the Schuylkill River near its confluence with the Delaware River. This region has a long history of human influence and disturbance, dating back to the early 17th Century when European settlers first arrived. The following sections present a brief discussion of the significant land surface morphologic changes that are apparent when comparing modern environments and topography to that shown on historical maps.

2.1.1 Historical Topography and Natural Depositional Environments

The City of Philadelphia Archives and several online archival resources have catalogued and provide free access to copies of many historical maps of Philadelphia. Based on a review of many of those maps, much of the land area occupied by the present-day Philadelphia Refinery was formerly tidal marsh and lowlands that once fringed the Schuylkill River. Figure 3 presents a geo-referenced United States Geological Survey (USGS) topographic map from 1898 (20-foot contour interval). The map indicates that several small tributary streams, digitized on-screen and shown as blue lines, formerly dissected that marshland and presumably would have exchanged water with the tidal Schuylkill River on a semi-diurnal basis. Several islands were also present throughout the lowlands, most notably League Island, which are interpreted as erosional remnants of uplands that formed sometime after deposition of the Trenton "gravel" sediments (discussed in detail below).

At that time, relatively higher topography was apparent north and west of the Schuylkill River, near Gibson's Point. South and east of that general area, the Schuylkill River coursed through a distinctive meander around Point Breeze, and appeared to have formed an erosive cut bank along present-day AOI 2 where higher elevations were present (and favoring point bar deposition north of AOI 10). A southwest/northeast trending ridge of higher elevation was also present south of Point Breeze near AOI 4 (see 20-foot contour on Figure 3), and between those two areas of higher elevation a stream was mapped to have been present. That stream appears to have originated in southern AOI 1 and flowed southwest through AOIs 3 and 7, towards its confluence with the Schuylkill River. Numerous other small streams and ditches draining the lowlands surrounding Hollander Creek were also noted. Additional historic maps indicate that by 1900, an earthen dike had been constructed along the banks of the lower Schuylkill River, and sluices were present at each stream/ditch confluence. Other maps show wooden pilings in places along the Schuylkill River. In general, the construction of containment dikes, sluices, and shoreline hardening would have altered the natural tidal exchange between the Schuylkill River and these historic creeks, thereby limiting the natural accretion of sediment in the marshes that once fringed the river. Moreover, the modifications indicated on these maps would have altered the pre-existing tidal regime and dynamic equilibrium of the Schuylkill River.

2.1.2 Post-Industrialization

Figure 3 indicates that by 1898, storage of petroleum near Point Breeze and Gibson Point had already begun. According to archived records, much of the remaining tidal marsh and lowland environments nearby were reclaimed and routinely dewatered for farming practices around this same time period (mostly on the west side of the Schuylkill River). Industrialization warranted further land filling activity and shoreline hardening, including bulk-heading and filling of the tributary streams that modified and generally raised the antecedent topography into its present-day configuration. Farms were displaced in favor of industrial and commercial land uses. Although some clusters of residential property and open space exist or have existed near the facility, most land in south Philadelphia is presently and has been used for industrial and commercial purposes for over 100 years (IST, 1998).

Light Detection and Ranging (LiDAR) data obtained from the USGS (USGS, 2010) and topographic contours published in 2007 by the City of Philadelphia indicate that present-day topography is relatively flat in the study area, and land surface elevations generally range from a few feet below sea-level near Mingo Creek to approximately 30 feet above sea level near the eastern boundary of the Philadelphia Refinery in AOIs 1 and 8 (referenced to the North American Vertical Datum of 1988 [NAVD 88]) (Figure 4). Although subtle, the high-resolution LiDAR model displays topographically low areas that based on location, likely correlate to the locations of former stream valleys (e.g., Franklin Delano Roosevelt Park). In addition to raising the land surface, much of the filled areas were either paved and/or rendered relatively impervious (Figure 5), which decreased rates of recharge to the water table and necessitated the construction of numerous sewers to convey stormwater runoff (and also sewage) to the Schuylkill and Delaware Rivers.

2.2 Regional Geology and Hydrogeologic Conditions

The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line," where crystalline bedrock of the Appalachian foothills intersects the ground surface (outcrops) (Figure 6). The Atlantic Coastal Plain is a physiographic province that is defined as having relatively flat topography and as being underlain by a characteristic wedge of unconsolidated sediments that thicken in a southeasterly direction, away from sediment source areas in the Appalachian Mountains. These sediments were deposited atop a sloping bedrock surface in complex fluvial, estuarine, and marginal marine environments along the passive Atlantic margin. Overall, subsidence of the Piedmont land surface in conjunction with cyclical sea-level fluctuations have been the primary controlling mechanisms driving periods of deposition, non-deposition and erosion in the Atlantic Coastal Plain (Trapp, 1992). In general, the resulting sedimentary record in the vicinity of the Philadelphia Refinery is complex, largely incomplete, and under-represented by only Cretaceous and Quaternary deposits, separated by a regional disconformity (Stantec, 2012). A summary of those deposits is presented below.

2.2.1 Coastal Plain Deposits

2.2.1.1 Anthropogenic Fill

For reasons discussed, much of the facility and surrounding area is underlain by historical fill material, which was placed for the purpose of reclaiming lowlands along the banks of the tidal

Delaware and Schuylkill Rivers during industrialization. These fill materials are heterogeneous in nature and have been described on borehole logs by others as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where antecedent topography was highest to greater than 50 feet where it was used as railroad ballast just east of the Philadelphia Refinery. Within the locations of former stream valleys and marshes (Figure 3), the historical fill material is generally 20 feet or greater in thickness.

The fill materials may contain isolated lenses of groundwater (perched groundwater) where coarse or granular materials are separated from the underlying water table by low permeability sediments. The fill may also be saturated and/or in hydraulic connection with the water table along the axes of former stream channels, where the water-table appears to intersect the fill, or where the fill was placed on marshland. However, at most locations across the Philadelphia Refinery, the fill layer occurs above the regional water-table under average head conditions.

2.2.1.2 Quaternary Deposits

Quaternary sedimentary deposits are present beneath the Philadelphia Refinery and are generally representative of geologically-recent cycles of deposition and erosion that occurred within the last 200,000 years. These cycles of sedimentation were the result of a series of glacial and interglacial periods, namely the Illinoian and Wisconsin glaciations, separated by an intervening interglacial period and followed by the present interglacial period through the Holocene (Sevon et al., 1999). Depositional environments through this Period were primarily controlled by sea-level and the successive down-cutting and infilling of ancestral river valleys, primarily that of the Schuylkill and Delaware Rivers (Owens and Minard, 1979). Details of the Quaternary deposits present at the Philadelphia Refinery are described below.

2.2.1.2.1 Recent (Holocene) Alluvium

Predominantly gray, muddy deposits with occasional sandy, gravelly, and organic-rich lenses comprise the most-recent alluvium present at the Philadelphia Refinery. These sediments were deposited in dynamic floodplain, channel, and marsh environments through the Holocene. As noted, the upper surface of alluvium, in most places covered by fill, defines the antecedent topography that pre-dated development of the Philadelphia Refinery area. This geologic unit is generally present below an elevation of approximately 20 feet NAVD 88. The alluvium ranges in thickness from a few feet at higher elevations, away from the present Schuylkill and Delaware River estuaries, to approximately 15 feet within the former floodplains of buried tributary streams. However, adjacent to and fringing these major river estuaries, apparent marsh deposits accreted in freshwater environments to as much as 60 feet thick (to elevations as low as approximately -60 feet NAVD 88) as sea-level transgressed and flooded the incised river valleys through the Holocene. Figure 3 provides some estimation of how extensive the tidal marshes once were prior to development, generally along the Schuylkill River south of and surrounding Point Breeze. A stratigraphic profile location map is presented on Figure 7. Stratigraphic profile E-E' supports this interpretation and distribution of the most recent alluvial deposits across the Philadelphia Refinery (Figure 8).

Similar to the fill described above, most recent alluvium at the facility has limited water-bearing capacity due to its fine-grained texture. However, heterogeneities within the alluvium may allow for

the presence of localized seasonal perched groundwater resulting from the percolation of recharge water. Within former marsh areas along the Schuylkill and Delaware River estuaries, the regional water-table occurs within the Holocene alluvium. At locations distal to the rivers and where the Schuylkill River appears to have eroded older alluvial deposits (e.g., along the western periphery of AOI 2), the Holocene alluvium occurs above the regional water-table and is unsaturated.

2.2.1.2.2 Pleistocene Alluvium ("Trenton Gravel")

Geologically-recent glacial outwash deposits, commonly referred to informally as the Trenton "gravel", have long been recognized in the vicinity of southeastern Pennsylvania along the Delaware River valley. Sevon and Braun (2000) provide a comprehensive map of glacial deposits in Pennsylvania, including the presence of sand and gravel outwash, interpreted as stratified drift, along the present Delaware River. Owens and Minard (1979) published a comprehensive summary of previous research into these deposits and subdivided the "Trenton gravel" into two distinct deposits (the Spring Lake and Van Sciver Lake beds) based on topographical position and lithology at those type sections. Low et al. (2002) indicate that in most places the Trenton gravel rests directly atop Cretaceous sediments and is overlain by younger alluvium of Holocene age near the Schuylkill River.

Based on literature review presented in the AOI 1 RIR (Stantec, 2016), the Trenton gravel was interpreted as a heterogeneous, stratified alluvial deposit of primarily sand and gravel, with occasional beds of clay and silt (the Van Sciver Lake beds), that resulted from glacial outwash through the Delaware River valley sometime after the Illinoian glacier receded. At the Philadelphia Refinery, the Trenton gravel is commonly described on boring logs as a brown, reddish-brown or, where stained, black, fine to coarse sand with lenses of gravel. The gravel fraction is often multicolored and comprised of a mixture of sub-angular to sub-rounded, sedimentary and metamorphic rocks derived from the Appalachian Piedmont. The Trenton gravel generally ranges in thickness from a few feet up to approximately 30 feet near the Philadelphia Refinery. It appears to be laterally continuous and its thickness depends on the antecedent Cretaceous topography that it filled and on the degree of erosion from above (Stantec, 2016). Along the Schuylkill River at the George C. Platt and Penrose Avenue bridges, and in places beneath the Delaware River, Greenman et al. (1961) mapped the Trenton gravel to be present beneath thick sections of Holocene alluvium to elevations near -60 feet NAVD 88, and those interpretations are shown on Figure 8.

The regional water-table at the Philadelphia Refinery most often occurs within the Trenton gravel, and, as a result of its stratigraphic position, this geologic unit forms the bulk of the unconfined aquifer (along with localized areas of saturated alluvium and fill). Published well records indicate that the Trenton gravel can be a prolific aquifer (Paulachok, 1991). Nevertheless, due to lateral changes in Trenton gravel thickness and to its heterogeneous character, hydraulic properties and groundwater yields can vary widely. Stantec reviewed published data and available on-site aquifer testing data regarding the hydraulic properties of the Trenton gravel and presented those data in the AOI 1 RIR (Stantec, 2016) which are included on Figures 9 and 10 in this report.

A nearly 7-day groundwater extraction test was conducted at recovery well RW-2 at the Philadelphia Refinery (IST, 1998). During testing, RW-2 was pumped at a constant rate of 225 gallons per minute (gpm). Distance-drawdown data analyzed along transects of observation

wells suggested that the area of influence extended approximately 1,680 feet from the pumping well under relatively isotropic conditions. The hydraulic conductivity (k) was estimated to be greater than 400 feet per day (ft/d). More recently, a 24-hour pumping test was conducted at the former DSCP property at monitoring well DSCP-MW-65, a well that appears to be screened across the Trenton gravel and underlying sandy Cretaceous deposits (ARCADIS, 2013). Analysis of that data provided in the referenced report supports comparable aquifer properties at that site. However, it is noted that during the test, the Trenton gravel was dewatered and individual aquifer k values could not be calculated/resolved. Other, in-situ, single well instantaneous displacement tests and short-duration pumping tests for remedial system design suggest a much lower k for the Trenton gravel, on average, but test results vary widely, from less than 1 ft/d to over 600 ft/d. The observed wide range in k values over relatively short distances is consistent with this geologic unit's lithologic heterogeneity.

2.2.1.3 Cretaceous Deposits

Many studies of the Atlantic Coastal Plain near the Philadelphia Refinery have identified the presence of Cretaceous age sediments in the subsurface. These are the oldest sedimentary deposits in the area and are configured in a southeasterly-thickening wedge, overlain by the much younger Quaternary deposits described above and underlain by Piedmont crystalline bedrock. Greenman et al. (1961) detailed the age, character, configuration, and hydraulic properties of these deposits in southeastern Pennsylvania. At the time of that publication, the Cretaceous deposits were assigned primarily to the Raritan Formation and noted to represent three distinct, fining-upward cycles of non-marine sedimentation. Similarities to lithologic sequences identified on borehole logs were correlated to previously-identified strata at their type locality in New Jersey, where the deposits are much thicker and more easily distinguished. Other similar, near time-equivalent geologic formations of Cretaceous age were elsewhere identified in Maryland and Delaware (Jordan, 1962), and more recently authors began wholly referring to the Cretaceous deposits in south Philadelphia as the Potomac-Raritan-Magothy (PRM) aquifer system.

In south Philadelphia, the PRM aquifer system is subdivided into six geologic units in order of increasing age:

- The upper clay unit
- Upper sand unit
- Middle clay unit
- Middle sand unit
- Lower clay unit
- Lower sand unit (Schreffler, 2001)

Near the Philadelphia Refinery, it is generally true that these units thin, intercalate, and exhibit gradual facies changes that make separation of individual units difficult. Total thickness of PRM deposits at the facility ranges from 0 feet, where Quaternary deposits are present atop bedrock, to more than 100 feet within paleochannels incised into bedrock. A structure contour map of the top of the bedrock surface is included on Figure 11. Details of the individual units based on boring log

records and published descriptions as presented in the AOI 1 RIR (Stantec, 20016) are presented below.

2.2.1.3.1 Upper Clay Unit

The upper clay unit is a variegated clay/silt that is sometimes discernible from older clay units of the PRM where sandy and gravelly. In general, it is thin when compared to the other PRM clay units in south Philadelphia, and in places distal to the Delaware River the upper clay may be entirely absent (Greenman et al., 1961). On the basis of geophysical log signature, others have mapped the upper clay to be at least 0.5 feet thick and up to 30 feet thick at the Philadelphia Refinery, exhibiting its greatest thickness in northern portions of the study area while pinching out to the south (IST, 1998). At the Philadelphia Refinery, Stantec assigned the upper clay to first occurrences of light brown, tan, mauve, yellow, gray, and less-commonly, red sandy, silty clay beneath the Quaternary alluvium. However, overall stratigraphic correlation of the PRM across the facility supports the upper clay unit pinching out or being truncated by younger deposits throughout most of the AOIs (Figure 8).

The upper clay unit by nature acts as a confining or leaky confining bed. Where present, it creates hydraulic separation between the upper sand unit and water-table aquifer.

2.2.1.3.2 Upper Sand Unit

The upper sand unit is a varicolored but predominantly brown to gray sand with varying amounts of gravel, clay, and silt (Greenman et al., 1961). Nearer the Philadelphia Refinery, it has been described as mostly silty and/or clayey fine to medium sand (IST, 1998). Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable, from the coarser and more heterogeneous Trenton gravel above. Stantec used color and lithologic changes, in addition to subtle changes in drilling conditions including Standard Penetration Test (SPT) blow counts, to make "picks" on upper sand occurrences (Stantec, 2016) to create the current geologic interpretation for the facility. In general, the upper sand appears restricted to northern portions of the refinery (AOIs 1, 2, 4, and 8) where it subcrops the Trenton gravel. The upper sand unit, where present, rarely exceeds 10 to 20 feet in total thickness.

The upper sand unit is an excellent aquifer where its thickness and extent are sufficient (Greenman et al., 1961). Aquifer testing of the upper sand unit in New Jersey has indicated that the aquifer has similar hydraulic properties to the middle and lower sand units where discrete (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any existing testing data for wells discretely screened across the upper sand unit from which to infer sole hydraulic properties (Stantec, 2016). The upper sand generally occurs in pockets beneath the Philadelphia Refinery and comprises a portion of the unconfined aquifer. Most wells that fully penetrate the unconfined aquifer in northern areas of the refinery may intersect and be influenced by the hydraulic properties of the upper sand.

2.2.1.3.3 Middle Clay Unit

Whereas other clay units of the PRM are described as being sandy and gravelly in places, the middle clay unit is generally regarded as being a laterally extensive and uniformly massive confining

bed of thick, red and white clay with very little sand (Greenman et al., 1961). Near the Philadelphia Refinery, others have found the middle clay to be nearly continuous in the subsurface (IST, 1998). Thicknesses of the middle clay unit generally range from approximately 20 feet, near the Belmont Terminal area, to just over 1 foot in southeastern AOI 1. While the middle clay appears to be everywhere present, at least on the eastern side of the Schuylkill River, its characteristically muddy texture can vary and become finely-laminated/bedded and intercalated with muddy sand. West of the Schuylkill River and particularly under areas north of Point Breeze, the middle clay unit (in addition to most if not all of the PRM) appears to have been incised and completely removed by erosion. Downgradient, nearer AOI 9 and the George C. Platt Bridge, some pockets or thin lenses of middle and/or lower clay may be present under a thick section of Quaternary alluvium. At other locations beneath the Philadelphia Refinery, the middle and lower clay units appear to be in direct contact with each other, where the middle sand is absent (Stantec, 2016).

The middle clay unit, in places resting directly on and combining with the lower clay unit, acts as a significant confining bed at the Philadelphia Refinery. In a regional context, it creates hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer(s) of the middle and/or lower sand units.

2.2.1.3.4 Middle Sand Unit

The middle sand unit is a light-colored, stratified, fine to coarse sand with occasional gravel and clay that was generally deposited in lenticular masses along the axes of troughs carved into the lower clay unit (Greenman et al., 1961). As such, it is by nature discontinuous in the subsurface. Stantec has mapped the presence of middle sand at the Philadelphia Refinery based on stratigraphic position and where present, is commonly described on boring logs as brown or orange sand and gravel. In some areas where the lower clay was entirely removed, it may be indistinguishable from and rest unconformably atop the lower sand unit. At those locations, Stantec used subtle changes in sample descriptions, including color and/or texture, of the sequences of sand below the middle clay to infer the contact between those units. The middle sand unit, where discernable from the lower sand, has been observed at thicknesses up to approximately 15 feet beneath the Philadelphia Refinery and is generally thickest in lenticular or tabular bodies.

Much like the other sand units of the PRM, the middle sand unit can be a prolific aquifer where it is laterally continuous and of sufficient thickness. Aquifer testing of the middle sand in New Jersey has indicated that the aquifer has similar hydraulic properties to the lower sand unit (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any wells discretely screened across the middle sand unit from which to infer sole hydraulic properties (Stantec, 2016). Most deep refinery wells are screened in the lower sand, or potentially across the lower and middle sand units, where hydraulically connected.

2.2.1.3.5 Lower Clay Unit

Published descriptions of the lower clay unit indicate that it appears very similar to, and is sometimes inseparable from, the middle clay unit where the middle sand is absent. The lower clay is generally tough, red clay but is known from drilling records to contain softer zones of gray clay stratified with fine sand. The lower clay tends to exhibit its greatest thickness along the lateral margins of paleochannels in underlying bedrock, and can be thin to absent along the axes of

paleochannels where eroded prior to deposition of the middle sand unit (Greenman et al., 1961). Of the PRM clay units, Stantec has interpreted the lower clay unit to be the least significant at the Philadelphia Refinery in terms of both its lateral extent and vertical thickness. (Stantec, 2016) This is based on stratigraphic correlation and likely the result of erosion prior to deposition of the middle sand. Generally gray and red, commonly sandy clay and muddy sand zones were assigned to the lower clay if observed below and distinguishable from the middle clay. Where present, the lower clay was observed at thicknesses ranging from less than 1 foot to no greater than 10 feet. The lower clay appears to thicken and become more continuous to the south and east of the Philadelphia Refinery.

Where physically connected, the lower and middle clay units combine to form a significant confining bed at the Philadelphia Refinery. In a regional context, they create hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer of the lower sand unit. The lower clay can also create localized areas of hydraulic separation between the lower and middle sands, where discretely present.

2.2.1.3.6 Lower Sand Unit

The lower sand unit is a varicolored but predominantly white to yellow sand with gravel, usually fining upward to a cap of fine to medium sand with occasional yellow and gray clay lenses. As further described below, the lower sand unit is the oldest of the PRM deposits and rests unconformably atop bedrock. The lower sand is generally thickest (up to 87 feet thick) along the axial troughs of paleochannels carved into bedrock by discharge through former positions of the Schuylkill and Delaware Rivers (Greenman et al., 1961). At the Philadelphia Refinery, the lower sand unit is present as a nearly continuous deposit, with the exception of some areas west of the Schuylkill River where it appears that the river entirely removed the PRM. Where present, the lower sand unit is observed to range in thickness from approximately 20 feet to a maximum of just over 50 feet, where it fills a bedrock paleochannel beneath a portion of AOI 1. Philadelphia Refinery borehole logs indicate that the lower sand unit is commonly yellow, white, and pale gray in color and predominantly medium to coarse sand with gravel, or gravel with sand. The lower sand's gravelly texture beneath the refinery has been well documented on drilling logs.

Of the PRM aquifer system, it can be argued that the lower sand unit was historically the most important groundwater resource in south Philadelphia. Figure 10 summarizes hydraulic information available for the lower sand unit, based on published aquifer testing results. Proximal to the Philadelphia Refinery at the Philadelphia Naval Shipyard (PNSY), a wealth of historical testing data is available for the lower sand unit and indicates an average k value of approximately 134 ft/d. Across the Delaware River in New Jersey, k values seem to be slightly higher. At the Philadelphia Refinery, there are several wells that appear to be discretely screened within the lower sand unit. However, Stantec did not identify any aquifer testing data derived from testing of onsite lower sand wells (Stantec, 2016). It is noted that Stantec recently installed two new AOI 4 monitoring wells screened within the lower sand unit aquifer. Those wells will be utilized for the collection of slug test data and for two short-duration, constant-rate pumping tests to estimate lower sand hydraulic properties at the Philadelphia Refinery. The data from this testing will be submitted in future Act 2 submittals.

2.2.2 Bedrock

Bedrock beneath the Coastal Plain near south Philadelphia has been inferred from surface outcroppings above the "Fall Line," and has been described in the subsurface where penetrated by past drilling activities. Bosbyshell (2008) has mapped schist of the Wissahickon Formation to occur in Philadelphia along the "Fall Line" (Figure 6). Relatively small bodies of granitic gneiss, resulting from igneous intrusions into the country rock during metamorphism, can also be present. Most boring log records of deep holes drilled at the Philadelphia Refinery indicate that schist is present beneath the Coastal Plain, in agreement with published maps.

Available data pertaining to the bedrock surface beneath the Philadelphia Refinery suggests that the surface generally dips to the southeast but contains local complexity. Greenman et al. (1961) recognized the presence of four paleochannels incised into bedrock and attributed those features to previous positions of the Schuylkill River. Two of those channels, referred to as the Schuylkill River and League Island Troughs by those authors, occur beneath parts of the Philadelphia Refinery and influence the total thickness of the Coastal Plain sedimentary sequence above them (Figure 11). Through boring log review, Stantec has identified additional detail in the bedrock surface beneath the Philadelphia Refinery, including a small bedrock paleochannel beneath the southern portion of AOI 1 that appears to be an extension of the League Island Trough, and a few localized bedrock surface highs (pinnacles) (Stantec, 2016).

In general, bedrock can store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). Bosbyshell (2008) indicates that the Wissahickon Formation can yield up to 20 gpm to wells in the mapped area above the "Fall Line." Balmer and Davis (1996) indicate that in Delaware County, Pennsylvania, the Wissahickon Formation is the most productive of the consolidated rock aquifers present in that county and can yield anywhere from 0 gpm to 300 gpm to wells (data from 127 wells). However, the wells included in their report were generally located above the "Fall Line" and were not screened below significant accumulations of Coastal Plain sediments. In general, when compared to the permeability and thickness of the Coastal Plain deposits, the water-bearing properties of the Wissahickon Formation beneath the Philadelphia Refinery are considered de minimis.

3. Soil Investigation

The following sections summarize the soil investigation activities performed as part of the remedial investigation activities in AOI 6. The site characterization activities conducted for the RIR in 2016/2017 were completed by Stantec, GHD and Aquaterra, on behalf of Evergreen. The goal of the 2016/2017 activities was to characterize soil in potential source areas, such as historic product handling and storage locations, open storage tank incident areas, and known product releases. Investigations before 2016-2017 are summarized in Section 3.1.

All characterization fieldwork was performed in accordance with Evergreen's *Quality Assurance/Quality Control Plan and Field Procedures Manual (*Appendix B). Soil borings were advanced using a variety of methods including hand auger, backhoe, split spoons in conjunction with hollow stem augers, and split spoons driven using direct push methods. The general strategy for the investigation was to characterize soil in the 0 to 2 ft. bgs and greater than 2 ft. bgs intervals

(unsaturated soil). Generally, subsurface soil samples were collected at the depth exhibiting the highest photoionization detector (PID) response and/or above the water table. Delineation was performed to the highest of the Act 2 non-residential SHS, the non-residential direct contact MSC, and the numeric SSS (for lead). Soil samples from BH-16-014 through BH-16-16 and from well installations B-172 through 175 were initially sampled for volatile organic analyses (VOCs) and then were re-sampled for semi-VOCs (SVOCs). The soil sample from BH-16-041 was only analyzed for pH in accordance with Table 2.

Table 2 summarizes the soil boring rational and soil boring logs are included in Appendix C. All soil analytical results are summarized in Tables 3a and 3b, which compares the results to the 1) non-residential SHS (as previously defined in this report, the more stringent of the soil to groundwater MSC and the direct contact MSC), 2) the non-residential direct contact MSC, and 3) the numeric SSS (for lead) (Soil Screening Levels). Samples were analyzed for the COCs on Table 1. Analysis of soil samples was conducted by Lancaster Laboratories. All laboratory analytical reports from this investigation work are included in Appendix D.

3.1 Summary of Previous Soil Analytical Results

Soil data collected during previous soil investigations are summarized in Tables 4a and 4b and the locations are shown on Figures 12a and 12b. The soil data summarized on Tables 4a and 4b were collected from 2002 to 2016 during RCRA, Act 2 and Tank investigation activities. The majority of the previous data collection activities were completed in support of the 2006 SCR/RIR and the 2013 SCR/RIR. A total of 57 soil borings and 20 monitoring wells were installed during the 2006 and 2013 site characterization activities. Information from these investigations is presented in the 2006 SCR (Langan, 2006) and the 2013 SCR/RIR (Langan, 2013).

Soil sampling was completed from 20 borings within SWMU 92 and from six borings in SWMU 95 between 2006 and 2012. No leaded tank bottom materials were observed in SWMU 92 (Storage Tank Areas: Buried Lead Sludge Area 6). Therefore, Sunoco requested a Final Agency Determination for SWMU 92 in AOI 6 from USEPA in 2013. Potential leaded tank bottom materials were observed in four soil samples from SWMU 95 (Storage Tank Areas: Buried Lead Sludge Area 9). The lead results were below the SSS for all samples and the TCLP results collected for three samples were below the USEPA maximum concentration of lead for toxicity concentration of 5 mg/L. Therefore, Sunoco requested a Final Agency Determination for SWMU 95 in AOI 6 from USEPA in 2013. A SWMU closure request letter will also accompany the copy of this report to the USEPA.

A total of 31 soil borings with soil sampling were advanced outside of the SWMU areas. Soil sampling also occurred during the installation of 14 monitoring wells in 2006 and six monitoring wells in 2012. The soil borings locations are shown on Figures 12a and 12b, as historic soil borings, the soil data from these investigations is summarized in Tables 4a and 4b. The 2006 and 2013 SCR/RIRs are included in Appendix J.

AOI 6 includes ASTs and many soil samples have been collected for tank characterization and closure under 25 PA Code Chapter 245, in addition to the sampling completed as part of the Act 2/One Cleanup Plan activities. Although the rationale and results of all of these soil sampling projects are not discussed in detail in this RIR, as they have been submitted to PADEP under 25 PA

Code Chapter 245 reporting, they are relevant to the characterization of AOI 6 under Act 2. The analytical results for these tank-related assessments are included in Tables 4a and 4b, and the soil sample locations are shown on Figure 2 as historic sample locations. The investigation of select tank incidents was performed as part of the field effort for this RIR, and those results are discussed in the following sections.

3.2 Historic Product Handling/Storage Areas

In order to investigate areas of historic product handling and storage, soil borings were advanced within the area of former Tank 237, former Tank 238 and Tank 251 during the 2016 site characterization activities. These borings included boring BH-16-039 in the vicinity of Tank 237 and BH-16-010 and SB-16-011 in the vicinity of Tank 238. None of the soil results from these borings exceeded the SHS.

3.3 Open Storage Tank Incidents

Evergreen intends to address all open AOI 6 storage tank incidents for which it is responsible through the 25 PA Code Chapter 245 CAP Program under separate cover. In 2014, the PADEP provided Evergreen with a list of the open Evergreen tank incidents in the PADEP database for AOI 6. One of the tank releases, PADEP Release Incident Number 37546 for Tank 250, was originally listed as on open incident by the PADEP in their 2014 summary of open incidents but was changed to closed in accordance with Mr. David Brown's Technical Review Memo dated August 29, 2017 which is included in Appendix E. PADEP release incident 46762 was assigned to a tank containing Nalco which is a filming agent (cyclohexylamine) used as an additive for boiler feedwater. Discussions with Sunoco personnel confirmed that this material was held in small temporary plastic tanks and therefore their location can not be shown on the figures. Cyclohexylamine is very biodegradable (Handbook of Environmental Fate and Exposure Data for Organic Chemicals, 1990) and is not expected to have lasted in the environment. Based on these conditions, no impacts are expected for the incident and therefore no further investigation was completed for incident 46762.The remaining open tank incidents are summarized in Table 5.

Soil characterization activities were conducted to further investigate the open storage tank incidents within AOI 6. For borings associated with storage tank incidents that involve releases within tank berms, soil analytical results are presented in this RIR for informational purposes only, as they relate to overall AOI 6 soil characterization. These data will be used in separately prepared SCRs for the identified open storage tank incidents, which will be submitted under separate cover to the PADEP in order to satisfy the requirements of 25 PA Code Chapter 245. The following summarizes the incidents that the PADEP provided to Evergreen, available information for these tanks, completed investigation activities during the 2016 site characterization activities and whether this tank will have a separate SCRs submitted to fulfill the requirements of 25 PA Code Chapter 245.

This section also includes groundwater data from the 2016 site characterization activities, if applicable to the discussion of the Tank Incident. The groundwater results are further discussed in Section 4.

3.3.1 GP T81 (Former PADEP Tank 121A, Incident 45692)

On September 11, 1993, a split in a line caused the release of approximately 100 gallons of liquid caustic onto the ground. The release was reported to PADEP on September 12, 1993 and Incident No. 45692 was assigned by the PADEP. A confirmation letter was sent to PADEP on October 4, 1993. The letter stated the liquid caustic was vacuumed up and the contaminated soil was removed for treatment. During the 2016 site characterization activities, three borings, BH-16-040, BH-16-041, BH-16-043 were completed in the vicinity of Tank 81. Sampling during the AOI 6 RI was conducted to characterize this release incident by analyzing for pH. The results indicate a pH range of 7.86 to 9.15 standard units (s.u.). The calculated median is 8.12. A SHS does not exist for pH. The pH results indicate the soil is slightly alkaline; however, these levels do not create hazardous condition. The pH results in groundwater in B-39 during the groundwater sampling in 2016 ranged from 7.3 to 7.5.

Although not related to the release, samples from BH-16-040, BH-16-041, and BH-16-043 had exceedances of the SHS for benzene, naphthalene, 1,2,4 TMB, none of these sample results exceeded the NRDC. The soil samples in BH-16-041 collected from 0.75 to 1.25 feet exceeded the SSS for lead, but it was vertically delineated by the soil sample collected from BH-16-041 from 1.75 to 2.25 feet. This SSS exceedance was horizontally delineated by four additional borings which were completed in 2017, BH-17-003 to 005 and BH-17-009.

3.3.2 GP 676 (Former Tank GPU 676, PADEP Tank 130A, Incident 4844)

Tank 676 was used to store No. 6 fuel oil. On July 19, 1998, 60 barrels of No. 6 fuel oil were released into the tank dike. Sunoco immediately took corrective action and recovered 59.5 barrels of fuel from the tank dike area. Sunoco notified the PADEP of the incident on July 20, 1998 and submitted a Notification of Reportable Release on August 10, 1998. Incident No. 4844 was assigned to this release by the PADEP. Boring BH-12-104, completed during the 2012 site characterization activities, is located in the area of former Tank 676 and had no exceedances of the SHS. During the 2016 site characterization activities, one boring BH-16-006 was completed in the tank dike of former Tank 676 and none of the soil samples collected from this boring exceeded the SHS.

Stantec conducted closure sampling within the tank berm of Tank 676 for PES in December 2016. Nine samples were collected as part of this investigation, GP676-1 though GP676-9. No obvious contamination was observed during the soil sampling. None of the samples had exceedances of the SHS. Groundwater well B-95, located in area of Tank 676, had one slight exceedance of the SHS for an estimated concentration of benzo(a)pyrene. Stantec's AST Closure Report Form for Tank 676, dated December 16, 2016 is included in Appendix J.

3.3.3 GP 797 (Former PADEP Tank 097A, Incident 29122)

GP 797 was an above ground storage tank (AST) which contained process water that contained light-end hydrocarbons (e.g., benzene and cumene) that was closed-in-place. The in-place closure of tank GP 797 was completed on April 30, 2002, by Sunoco. As part of the closure activities, four hand augers borings (HA-1, HA-2, HA-3, and HA-4) were completed and shallow soil samples were collected at each location, with two samples collected at HA-3. Benzene was detected at

concentrations above the NRDC in two samples. The SHS was exceeded for benzene, ethyl benzene and toluene. Based on these results Sunoco notified the PADEP of a release on June 10, 2002. PADEP issued a Notice of Violation (NOV) dated July 29, 2002 and Incident No. 29122 was assigned. In the NOV, PADEP requested a characterization of the extent of soil contamination and impact submitted in an SCR.

Sunoco submitted a closure assessment report to the PADEP for AST 797 dated July 10, 2002. Sunoco subsequently submitted a SCR for AST 797 to the PADEP dated December 12, 2002, to further characterize the release from this tank. The SCR documented the collection of three soil samples from three locations, MW-1, MW-2, and MW-3 completed outside of the containment dike. Benzene (in MW-1, MW-2, and MW-3) and toluene (in MW-3) exceeded the SHS during this sampling. Benzene also exceeded the NRDC in the soil sample collected from MW-3. Wells MW-1 through MW-3 were renamed B-149 through B-150 respectively.

During the 2012 site characterization activities, five additional soil borings with the collection of six soil samples were completed to further characterize Tank 797. Four of the borings were installed in the locations of HA-1 through HA-4 to characterize soil greater than two feet below grade. Benzene and toluene exceeded the NRDC in four of the five soil samples. The surface soil sample from boring BH-12-125 had no exceedances of the SHS. PADEP requested delineation to the northwest, north, and northeast of tank GP 797 in SCR comments dated November 22, 2013. Nine soil borings (BH-16-030 through BH-16-038) were completed during the 2016 site characterization activities to delineate conditions near the tank area within the limits of the tank berm. These samples had exceedances of the SHS for benzene, isopropyl benzene and toluene. In addition, the sample from BH-16-037 also exceeded the NRDC for benzene.

Groundwater from well B-155 located downgradient of tank 797 had exceedances of the groundwater SHS for benzene and benzo(a)pyrene during the 2016 site characterization activities as summarized in Table 7a.

3.4 Historic Releases

The following section discusses known historic releases that were investigated as part of the AOI 6 characterization activities. As part of the remedial investigation under Act 2, historic releases that may have created sources for COCs in soil were identified based on the available information. In order to identify areas that would require further investigation, a review of internal facility files was completed by Evergreen. PADEP also reviewed its records and provided information on historic incidents. Specific release locations were determined based on document descriptions and interviews with refinery personnel. Based on information obtained, targeted soil investigations were performed as described in the following subsections. This section also includes groundwater data from the 2016 site characterization activities, if applicable. The groundwater results are also further discussed in Section 4.

3.4.1 'Area West of' GP 676, or '2000 Surface Release'

On September 29, 2000, approximately 15,000 gallons of No. 6 fuel oil from No. 3 Boiler House was released from a product line outside of the tank berm for Tank 676. Approximately 7,500 gallons of product was recovered by vacuum trucks, a boom was set up due to the proximity to the bulkhead

and the contaminated soil was excavated and sent for off-site disposal. Since the release occurred outside of a tank dike, this is considered a historic release even though the PADEP assigned incident number 6133 to this event. During the 2016 site characterization activities, five borings (BH-16-002 through BH-16-006) were completed to characterize conditions between the outside of the dike for Tank 676 and the bulkhead to characterize this area. None of the soil samples collected from BH-16-002 to BH-16-006 exceeded the SHS or the SSS for lead. Groundwater downgradient of these borings in monitoring wells B-170, B-153, B-168, and B-169 had no exceedances of the SHS with the exception of lead in B-169.

3.4.2 1733 Unit

Approximately 840 gallons of benzene were released at the 1733 unit (Bell Hood CUE 4B) on November 27, 1995 based on a review of Sunoco's records. Three borings were completed in this area during the 2016 site characterization activities (BH-16-007 through BH-16-009). None of the soil results from these borings exceeded the SHS.

3.4.3 Transfer Line Located Northeast of No. 4 Boiler House

Approximately 1,300 gallons of No. 2 fuel oil were released from a transfer line located north east of the No. 4 Boiler House and east of Tank 238 on September 3, 1993. Two borings were completed during the 2016 site characterization activities (BH-2016 -16-012 through BH-2016-16-013). None of the soil results from these borings exceeded the SHS.

3.4.4 1332 Line

Approximately 4,400 gallons of naphtha were released from the 8-inch line outside of the tank dike for GP-251 that lead to unit 1332 on February 2, 1994. Chevron personnel applied foam and then completed vacuum removal of the release. Three borings were completed in this area during the 2016 site characterization activities (BH-16-17, BH-16-018 and BH-16-023). None of the soil results from these borings exceeded the SHS. An additional three borings (BH-16-14 to BH-16-16) were completed inside the dike of Tank 251 during the 2016 field activities based on comments from former Sunoco employees. None of the soil results from these borings exceeded the SHS.

3.4.5 Main Office

Approximately 4,000 gallons of jet fuel were released from an underground line near the main office in September 1992. Three borings were completed during the 2016 site characterization activities (BH-16-019 to BH-16-022). None of the soil results from these borings exceeded the SHS, with exception of BH-16-019 which exceeded the SSS for lead. The lead detection in BH-16-019 was delineated by BH-17-001 and BH-17-002.

3.5 Delineation of Direct Contact MSC/SSS Exceedances

In order to complete horizontal and vertical characterization in soil, areas exhibiting exceedances of the non-residential direct contact MSC (and the SSS for lead) were delineated. These areas and associated investigations are described below:

- A historic soil sample (BH-30-09) from 0 to 2 ft. bgs had a lead detection above the SSS for lead and historic soil sample (BH-29-06) from 0 to 2 ft. bgs had a lead detection above the numeric SSS for lead and a BaP detection above the NRDC. Soil samples collected from B0152, BH-12-108, BH-32-09, BH-27-09, BH-28-09, BH-29-09, BH-31-09, and BH-27-06 delineate these NRDC.
- Historic soil samples GP-797-HA-1, GP-797-B-150, and GP-797-HA-3 in the GP-797 area from 0 to 2 ft. bgs had an exceedance of the NRDC for benzene. The soil samples from BH-16-029, BH-12-122, BH-12-119, B-149, BH-16-033, BH-16-32, BH-16-031, GP-797-HA-4, and BH-12-130 delineated these NRDC exceedances for benzene.
- Historic sample BH-12-128 had an exceedance of the NRDC for benzene. The soil samples from BH-16-032, BH-12-125, BH-16-031, and BH-16-033 delineated the NRDC for benzene.
- Historic soil samples BH-12-149, BH-12-129, BH-12-128, and BH-12-124 in the GP-797 area from >2 ft. bgs had an exceedance of the NRDC for benzene. The soil samples from BH-16-032, BH-16-033, BH-12-129, BH-16-036, BH-16-035, and BH-16-008 generally delineate this exceedance for benzene.
- Soil sample BH-16-037 from 0 to 2 ft. bgs exceeded the NRDC for benzene during the 2016 site characterization activities. This sample was delineated by BH-16-025, BH-16-026, BH-16-036, BH-16-038, and by BH-12-149.
- Soil sample BH-16-019 from 0 to 2 ft. bgs exceeded the SSS for lead during the 2016 site characterization activities. This sample was delineated by BH-16-021, BH-16-020, BH-17-002, and BH-17-001.
- Soil samples BH-16-041 and BH-17-004 from 0 to 2 ft. bgs exceeded the SSS for lead during the 2016/2017 site characterization activities. These samples were delineated by BH-17-003, BH-17-009, BH-17-005, BH-16-043, and BH-16-040.
- Soil samples BH-16-025 and BH-16-037 from greater than 2 ft. bgs exceeded the NRDC for benzene during the 2016 site characterization activities. These sample were delineated by BH-16-036, BH-16-034, BH-16-030, and BH-16-008. Additional sampling may be completed for BH-16-025 during risk assessment or remedial design activities.

3.6 Site Characterization in the 0-2 ft. bgs interval, 2-15 ft bgs Interval and Beneath LNAPL

In response to PADEP comments to previous site characterization activities and the February 19, 2016 meeting, additional soil sampling was completed to complete characterization in the 0-2 ft. bgs

interval, 2-15 ft. bgs. interval and beneath LNAPL. These results associated with the 2016/2017 site characterization activities are described below:

- As shown on Figure 12a, the following surface samples (0-2 ft. bgs) exceeded the NRDC (or numeric SSS for lead): BH-16-019 (lead), BH-16-041 (lead), BH-16-037 (benzene), BH-17-004 (lead) and BH-16-019 (lead) during the 2016/2017 site characterization activities.
- As summarized in Table 3a, Surface samples (0-2 ft. bgs) exceeded the soil to groundwater MSCs for benzene (BH-16-026, BH-16-029, BH-16-030, BH-16-031, BH-16-034, BH-16-036, BH-16-037, BH-16-038, BH-16-040, BH-16-043, and B-175), ethylbenzene (BH-16-037), isopropylbenzene (BH-16-037), toluene (BH-16-037) and lead (BH-16-003, BH-13-004, BH-16-007, BH-16-010, BH-16-011, BH-16-15, BH-17-003, BH-17-005) during the 2016/2017 site characterization activities.
- As shown on Figure 12b, the following subsurface samples (>2 ft. bgs) exceeded the NRDC for benzene: BH-16-025 and BH-16-037 during the 2016/2017 site characterization activities.
- As summarized in Table 3b subsurface samples (>2 ft. bgs) exceeded the soil to groundwater MSCs for benzene (BH-16-027, BH-16-029, BH-16-030, BH-16-031, BH-16-032, BH-16-034, BH-16-036, and BH-16-043), 1,2,4-trimethylbenzene (BH-16-025), isopropylbenzene (BH-16-037), naphthalene (BH-16-040) and toluene (BH-16-025 and BH-16-037) during the 2016/2017 site characterization activities.
- Soil samples from BH-17-003 and BH-16-040 were selected to be collected in the vicinity of well B-39 which has identified LNAPL to address the PADEP request for soil samples in LNAPL areas. None of the results from BH-17-003 exceeded the SHS. The soil results from BH-16-040 had an exceedance of the SHS for benzene, but none of the results exceeded the NRDC. In addition, soils from historical sampling events collected in LNAPL areas from 0-2 ft collected from BH-21-06, B-161, B-148, B-149, B-150, B-175 and BH-25-06 had no exceedances for the SHS with the exception of benzene (B-148, B-149, B-150, B-175 and BH-25-06) and toluene (B-150). The soil sample collected from 2-15 feet from B-175 did not exceed the SHS.

4. Groundwater Investigation

4.1 Historic Groundwater Investigations

Available well construction details are summarized in Table 6. Previous consulting reports in Appendix L describe the various historic groundwater sampling events that have been conducted within AOI 6. All of the available analytical data for wells located in AOI 6 from 2013 to present are presented in Table 8 and all available historic groundwater data are presented in Appendix K.

4.2 Well Installation Activities

This section describes well installation activities that were performed as part of the 2016 remedial investigation. Activities are discussed by purpose in order to clarify characterization goals. All fieldwork was performed in accordance with *Evergreen Field Procedures (*Appendix B). Monitoring well locations are shown on Figure 2. Well logs, including both lithologic information and well construction details, are included in Appendix C. Well construction details are also summarized in

Table 6. The following sections discuss the well installation strategy/rationale; however, a summary is also available in Table 2.

In order to better delineate LNAPL and dissolved benzene plumes interior to AOI 6, additional water-table monitoring wells B-172 through B-175 (WP9-1 replacement) were installed during the 2016 remedial investigation activities. An additional location, B-171 was attempted; however, the well was not installed due to the presence of a concrete floor in this area. Several attempts were made to install B-171, but the concrete flooring was encountered at each location. Prior to the installation of the monitoring wells, well locations were cleared for subsurface utilities to 8 ft. bgs using a vacuum truck. Monitoring well installation activities were performed using hollow stem auger methods by US Environmental of Mullica, New Jersey under the oversight of GHD in April 2016. During borehole advancement, surface and subsurface soil samples were collected for laboratory analysis of the COCs in Table 1. Continuous soil sampling using a split spoon sampler was performed. A GHD geologist screened soil with a PID and logged sample lithologies. LNAPL was not observed in B-172, B-173, B-174, or B-175.

4.3 Groundwater Sampling Events

A comprehensive characterization groundwater sampling event, consisting of 37 monitoring wells was conducted in May 2016. A second, more focused groundwater sampling event was conducted in August 2016 for B-39, B-43, B-116, B-117, B-125, B-126, B-132, B-133, B-145, B-150, B-158, B-164, B-169, U-4, URS-1, URS-2, URS-3, URS-4, URS-5, and the newly installed wells (B-172 to B-175). All fieldwork was performed in accordance with *Evergreen Field Procedures (*Appendix B). Monitoring well locations are shown on Figure 2. All samples were analyzed for the COCs (Table 1) by Lancaster Laboratories, located in Lancaster, Pennsylvania.

Analytical results for groundwater samples collected in 2016 and all historic results for AOI 6, are summarized in Tables 7a and b and in Appendix K, respectively. Concentrations of the following COCs were detected above the non-residential MSC during the 2016 groundwater sampling events: benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead. The following observations can be made concerning the groundwater exceedances:

- The benzo(a)pyrene groundwater MSC exceedances in B-162 and B-117 are delineated by B-116 and B-115.
- As shown on Figure 19, there are several wells with exceedances of the groundwater MSC for benzene. As shown on Figure 19, these wells are delineated in the downgradient direction with the exception of benzene in URS-5, which intermittently has detections of LNAPL, and is located adjacent to the bulkhead.
- One additional well with a benzene exceedance of the MSCs is B-152. This well is delineated by wells B-43 and B-168.
- Wells B-145, U-4, B-175, B-125, URS-3, B-173, and B-126 had SHS exceedances of benzene, SVOCs or lead which were delineated by B-174, URS-1, URS-4, and B-164.
- Wells B-156 and B-172 had SHS exceedances of benzene and SVOCs generally delineated by B-170.

- Groundwater samples from B-39, B-132, B-134, B-144, and B-150 were collected beneath LNAPL. As shown on Figure 19 and in Tables 7a and 7b, all of these samples had at least one detection above the groundwater MSCs as discussed below:
  - B-39 had low level exceedances of the MSCs for ethyl dibromide, benzo(a)pyrene, benzo(b)fluoranthene, benzo(b)fluoranthene, benzo(g, h, i)perylene, chrysene and lead.
  - B-132 had low level exceedances of the MSCs for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene which is delineated by URS-5 except for benzo(a)pyrene.
  - B-134 had low level exceedances of the MSCs of benzo(a)pyrene which is delineated by B-126 and URS-5.
  - B-144 had low level exceedances of 1,2,4-trimethylbenzene, benzene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene and chrysene which is delineated by B-126.
  - B-150 had elevated exceedances of the MSCs 1,2,4-trimethylbenzene, benzene, isopropyl benzene, and toluene and low levels of benzo(a)pyrene which is delineated by B-156 with the exception of benzo(a)pyrene which is delineated by URS-5.
- The remaining wells with groundwater MSC exceedances, B-43 and B-169, are located in close proximity to the bulkhead and will be evaluated through the site-wide fate and transport report.
- None of the monitoring wells screened in the lower aquifer had exceedances of the non-residential groundwater MSCs, as presented on Figure 20.

4.4 Well Gauging Activities

Stantec presently conducts annual groundwater and LNAPL gauging of all existing wells at the Philadelphia Refinery. The site-wide annual well gauging event, which is typically conducted during the second quarter of each year, is used to identify the presence of LNAPL and determine groundwater flow patterns. Liquid level measurements, groundwater contour figures, and product thickness figures are submitted to PADEP with the Philadelphia Refinery Remediation Program Groundwater Remediation Status Reports during the first half of each year. Groundwater elevation contours from the May 2016 annual gauging event is included on Figure 13. In addition to the annual events, the wells included in the September 2016 groundwater gauging event were gauged are shown on Figure 14.

5. Site-Specific Hydrogeologic Conditions

In Section 2 above, details regarding the methodology and interpretation of regional geologic conditions were presented. The purpose of this discussion of site-specific conditions is to refine the regional hydrogeologic framework to summarize conditions observed beneath AOI 6, with an emphasis on groundwater occurrence, groundwater flow, and hydraulic head potentials. It is understood that although this RIR is designed to address subsurface conditions beneath AOI 6, PADEP has previously requested that investigations of individual AOIs look beyond the boundary of the AOI being investigated. As such, GHD has utilized well gauging from AOIs 5, 6, and 7.

Groundwater contouring and evaluation of head conditions in the study area are included on Figures 13 and 14.

5.1 Geologic Formations and Units Observed

On the basis of available lithologic data from boring logs, the principle of stratigraphic position, results of past investigations, review of historical maps, attempted correlation of observed lithologies across the study area to a published geologic framework (e.g., Quaternary deposits and the PRM aquifer system) documented in the AOI 1 RIR (Stantec, 2016), GHD has interpreted the following stratigraphy in the subsurface beneath AOI 6. A generalized stratigraphic column is included as Table 10 and the cross section through the facility, including AOI 6, is shown on Figure 8.

5.1.1 Anthropogenic Fill

Apparent fill is present everywhere beneath the existing land surface in AOI 6 and has been identified averaging approximately 10 feet. Stratigraphic Profile E-E' (Figure 8) presents the interpreted fill thickness in AOI 6.

5.1.2 Recent (Holocene) Alluvium

Recent alluvial deposits that post-date the Trenton gravel are present beneath filled areas within AOI 6. In general, recent alluvium defines the antecedent topography that preceded industrialization at the Philadelphia Refinery. In large part, recent alluvium within the facility is fine-grained, brown to brownish gray silt/clay with occasional lenses of sand and gravel that commonly grades with depth to include some sand. In places, decomposing organic material has also been indicated. The thickness of the recent alluvium within AOI 6 has been observed to range from approximately 20 to 35 feet. The recent alluvium is the most significant units to occur beneath AOI 6, as shown on Figure 8.

5.1.3 Trenton "Gravel"

The Trenton "gravel" does not occur uniformly throughout AOI 6. The Trenton "gravel" ranges in thickness from approximately 10 feet to pinching out along the eastern boundary of AOI 6. Its predominant lithology appears to be silty, clayey, poorly-sorted sand with gravel, but includes secondary sandy gravel and clay/silt lithologies in lenses. As described site-wide, the Trenton gravel is a heterogeneous unit that is reflective of its depositional environment.

5.1.4 Upper Clay Unit/Upper Sand Unit/Middle Clay/Middle Sand/Lower Clay

The PRM upper clay/upper sand/middle clay/middle sand and lower clay units are not interpreted to be present beneath AOI 6. It appears that these units were truncated by erosion prior to or contemporaneous with deposition of the Trenton "gravel". The Trenton "gravel" or alluvium (where the Trenton "gravel" is absent) rests unconformably above the Lower Sand unit as shown on Figure 8.

5.1.5 Lower Sand Unit

In general, the lower sand coarsens with depth, from a dense fine to medium pale gray, pale yellow and white quartz sand to white and varicolored sandy gravel and gravelly sand. An area of sandy gravel has been mapped beneath AOI 6 in the Lower Sand Unit. The thickness of the lower sand in AOI 6 is approximately 20 feet.

5.1.6 Crystalline Bedrock

Bedrock where encountered, has been described as moderately to highly-weathered mica schist. As shown on Figure 6, bedrock elevations beneath AOI 6 range from a maximum of approximately -60 feet NAVD 88, near the AOI 7/AOI 3 boundary, to a minimum of approximately -80 feet NAVD 88 in the northwest portion of AOI 6.

5.2 Aquifer Hydraulic Properties

Two aquifers have been identified beneath AOI 6. In general, these are the water-table (unconfined) and lower (semi-confined) aquifers. Stantec identified and evaluated properties of those aquifers at the facility through review of approximately 300 well records as documented in the AOI 1 RIR (Stantec, 2016). Records reviewed included well gauging data and where available, lithologic logs, physical properties, and well/aquifer testing data. Hydrostratigraphic units were assigned by Stantec to wells where possible using the stratigraphic profiles and nearby and deep boreholes as control points. Overall, approximately 90 percent of existing monitoring wells used at the facility are screened across the unconfined aquifer and are designed to intersect the water table. Of the remaining 10 percent screened in the lower aquifer, approximately 9 percent partially penetrate the lower sand and 1 percent are screened in either the middle sand, or across the middle clay.

It is noted that intervening PRM upper sand and middle sand aquifers do not appear to be present beneath AOI 6. It is also noted that hydraulic head potentials between the unconfined and lower aquifers are downward across AOI 6. These site-specific hydrogeologic conditions are discussed further below and are supported by Figures 13 and 15 which show groundwater elevation contours for both aquifers for 2016.

5.2.1 Methodology for Evaluation of Hydraulic Data

For the purposes of evaluating hydraulic head, flow direction(s) and magnitudes of groundwater flow for the aquifers identified in this RIR, GHD reviewed 2015 and 2016 water levels from annual, site-wide gauging data within the facility. For wells gauged by GHD, depth-to-water measurements were collected with an optical interface probe and reported to the nearest hundredth of a foot. Water-table elevations were calculated using surveyed well top-of-casing elevations and, where necessary due to LNAPL accumulations, corrected using LNAPL density data from the nearest available LNAPL sample data (see Table 9) for density assignments and for gauging data)

5.2.2 Unconfined (Water-Table) Aquifer

Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of the fill and alluvium and the Trenton "gravel." On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet. As a part of the AOI 1 RIR, Stantec (Stantec, 2016)

mined existing data and has identified estimations of horizontal hydraulic conductivity (k_h) for the unconfined aquifer from 15 in-situ aquifer (slug) tests and two, short-duration pumping tests (see Figure 9). None of these tests were identified in AOI 6. From those tests, estimated values of unconfined aquifer k_h vary two orders of magnitude across the facility. The wide range of estimated values of k_h is reflective of the heterogeneous nature of the Trenton gravel. Anomalously low values of k_h may also be the result of poor well-aquifer hydraulic communication related to inadequate well development, or fouling of the well screen. Stantec is presently evaluating potential values of reported unconfined aquifer k_h as a part of site-wide numerical model calibration and sensitivity analysis.

5.2.2.1 Hydraulic Heads and Groundwater Flow

As shown on Figure 14, water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead and one is in the southeastern portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. There are also two areas of groundwater depression in the eastern and central portion of AOI 6. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours. Evaluation of groundwater mounding/depression is an important component of understanding horizontal hydraulic gradients since they strongly influence contaminant fate and transport in an analytical or numerical model.

Groundwater flows to the south west towards the river. The gradient towards the southwest is 0.0019 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

5.2.3 Semi-confined (Lower) Aquifer

Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.002 ft/ft.

GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2013 RIR).

Beneath the study area, the lower aquifer is primarily composed of saturated portions of the lower sand unit. On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet. There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard and has been summarized on Figure 10. From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

6. LNAPL Investigation

6.1 LNAPL Characterization Sampling

Various petroleum products have been stored and distributed within AOI 6. Historic testing has been completed to characterize the LNAPL at the Site. The results of the tests are summarized in Appendix F and are discussed below. Stantec has gone back through the historic LNAPL sampling and has reclassified some of the LNAPL types as summarized in Table 11, these re-classifications are also included below.

2004

In 2004, LNAPL samples from wells B-129, B-130, B-144, B-39, B-43, and WP 9-2 were collected and submitted to Torkelson Geochemistry, Inc. (Torkelson) for analysis. Torkelson completed gas chromatograph analysis of the samples. LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well B-129 is located near the eastern border of AOI 6. Torkelson characterized the sample from B-129 as being severe-extremely weathered middle distillate with heavier material and gasoline (Langan, 2004).
- Well B-130 is located near the western border of AOI 6 along the bulkhead. Torkelson characterized the sample from B-130 as being severely-extremely weathered middle distillate and residual oil (Langan, 2004).
- Well B-144 is located near 2nd Street. Torkelson characterized the sample from B-144 as being severely weathered gasoline and residual oil (Langan, 2004).
- Well B-39 is located in the southwestern corner of AOI 6. Torkelson characterized the sample from B-39 as being severely weathered middle distillate and gasoline (Langan, 2004).
- Well B-43 is located along the bulkhead in the northwestern area of AOI 6. Torkelson characterized the sample from B-43 as being extremely weathered middle distillate (Langan, 2004).
- WP 9-2 is located along 2nd street in the southwestern corner of AOI 6. Torkelson characterized the sample from WP 9-2 as being severely weathered aviation gasoline and middle distillate (Langan, 2004).

2006

In 2006, LNAPL samples from wells B-47 and B-150 were collected and submitted to Torkelson Geochemistry, Inc. (Torkelson) for analysis. LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well B-47 is located near the center of AOI 6. Torkelson characterized the sample from B-47 as being extremely weathered residual oil with a trace of unknown aromatics (Langan, 2006).
- Well B-150 is located west central of AOI 6. Torkelson characterized the sample from B-150 as being unknown aromatics with unknown weathering (Langan, 2006).

2013

- During the January 2013 groundwater sampling event, 19 monitoring wells had measureable (>0.01 feet) LNAPL.

6.2 LNAPL Distribution

Numerous monitoring wells across AOI 6 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 76 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 21 wells with a maximum thickness of 4.27 feet at well B-116 during the May 2016 gauging. Figure 16 presents the May 2 2016 apparent LNAPL thicknesses from a limited groundwater gauging event and Figure 17 presents the LNAPL thickness from the May 11 2017 annual gauging.

A shown on Figure 16, during the May 2016 event there was three main areas with LNAPL detections:

- LNAPL in wells B161, B-124, B-175 delineated by B-173 and B-125.
- LNAPL in wells B-143, B-142, Sump-1, B-138 and B-147 delineated by B-126, B-138, B-141, B-134 and B-133.
- LNAPL in wells B-150, B-149 and B-148 delineated by B-155, B-156, B-163and B-154.

LNAPL was also detected in isolated wells B-130, URS-3, B-152, RW-9, U-3, and B-129 delineated by adjacent wells.

Based on evaluation of multiple lines of evidence, as presented in Appendix F (LNAPL Evaluation), LNAPL is largely present as hydraulically immobile and unrecoverable residual that is stable in overall extent. The fact that the 27 Pump House Total Fluids Recovery System has been off since September 20, 2010 and passive remediation was discontinued on January 26, 2015, with no perceived rebound in LNAPL thicknesses, also lends support to this assertion.

7. Vapor Investigation

The vapor intrusion pathway in AOI 6 was evaluated for potential receptors of vapors originating from subsurface soil or groundwater, in accordance with the PADEP, Land Recycling Program; Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2, January 2017 (VI Guidance).

7.1 Indoor Air Sampling

Evergreen and PES identified structures that could be occupied in AOI 6 during the initial building survey and the October 2017 building survey review, as shown in Table 12 and on Figure 18. During this survey 16 structures were identified as routinely occupied or potentially occupied. These buildings included: Building 6636, 24 Gate Building 295, Lab/Bottle Washing Building 163, Girard Point Training Building 651, Girard Point Main Office Building 650, Capital Projects Tank Group

Trailers, Control Room 739, Trade Shops 178, Carpenter Shop 726, North Tank Field Blockhouse 475, WTP Control Room 745, Control Room 6627, Control Room south of Boiler House #3, Former Locker House associated with former Boiler House #2, and Office near Separator. The characteristics of several of these buildings were such that vapor intrusion is not considered a complete pathway. The building-specific conditions are as follows:

- Refinery Lab/Bottle Washing Building 163 – broken windows visible throughout that allows outdoor air flow
- Capital Projects Tank Group Trailers – elevated trailers with perforated soffit-style skirt that allows outdoor air flow
- Control Room south of Boiler House #3 – elevated without a skirt
- Former Locker House near former Boiler House #2/Process Building – locked and inaccessible, not occupied
- Office near Separator – blast resistant building sitting on ground and fork truck holes at the surface (to facilitate relocation)
- Paint Shop Building 701 – accessible but unoccupied
- Insulation Building 265 – unoccupied building used for storage

Indoor air and outdoor ambient (background) air samples were collected in March 2016 and March 2017 from the occupied buildings where the vapor intrusion pathway is potentially complete. The numbers of samples collected for each building was based on a combined approach from Appendix Z of the PADEP VI Guidance and professional judgement. The data from these sampling events are summarized in Table 13 and the locations sampled are shown on Figure 18.

A building survey and inspection was conducted to identify any potential indoor air sources of volatile organic compounds (VOCs) possibly already present within the building (e.g., smoking, cleaning products, building products, manufacturing chemicals, etc.), the number and frequency of occupants within the various buildings, and potential preferential migration pathways through the building slab (e.g., utility conduits, slab cracking, etc.). At each building GHD completed an Indoor Air Sampling Field Sheet, which is included in Appendix K.

Indoor and ambient air samples were collected using 6-liter capacity Summa™ canisters in a suitable location(s) in each building at a representative breathing zone height (i.e., 3 to 5 feet above grade). Canisters were laboratory-certified clean in accordance with Appendix Z of the PADEP draft VI guidance. The canisters were fitted with a laboratory-calibrated critical orifice flow-regulation device sized to limit the indoor air sample collection flow rate to allow for 8-hour sample collection. Canisters maintained a minimum residual negative pressure of approximately 1 to 5 inches of mercury following sample collection. Written documentation of all field activities, conditions, and sampling processes, including names of field personnel, dates and times, etc. were recorded. Documentation included building designation, building use, occupant information, and weather conditions at the time of sampling (temperature, barometric pressure, wind direction and speed, and humidity).

Outdoor air sampling locations were selected for collection of an ambient air sample in AOI 6. The outdoor locations were set at the same general elevation of the samples in the buildings and were in a position that is generally upwind of the buildings being assessed.

Table 13 summarizes the indoor air and outdoor data and compares the detected concentrations to the generic screening criteria. As shown in Table 13, all detected concentrations of constituents in indoor air were below the Pennsylvania generic non-residential SHS for indoor air, except IA-AOI6-6627 (Building 6627 Control Room), which exceeded for benzene. As shown on Table 13, the benzene concentration at this locations also exceeded 1/10th of the SHS. The location of indoor and outdoor air samples is shown on Figure 18.

One additional round will be conducted and reported in a future submittal. If concentrations continue to be detected above the indoor air screening level in IA-AOI6-6627 (Building 6627 Control Room) or other locations, then it will be addressed through risk assessment or remedial activities as presented in the site-wide Risk Assessment report or site-wide Cleanup Plan.

7.2 Air Sampling over LNAPL Plumes

In March 2016, two air samples (two locations) were collected to evaluate outdoor air quality in locations over NAPL plumes within AOI 6, at the request of the PADEP. The locations of these samples are shown on Figure 18 and the results are summarized in Table 14. These samples were collected from the breathing zone (3 to 5 feet above ground level) using Summa© canisters with laboratory-provided regulators set to collect air over one continuous 8-hour period. The samples were packaged by field personnel and transported by FedEx to Lancaster Laboratories under Chain-of-Custody documentation for analysis of volatile organic compounds (VOCs) on the Act 2/One Cleanup program petroleum short list by EPA Method TO-15.

Table 14 summarizes the outdoor air data collected over NAPL plumes and compares the detected concentrations to background concentrations. PADEP operates a network of air toxics monitoring stations that analyze for VOCs. Regional ambient air quality in the Philadelphia area where the refinery is located is best represented by data from the Marcus Hook monitoring station (latitude 39.8178, longitude -75.4142). USEPA's background residential indoor air values are also included in Table 14 to determine whether detected concentrations are within background levels. As shown in Table 14, the results for the ambient air samples collected from over LNAPL in AOI 6 are within the background levels for this area. The location of indoor and outdoor air samples is shown on Figure 18. No additional sampling is proposed for the air quality over the LNAPL areas.

8. Quality Assurance/Quality Control

All fieldwork conducted as part of the site characterization activities was performed in accordance with the methods outlined in Appendix B, Evergreen Field Procedures. Methods established by Evergreen to examine data quality are outlined in the Evergreen Data Usability Standard Operating Procedure (SOP). An assessment of analytical data collected as part of this investigation under the SOP is also included in Appendix H in the data usability assessment. The following sections describe specific aspects of quality assurance/quality control procedures that pertain to the activities outlined in this report.

8.1 Equipment Decontamination

All sampling equipment was either dedicated or decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent, potable water, and distilled water.

8.2 Equipment Calibration

Air quality monitors used for both air monitoring and soil screening were calibrated prior to use. Both a zero calibration and a span calibration using gases of known concentration as recommended by the manufacturer (i.e., 100 parts per million by volume (ppm_v) isobutylene for the photoionization sensor) were performed.

8.3 Sample Preservation

Samples were placed directly into chemically preserved and/or non-preserved glassware provided by the analytical laboratory, as appropriate. All samples were preserved and shipped at a temperature of approximately 4°Celsius (C) or less by application of ice prior to shipment to the analytical laboratory. This temperature was maintained during shipment by placing ice in zip-top bags above, around, and below the sample containers.

8.4 Documentation

Chain-of-custody forms were maintained throughout the sampling program to document sample acquisition, possession, and analysis. Chain-of-custody documentation accompanied all samples from the field to the laboratory. Each sample was assigned a unique identifier that was recorded in the field notes as well as on the chain-of-custody document.

9. Conceptual Site Model

GHD's conceptual understanding of the present conditions identified at AOI 6 and nearby proximity is summarized as follows.

9.1 Description and Site Use

- The Philadelphia Refinery is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. Current operations at the facility consist of the production of fuels and basic petrochemicals for the chemical industry.
- The area surrounding the facility is characterized by a mixture of residential, commercial, and industrial properties.
- AOI 6, also known as the Girard Point Chemicals Processing Area, encompasses approximately 100 acres and is located on the east side of the Schuylkill River. AOI 6 is a wedge-shaped property bordered by Lanier Avenue/AOI 3 to the east, Penrose Avenue

(Route 291)/Platt Memorial Bridge/AOI 5 to the south and Pennypacker Avenue/AOI 7 to the north (Figures 1 and 2).

- The entire western boundary of AOI 6 along the Schuylkill River is bound by a sheet pile wall.
- AOI 6 formerly contained numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area.
- AOI 6 currently consists of Udex and cumene units, reformer and associated naphtha hydrotreater, a diesel hydrotreater, tankage, boiler-houses and associated feed water treatment, maintenance buildings, lay-down yards, office buildings, the # 2 oil-water separator and remote Laboratory.
- There are two leaded tank bottom SWMUs (SWMU Nos. 92 and 95) located in AOI 6 that were addressed in several previous RCRA investigations as part of the EPA Corrective Action Process (CAP).

9.2 Geology and Hydrogeology

9.2.1 Geologic Framework

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line".
- Beneath AOI 6, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 6.

9.2.2 Unconfined (Water-Table) Aquifer

- Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 6. Evergreen is planning additional aquifer testing in AOI 4 as part of the facility wide fate and transport numerical model.
- Water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. There is also an area of groundwater depression in the eastern and central portions of AOI 6. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours.

- Groundwater flows to the southwest towards the river. The gradient towards the southwest is 0.002 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

9.2.3 Lower Aquifer (Semi-Confined)

- Beneath AOI 6, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.0019 ft/ft.
- GHD evaluated the vertical hydraulic head gradients for the 2016 gauging events between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2010 RIR and 2012 RIR).
- There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

9.3 Compounds of Concerns

9.3.1 Soil

- Soil delineations were performed to the non-residential direct contact MSC for COCs on Table 1 and the numeric SSS (for lead), except along the bulkhead in AOI 6.
- Several soil samples collected during the 2016 site characterization activities exceeded the non-residential direct contact MSCs for lead and benzene and one sample for benzo(a)pyrene.

9.3.2 Groundwater

- Two rounds of characterization groundwater sampling were completed in 2016 in addition to other sampling in 2006 and 2012 as a part of this RIR and groundwater samples were analyzed for the COCs on Table 1.
- Concentrations of the following COCs were detected above the non-residential MSC in the water table aquifer during the 2016 groundwater sampling events: benzene, isopropyl benzene, toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead.

- None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.

9.3.3 Indoor/Ambient Air

- An indoor and outdoor air sampling events were conducted in March 2016 and March 2017 to represent ambient air and indoor air conditions during two heating seasons when levels of VOCs inside buildings are expected to be higher than during warmer months.
- Only one COC, benzene (in 6627 Building Control Room), was detected in an indoor samples above the PADEP VI screening criteria and the USEPA RSLs.

9.4 LNAPL Distribution and Mobility

- Numerous monitoring wells across AOI 6 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 76 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 21 wells with a maximum thickness of 4.27 feet at well B-116 during the May 2016 gauging.
- Based on evaluation of multiple lines of evidence, as presented in Appendix F (LNAPL Evaluation), LNAPL is largely present as hydraulically immobile and unrecoverable residual that is stable in overall extent. The fact that the 27 Pump House Total Fluids Recovery System has been off since September 20, 2010 and passive remediation was discontinued on January 26, 2015, with no perceived rebound in LNAPL thicknesses, also lends support to this assertion.
- A shown on Figure 16, during the May 2016 event there was three main areas with LNAPL detections:
  - LNAPL in wells B161, B-124, B-175 delineated by B-173 and B-125.
  - LNAPL in wells B-143, B-142, Sump-1, B-138 and B-147 delineated by B-126, B-138, B-141, B-134 and B-133.
  - LNAPL in wells B-150, B-149 and B-148 delineated by B-155, B-156, B-163and B-154.

  LNAPL was also detected in isolated wells B-130, URS-3, B-152, RW-9, U-3, and B-129 delineated by adjacent wells.

9.5 Qualitative Fate and Transport of Selected Compounds

- A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport assessment presented in this RIR. Rather, a qualitative-level assessment of groundwater data was warranted at this stage of the investigation.
- Of the COCs identified to be present in groundwater exceeding the non-residential MSC beneath AOI 6, the majority of the exceedances are for benzene as shown on Figure 19 which are associated, generally, with the occurrence of LNAPL which is immobile as discussed in Appendix F.

9.6 Potential Migration Pathways and Site Receptors

- AOI 6 encompasses approximately 100 acres and is located on the east side of the Schuylkill River and access is restricted by fencing and security measures.
- PES is responsible for overall facility security and oversight of contractor safety, and PES implements PPE and work plan/permitting protocols that mitigate the potential for worker exposure to impacted soil, groundwater, and/or LNAPL through the direct contact pathway.
- AOI 6 areas with identified soil exceedances of the direct-contact MSC for BaP and benzene, with the exception of BH-16-025, and SSS for lead have been delineated and remedies will be addressed in future Act 2 submissions, including a Facility-Wide Cleanup Plan. Additional delineation of benzene in BH-16-025 may be completed to support risk assessment or remedial activities.
- Concentrations of COCs identified through indoor and ambient air sampling met the PADEP indoor air criteria and the USEPA RSLs 1e-5 or HI of 0.1.
- Free-phase and residual LNAPL present beneath portions of AOI 6 appear to be contained within the property boundary and where present, of limited mobility.
- COCs are present in unconfined aquifer groundwater at concentrations above their respective SHS within AOI 6 and adjacent to the river.
- None of the COCs exceeded the groundwater MSCs in the lower aquifer.
- The Schuylkill River is adjacent to, AOI 6 but the bulkhead separates the water table aquifer and the river. The unconfined aquifer is not utilized for municipal or nearby communal, potable water supply in south Philadelphia. Results of the potable well search are presented in Appendix M.

10. Qualitative Fate and Transport Assessment

On September 28, 2015, Evergreen's team of consultants met jointly with the PADEP to discuss the groundwater fate and transport modeling approach under Act 2 at the Philadelphia Refining Complex. At that time, it was collaboratively decided that individual AOI RIR submissions would include qualitative assessments of contaminant fate and transport, including an evaluation of plume stability, COC trends, and potential impacts to surface water. Findings and conclusions of the AOI-specific, qualitative assessments of fate and transport will ultimately be used in a calibrated, steady-state MODFLOW model to perform quantitative fate and transport, including predictive simulations that will address cumulative mass loading to potential receptors.

The following discussion qualitatively summarizes factors that may influence contaminant fate and transport at AOI of the facility.

10.1 Geologic Framework

As discussed in detail in Sections 2 and 5 of this report, the geologic framework present beneath and in close proximity to AOI 1 can be summarized as follows:

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line".
- Beneath AOI 6, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 6.

10.2 Hydrogeology

As summarized above and discussed in detail in Section 5 of this report, the geologic framework present beneath and in close proximity to AOI 6 supports the following hydrogeologic conditions:

- Two aquifers have been identified beneath the Philadelphia Refinery. In general, these are the water-table (unconfined) and a lower aquifer. Their properties are as follows.

10.2.1 Unconfined (Water-Table) Aquifer

- Beneath AOI 6, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 6 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 6. Evergreen is planning additional aquifer testing in AOI 4 as part of the facility-wide fate and transport numerical model.
- Water-table mounds are apparent in AOI 6. These mounds are found immediately adjacent to the bulkhead. Groundwater depressions are found in the eastern and central portion of AOI 6.
- Groundwater flows southwest towards the river with a gradient of 0.002 ft/ft. This pattern is consistent with the historical contours and supports that flow in AOI 6 is towards the river.

10.2.2 Lower Aquifer (Semi-Confined)

- Beneath AOI 6, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 6 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 6 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for

synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the southwest under a hydraulic gradient of approximately 0.002 ft/ft.

- GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 6. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 6 (2006 SCR and 2012 RIR).
- There is no available aquifer testing data for the lower aquifer at the facility. Evergreen is planning on conducting slug and hydraulic tests on the lower aquifer in AOI 4 in support off the facility wide fate and transport modeling. At the time of this RIR however, the best available k_h data for the lower aquifer is estimated from historical testing performed at the Philadelphia Naval Shipyard From those tests, values of lower sand k_h are estimated to vary from approximately 123 ft/d to 151 ft/d.

10.3 Hydrogeology and Topography

- LiDAR data collected in 2010 indicates that present-day topography is relatively flat within AOI 6 and proximity, where land surface elevations generally range from approximately 60 feet to just over 75 feet NAVD 88.
- Within AOI 6, much of the surface area present is impervious or assumed to be of limited permeability.
- The Schuylkill River is directly adjacent to AOI 6.
- National Weather Service Online Weather Data (NOWData) for Philadelphia, Pennsylvania, indicates that since 1872, mean annual precipitation is approximately 42 inches (ranging from approximately 29 to 64 inches).
- Stormwater runoff within AOI 6 is managed by an onsite storm sewer system that is sent to the facility's Girard Point Wastewater Treatment Plant.
- Natural recharge of the unconfined aquifer beneath AOI 6 and proximity is assumed to be spatially variable but limited in overall capacity as a result of: the high percentage of impervious surface coverage present; and, the fine-grained nature and extent of recent alluvial deposits above the water table.

10.4 Anthropogenic Features

10.4.1 Historic Fill

Apparent fill is present beneath the existing land surface at most locations in AOI 6 and has been identified to be approximately 10 feet. The fill is generally heterogeneous in nature and is composed of an admixture of sand and gravel, mud, and anthropogenic debris included cinders, ash, bricks, cinder block, and metal.

10.4.2 Former Remediation Systems

The 27 Pump House Total Fluids Recovery System was turned off September 20, 2010 due to absence of recoverable product. Passive remediation began on October 10, 2010 with the installation of absorbent socks in wells B-124, B-132, B-137, B-139, B-142, B-143, and B-147. These wells were gauged on a quarterly basis and any detected LNAPL was passively recovered and transferred to the system holding tank. Based on limited recoverable LNAPL in the proximal wells, passive remediation was discontinued on January 26, 2015. A summary of the remediation systems is presented in Appendix G.

10.5 Groundwater Constituents of Concern

10.5.1 Unconfined (Water Table) Aquifer

Concentrations of the following COCs were detected above the groundwater MSCs in unconfined aquifer groundwater during the 2016 characterization sampling events; benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead. These results are consistent with historic sampling for COCs that have been previously analyzed in AOI 6.

The areas that are not proposed to be evaluated for remedial action in the Cleanup Plan have very low levels of semi-volatile compounds and are delineated by other monitoring wells or the bulkhead. These compounds will be evaluated by the site-wide Fate and Transport modeling.

10.5.2 Lower Aquifer

No concentrations of COCs were detected above the groundwater MSCs in lower aquifer groundwater during 2016 characterization sampling events. This is consistent with the results from previous sampling events.

10.6 Potential Onsite and Offsite Receptors

Based on the identified impacts to groundwater at AOI 6, GHD has evaluated the following as potential receptors:

- Vapor intrusion effecting potential occupants of buildings in AOI 6 was evaluated. The results did not exceed the PADEP VI screening levels with the exception of one detection of benzene.
- The Schuylkill River could receive AOI 6 groundwater discharging to the river. Although the bulkhead will limit migration of the groundwater from AOI 6 to the river.
- Potable consumption of impacted groundwater could affect human health. No known potable supply wells exist at or in proximity to AOI 6. Results of the potable well search are presented in Appendix M.
- The PRM aquifer system is heavily utilized for water supply in New Jersey. The aquifers of that system, chiefly the lower sand unit, receive recharge via vertical leakage through confining units and direct recharge from younger deposits along their subcrop area in south Philadelphia. None of the COCs were above the groundwater MSCs in the lower Aquifer in AOI 6.

10.7 Plans for Quantitative Fate and Transport Analysis

Stantec is presently developing a site-wide groundwater flow model using the USGS MODFLOW2000 computer code and Groundwater Vistas Version 6 software. The MT3DMS contaminant transport module will be utilized to simulate predictive scenarios of the fate and transport of selected COCs in groundwater. The modeling is being performed to meet and demonstrate compliance with the PADEP Site-Specific Standard for remediation of pre-existing contamination under Act 2, Pennsylvania's Land Recycling Program. Under Act 2 and in consideration of the One Cleanup Program, an analysis of the fate and transport of petroleum-related constituents is needed, in general, to assess risk to potential receptors, assess plume stability, and estimate time to project closure.

The site-wide flow model will focus on groundwater movement within the Coastal Plain of south Philadelphia, Pennsylvania, near the Philadelphia Refinery. The model domain was adopted from an earlier USGS model developed by Schreffler (2001), later updated by Sloto (2012), and has been updated by Stantec to more-closely simulate site-specific groundwater flow conditions beneath the facility. Updates to the Schreffler (2001) model have included model layer refinement, grid discretization, updates to the model layer hydraulic properties using site-specific testing data, and the inclusion of drains to simulate losses to the sewers and/or localized pumping centers (e.g., Mingo Creek Pump Station). It is anticipated that Stantec will present the site-wide flow model to PADEP for comment prior to utilization of the model in any fate and transport analyses at the refinery in support of a facility-wide Cleanup Plan, or a site-wide RIR to address cumulative loading of COCs to receptors.

11. Ecological Assessment

The majority of AOI 6 is covered with soil, gravel, and impervious surfaces. The soil and gravel-covered portions of AOI 6 are not likely to serve as a breeding area, migratory stopover, or primary habitat for wildlife. On September 23, 2016, a survey of endangered, threatened, and special concern wildlife and habitat was conducted by submitting a search request through the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Tool. The results of the PNDI search identified no known impacts by the PA Game Commission, the PA Department of Conservation and Natural Resources, and the U.S. Fish and Wildlife Service.

The PNDI search identified potential endangered and threatened species impacts that required further review by the PA Fish and Boat Commission. A no effect letter request was submitted to the PFBC on October 22, 2016. A response was received from the PFBC on November 3, 2016 indicating that no impact is anticipated to the species of special concern. Evergreen intends on completing a habitat assessment to document habitat types present and adjoining AOI 6 and the suitability of these habitats to support species of concern based on the results of the PNDI search even though a no effect letter was received from the PFBC. Evergreen will complete these assessments in accordance with PA Chapter 250.311 and the Pennsylvania Technical Guidance Manual (TGM) by a qualified biologist. The results of this assessment will be included in a future submittal. All ecological assessment documentation is included in Appendix I.

12. Community Relations Activities

A Community Relation Plan (CRP) that includes public involvement with local residents to inform them of the anticipated investigations and remediation activities was completed as part of the original NIR submittal in 2006. A revised NIR was submitted in 2014. The purpose of the CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens to be informed of on-site activities related to the investigation activities at the Site. This plan incorporates aspects of public involvement under both PADEP's Act 2 program and USEPA's RCRA Corrective Action program. This report and future Act 2 reports will include the appropriate municipal and public notices in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper. As part of the CRP, Evergreen has held an initial public meeting in the City of Philadelphia to present the strategy and give status updates of the project at the CRP meeting on an as requested basis. A copy of the original NIR, the 2014 NIR and the Act 2 report notifications for this RIR are included in Appendix A.

13. Conclusions and Recommendations

GHD has prepared this RIR for AOI 6 of the Philadelphia Refinery Complex to satisfy the requirements of Act 2, as specified under 25 PA Code §250.408. The documented investigation activities were performed in general accordance with a 2011 revised Work Plan for Site-wide Approach Under the One Cleanup Program, and were conducted in support of Evergreen's commitment to remediate legacy environmental impacts that existed at the facility prior to its conveyance to PES in 2012 (Buyer-Seller Agreement). In support of those stated objectives, this report has described a comprehensive evaluation of available historical data pertaining to AOI 6, and has documented a remedial investigation strategy that included the collection of a significant amount of additional subsurface information in the time since previous AOI 6 Act 2 deliverables were submitted to PADEP (2013 SCR/RIR). Investigations performed as a part of this report also considered and where relevant, sought to address PADEP comments directed towards previous RIR submissions for the facility.

The following summarizes the conclusions and recommendations regarding AOI 6.

13.1 Soil

Some historical samples had exceedances of the direct-contact MSC for, BaP, lead and benzene. These historical samples have been delineated.

Limited soil samples collected in 2016 exceeded the numeric SSS for lead, the NRDC for benzene and BaP. Additional sampling may be completed to support site-wide Risk Assessment or site-wide Cleanup Plan Reports to delineate benzene in the vicinity of AOI 6-16-025.

13.2 Groundwater

13.2.1 Unconfined (Water-Table) Aquifer

Benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead exceeded the current non-residential MSCs in the unconfined aquifer.

The concentrations of COCs exceeding the MSCs in the unconfined aquifer have generally been delineated. The following wells have groundwater MSC exceedances but are not explicitly delineated by other wells with concentrations below MSCs: B-39, B-43, B-169, U-4, and URS-5. These wells are located near the bulkhead and do not have any wells that can delineate these concentrations.

13.2.2 Lower Aquifer

None of the samples in the lower aquifer exceeded the non-residential MSCs, which is consistent with historic data in AOI 6 therefore no further assessment was completed for the Lower Aquifer in this RIR. As indicated above for the unconfined aquifer, a MODFLOW model will be utilized during quantitative fate and transport analyses to evaluate the Lower Aquifer for the facility.

13.3 Vapor Intrusion

Concentrations of COCs in indoor and outdoor ambient air were evaluated in the ten occupied buildings in AOI 6 where the vapor intrusion pathway is potentially complete. There were no exceedances of the PADEP VI criteria except IA-AOI6-6627 (Building 6627 Control Room), which exceeded for benzene. Evergreen is intending to complete an addition round of indoor air sampling within AOI 6. Results of the additional sampling event will be reported to PADEP in a future Act 2 deliverable. Indoor air concentrations in exceedance of the indoor air screening criteria will be addressed in a site-wide risk assessment or remedial activities as presented in the site-wide Risk Assessment report or site-wide Cleanup Plan.

13.4 LNAPL

LNAPL within AOI 6 has been delineated, except in areas along the bulkhead where delineation is not possible. The majority of LNAPL sampled was categorized as a light to middle distillates. LNAPL recovery has been suspended due to poor recovery and immobility of the LNAPL.

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Attachment 53

April 30, 2018 Reference No. 11109613

Mr. David Brown
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania
U.S.A. 19401

ATTACHMENTS OMITTED BY CLEAN AIR COUNCIL

Dear Mr. Brown:

Re: Responses to Comments – AOI 6 Remedial Investigation Report
Dated November 21, 2017
Philadelphia Energy Solutions Refining & Marketing LLC (PES)
Philadelphia Refinery Complex
3144 West Passyunk Avenue Philadelphia, PA (PHAOI-6)

This letter is being submitted on behalf of Evergreen Resources, LLC to provide responses to comments from the Pennsylvania Department of Environmental Protection (PA DEP) Act 2 Program (Act 2) dated March 1, 2018 regarding the 2017 Remedial Investigation Report (RIR) for Area of Interest (AOI) 6 at the Philadelphia Energy Solutions complex (Site). The original comments provided by PA DEP are reproduced in *italicized text* below, with Evergreen's responses following.

Soil

1. *Benzene direct contact exceedances were present in samples collected from borings BH-16-025 and BH-16-037, in the area north and northeast of Tank 797. These exceedances do not appear to be delineated immediately west of these borings. We recognize that this area is part of an active process unit. Further delineation may be needed to implement a remedy.*

The benzene direct contact exceedances from boring BH-16-025 and BH-16-037 will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report or the site-wide Cleanup Plan. Additional sampling is anticipated to support either the Risk Assessment or the Cleanup Plan activities.

2. *The lead direct contact standard exceedance at BH-17-004 does not appear to be delineated between the bulkhead and the boring location. Further delineation may be needed to implement a remedy.*

Sample location BH-17-003 is located in the general area between BH-17-004 and the bulkhead and has lead detections at concentrations below the direct contact standard. Additionally, lead in the area between BH-17-004 and the bulkhead will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report or the site-wide Cleanup Plan. Additional sampling is anticipated to support either the Risk Assessment or the Cleanup Plan activities.

3. *An exceedance of the benzo(a)pyrene direct contact MSC was identified in shallow soil (BH-29-06). EPA issued a new IRIS toxicological review of benzo(a)pyrene in Jan 2017. Evergreen might consider calculating a site-specific numerical value for benzo(a)pyrene or performing a risk assessment using the updated toxicological information.*

Evergreen is planning to submit a site-wide Human Health Risk Assessment for the entire Site. Evergreen will consider including benzo(a)pyrene with the updated toxicological information in the site-wide Risk Assessment.

Groundwater & LNAPL

4. *LNAPL is not delineated between B-39 and the river. Potential migration of LNAPL to the river should be considered as part of the fate-and-transport and surface water attainment analyses.*

Since 2007, the appearance of measurable LNAPL in B-39 has been ephemeral, only being noted in two of fourteen well gauging events. Additionally, the LNAPL in this well has been identified as highly weathered/degraded. Considering these points collectively, the LNAPL in the vicinity of B-39 is largely present as old, immobile residual which will be considered during the quantitative fate and transport and surface water attainment analysis. Additional assessment of LNAPL in this area will be conducted and included in a future Act 2 submittal.

5. *LNAPL distribution and mobility discussions (Sections 6.2 and 9.4) do not include well B-39 as indicated on Figure 16.*

LNAPL was present in B-39 in May 2016 as shown on Figure 16. However, LNAPL was not detected in this well in the two more recent gauging events in August 2016 and May 2017. Furthermore, as previously mentioned, the appearance of measurable LNAPL in B-39 has been ephemeral, only being noted in two of fourteen well gauging events since 2007. In other words, measurable LNAPL has not typically/regularly been present in this well with reference to numerous monitoring events in the last 10 years. Additionally, as noted above, the age of the LNAPL, well gauging history, and level of degradation indicate that the LNAPL in the vicinity of B-39 is largely immobile residual. However, since LNAPL has been detected in B-39, it will be considered during the quantitative fate and transport and surface water attainment analysis. Additional assessment of LNAPL in this area will be conducted and included in a future Act 2 submittal.

Exposure Pathways

6. *We note that there were vapor intrusion screening value exceedances for benzene and naphthalene in some buildings. An inhalation risk assessment should be performed for those receptors in future reporting.*

The vapor intrusion (VI) screening value exceedances for benzene and naphthalene will be evaluated in the site-wide Risk Assessment Report.

7. *Some reporting levels in the indoor air sample analyses exceeded applicable screening values (Table 13). Please refer to DEP's FAQs on the VI guidance for the application of PQLs to screening.*

The method TO-15 PQLs were obtained from the laboratory by requesting documentation of the lowest calibration point attained for the time of the sample analysis. This documentation is included in Attachment A to this letter. Table 13, also included in Attachment A, has been revised to present both the sample-specific practical quantitation limits (PQLs), as well as the method detection limits (MDLs). The PQL is used as the reporting limit. The samples with detected concentrations or reporting limits greater than the VI screening levels will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report or the site-wide Cleanup Plan. Additional VI sampling is anticipated to support either the Risk Assessment or the Cleanup Plan activities.

8. *Evergreen could consider collecting additional outdoor air samples in the area of benzene soil direct contact MSC exceedances (vicinity of Tank 797). The direct contact MSC for benzene is based on an inhalation exposure pathway.*

The benzene soil direct contact MSC exceedances (vicinity of Tank 797) will be assessed through Risk Assessment activities as presented in the site-wide Risk Assessment Report. Additional soil and ambient air sampling will be conducted to support the Risk Assessment activities.

9. *In the PNDI review, the Pennsylvania Fish and Boat Commission indicated that four threatened/endangered species may be present at AOI 6 (Appendix I). Please identify these species. There is a potentially complete exposure pathway for the species of concern, and the report notes that a habitat assessment will be performed.*

Evergreen will include the habitat assessment for ecological receptors in a future submittal.

Tables, Figures, and Appendices

10. *Figure 20 does not show all of the deep wells. The figure should be revised; we recommend that it depict only the deep wells rather than all AOI 6 sample locations.*

Figure 20 has been revised to present the locations of the deep wells in AOI 6, and is included in Attachment B.

11. *The AOI 6 deep wells are not listed in Table 6. Provide a corrected version with the deep well information.*

Table 6 has been revised to include the deep wells in AOI 6, and is included in Attachment B.

12. *According to Appendix F.1, there is a substantial LNAPL thickness in B-129. However, Figures 16, 17, and Figure 16 of Appendix F do not show LNAPL at this well. Provide corrections to these figures.*

As shown in Appendix F.1, LNAPL was detected in B-129 during the May 11, 2017 groundwater measurement event. LNAPL was not detected during the May 2, 2016 or the May 11, 2016 groundwater measurement events. LNAPL was detected in B-116 during the May 11, 2016 measurement event. B-116 has no history of LNAPL. Depth to water at B-116 is typically approximately 6 feet while the depth to water at B-129 is typically approximately 10 feet. During the May 11, 2016 water level measurements, the depth

to water at B-116 was recorded as 9.46 feet and the depth to water at B-129 was recorded as 5.88 feet. Given the proximity of B-116 and B-129, field measurements during May 2016 for these two wells were likely switched. Despite this mix-up in the field, the LNAPL thicknesses in Figure 17 of the RIR and Figure 16 of Appendix F were not revised. Figure 17, of the RIR, was inaccurately dated May 11, 2017 instead of May 11, 2016. The date of Figure 17 and Figure 16 of Appendix F, however, has been revised to May 11, 2016 and is included in Attachment C. The absence of LNAPL in B-116 was confirmed again via gauging on April 24, 2018.

13. *Please provide a hardcopy of Appendix F to include in our file. (It can exclude Table 3 and the appendices, and reference the CD-ROM to access them.)*

Attachment D includes a hardcopy of Appendix F without Table 3 and the appendices. Additional language has been added to reference the CD-ROM for Table 3 and the appendices.

Should you require any additional information, please do not hesitate to contact us.

Yours truly,

GHD

Colleen Costello

MT/ks/1

cc: Tiffani Doerr – Evergreen
Michael Tomka - GHD

Lisa Alic

From: Brett Nedelkoff <Brett.Nedelkoff@Phila.gov>
Sent: Wednesday, January 13, 2021 7:47 PM
To: Philly Refinery Cleanup
Cc: rapatel@pa.gov; Kenyatta Johnson; Joshu Harris
Subject: Councilmember Kenyatta Johnson's Comments on Evergreen Remediation
Attachments: CMJohnson Evergreen Letter.pdf

To Whom it May Concern,

Please see the attached letter from Councilmember Kenyatta Johnson regarding his comments on Evergreen's planned remediation of the former Philadelphia refinery site. This letter is to be included on the record for public input for the consideration of Evergreen and the Pennsylvania Department of Environmental Protection (DEP).

If you have any questions about this letter, please feel free to reach out to our office.

Thank you,

Brett Nedelkoff
Legislative Assistant
Pronouns: She | Her
Office of Councilman Kenyatta Johnson
City Hall, Room 580
Philadelphia, PA 19107
(215) 686-3412
Brett.Nedelkoff@phila.gov

CITY OF PHILADELPHIA
CITY COUNCIL

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2ND DISTRICT COUNCILMEMBER

January 13, 2020

Philadelphia Refinery Operations
(a Series of Evergreen Resources Group, LLC)
P.O. Box 7275
Wilmington, DE 19803
Sent via electronic mail

To Whom It May Concern,

As the Councilmember for the 2nd District of Philadelphia which includes the area of Evergreen's cleanup site, I am concerned about the potential impacts this remediation will have on my constituents.

Pennsylvania's statewide health standards for lead contamination in soil notes the direct contact numeric value in state regulations is 1,000 mg/kg. Evergreen proposed a site-specific standard at a level more than twice the state standard, the amount of 2,240 mg/kg is. The level is also twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Any lack of consideration and effort given to this remediation will impact generations of Philadelphians to come. I ask that Evergreen consider operating within the existing state standards to ensure the safety of my 2nd district constituents.

Additionally, I would encourage Evergreen to consider the impacts of climate change on existing soil and water contamination, and to include such considerations into the remedial investigation reports. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. Certain areas in the 2nd have been greatly impacted by flood and storm water, and I must ask you to consider the danger of their potential exposure to toxic soil such as lead.

I implore you to take these comments and concerns seriously and to ensure the protection of Philadelphian's public health.

Yours sincerely,

Councilmember Kenyatta Johnson
Second Council District

From:	Eliza Alford
To:	Philly Refinery Cleanup; rapatel@pa.gov
Cc:	Katherine Gilmore Richardson
Subject:	Comment from Philadelphia City Council Committee on the Environment
Date:	Thursday, January 14, 2021 5:37:41 PM
Attachments:	image001.png[100].png 01.14.20 Evergreen Comment vFINAL.pdf

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Good evening,

Please find attached a comment on the legacy environmental clean-up of the former refinery site from the following members of the Philadelphia City Council Committee on the Environment: Councilmembers Katherine Gilmore Richardson, Cindy Bass, Kendra Brooks, Jamie Gauthier, Derek Green, and Helen Gym.

Thank you,

Eliza Alford
Policy & Communications Director
Office of Councilwoman Katherine Gilmore Richardson
Councilwoman At-Large
Room 581, City Hall
Philadelphia, PA 19107
(215) 686-0454 phone
Pronouns: she/her

KATHERINE GILMORE RICHARDSON
COUNCILMEMBER, AT-LARGE

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Global Opportunities & Creative Economy
Streets & Services
Licenses & Inspections
Labor & Civil Service

VIA EMAIL

Thursday, January 14, 2021

Philadelphia Refinery Operations
(a Series of Evergreen Resources Group, LLC)
P.O. Box 7275
Wilmington, DE 19803

Re: Legacy Environmental Cleanup of the Former Philadelphia Refinery

To Whom It May Concern:

Below please find Councilmember Katherine Gilmore Richardson's comments on Evergreen's Proposed Act 2 Remedial Investigation Reports (RIRs) on behalf of the undersigned members of the Philadelphia City Council Committee on the Environment: Councilmembers Katherine Gilmore Richardson, Cindy Bass, Kendra Brooks, Jamie Gauthier, Derek Green, and Helen Gym.

1. **The standards identified in the Remedial Investigation Reports should align with the highest recommended standard for public health and safety.**

Philadelphia continues to struggle with the public health impacts of toxic pollution and environmental racism. According to the 2020 Health of the City report, life expectancy estimates in the neighborhoods closest to the former refinery site are some of the lowest in the city.[1] Communities in Southwest Philadelphia also see high rates of childhood asthma and elevated Blood Lead Levels (BLL).[2] For generations, those living closest to the site, predominately communities of color, have reported adverse health impacts.[3] Research has demonstrated that this is not an accident: people of color are more likely to live near polluting industries.[4] A study in the Proceedings of the National Academy of Sciences found that pollution exposure among Black and Hispanic people far outweighs the amount of pollution

[1] Philadelphia Department of Public Health. December 30, 2020. "Health of the City." Available at https://www.phila.gov/media/20201230141933/HealthOfTheCity-2020.pdf.
[2] *Id.*
[3] Villarosa, L. July 28, 2020. "Pollution is Killing Black Americans. This Community Fought Back." *The New York Times.* Available at https://www.nytimes.com/2020/07/28/magazine/pollution-philadelphia-black-americans.html.
[4] Tabuchi, H. May 17, 2020. "In the Shadow of America's Smokestacks, Virus is One More Deadly Risk." *The New York Times.* Available at https://www.nytimes.com/2020/05/17/climate/pollution-poverty-coronavirus.html

they cause.[5] These environmental impacts have led to significant health disparities for Black and Hispanic Americans, including higher rates of asthma[6], as well as premature, underweight, and stillborn births[7] to name only a few. Most recently, we've seen significantly higher rates of COVID-19 infection and mortality among people of color, which can likely be attributed to systemic conditions that cause racial health disparities, such as pollution and toxin exposure.[8]

With the clear picture painted by this data, it is incumbent upon Evergreen to clean up this site in accordance with the highest standards for public health and safety. While a significant amount of work has been undertaken in the RIRs, a few important concerns have been brought to our attention, including the site-specific standard for lead in soil, the exclusion of per- and polyfluoralkyl substances (PFAS), the Pennsylvania Department of Environmental Protection's (PADEP) concerns about potential human exposure to polluted water from the deep aquifer under the site, and the potential use of outdated data in the RIRs:

- **Lead:** It is of the utmost importance that Evergreen design its remediation plans using the most stringent standards for addressing lead contamination in soil. Our communities already face significant challenges with the impacts of lead, and Governor Tom Wolf recently launched an initiative to keep Pennsylvania free of lead. The City of Philadelphia has been focused on reducing its residents' exposure to lead, enacting new legislation for homes in recent years. Therefore, we request that, as good corporate partners, you join us in this effort to reduce the potential for lead exposure in our communities by using the stricter 1,000 parts per million standard that is the current Pennsylvania statewide health standard for non-residential sites such as this. While PADEP was considering raising this statewide health standard for lead, it now appears poised to essentially maintain the current standard. Evergreen should follow PADEP's lead and withdraw its less protective site-specific standard.

- **PFAS:** On February 15, 2020, the Pennsylvania Environmental Quality Board (EQB) proposed to amend Act 2 to update existing statewide health standards for medium-specific concentrations (MSCs) to include three new PFAS contaminants: Pefluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS), and Perflouorobutane Sulfonate (PFBS).[9] While this rulemaking process is ongoing, it appears likely that this update will go into effect. Therefore, it is important that Evergreen's Remedial Investigation include these highly toxic and environmentally damaging chemicals.

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[5] Tessum, C.W., Apte, J.S., et. al. March 26. 2019. "Inequity in consumption of goods and services adds to racial-ethnic disparities in air pollution exposure." PNAS 116 (13). Available at https://www.pnas.org/content/116/13/6001

[6] Caffrey, M. August 8, 2017. "Princeton Study: Being Black Doesn't Cause Asthma; The Neighborhood Does." *American Journal of Managed Care*. In Focus Blog. Available at https://www.ajmc.com/focus-of-the-week/princeton-study-being-black-doesnt-cause-asthma-the-neighborhood-does

[7] Flavelle, C. June 18, 2020. "Climate Change Tied to Pregnancy Risks, Affecting Black Mothers Most." *The New York Times*. Available at https://www.nytimes.com/2020/06/18/climate/climate-change-pregnancy-study.html?algo=identity&fellback=false&imp_id=827029242&action=click&module=Science%20%20Technology&pgtype=Homepage

[8] Ray, R. April 9, 2020. "Why are Blacks dying at higher rates from COVID-19?" *The Brookings Institution*. Available at https://www.brookings.edu/blog/fixgov/2020/04/09/why-are-blacks-dying-at-higher-rates-from-covid-19/

[9] 50 Pa. B. 1011 (February 15, 2020)

- **Deep Aquifer:** PADEP has submitted comments to Evergreen regarding the potential for contamination of a deep aquifer that provides drinking water in New Jersey. As good neighbors, we care deeply about protecting the natural resources that are important to nearby states, and we respectfully request that you provide a robust and prompt response to these concerns and make the data publicly available with the rest of the Act 2 documents.

- **Data:** All of the RIRs, as well as the Ecological Risk Assessment and the Site Wide Lead Human Health Risk Assessment, were completed between June 2011 and December 2017. As all of these reports are now three to ten years old, we request that Evergreen demonstrate that the data in the RIRs remains consistent with the site's current conditions.

2. Climate change impact analysis should be included in Remedial Investigation Reports.

Climate change presents one of the most significant threats to the health, safety, and sustainability of our communities. Flooding is one of Philadelphia's central climate vulnerabilities, and the location of the former refinery site puts it at significant risk. At present, Evergreen has not included any climate change impact analysis in its RIRs or released any other information on how climate change will impact the site and how that could change the necessary remediation efforts. EPA Region III has released policy guidance stating that sea level rise should be considered as part of the remedial investigation stage.[10] We request that you follow this guidance and update all relevant Act 2 materials to include the impacts of climate change on the site.

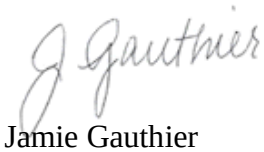
Conclusion

As elected representatives of the public who have been tasked with protecting our local environment, we respectfully request your attention to these matters. Additionally, we support the comments submitted by our colleague, Councilmember Kenyatta Johnson, who represents the Second District. We also recognize and appreciate the work that Evergreen has completed to date in the Remedial Investigation phase, as well as the level of access they have provided to the RIRs and other helpful information on their website and through email communications. We appreciate and support Evergreen's responsiveness to public comment and ongoing efforts to enhance community engagement. We look forward to our continued work together to protect the people and natural resources of the City of Philadelphia.

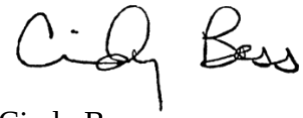
[10] U.S. Environmental Protection Agency Mid-Atlantic Region III. (May 30, 2014). Climate Change Adaptation Implementation Plan. Available at https://www3.epa.gov/climatechange/Downloads/Region3-climate-change-adaptation-plan.pdf.

In Service,

Katherine Gilmore Richardson
Councilmember, At-Large
Chair, Committee on the Environment



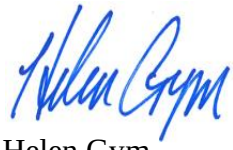
Jamie Gauthier
Councilmember, Third District



Cindy Bass
Councilmember, Eighth District
Vice Chair, Committee on the Environment

Derek Green
Councilmember, At-Large

Kendra Brooks
Councilmember, At-Large



Helen Gym
Councilmember, At-Large

From:	Tracy Carluccio
To:	Philly Refinery Cleanup
Subject:	Comment to Evergreen re. Philadelphia Refinery Operations remediation
Date:	Thursday, January 14, 2021 2:18:59 PM
Attachments:	DRN comment to Evergreen 1.13.21.pdf

Please find attached written comments submitted by Delaware Riverkeeper Network.
Thank you,
Tracy Carluccio

Tracy Carluccio
Deputy Director
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January 14, 2021 Submitted by email to: **phillyrefinerycleanup@ghd.com**

Evergreen Resources Group
P.O. Box 7275
Wilmington, DE 19803

Re: Philadelphia Refinery Operations (a Series of Evergreen Resources Group, LLC) Public Comment on Act 2 Process Remedial Investigation Reports (RIRs)

Delaware Riverkeeper Network submits these comments on behalf of the organization and our members, and in defense of the Delaware River, its tributaries and watersheds. The Philadelphia Energy Solutions (PES) site is situated at an especially valuable and vulnerable location where the last stretch of the Schuylkill River, the largest tributary of the Delaware River, flows south to join the main stem Delaware.

The 1400-acre former PES site is the largest contiguous parcel of waterfront land in Philadelphia without a current use. How the former 140-year refinery site will be used, the level of access for the public, and the level of cleanup of pollution that is achieved at the site will redefine the entire city. For neighborhoods and communities located adjacent and in proximity to the sprawling complex, the quality of life and the health of the people who live and work there will be transformed as these areas emerge from being burdened with air quality that was among the worst in a city that is rated as the 25th worst air quality in the nation. That's because when the PES refinery was operating it was the largest single source of air pollution in the city. That means local residents were bombarded perpetually for decades. The 140 years of operation also polluted the groundwater and soil at the site and nearby communities.

This has led to the requirement by the U.S. Environmental Protection Agency and the PA Department of Environmental Protection (PADEP) that Sunoco clean up the site, which they have engaged Evergreen to plan, for the pollution that built up prior to PES's formation in 2012. This effort is crucial. However, it also can be difficult for people to engage meaningfully in the all-important decision making process, which, from Delaware Riverkeeper Network's experience, has been top-heavy and overly structured without much exchange of information. The virtual community outreach meeting, for instance, was hard to hear and simply not participant-friendly. In addition, groups from the community were apparently not heavily recruited to attend. The entire cleanup process can also become mired in bureaucracy that limits what ends up being

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accomplished in terms of pollution cleanup. In this case, the state is using the voluntary cleanup mechanism under Act 2 to carry out the remediation of the site. This, in itself, puts limits on the remediation in some ways. However, Delaware Riverkeeper Network considers the cleanup of this property to be of such importance that even if there are flaws in the process, working for an effective and community-driven cleanup of the property is unquestionably worthy of the work required by all parties.

How thoroughly the site is cleaned up and its reconnection to the City's neighborhoods will define the future of the property, the environmental quality of the region, and the hydrologically connected groundwater and tributaries, as well as the Schuylkill and Delaware Rivers. Currently the City has 10,000 acres of parks; converting the PES site to open space or parkland could increase that by about 14%, the largest single increase possible in today's cityscape, which would be an historic achievement. Philadelphia holds in its hands a moment in time when transformative change can occur with the execution of the highest quality vision for the remediation of this property. Alternatively, halfway measures, boxed in by predetermined weak standards, cumbersome bureaucratic processes, and lack of robust public participation from impacted communities could result in wasting this moment in time and condemning the property to a forever-polluted condition. Overly restricted spending and timid planning can lock this site into forever being a source of contamination for the city and the rivers that flow through it. Delaware Riverkeeper Network advocates for the former action, to restore this site with a big vision founded on public good and environmental quality.

We realize Evergreen's cleanup process is ongoing and there will be more opportunities for public input. Delaware Riverkeeper Network plans to take part as opportunities continue to open up. We note that we were gravely concerned and participated through the Green Justice Philly coalition to push for Evergreen to be required to back up and revise its earlier grossly inadequate community outreach program to require a robust public involvement plan (PIP) for the Act 2 remediation process.

There had been a nonexistent public process under Philadelphia's early handling of the remediation process. The City and PADEP allowed Evergreen to proceed with important decisionmaking about the site without involving the public in any meaningful manner. As a result, no one knew or grasped the significance of the decision to not use health-based cleanup standards for some toxic substances, such as lead, so it wasn't contested. Unfortunately, many of the poor decisions from that time are still imbedded in the plan.

However, the lack of any public awareness was corrected in response to demands from the public insisting the City ensure the required public input process, particularly from neighborhood groups who had been demanding changes at the refinery for years. The public and lawmakers became very engaged after the June 2019 enormous explosion at PES, which led to the already financially ailing refinery to close. The explosive event was horrific; it released over 5,000 pounds of toxic hydrofluoric acid and 6,700 pounds of hydrocarbons into the air, and, according to federal investigators, no one measured or accounted for where exactly these dangerous pollutants ended

up.[1] However, apparently by a stroke of luck, this was a near miss of a greater catastrophic event if the shrapnel had landed elsewhere or the hydrogen fluoride alkylation unit exploded, which could have taken out most of the city. The fortunate dodging of loss of life and monumental destruction of property is a part of this remarkable story that now present the once-in-a-generation opportunity to replace more than a hundred years of environmental injustices with a truly clean site that turns a legacy of pollution into a public amenity.

Specific comments:

Delaware Riverkeeper Network comments on a few of the Remedial Investigation Reports (RIR) for the Areas of Interest (AOI). We organize our comments by issue below:

1. We object to the use of the proposed site-specific standard for lead in surface soil at the site. The proposed standard will not be protective of public health. It is more than twice the statewide health-based maximum standard for lead – the direct contact numeric value in state regulations is 1,000 mg/kg. The correct calculations should be done based on the current science to set a site-specific standard for this site. Current health-based standards must be used and the site-specific standard revised to be protective of public health. The only advantage to using the weaker standard is for Sunoco and Evergreen, as less of the site would have to be cleaned up if the lower standard is used. This decision must be made using science and prioritizing public health without consideration of minimizing costs for the responsible party.

2. We advocate that a site specific standard be set for PFAS compounds based on the latest science. These highly toxic compounds are known to occur in the site. Pennsylvania proposed that new statewide health standard medium-specific concentrations (MSCs) in soil and groundwater be adopted into the Act 2 cleanup program for three PFAS contaminants: Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonate (PFOS), and Perfluorobutane Sulfonate (PFBS). Evergreen and PADEP need to take further action due to the inadequacy to date in addressing PFAS at the site. First, more PFAS should be sampled for and then included in the standards, based on the results of the sampling of soil and groundwater at the site. Second, the state MSC standards proposed to use EPA's analysis that resulted in the federal health advisory level (HAL) of 70 ppt for PFOA and PFOS (lifetime PFOA and PFOS health advisory level (HAL) of 70 ppt when found singly or a combined total of 70 ppt when both are found)[2] which is not protective of human health[3].

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[1] "Philadelphia dodged several potential catastrophes during a dramatic June 21 refinery blast, which released about 5,239 pounds of a deadly chemical and launched pieces of shrapnel as large as a truck hurtling across the 1,300-acre refinery complex, according to federal findings released Wednesday", from Philadelphia Inquirer, Andrew Maykuth, Updated: October 16, 2019. https://www.inquirer.com/business/deadly-chemicals-philly-refinery-explosion-fire-new-findings-20191016.html

[2] "DEP has directly incorporated the EPA's 2016 health advisory levels (HALs) regarding PFOS and PFOA as groundwater MSCs and has used the data developed by the EPA for those HALs to calculate soil MSCs for both compounds. With respect to PFBS, the DEP is proposing soil and groundwater standards based on a 2014 EPA Provisional Peer-Reviewed Toxicity Value.", https://www.jdsupra.com/legalnews/pennsylvania-proposes-pfas-cleanup-37933/ , page 1.

[3] "The NJDWQI deviated from some of USEPA's conclusions because the 2005 USEPA draft risk assessment problematically did not develop a cancer slope factor or Reference Dose (Rfd) for PFOA, and it did not address the

Many states have adopted stricter standards for PFAS than EPA's HAL because of the conclusion arrived at through state risk assessments that found the EPA HAL flawed. Third, because the state has not adopted maximum contaminant levels (MCLs) for the PFAS compounds and has not added them as hazardous substances under current law, there is a legal question if there is any means to require the cleanup of PFAS compounds at the site.[4] This presents the urgent need for the adoption of statewide MCLs for PFAS compounds and their listing as hazardous substances. These are state actions that are far overdue and immediately needed to protect the public from the adverse health effects of these substances through drinking water and other environmental media. This need has been urgent for years but PADEP has not taken action under the state's Safe Drinking Water Act to adopt MCLs for PFAS, leaving Pennsylvanians exposed to contaminated drinking water that is known to be linked to several adverse health effects, including cancer. Delaware Riverkeeper Network has advocated for many years and continues to work for the adoption by PADEP of MCLs for PFAS compounds to require their removal from drinking water supplies and the listing of PFAS as hazardous substances to force their clean up from the environment. The need for MSCs that are site-specific and based on the latest science (which requires removal to "non-detect" levels for PFOA and PFOS), are made all the more urgent in order to require their removal from the soil and groundwater at the former PES site.

3. Delaware Riverkeeper Network is opposed to the site being cleaned up only to industrial use standards. This decision limits the use of the site and the cleanup required. The site is a rare opportunity for public open space and uses that are compatible with residence, mixed community use, and recreational use such as river access for paddling and water sports. The connection of people to the Schuylkill is of great value, as is demonstrated by the historically and economically important river access for rowing and boating upstream. These river friendly activities can be fostered by providing access from this property to the natural riverside on the Schuylkill and the downstream Delaware River. Most importantly, requiring clean up to residential standards and setting cleanup standards based on human health standards and site-specific scientifically-based standards that are protective of human health and the environment will provide maximum benefit and use of the site and not condemn it to always be a source of pollution because those responsible successfully avoided the costs of cleaning up the pollution they caused.

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relationship between human body burden and drinking water concentration, as measured by blood serum level. Comparisons between effect levels in human exposures and animal studies were made by the NJDWQI on the basis of serum levels rather than external dose because the half-life of PFOA is much longer in humans (several years) than in the animal species used in the toxicological studies (several hours to 30 days).", https://www.delawareriverkeeper.org/sites/default/files/Cover_letter_pet_att_combnd.webpdf.pdf Page 16.

[4] "However, under those statutes DEP probably has limited authority to create the referenced liability for PFOA, PFOS, and PFBS remediation, although DEP, under the Safe Drinking Water Program, could order offline water supply wells when concentrations of PFOA and PFOS are found to exceed the EPA health advisory level for drinking water of 70 ppt. In any event, there is no federal or state enforceable Maximum Contaminant Levels (MCLs). Additionally, under the Solid Waste Management Act, PFAS are not hazardous substances, and therefore, EQB's claim of SWMA-related obligations for PFOA, PFOS, and PFBS remediation are not enforceable until those contaminants are listed as hazardous substances." https://www.jdsupra.com/legalnews/pennsylvania-proposes-pfas-cleanup-37933/ , page 1.

The value of restored natural areas, parks, and the public's access to open space and water is well documented and supports returning this industrial land to natural open space that is accessible and provides connection to the river. Benefits are accrued to the quality of life, cleaner air and water, and to higher economic value through enhanced property values. Trees, in themselves, when restored to a site, increase the value and quality of the property for the public good.
Some facts on this:

- When comparing visitors to 2019, Pennsylvania state parks saw a 29 percent increase in visitors compared to March 2019, a 13.3 percent increase in visitors over April 2019, and a 36 percent increase in visitors over May 2019.[5]

- According to a report released by GreenSpace Alliance and Delaware Valley Regional Planning Commission in 2011, the protected open space system in southeastern Pennsylvania adds an estimated $16.3 billion to the value of its housing stock. The value reflects the willingness of homeowners to pay a premium in order to live in proximity to protected open space. Open space also creates indirect cost savings, such as the $795 million annually in avoided medical costs, thanks to the recreation occurring on protected open space.[6]

- Trees have been shown to contribute to higher housing values. Mature trees on a property are very often seen as an asset when marketing and selling both residential and commercial properties. During the summer, deciduous and evergreen trees provide shade for buildings. This shade contributes to a cooler interior temperature of the building, reducing the costs associated with air conditioning. During the winter, shade trees lose their leaves, allowing the sun to reach into the building and provide a source of natural heat and daylight. This contributes to a lower heating costs and a reduced need for artificial lighting in the winter. In commercial areas, trees can buffer visitors and pedestrians from traffic noise and views, while providing shade in the warmer months. These benefits allow for a more pleasant experience for a visitor, which contributes to more regular foot traffic along commercial corridors and shopping centers.[7]

- Trees help to maintain the natural hydrological cycle by capturing and storing rainfall in the canopy and root zone. Much of the rainwater caught in the tree canopy is released into the atmosphere through evapotranspiration, and stormwater runoff surrounding the tree is infiltrated into the soil, where it is stored as groundwater. The soil, tree roots, and microscopic organisms within the soil filter pollutants out of the water. By slowing and filtering runoff, trees prevent harmful pollutants from reaching local water bodies, significantly decreasing the volume and intensity of streams during storm events. Trees are particularly effective at reducing and filtering runoff from smaller, more frequent storms.[8]

[5] https://www.dcnr.pa.gov/GoodNatured/Pages/Article.aspx?post=134
[6] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf
[7] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf
[8] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf

- Trees improve air quality by removing nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), and particulate matter 10 microns or less in size. Nitrogen dioxide, sulfur dioxide, and carbon monoxide are results of the burning of fossil fuels. Ozone is the primary constituent of smog but is not the direct result of specific sources. It is created by the reaction of sunlight and other pollutants in the atmosphere. Trees work to maintain consistent air quality by breaking down these chemicals into more harmless byproducts through a natural process. The leaves of the tree canopy act as catch points for the pollutants in the air. Small pores on the leaves of trees, called stomata, give trees the ability to absorb carbon monoxide, and other compounds from the air. The tree then handles these compounds in a variety of ways before finally releasing fresh oxygen.[9]

- Trees use carbon dioxide (CO2) as a source of food and growth by converting it into sugar, cellulose, and other carbohydrates during the process of photosynthesis. The trees store carbon dioxide in the tree trunks, branches, foliage, roots (referred to as biomass) and soil surrounding it. The burning of fossil fuels is a large producer of carbon dioxide, which is naturally present in the atmosphere, but can be harmful at higher levels. Trees work to continuously absorb carbon dioxide and break it down into components useful for its growth.[10]

- Economic benefits are accrued through open space protection, and it has been shown that it attracts business, fosters tourism, elevates property values, and fosters a pride of place.[11]

- Vegetated buffers enhance property market values. For example, Pennypack Park in Philadelphia is credited with a 38% increase in the value of a nearby property. Two regional economic surveys documented that conserving forests on residential and commercial sites enhanced property values by an average of 6 to 15% and increased the rate at which units were sold or leased. And in a survey conducted by the National Association of Home Builders, 43% of home buyers paid a premium of up to $3,000, 30% paid premiums of $3,000 to $5,000, and 27% paid premiums of over $5,000 for homes with trees.[12]

- In fact, restoring naturally vegetated riparian areas along the Schuylkill River will provide multiple benefits and should be a requirement for any use of the site. Without more effective protection for riparian buffers, ECONorthwest estimated an annualized loss of approximately $981 thousand to $2.5 million in the value of monetized ecosystem services. Translated to a single acre, buffers provide over $10,000 per acre per year in monetized benefits, with additional non-monetized benefits expected to increase this total. Considering these benefits over time, policies that protect riparian corridors represent one of the most efficient investment opportunities facing communities in the

[9] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf
[10] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf
[11] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf
[12] DRN Fact Sheet (2012). Bigger Buffers Are Definitely Better

Delaware River Basin. Total benefits over time, and with extension to even wider buffers, are clearly in the tens of millions of dollars.[13]

It is imperative that the standards applied allow for public use, open space, and meet residential standards, not limit the site only to industrial operations.

4. AOI 111 – *Deep aquifer beneath the complex* – Delaware Riverkeeper Network brings to your attention that the pollution of the deep aquifer has direct negative impacts on groundwater beneath the site, on the Schuylkill and Delaware River, and on the important Potomac-Raritan-Magothy (PRM) aquifer that flows under the river to New Jersey. The pollution from the refinery is believed by investigators to have traveled as a plume towards New Jersey and caused contamination with hydrocarbons - benzene in particular. This ongoing threat is not being addressed by Evergreen but it cannot be swept under the rug. The migration of the pollution must be tracked through sampling and then cleaned up to protect the PRM aquifer, which is a major source of drinking water for Camden and other South Jersey communities. The PRM aquifer underlies the Pinelands, a federally protected region in New Jersey. New Jersey has planned and regulated the Pinelands region for decades with special protection regulations under New Jersey law. These efforts are undermined by this pollution source.

   The path of the groundwater flow from the refinery site and Delaware River has been mapped by the U.S. Geologic Survey (USGS) and examined in the report by Christina Simeone of the Kleinman Center for Energy Policy at the University of Pennsylvania[14]. The report states, “There is widespread hydrocarbon contamination of soil and groundwater at the site, including migration outside the property line and potentially into the deep aquifer New Jersey uses as a water source.”[15]

   The USGS shows the danger of ongoing and uncontrollable migration into the PRM aquifer, as discussed in both the Kleinman Report and in a news investigation by the Philadelphia Inquirer: “I think there’s enough here to be asking questions,” Simeone said in a phone interview. Simeone’s report contained a section on the refinery’s historic impact on the Potomac-Raritan-Magothy underground aquifer system, which holds billions of gallons of fresh water. Known as PRM, the aquifer runs under the refinery complex — and under the Delaware River, eastward into New Jersey. The aquifer’s outcrop — where it is closest to the surface — is at the Delaware River. The aquifer is a main supply for drinking water in Gloucester and Salem Counties. Gloucester County is directly across the river from the refinery. With increased population growth and development in the counties, withdraws are expected to increase, according to the USGS. The PRM aquifer — composed of upper, middle, and lower aquifers separated by rock or earth — is also a source of drinking water in Camden County.”[16] “’There is widespread hydrocarbon contamination of soil and

[13] ECONorthwest (2018). The Economic Value of Riparian Buffers in the Delaware River Basin
[14] https://kleinmanenergy.upenn.edu/wp-content/uploads/2020/08/Beyond-Bankruptcy-1.pdf
[15] Ibid. page 44.
[16] “Contamination from Philadelphia refinery that exploded could pollute New Jersey groundwater. Here’s how”, **by Frank Kummer**, Philadelphia Inquirer. Updated: July 5, 2019

groundwater at the site, including migration outside the property line and potentially into the deep aquifer New Jersey uses as a water source,' Simeone wrote in her report, adding that benzene, lead, the gasoline additive MTBE, toluene, benzo(a)pyrene, and other toxic compounds also pose threats. 'In some areas, contaminants have migrated offsite, and a drinking water aquifer used by the state of New Jersey could potentially be impacted,' Simeone wrote. Simeone noted a joint 1985 U.S. Geological Survey and New Jersey DEP study that looked at contamination near the aquifer's outcrop and found spikes in benzene levels in the area of the refinery. 'You can't say there's a causal relationship,' Simeone said. 'But it raises questions.' Sunoco's own monitoring wells detected benzene levels in the groundwater, but the company noted that groundwater throughout Philadelphia is contaminated."[17]

Of particular concern are impacts to living species in the Schuylkill and Delaware Rivers:

- Persisting water quality problems stemming from site pollution (including sedimentation) that enters surface water through stormwater runoff and other pathways. These problems include low Dissolved Oxygen that impinges on fish and other aquatic life, hydrocarbons such as benzene and polychlorinated biphenyls (PCBs), along with other legacy pollutants that harm species and their habitats
- Endangered species (i.e., Atlantic Sturgeon and Shortnose Sturgeon, both of which are federally endangered); both of these sturgeon species are greatly imperiled and use this part of the tidal Schuylkill and the tidal Delaware
- Fish and fishlife and other vulnerable species such as mussels and migratory fish, known to live and utilize the river

The evidence points to an ongoing and unaddressed pollution problem that is not going to go away just because it is ignored by the company. The groundwater pollution and migration must be fully investigated, the plumes delineated, and the rate of migration estimated by Evergreen and it must be cleaned up. It is also critical that Evergreen and PADEP notify, consult with, and fully engage the relevant agencies such as NJ Department of Environmental Protection, Delaware River Basin Commission, and counties municipal authorities, as well as water suppliers and other "stakeholders" on both sides of the river and downstream in the receiving waters of Delaware.

5. Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like super storms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is highly questionable that the data underlying the reports are still reliable. New reports have been issued since then that reflect rising seas, storm surges, and greater storm frequencies driven by climate change here in the Delaware River Watershed.

[17] Ibid.

The Delaware River Basin Commission (DRBC) formed a climate change advisory committee in 2020 based on a resolution that called out their own report and several other reports detailing climate impacts that are being felt in some ways more acutely here than in other locations. From the DRBC's resolution: "WHEREAS, evaluations and projects conducted and being conducted by the Commission,[18] United States Army Corps of Engineers,[19] United States Geological Survey[20] and others have shown the potential for changes in the seasonality and volume of streamflows, as well as the potential for sea level rise to impact the location of the salt front and the availability of storage to manage salinity in the Delaware River Estuary." Other recent reports document climate change impacts in the Delaware River estuary such as the Delaware Valley Regional Planning Commission (DVRPC) (2019) that stated "…water levels of the tidal section of the Delaware River will rise as sea level rises along the Atlantic Coast. These rising water levels will be a permanent change to the landscape and will introduce new flooding vulnerabilities along the Delaware that communities will need to address."[21] It is clear that there are new studies and data available and Evergreen needs to update their climate analysis.

Analyzing climate change impacts, including sea level rise and storm surge, on the site is key to recognizing that and providing for changes to the surface of the property that will minimize effects such as flooding. Flooding in locations such as the confluence of the Schuylkill and the Delaware Rivers regularly threatens residential, industrial, and business owners, as well as public amenities, with property damage and personal injury. How the site is remediated and repurposed can improve the current conditions that contribute to river flooding. Converting the site to open space can allow natural vegetation and riparian buffer areas to be used to store runoff, helping to reduce stormwater runoff and urban flooding downstream and locally.[22]

6. It is unclear to us which entity will be responsible for cleanup of the site after PES purchased it, which includes a very active refinery site, old equipment and site infrastructure that was used by PES, one of the largest crude oil rail yards in the nation, and the horrendous fire and explosion that was the straw that broke PES' back. If Hilco will be working with Evergreen or another company, we feel it is important to share information we have about Hilco. Delaware Riverkeeper Network has concerns related to the history and reputation of Hilco and its past efforts at "remediation." It was very recently involved in a notorious cleanup effort that took place in Chicago, IL at the former Crawford Coal Power Plant. It first required the company to obtain a Planned Development zoning change from

[18] Shallcross, Amy. (2017). Analyzing Climate Change Impacts to Water Resources in the Delaware River Basin - Big Picture Risks. https://www.nj.gov/drbc/library/documents/Shallcross_climate-change-wrm_WRADRBnov2018.pdf
[19] Johnson, Billy H., (2010). Report prepared for U.S. Army Engineer District, Philadelphia: Application of The Delaware Bay and River 3d Hydrodynamic Model to Assess the Impact of Sea Level Rise on Salinity. Available from U.S. Army Engineer District, Philadelphia or Delaware River Basin Commission.
[20] Williamson, T.N., Lant, J.G., Claggett, P.R., Nystrom, E.A., Milly, P.C.D., Nelson, H.L., Hoffman, S.A., Colarullo, S.J., and Fischer, J.M., 2015, Summary of hydrologic modeling for the Delaware River Basin using the Water Availability Tool for Environmental Resources (WATER): U.S. Geological Survey Scientific Investigations Report 2015–5143, 68 p., http://dx.doi.org/10.3133/sir20155143.
[21] DVRPC, Coastal Effects of Climate Change in Southeastern PA, Introduction and Project Background, November 5, 2019. https://www.arcgis.com/apps/MapSeries/index.html?appid=8080c91a101d460a9a0246b90d4b4610
[22] https://www.delcopa.gov/planning/pubs/OSRGP/Vol-I_OpenSpaceAndRecreationPlan.pdf

the City Planning Commission, which was granted despite vocal community opposition to change. Under the applicable remediation program in Illinois, Hilco was required to perform and produce a Comprehensive Site Investigation Report to document the nature and extent of contamination on site. After Hilco's original CSIR was disapproved by IL EPA for failing to execute the minimum extent of samples throughout the site, they progressively altered the proposed remedial measures and slowly transitioned to a lower standard of remediation, ***one that produces sites approved solely for future industrial uses*** (emphasis added). (Cite for technical documents for this information: https://external.epa.illinois.gov/DocumentExplorer/Documents/Index/170000041238). They also greatly expanded the proposed cap on site so as to limit the amount of sampling required to be performed.

Beyond that, Hilco was responsible for an appalling failure during remediation that put local residents, an immigrant-heavy, environmental justice community, at risk. As part of the remediation process, they had to demolish the former smoke stack from the Plant. Although they had all of the permits necessary, they still completed it in such a way that sent a cloud of potentially toxic chemicals into the air. Chicago Mayor, Lori Lightfoot, commented that "The city was given repeated assurances that Hilco had a solid plan to contain the dust. Clearly that didn't happen," Lightfoot said. "This is absolutely and utterly unacceptable. It's unsafe, it's unsanitary. I would not tolerate this in my neighborhood and we're not going to tolerate it here either."[23] Ultimately, because of the danger that Hilco created to the community, Hilco agreed to pay $370,000 to settle a lawsuit filed by the State.[24]

Delaware Riverkeeper Network appreciates the opportunity to comment on the RIRs through this public process, one that people worked to be established. We consider it essential that the planning and cleanup decisionmaking process involves robust public participation, with special consideration for the local communities that have disproportionately borne the environmental burdens of the refinery complex for so long. We plan to continue to comment and participate as opportunities for input arise. Our goal is to support and advocate for the highest and most beneficial use of the site through a remediation plan that cleans up the pollution in all its forms, applies health-based cleanup standards, investigates and addresses off site migration of pollution, restores natural amenities and benefits, and allows for public access and use as protected parkland and open space with access to the Schuylkill and Delaware Rivers from the property.

Thank you for consideration of our input.

Respectfully submitted,

Maya van Rossum
the Delaware Riverkeeper

Tracy Carluccio
Deputy Director

[23] https://news.wttw.com/2020/04/12/city-clampdown-coal-plant-demolition-too-little-too-late
[24] https://www.chicagotribune.com/business/ct-biz-hilco-little-village-demolition-settlement-health-clinic-20201120-ixkeknebonc g3mycgmnq5uc54u-story.html

Lisa Alic

From: Albert Littlepage <apage1801@aol.com>
Sent: Wednesday, January 13, 2021 9:23 AM
To: Philly Refinery Cleanup
Subject: PES
Attachments: PBCDC Comment to Evergreen.docx

Please see attached document

Point Breeze
COMMUNITY DEVELOPMENT COALITION

1/12/2021

To: Evergreen &
Pennsylvania Department of Environmental Protection

Re: Safety & Contamination Concerns

As the President of the Point Breeze Community Development Coalition (PBCDC), I have an obligation to represent the community stakeholders, residents, and businesses leaders within our boundaries. I have received several calls regarding the unsafe conditions at the PES refinery. The community believes that the toxicity levels and environmental contaminants pose serious health conditions to members of our community, especially our youth and seniors. Our first request is that you present an updated and transparent report on the safe way to remediate the site.

We are aware of a number of serious concerns about Evergreen's proposed lead standard for surface soil. As you know, lead is a highly toxic chemical known to impair brain function and is very harmful, especially to children. Evergreen has proposed a site-specific standard that is more than twice the direct contact numeric value for lead in soil, part of Pennsylvania's statewide health standards. Using this inappropriate value, regulatory agencies would require Evergreen to take corrective action on a much smaller fraction of the site than would be required with the correct value. Why put our community at risk?

Our community feels that Evergreen's investigation reports for environmental contamination are flawed in a number of ways, and lack transparency of accurate detail. They are supposed to identify the nature and extent of contamination in soils and the movement of contaminants in groundwater to evaluate what needs to be remediated. Evergreen did not consider the impacts of climate change on soil and groundwater contamination at the site. It failed to consider sea-level rise, storm surges, and the increased frequency and volume of events like superstorms. In addition, Evergreen prepared the reports over three years ago and it is not clear whether the data underlying the reports are still reliable. We are also requesting that OSHA inspects the site and provides the community with a detail report ensuring that all OSHA precautions are adhered to.

Again, we request that the community receives prompt, meaningful responses and resolution to the issues we raised on the environmental and toxic conditions of this site. Our families have suffer enough, and we will no longer endure these unreasonable acts or conditions without protest.

Members of the Point Breeze Community Development Coalition

From:	Cahill, Natasha
To:	rapatel@pa.gov; Philly Refinery Cleanup
Cc:	Donnelly, George
Subject:	Comment on Proposed Site-Specific Lead Levels from Senator Saval
Date:	Thursday, January 14, 2021 10:51:11 AM
Attachments:	image002.jpg image004.jpg image006.jpg Senator Saval_PES Refinery Site Lead Level Comments.pdf
Importance:	High

Dear Mr. Patel and Evergreen Resources Group Managers,

Attached with this message, please find State Senator Nikil Saval's comments for submission on the proposed site-specific lead levels at the former Philadelphia Energy Solutions refinery site.

We appreciate your consideration of requests to amend the proposed lead levels. Please don't hesitate to be in touch with any questions or concerns.

Sincerely,
Natasha

Natasha Cahill (she/her)
Communications Director
Office of State Senator Nikil Saval

www.pasenatorsaval.com

Email: natasha.cahill@pasenate.com
Cell: 610-247-9754

Submitted to:

Ragesh Patel, Program Manager
Environmental Cleanup and Brownfields
DEP Southeast Regional Office
2 East Main St.
Norristown, PA 19401
rapatel@pa.gov

Evergreen Resources Group LLC
P.O. Box 7275
Wilmington, DE 19803
phillyrefinerycleanup@ghd.com

January 14, 2020

Dear Mr. Patel and Evergreen Resources Group Managers,

My name is Nikil Saval, and I proudly serve as State Senator for Pennsylvania's First Senatorial District, where the former Philadelphia Energy Solutions refinery is located. I write with great concern about the high site-specific standard lead level proposed for use in the remediation work. For the health of the workers and those who live in the surrounding communities, this value must be brought in alignment with current state regulations.

Evergreen, a subsidiary of Sunoco, has been tasked with the work of cleaning and remediating the site, and has proposed a site-specific standard lead level of 2,240 mg/kg. However, this proposed level is more than twice as high as the standard levels permitted by our state's regulations (1,000 mg/kg). This is unacceptable. I urge Evergreen, the Pennsylvania Department of Environmental Protection, and the U.S. Environmental Protection Agency to reconsider this proposal and amend the site-specific standard in accordance with state regulations and current scientific understanding.

The lead contamination, from decades of production of leaded gasoline, is of acute concern. Lead is a heavy metal, but it will not remain stationary. Contaminated soil will be kicked up as dust by cars on the road, construction projects, and even by children at play. Contaminated groundwater in this low-lying geographic region will be affected by sea-level rise and frequent superstorms ushered in by the climate crisis. Lead levels vary throughout the former refinery site, and because Evergreen's proposed site-specific standard lead level is so high, a much smaller fraction of this site will be considered for remediation than would be required with a standard level that is in accordance with state regulations.

It is important to note that there is no "safe" blood lead level concentration; all exposure is toxic.

I urge you to take my comment and all others submitted seriously. The lives of my constituents rest in your hands. Please commit to the necessary changes to protect the health of Philadelphians.

Nikil Saval, State Senator
Pennsylvania's First Senatorial District
184 Main Capitol Building
Senate Box 203001
Harrisburg, PA 17120-3001
(717) 787-5662
saval@pasenate.com

Appendix B: Questions and TASC Responses from August 6, 2020 Community Meeting

On August 6, 2020, EPA convened a virtual community meeting with community members in Philadelphia to provide TASC the opportunity to present the RIR summary report and to respond to questions from community members. The following are questions asked during the meeting with TASC responses. EPA provided additional information to the responses below where appropriate.

1. What is the rationale for providing the breakout of the site characterization into the different areas of interest? For lay persons and the public at large, it seems to add unnecessary confusion and complexity.
    a. TASC response: Large, complicated hazardous waste sites are often divided into different areas or units to help organize environmental sampling and risk characterization. For the PES-Sunoco site, the areas of interest (AOIs) were determined based on past operation areas and were prioritized based on potential risk factors.

2. Benzene is known to cause cancer. It is prevalent in high concentrations throughout the site and it is suspected to be moving off of the site in some areas. There are also high concentrations in certain surrounding residential areas. What is being done to correct this situation?
    a. TASC response: The remedial investigation report (RIR) for AOI 1 states that concentration trends generally support that dissolved-phase benzene groundwater plumes have stabilized on site. It is expected that the upcoming fate and transport report and the human health risk assessment will discuss the potential migration of benzene on site and off site, as well as any potential exposure pathways to the surrounding residential areas. Currently, there are interim remedial systems in place at the site that are intended to contain benzene on site.

3. In a few of the AOIs, it is stated the contamination cannot be "delineated" beyond the bulkhead that acts as a barrier between the site and the Schuylkill River. If the contamination is right up against the barrier, and we can't see where it stops, how do we know the bulkhead is effective and the contamination is not going into the river?

a. TASC response: Contamination has been detected on site near the bulkhead, but full delineation has not been possible because it would disturb the structural integrity of the bulkhead. The areas near the bulkhead will be further evaluated in the upcoming sitewide fate and transport report.

4. I understand this presentation will not mention AOI 11 which is the entire underground aquifer of the site that has also been undefined.
    a. TASC response: AOI 11 is not part of the current TASC review. Additional information provided by EPA: TASC support centered on reviewing and providing the public with the information contained in the eight approved AOI RIRs. AOI 11 consists of the deep aquifer. Shallow groundwater is included in the respective individual AOI RIRs. Although deep groundwater data has been included in individual AOI RIRs since 2017, the fate and transport RIR for the deep groundwater will be submitted by December 2021 (per new PADEP Order). The RIR for the fate and transport model will be available for public review and will have its own comment period.

5. Now that the site has a new owner and they have a new vision for the site, shouldn't the cleanup be based on the vision of the future, rather than what has occurred historically?
    a. TASC response: The cleanup plan would be expected to include considerations of the future land use. The RIRs and human health risk assessment for lead assess the properties assuming a continued industrial or commercial land use.

6. Why wasn't the community given an opportunity to weigh in on site specific standards for lead? Who was at the table when this decision was made?
    a. TASC response: The February 2015 Human Health Risk Assessment Report used the standard EPA model for calculating lead cleanup goals for soils based on adult exposure and for non-residential use. PADEP approved the standard in 2015 under the Act 2 regulations.

7. Is there any consideration of long-term climate change leading to sea level rise leading to changes in groundwater levels, and transport of contaminants across and out of the site?
    a. TASC response: The RIRs do not consider impacts of long-term climate change. These potential impacts to the site may be factored into the fate and transport model or the assessment of cleanup options for the site.

8. Why wasn't the soil in AOI 10 delineated?
    a. TASC response: According to communication between Evergreen and PADEP, additional surface soil delineation for lead and benzo(a)pyrene are planned. Subsurface samples were only collected around waste areas. According to communication between Evergreen and PADEP, additional subsurface sampling will be conducted before a proposed cleanup.

9. How far did the contamination go under our homes?
    a. TASC response: The extent of off-site contamination should be further assessed in the upcoming fate and transport report. The RIRs indicate benzene may be present off site. Additional investigations will evaluate the source of off-site benzene.

10. When will the groundwater and LNAPL be fully delineated? What about heavy NAPL at the site?
    a. TASC response: Areas of groundwater and light non-aqueous phase liquid (LNAPL) contamination have yet not been delineated. Additional investigations and modeling for groundwater and LNAPL contamination will be part of an upcoming fate and transport report. Sampling at the site has identified the presence of LNAPL but has not identified the presence of dense non-aqueous phase liquid (DNAPL).

11. When will this investigation of air quality be extended to surrounding areas/neighborhoods? Their buildings were designed to prevent vaporization; our homes were not.
    a. TASC response: This question is beyond the scope of the TASC review. EPA has provided the following information: It is important to note the difference between ambient air quality and indoor air impacted by groundwater contamination beneath buildings. In relations to the neighborhood air quality, Philadelphia Air Management Services operates two ambient air monitoring stations in Philadelphia less than one mile from the PES refinery. The Ritner site is located northeast of the facility at 24th and Ritner Streets and has been in operation since 2004. The second site is the SWA site and is located southwest of the facility at 8200 Enterprise Avenue and has been in operation since 2009. Both locations sample for toxics including benzene once every six days for a 24-hour period. For the past three years, the average benzene data collected from these ambient air

monitoring locations has been below the 9 ug/m^3 annual average health benchmark for benzene. Philadelphia Air Management services has no plans on discontinuing either ambient air monitoring location. Vapor intrusion is the migration of volatile chemicals from contaminated groundwater and soils into the indoor air spaces of buildings through openings in the building foundation. The upcoming groundwater fate and transport and human health risk assessment should evaluate any potential for vapor intrusion.

12. Why hasn't indoor air monitoring been conducted at off-site buildings with underlying contaminant plumes?
    a. TASC response: The upcoming groundwater fate and transport and human health risk assessment should evaluate any potential for vapor intrusion off site.

13. Will EPA refinery fenceline air monitoring for benzene under method 325A/B continue on the site? The most recent data on the EPA website is from March 2020 but I understand that the data is uploaded quarterly.
    a. TASC response: This question is beyond the scope of the TASC review. EPA has provided the following information: Fence line air monitoring is currently continuing at the site. However, this monitoring was required under a federal regulation that applies to petroleum refineries. Once the site is no longer "a petroleum refinery," it will no longer be subject to the regulation and therefore not legally required to continue monitoring.

14. Has there been soil investigations for lead conducted outside the fenceline of the property?
    a. TASC response: The data presented in the RIRs are limited to the facility properties. Soil samples that exceeded the site-specific standard for lead were delineated on site, with the exception of AOI 10, which is located away from residential areas.

15. How does the Bulkhead Protection prevent transmission to the river under all conditions (seasonal, sea level rise, storm surge, flooding)?
    a. TASC response: The bulkheads are generally keyed into underlying clay layers and are expected to prevent or limit groundwater to surface water flow. The areas near the bulkhead and the effectiveness of the bulkheads should be further evaluated in the upcoming sitewide fate and transport report.

16. Why is Evergreen's site-specific lead standard (2,240 ppm) so much higher than the state standard (1,000 ppm)?
    a. TASC response: This question is beyond the scope of the TASC review.

17. How and where do the benzene pools interact?
    a. TASC response: The extent and delineation of benzene in groundwater is anticipated in the upcoming fate and transport report.

18. These graphics could be improved for better understanding:
    - The terms in the legend are not defined (NR SO to GW SHS, for example)
    - The dots are on top of each other in some areas.
    - The maps might benefit from being bigger, and shown with a higher resolution
    - Why are you just using shades of green to depict BENZENE in our water? Misleading

    a. TASC response: TASC's summary report and PowerPoint relied on Evergreen graphics from the RIRs and existing fact sheets.

19. Why are you just using shades of green to depict BENZENE in our water? Misleading.
    a. TASC response: TASC's summary report and PowerPoint relied on Evergreen graphics from the RIRs and existing fact sheets.

20. Will the cleanup be worse than the explosion with the chemical that you use for the cleanup?
    a. TASC response: The RIR reports do not present cleanup alternatives. Any use of potential chemical-based remediation would be considered in the proposed cleanup plan.

21. How can there be LNAPL on top of the shallow aquifer yet you say it's not contributing to groundwater contamination?
    a. TASC response: LNAPL can be a source of dissolved groundwater contamination. Sampling to date has included analyzing for dissolved concentrations in wells with LNAPL. This sampling occurs below the LNAPL. A comparison of dissolved concentrations in groundwater to the presence and amount of LNAPL present as well as the concentrations of contaminants in the LNAPL are used to determine if LNAPL is contributing to groundwater contamination. A more comprehensive,

sitewide evaluation of these data should be evaluated in the fate and transport report.

22. What is being done to prevent contaminated groundwater from entering the Pollock and 26th St Sewers?
    a. TASC response: Currently, there are interim remedial systems in place at the site that are intended to contain benzene on site and prevent contamination from moving off site and into receptors. While these systems are discussed in the RIRs for each AOI, their performance and effectiveness are not the focus of the RIRs. The Groundwater Remediation Status Reports may include more information about the groundwater remediation systems currently operating as part of the site. The August 2019 Groundwater Remediation Status Report is available on EPA's website: https://www.epa.gov/hwcorrectiveactionsites/documents-reports-and-photographs-sunoco-point-breeze-refinery-and-marketing

23. What is the quality of the water discharged from the Pollock St well system into the Schuylkill?
    a. TASC response: Currently, there are interim remedial systems in place at the site that are intended to contain benzene on site and prevent contamination from moving off site and into receptors. While these systems are discussed in the RIRs for each AOI, their performance and effectiveness are not the focus of the RIRs. The Groundwater Remediation Status Reports may include more information about the groundwater remediation systems currently operating as part of the site. The August 2019 Groundwater Remediation Status Report is available on EPA's website: https://www.epa.gov/hwcorrectiveactionsites/documents-reports-and-photographs-sunoco-point-breeze-refinery-and-marketing.

24. Heinz Nature preserve has a plant filtration system. Will there be any attempt to use natural systems to purify or clean the water and soil?
    a. TASC response: The RIR reports do not present cleanup alternatives. Any use of potential natural systems in the remedial approach would be considered in the proposed cleanup plan.

25. Please describe subsurface and airborne presence of benzene, their differences, prevalence, and connections.
    a. TASC response: The upcoming fate and transport report as well as the human health risk assessment will discuss the extent of benzene, the potential migration

of benzene off site, and any potential exposure pathways to the surrounding residential areas.

26. Why did it take 10+ years, and an almost-catastrophic explosion, for Evergreen to come back and engage the public?

    TASC response: This question is beyond the scope of the TASC review.

27. Will vapor intrusion studies be done in residents' homes to investigate the off-site benzene?
    a. TASC response: Ambient air and indoor air sampling conducted at AOI 8 in 2016 and 2017 indicated no exceedances of the EPA regional screening levels for industrial use. AOI 8 is located closest to the nearby residential neighborhood (Greys Ferry). The upcoming groundwater fate and transport and human health risk assessment should evaluate any potential for vapor intrusion off site.

28. What about the air quality after the cleanup? Can that be measured?
    a. TASC response: The RIR reports do not present cleanup alternatives. Any remedial technologies that would produce air emissions would be expected to comply with applicable air emission regulations and would be explained further in the cleanup plan.

29. Is pump-and-treat an appropriate technology for a site that is adjacent to the river? How can they ensure hydraulic containment when there is connection to the lower aquifer?
    a. TASC response: The RIR reports do not present cleanup alternatives. Pumping and treating of groundwater may be evaluated as a long-term cleanup component for the site. Assessment of pump-and-treat approaches would include considerations of aquifer connections and groundwater to surface water interactions.

30. What does "other ways" mean for bio and phyto-remediation?
    a. TASC response: The RIR reports do not present cleanup alternatives. Any specific approaches involving bioremediation or phytoremediation would be expected to be explained further in the cleanup plan.

31. Is capping an appropriate technology for an area that is prone to flooding? How could this impact stormwater management site, especially with climate change risks?

a. TASC response: The RIRs do not present cleanup alternatives. It is expected the cleanup plan will factor in the local flood risks when assessing remedial alternatives.

32. What was the impact of the recent hurricane on the ongoing remediation processes? Were any of the water treatment processes overwhelmed and were there any discharges into the River?
    a. TASC response: The RIRs do not include discussion of recent hurricane events or other weather events. The Groundwater Remediation Status reports may provide additional information: https://www.epa.gov/hwcorrectiveactionsites/documents-reports-and-photographs-sunoco-point-breeze-refinery-and-marketing.

33. Noting how LATE Evergreen's involvement has been.....how will Evergreen's/Sunoco's act 2 requirements change based on PES' heavy industrial classification into a light industrial classification?
    a. TASC response: The PADEP Act 2 standards applied in the RIRs assume non-residential land use (industrial or commercial). A zoning change from heavy to light industrial would not affect the Act 2 standards used in the RIRs.

34. LNAPL has been retrieved for years. What has been accomplished? What are conditions now as opposed to previously? Hilco plans to replace the water treatment systems. How? Why? What will the future hold?
    a. TASC response: The remediation systems operating in each AOI are described briefly in the RIRs, however these systems and their effectiveness are not the focus of the RIRs. The Groundwater Remediation Status reports may provide additional information: https://www.epa.gov/hwcorrectiveactionsites/documents-reports-and-photographs-sunoco-point-breeze-refinery-and-marketing.

35. How long will it take until cleanup starts?
    a. TASC response: TASC is not aware of an anticipated time for cleanup to begin.

36. We are still waiting on a city response to our request for a public hearing on Evergreen's existing remediation infrastructure, including vents that emit fumes coming from underground pollutants.
    a. TASC response: This question is beyond the scope of the TASC review.

37. The TASC Report (and RIRs) doesn't address issues related to PFAS. AFFF (Aqueous Film-Forming Firefighting Foam), which is used for Class B (liquid based, especially hydrocarbon fuel) fires contains PFAS ("forever" toxic contaminants). The PES Fire Brigade used AFFF to contain the fire at Point Breeze on 6/10/19 and Girard Point on 6/21/19. EPA and PADEP cannot ignore the PFAS problem at this site
    a. TASC response: This question is beyond the scope of the TASC review. EPA has provided the following information: EPA and PADEP are aware of this concern and are evaluating options with regard to PFAS.

38. Why wasn't a map/graphic of the benzene's mobility included in this presentation?
    a. TASC response: TASC's summary report and PowerPoint relied on Evergreen graphics from the RIRs and existing fact sheets.

39. There are still operation going at the site who are the operators filling tanks with order coming this way in south Philly
    a. TASC response: TASC is unaware of ongoing operations within the site area.

40. When will the fate and transport model be available?
    a. TASC response: TASC is unaware of the expected submittal date of the fate and transport report or when it will be available for public comment.

41. Will the cleanup affect the air and the water?
    a. TASC response: The RIRs do not present cleanup options for the site.

42. Can you describe the assumptions that were made during the risk assessment process (as referenced during conversation around lead)?
    a. TASC response: Both the PADEP standards and the calculated lead standard assume the property will not be used for residential purposes and will remain zoned for industrial or commercial use.

43. Of the various remediation methods, which ones are and are not options for this site? Which would expose the community the most? Which would primarily involve moving the problem to another community?
    a. TASC response: The RIRs do not present cleanup options for the site.

44. If the site were to be cleaned up to the most protective standard, what would need to be different in terms of cost or remediation methods used?

a. TASC response: The RIRs do not present cleanup options. In general, if more stringent standards are applied then the associated remedial costs would increase. In some cases, cleanup to the most protective standard is not possible due to physical limitations (infrastructure in the subsurface) or background contamination resulting from industrial activities outside of the site area. In addition, if cleanup goals were selected that differ from the Act 2 standards applied in the RIRs, then the extent of contamination would require reassessment.

45. The City's consultants recommend considering 6 feet of sea level rise by 2100 as an upper bound.
    a. TASC response: The RIRs do not consider impacts of long-term climate change. These potential impacts to the site may be factored into the assessment of cleanup options for the site.

46. Beyond the TASC Report and this Public Meeting, what is in the scope of work for Skeo technical assistance to the community? Will Skeo assistance extend beyond review/explanation of the Evergreen RIRs?
    a. TASC response: The purpose of TASC was to provide technical assistance in the form of a plain language summary of the RIR technical documents in order to provide the community at large with information needed to be better prepared for the meeting with Evergreen. That task has been completed, and the TASC project is now concluded.

47. Really, no anticipation of questions and concerns for the neighborhood? I look forward to response to today's questions.

    TASC response: The goals of the TASC assistance were to (1) enhance the community's understanding of the completed soil and groundwater investigations at the refinery and (2) provide the community the necessary knowledge to fully participate as the site progresses through the remaining investigations and remedy selection. Responses to questions within the scope of the assistance have been provided.

48. Can anything be built there after the cleanup?
    a. TASC response: Potential future development or reuse are not discussed in the RIRs.

49. Given Skeo's experience with remediation and advising communities through TASC, what deficiencies have you found with the RIRs? What contaminants or areas should community members focus on?
    a. TASC response: While not a deficiency of the RIRs, it is clear that full delineation of on-site and off-site contamination is not complete and there is no final conceptual site model that includes all pathways of concern. Going forward, the community members may choose to pursue clarity on the final delineation of all soil and groundwater contamination as well as potential exposures to migrating benzene contamination in off-site areas.

50. What questions has Skeo asked to Evergreen? Were the answers received satisfactory? What unanswered questions does Skeo have for Evergreen?
    a. TASC response: TASC has not engaged directly with Evergreen. The RIRs reviewed by TASC have been approved by PADEP.

51. What ways can we expect Skeo to engage with the community going forward? Will there be an opportunity for meaningful dialogue, as opposed to a 'managed' Q&A?
    a. TASC response: The purpose of TASC was to provide technical assistance in the form of a plain language summary of the RIR technical documents in order to provide the community at large with information needed to be better prepared for the meeting with Evergreen. That task has been completed, and the TASC project is now concluded.

52. Does bringing in EPA EJ trigger NEPA and the 'meaningful engagement' standard when doing EJ work? Why wasn't EPA EJ more present when Evergreen was absent (for so long) in the process?
    a. TASC response: This question is beyond the scope of the TASC review. EPA has provided the following information: Environmental justice (EJ) does not trigger NEPA. EPA is working to integrate EJ into all programs. EPA's EJ Program has not been previously involved in ACT 2 cleanups because the PADEP is the lead agency responsible for overseeing the cleanup and any public participation requirements. At the request of community members, EPA's EJ Program became involved and was able to secure TASC to address the community questions about the technical nature of the RIR documents.

53. Would a hurricane/storm surge/flooding bring LNAPL (and others?) to the surface, and leave them there once the flooding subsides?

a. TASC response: The RIRs do not present cleanup alternatives. It is expected the cleanup plan will factor in the local flood risks when assessing remedial alternatives.

54. Regarding legibility, Figure 3 on page 8 of the report is also not very readable.
    a. TASC response: TASC's summary report and PowerPoint relied on Evergreen graphics from the RIRs and existing fact sheets.

55. A lot of the cleanup options are not very benign, like stirring up dust and toxic chemicals if digging waste up, or soil vapor extraction (where chemicals are stripped into the air), or where incineration is used in any form (including "soil burner" plants like the one in SW Philly), or where plants used in phytoremediation are disposed of by burning.
    a. TASC response: The RIR reports do not present cleanup alternatives. The risks and associated regulations and best management practices of each remedial alternative would be considered in the cleanup plan.

56. The climate change issue here is not so much increased precipitation, but rather that the Schuylkill is tidal, and will rise along with sea levels worldwide. What impact might a 6-foot higher level of the Schuykill have?
    a. TASC response: The RIRs do not consider impacts of long-term climate change. These potential impacts to the site may be factored into the assessment of cleanup options for the site.

57. As a community member, it appears this presentation continues to give the community responses that don't fully answer community concerns to assure that areas around the refinery site are going to any better off by the clean-up efforts presently being used. In the upcoming feedback and comment sessions I would hope off-site community concerns will be addressed.
    a. TASC response: This presentation focused on the completed RIRs. The upcoming fate and transport, risk assessment, and proposed cleanup plan and associated outreach will continue to address the community's questions and concerns.

58. I'd like to see green infrastructure plans for the property.
    a. TASC response: The RIR reports do not present cleanup alternatives or reuse ideas. Any use of potential green infrastructure at the property would be considered in the proposed cleanup plan or separate reuse planning documents.

59. How can we copy the chat? Can this be made available?
    a. TASC response: This list of questions and responses reflects the extent of questions asked in the chat log.

From:	Colleen Costello
To:	Chelsey Shepsko; Michael Fuerte; Lisa Alic
Subject:	FW: public comments, Philadelphia Refinery
Date:	Tuesday, January 26, 2021 9:13:35 AM
Attachments:	refinery public comments to DEP.pdf

From: Brown, C David <cdbrown@pa.gov>
Sent: Tuesday, January 26, 2021 9:09 AM
To: DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com>
Cc: Colleen Costello <ccostello@sanbornhead.com>; phillyrefinerycleanup@ghd.com; Strobridge, Lisa <lstrobridg@pa.gov>; Patel, Ragesh <rapatel@pa.gov>; Cain, Virginia <vicain@pa.gov>; Dula, Justin <jdula@pa.gov>
Subject: RE: public comments, Philadelphia Refinery

Tiffani,

Attached is the current compilation of comments received by DEP based on the CAC form letter. These comments should be addressed in Evergreen's comment/response RIR.

From: Brown, C David
Sent: Monday, December 14, 2020 11:27 AM
To: DOERR, TIFFANI L <TLDOERR@evergreenresmgt.com>
Cc: Colleen Costello <ccostello@sanbornhead.com>; phillyrefinerycleanup@ghd.com; Strobridge, Lisa <lstrobridg@pa.gov>
Subject: public comments, Philadelphia Refinery

Tiffani,

Last week we received 81 public comments on the Act 2 reports, attached. These are based on a Clean Air Council form letter and focus on the lead standard and climate change. They may have also sent the comments to Evergreen, but in case some didn't I'm providing them to you. If we receive more I'll append them to this document and get you an update.

C. David Brown P.G. | Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5792 | Fax: 484.250.5961
www.dep.pa.gov

From: Joseph McCullough <jerseyman01@gmail.com>
Sent: Friday, December 4, 2020 6:35 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Joseph McCullough
1854 Plymouth Drive
Woodlyn, PA 19094

From: Linnea Bond <linneajbond@gmail.com>
Sent: Friday, December 4, 2020 3:32 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linnea Bond
1338 N 26th St
Philadelphia, PA 19121

From: Marie DiMattia <dimatm90@gmail.com>
Sent: Friday, December 4, 2020 10:58 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marie DiMattia
542B S 48th St
Philadelphia, PA 19143

From: Edward Thornton <ert@sas.upenn.edu>
Sent: Friday, December 4, 2020 11:42 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Edward Thornton
7 Swarthmore Pl
Swarthmore, PA 19081

From: Sheila Erlbaum <sjerlbaum@gmail.com>
Sent: Friday, December 4, 2020 5:58 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sheila Erlbaum
7150 Bryan St.
Philadelphia, PA 19119

From: Robert DuPlessis <rduples1@swarthmore.edu>
Sent: Friday, December 4, 2020 5:04 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Robert DuPlessis
413 S 24th St
Philadelphia, PA 19146

From: Arden Kass <Arden@ardenkass.com>
Sent: Friday, December 4, 2020 4:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Dear Ragesh Patel,

WE LIVE RIGHT NEAR THE AIRPORT & REFINERY SITES. MY BLOCK IS FULL OF YOUNG CHILDREN. PLEASE MAKE THE MOST ETHICAL CHOICE AND PROTECT ALL OF OUR HEALTH.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Arden Kass
758 S. 18th Street
Philadelphia, PA 19146

From: Anisa George <anisageorge@gmail.com>
Sent: Friday, December 4, 2020 4:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Anisa George
1232 Reed St
Philadelphia, PA 19147

From: Walter Tsou <walter@psrpa.org>
Sent: Friday, December 4, 2020 4:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Walter Tsou
325 E. Durham St.
Philadelphia, PA 19119

From: Sheldon Isaac <sheldonhisaac@gmail.com>
Sent: Friday, December 4, 2020 4:05 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sheldon Isaac
658 W. Park Lane
Philadelphia, PA 19144

From: Rose Paddison <rbpaddison@gmail.com>
Sent: Friday, December 4, 2020 4:04 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Rose Paddison
2003 W Girard Ave
Philadelphia, PA 19130

From: Russell Zerbo <rzerbo@cleanair.org>
Sent: Friday, December 4, 2020 1:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Russell Zerbo
1330 S Melville
Philadelphia, PA 19143

From: Priscilla Mattison <sallymattison@gmail.com>
Sent: Friday, December 4, 2020 1:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Dear Ragesh Patel,

I am a concerned Pennsylvanian who cares about the environment and public health.

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Please make the necessary changes.

Sincerely,
Priscilla Mattison
1052 Broadmoor Rd
Bryn Mawr, PA 19010

From: John Colgan-Davis <j.colgan-davis@att.net>
Sent: Friday, December 4, 2020 1:20 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
John Colgan-Davis
101 W Mount Airy Ave
Philadelphia, PA 19119

From: Karen Guarino Spanton <kguarinospanton@gmail.com>
Sent: Friday, December 4, 2020 1:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Karen Guarino Spanton
199 DuPont St
Philadelphia, PA 19127

From: Gianna Rosati <grosati1@gmail.com>
Sent: Friday, December 4, 2020 1:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gianna Rosati
1600 Arch St
Philadelphia, PA 19103

From: Jody Ferry <jodyferry@gmail.com>
Sent: Friday, December 4, 2020 1:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jody Ferry
441 Hawarden Rd
Springfield, PA 19064

From: Nora Nash <nnash@osfphila.org>
Sent: Friday, December 4, 2020 1:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nora Nash
609 S. Convent Rd
Aston, PA 19014

From: Alex Bomstein <bomstein@gmail.com>
Sent: Friday, December 4, 2020 1:38 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alex Bomstein
1438 S 9th St
Philadelphia, PA 19147

From: Jason Volpe <jason.a.volpe@gmail.com>
Sent: Friday, December 4, 2020 1:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Volpe
826 N Capitol St
Philadelphia, PA 19130

From: Susan Babbitt <philad49@att.net>
Sent: Friday, December 4, 2020 1:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Susan Babbitt
319 South Tenth Street, 133
Philadelphia, PA 19107

From: Donna Cosgrove <dzymzy@gmail.com>
Sent: Friday, December 4, 2020 1:42 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Donna Cosgrove
2411C Delancey Pl
Philadelphia, PA 19103

From: Marisa Wilson <marisatwilson@gmail.com>
Sent: Friday, December 4, 2020 1:48 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marisa Wilson
4916 Hazel Ave Apt 1
Philadelphia, PA 19143

From: Rebecca Finkel <rfinkel712@gmail.com>
Sent: Friday, December 4, 2020 1:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Rebecca Finkel
916 PARK AVE
Collingswood, NJ 08108

From: Serena Levingston <serenalevingston@gmail.com>
Sent: Friday, December 4, 2020 2:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Serena Levingston
6909 Henley St
Philadelphia, PA 19119

From: Sandra Foehl <sandra.foehl@temple.edu>
Sent: Friday, December 4, 2020 2:24 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Sandra Foehl
3443 W Penn St
Philadelphia, PA 19129

From: Loree Schuster <lsschuster@att.net>
Sent: Friday, December 4, 2020 2:31 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Loree Schuster
53 W Tulpehocken St
Philadelphia, PA 19144

From: Sandahl Tolbert <sandahl.parrish@gmail.com>
Sent: Friday, December 4, 2020 2:55 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Sandahl Tolbert
2504 Deepwood Dr
Wilmington, DE 19810

From: Tim Miller <timmiller203@gmail.com>
Sent: Friday, December 4, 2020 2:42 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Tim Miller
2401 Pennsylvania Ave
Philadelphia, PA 19130

From: Allan Freedman <apfreedman@gmail.com>
Sent: Friday, December 4, 2020 3:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Allan Freedman
7821 PARK AVE
ELKINS PARK, PA 19027

From: James Castellan <james.castellan@gmail.com>
Sent: Friday, December 4, 2020 3:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
James Castellan
42 Rabbit Run Rd
Rose Valley, PA 19086

From: Gerrie Schmidt <gerriehope@gmail.com>
Sent: Friday, December 4, 2020 3:30 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gerrie Schmidt
733 Bradford Aly
Philadelphia, PA 19147

From: Roberta Camp <robertacamp@verizon.net>
Sent: Sunday, December 6, 2020 2:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Sincerely,
Roberta Camp
713 S Warnock St
Philadelphia, PA 19147

From: Jean Plough <jeanough@gmail.com>
Sent: Friday, December 4, 2020 11:07 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jean Plough
817 Westview st
Philadelphia, PA 19119

From: Emily Davis <emilylambertdavis@gmail.com>
Sent: Monday, December 7, 2020 9:58 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Emily Davis
1901 John F Kennedy Blvd
Philadelphia, PA 19103

From: Marielle Lerner <marielle.lerner@gmail.com>
Sent: Sunday, December 6, 2020 9:49 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marielle Lerner
328 Dawson St
Philadelphia, PA 19128

From: Annette Ballard <nballard@dca.net>
Sent: Sunday, December 6, 2020 11:13 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Annette Ballard
265 Northwestern Ave
Philadelphia, PA 19128

From: Katherine Packer <kzane5007@gmail.com>
Sent: Sunday, December 6, 2020 10:39 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Packer
2601 Pennsylvania Avenue
Philadelphia, PA 19130

From: MICHELLE Doron <doron.michelle@gmail.com>
Sent: Sunday, December 6, 2020 9:04 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
MICHELLE Doron
2418 Linden Dr
Havertown, PA 19083

From: frann shore <frannshore@gmail.com>
Sent: Saturday, December 5, 2020 5:41 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
frann shore
1263 Dixon Ln
Jenkintown, PA 19046

From: David Spangenberg <pooch@professorpooch.com>
Sent: Saturday, December 5, 2020 5:35 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
David Spangenberg
170 East. St.
Philadelphia, PA 19127

From: Tiffany Gaal <tiffanygaal@gmail.com>
Sent: Saturday, December 5, 2020 5:04 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tiffany Gaal
7911 Heather Rd.
Elkins Park, PA 19027

From: Helen Syen <shhhhhsilenceisgolden@gmail.com>
Sent: Saturday, December 5, 2020 2:26 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Sincerely,
Helen Syen
2542 Faunce St
Philadelphia, PA 19152

From: Carl Gershenson <cgershenson@gmail.com>
Sent: Saturday, December 5, 2020 12:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carl Gershenson
2118 Ellsworth St
Philadelphia, PA 19146

From: Shawn Megill Legendre <sslegend2000@gmail.com>
Sent: Saturday, December 5, 2020 11:48 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Shawn Megill Legendre
1 Linden Place
Philadelphia, PA 19144

From: Jill Turco <jillylovespugs@gmail.com>
Sent: Friday, December 4, 2020 11:59 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Jill Turco
2428 Manton St
Philadelphia, PA 19146

From: Elizabeth Anderson <libby@painterhill.com>
Sent: Friday, December 4, 2020 11:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Anderson
3300 Darby Rd Apt 7118
Haverford, PA 19041

From: Megan LeCluyse <azmeg2001@yahoo.com>
Sent: Saturday, December 5, 2020 7:33 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Megan LeCluyse
1018 Christian St
Philadelphia, PA 19147

From: Michael Miller Jr. <michamille@comcast.net>
Sent: Friday, December 4, 2020 11:55 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Michael Miller Jr.
1512 Spruce St Apt 809
Philadelphia, PA 19102

From: William Gordon <wcharlesgo@verizon.net>
Sent: Friday, December 4, 2020 9:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
William Gordon
109 S Mac Dade Blvd.
Glenolden, PA 19036

From: Tanya Seaman <tanya.seaman@verizon.net>
Sent: Friday, December 4, 2020 9:07 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Tanya Seaman
2414 Madison Sq
Philadelphia, PA 19146

From: Gina LoBiondo <reggie13chip@yahoo.com>
Sent: Friday, December 4, 2020 7:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Gina LoBiondo
105 Greenbriar Ln
Havertown, PA 19083

From: Bonnie Hallam <etbegood44@hotmail.com>
Sent: Friday, December 4, 2020 6:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes. The only reason for Evergreen not doing the most cautious job they can do is saving money for the company. Is saving money for the business worth the potential death or serious health issues that could impact people if they don't use the strictest possible standards. Not in my book.

Sincerely,
Bonnie Hallam
4719 Woodland Avenue
Drexel Hill, PA 19026

From: Johnny Johnson <johnnyjayjohnson@yahoo.com>
Sent: Friday, December 4, 2020 5:16 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Johnny Johnson
925 Edgemore Rd
Philadelphia, PA 19151

From: Melissa Johnson <cutiemj_2000@yahoo.com>
Sent: Friday, December 4, 2020 4:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melissa Johnson
34 Village of Stoney Run
Maple Shade, NJ 08052

From: Vincent Prudente <pruv9@verizon.net>
Sent: Friday, December 4, 2020 4:52 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Vincent Prudente
1826 Fitzwater Street
Philadelphia, PA 19146

From: F Hagedorn <flhagedorn@yahoo.com>
Sent: Friday, December 4, 2020 4:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
F Hagedorn
2341 S 16th St
Philadelphia, PA 19145

From: Camille Bell <enjoylife59@aol.com>
Sent: Friday, December 4, 2020 4:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Camille Bell
251 Arden Rd
Conshohocken, PA 19428

From: Victoria English <eglish123ve@verizon.net>
Sent: Friday, December 4, 2020 4:16 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Victoria English
617 RADNOR VALLEY DR.
VILLANOVA, PA 19085

From: Carolyn Klepser <pjcritter@yahoo.com>
Sent: Friday, December 4, 2020 4:15 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I have three urgent requests:

I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater.

Also, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still accurate.

Please take these comments seriously and make the necessary changes. Thank you!

Sincerely,
Carolyn Klepser
931 Clinton St Apt 310
Philadelphia, PA 19107

From: Jason Driesbaugh <jason.driesbaugh@yahoo.com>
Sent: Friday, December 4, 2020 3:18 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Driesbaugh
2434 Whitby Rd
Havertown, PA 19083

From: Jason Sandman <jason@climatedads.org>
Sent: Friday, December 4, 2020 3:00 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Sandman
942 S. 8th St.
Philadelphia, PA 19147

From: Diane Krassenstein <dkrassen1@verizon.net>
Sent: Friday, December 4, 2020 2:35 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Diane Krassenstein
7617 Fillmore St
Philadelphia, PA 19111

From: Sarah Collier <whcsec@verizon.net>
Sent: Friday, December 4, 2020 2:34 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sarah Collier
124 Brooke Farm Rd
Wayne, PA 19087

From: Paul Hagedorn <pahag@verizon.net>
Sent: Friday, December 4, 2020 2:31 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Paul Hagedorn
2341 S 16th St
Philadelphia, PA 19145

From: Bonnie Eisenfeld <bwehrl@yahoo.com>
Sent: Friday, December 4, 2020 1:42 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bonnie Eisenfeld
2031 Locust St Apt 402
Philadelphia, PA 19103

From: Rachel Schottenfeld <rschottenfeld@arcadia.edu>
Sent: Friday, December 4, 2020 2:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rachel Schottenfeld
308 East girard avenue
Philadelphia, PA 19125

From: Jeanne Carol Myers <jeannec@comcast.net>
Sent: Friday, December 4, 2020 2:05 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to WITHDRAW the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is TWICE the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site. Clearly, with the higher lead levels allowed, Evergreen will save money and that is their priority, NOT HUMAN HEALTH.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

It is critical that you take these comments seriously and make the necessary changes.

Sincerely,
Jeanne Carol Myers
210 Locust St Apt 23D
Philadelphia, PA 19106

From: Matthew O'Donnell <gizmo8204@yahoo.com>
Sent: Friday, December 4, 2020 2:05 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Matthew O'Donnell
14B Apel Ave
Oreland, PA 19075

From: Liz Robinson <liz.rob2@verizon.net>
Sent: Friday, December 4, 2020 2:01 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Liz Robinson
566 Jamestown Street
Philadelphia, PA 19128

From: Brent Groce <brentgroce@me.com>
Sent: Friday, December 4, 2020 1:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Brent Groce
325 S 25th St
Philadelphia, PA 19103

From: Chris Ozbun <tigger34@mac.com>
Sent: Friday, December 4, 2020 1:51 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Chris Ozbun
823 Dover Rd
Wynnewood, PA 19096

From: Mark Waltzer <mlwaltzer@verizon.net>
Sent: Friday, December 4, 2020 1:49 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mark Waltzer
1509 Squire Lane
Cherry Hill, NJ 08003

From: Susan Saltzman <scsaltzman@aol.com>
Sent: Friday, December 4, 2020 1:36 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Susan Saltzman
1420 Locust St Apt 23M
Philadelphia, PA 19102

From: Bharati Sharma <sharma92@yahoo.com>
Sent: Friday, December 4, 2020 1:26 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bharati Sharma
2337B Wallace Street
Philadelphia, PA 19130

From: Elizabeth Shober <ejshober@verizon.net>
Sent: Friday, December 4, 2020 1:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Shober
172 Foxhound Dr
Lafayette Hill, PA 19444

From: A. Brennan <redshaleab@yahoo.com>
Sent: Friday, December 4, 2020 1:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
A. Brennan
1919 Chestnut St
Philadelphia, PA 19103

From: Knar Gavin <knarge@sas.upenn.edu>
Sent: Friday, December 4, 2020 1:16 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Knar Gavin
524 Alexander Ave
Drexel Hill, PA 19026

From: Jason Rash <jarash11@verizon.net>
Sent: Friday, December 4, 2020 1:15 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Rash
305 Dogwood Ln
Wallingford, PA 19086

From: Daniel Safer <saferdan@hotmail.com>
Sent: Friday, December 4, 2020 1:14 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Daniel Safer
3305 Hamilton St
Philadelphia, PA 19104

From: michael zuckerman <mzuckerm@upenn.edu>
Sent: Friday, December 4, 2020 5:18 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
michael zuckerman
3207 Winter St
Philadelphia, PA 19104

From: Camille Bell <enjoylife59@aol.com>
Sent: Friday, December 4, 2020 4:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Camille Bell
251 Arden Rd
Conshohocken, PA 19428

From: Roberta Camp <robertacamp@verizon.net>
Sent: Sunday, December 6, 2020 2:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Roberta Camp
713 S Warnock St
Philadelphia, PA 19147

From: Amy Wilson <amy.wilson2008@gmail.com>
Sent: Wednesday, December 9, 2020 6:54 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Amy Wilson
245 S. 53rd St
Philadelphia, PA 19139

From: Sydney Meyer <sydmeyer11@gmail.com>
Sent: Tuesday, December 8, 2020 8:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sydney Meyer
3230 Aramingo Ave
Philadelphia, PA 19133

From: Spencer Koelle <42sbkoelle@gmail.com>
Sent: Wednesday, December 9, 2020 4:21 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes. Sometimes the tapwater in this state catches on fire.

Sincerely,
Spencer Koelle
2112 Mifflin St
Philadelphia, PA 19145

From: Jennifer Clark <fivetenjen@hotmail.com>
Sent: Wednesday, December 9, 2020 12:38 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jennifer Clark
27 Wallingford Ave
Wallingford, PA 19086

From: Jessica Bellwoar <jbellwoar@cleanair.org>
Sent: Thursday, December 10, 2020 1:57 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Bellwoar
1441 S Beulah Street
Philadelphia, PA 19147

From: Carl Anderson <carl907anderson@yahoo.com>
Sent: Sunday, December 27, 2020 3:00 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carl Anderson
907 Bullock Ave
Lansdowne, PA 19050

From: Donna M. Gibson-Wells <gibsontoob@aol.com>
Sent: Tuesday, December 29, 2020 11:54 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

We don't want to experience what Tom's River and Flint Michigan have endured.
Our health and our babies future matter.

Very Concerned Citizen

Sincerely,
Donna M. Gibson-Wells
2840 South 64th Street
Philadelphia, PA 19142

From: Darryl Roberts <darryl.roberts724@gmail.com>
Sent: Tuesday, December 29, 2020 7:11 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Darryl Roberts
1910 Mountain Street
Philadelphia, PA 19145

From: Danielle Mckenzie <dmckenzie5726.dm@gmail.com>
Sent: Wednesday, December 30, 2020 2:55 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Danielle Mckenzie
6840 Grebe Place
Philadelphia, PA 19142

From: charles reeves jr <creeves.rac2@gmail.com>
Sent: Sunday, January 3, 2021 2:31 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
charles reeves jr
1539 S Patton St
Philadelphia, PA 19146

From: Harley Frances <harlsquinn73@gmail.com>
Sent: Thursday, December 31, 2020 6:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Harley Frances
7900 Lindbergh Blvd
Philadelphia, PA 19153

From: matthew feldman <matthew.ean.feldman@gmail.com>
Sent: Monday, January 4, 2021 9:43 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
matthew feldman
4837 Pulaski Ave
Philadelphia, PA 19144

From: Billy Nichols <wnichol2@gmail.com>
Sent: Monday, January 4, 2021 9:55 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Billy Nichols
1935 Mount Vernon St
Philadelphia, PA 19130

From: Katy Ruckdeschel <katyruck11@gmail.com>
Sent: Monday, January 4, 2021 10:07 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katy Ruckdeschel
309 Valley Rd
Merion Station, PA 19066

From: Michael Bourg <bourgmike@gmail.com>
Sent: Monday, January 4, 2021 10:07 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michael Bourg
2639 E Venango St
Philadelphia, PA 19134

From: Phyllis Blumberg <Phyllis2723@gmail.com>
Sent: Monday, January 4, 2021 10:06 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Phyllis Blumberg
332 Kent Rd.
Bala Cynwyd, PA 19004

From: David Gibson <peacehome.campaigns@gmail.com>
Sent: Monday, January 4, 2021 10:03 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I completely concur with the message below. As a tax payer and voter I demand action.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
David Gibson
657 N 37th St
Philadelphia, PA 19104

From: Henry Frank <henrynco@comcast.net>
Sent: Monday, January 4, 2021 9:44 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Please withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health.

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Please take these comments seriously and make the necessary changes.

Respectfully,

Sincerely,
Henry Frank
2763 Island Ave
Philadelphia, PA 19153

From: Alex Vazquez <vazull@yahoo.com>
Sent: Monday, January 4, 2021 9:43 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alex Vazquez
1027 arch st.
Philadelphia, PA 19107

From: David Wiley <the_kenosha_kid@yahoo.com>
Sent: Monday, January 4, 2021 9:36 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
David Wiley
511 S 49th St
Philadelphia, PA 19143

From: Wesley Merkle <wwm102@hotmail.com>
Sent: Monday, January 4, 2021 9:35 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Wesley Merkle
3458 Midvale Ave
Philadelphia, PA 19129

From: Howard Sherman <Howardsherman8@gmail.com>
Sent: Monday, January 4, 2021 10:44 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Howard Sherman
267 N. Highland Avenue
Lansdowne, PA 19050

From: Marcus Ferreira <marcusferreira2000@gmail.com>
Sent: Monday, January 4, 2021 10:40 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Any remediation plan should include the planting of trees and installation of robust riparian buffer zones (100' or greater), cleared of invasive plants and with an eye towards native species (selected with the goal of maximizing phytoremediation, air purification and riparian habitat restoration) should be included as part of the solution.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marcus Ferreira
1620 South Street
Philadelphia, PA 19146

From: Albert Littlepage <apage1801@aol.com>
Sent: Monday, January 4, 2021 10:32 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Albert Littlepage, Point Breeze,CDC
apage1801@aol.com

Sincerely,
Albert Littlepage
1801 S 17th st
Philadelphia, PA 19145

From: Jaclyn McIlwain <jaclyn.mcilwain@gmail.com>
Sent: Monday, January 4, 2021 11:33 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jaclyn McIlwain
2785 N Speer Blvd
Denver, CO 80211

From: Vivian Murray <vivomurray@gmail.com>
Sent: Monday, January 4, 2021 12:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Vivian Murray
2600 Pine Street
Philadelphia, PA 19103

From: Susan Schewel <psoozin@GMAIL.COM>
Sent: Monday, January 4, 2021 12:14 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Susan Schewel
419 Gate Lane
Philadelphia, PA 19119

From: Lori Flanagan-Cato <flanagan@psych.upenn.edu>
Sent: Monday, January 4, 2021 1:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lori Flanagan-Cato
525 Prescott Rd
Merion Station, PA 19066

From: Jack Byerly <jackson.m.b.1234@gmail.com>
Sent: Monday, January 4, 2021 1:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jack Byerly
1234 S. 7th Street
Philadelphia, PA 19147

From: Tina Solak <tinasolak@yahoo.com>
Sent: Monday, January 4, 2021 12:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tina Solak
57 Roberts Ave
Haddonfield, NJ 08033

From: Sharon Strauss <sestrauss@verizon.net>
Sent: Monday, January 4, 2021 12:35 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sharon Strauss
758 St. Georges Road
Philadelphia, PA 19119

From: Tom Vernon <vaxmd@comcast.net>
Sent: Monday, January 4, 2021 12:41 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tom Vernon
2134 Spring St.
Philadelphia, PA 19103

From: Ira Josephs <irabike@yahoo.com>
Sent: Monday, January 4, 2021 12:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ira Josephs
499 W Jefferson St
Media, PA 19063

From: Richard Metz <thembones2@hotmail.com>
Sent: Monday, January 4, 2021 11:40 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Richard Metz
910 Bent Lane
Erdenheim, PA 19038

From: Maryanne Zakreski <mzakreski21@gmail.com>
Sent: Monday, January 4, 2021 2:38 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Maryanne Zakreski
120 Hilldale Rd
CHELTENHAM, PA 19012

From: Diana Hulboy <hulboyd7@gmail.com>
Sent: Monday, January 4, 2021 2:27 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Diana Hulboy
308 Ripka St
Philadelphia, PA 19128

From: Andrew Kalan <andrewkalan@gmail.com>
Sent: Monday, January 4, 2021 5:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Andrew Kalan
802 Northwinds Dr
Bryn Mawr, PA 19010

From: Alexandria Barbadoro <barbadoroalex505@gmail.com>
Sent: Monday, January 4, 2021 6:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alexandria Barbadoro
2954 S Smedley St
Philadelphia, PA 19145

From: Michelle Dugan <mdugan1952@gmail.com>
Sent: Monday, January 4, 2021 6:10 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michelle Dugan
222 Maypole Rd
Upper Darby, PA 19082

From: Alexis Brzuchalski <alexis.brzuchalski@gmail.com>
Sent: Monday, January 4, 2021 9:58 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

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Please take these comments seriously and make the necessary changes.

Sincerely,
Alexis Brzuchalski
1108 South 8th Street
Philadelphia, PA 19147

From: Russ Allen <rallen@writersstudio.com>
Sent: Monday, January 4, 2021 10:20 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Russ Allen
1510 Grove Av.
Jenkintown, PA 19046

From: Jeremy Leman <jcrleman@icloud.com>
Sent: Monday, January 4, 2021 4:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jeremy Leman
2043 Appletree
Philadelphia, PA 19103

From: Kelly Wong <yakuzakell@yahoo.com>
Sent: Tuesday, January 5, 2021 3:28 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please use compassion, take these comments seriously and make the necessary changes. Please do the right thing.

Sincerely,
Kelly Wong
550 Lafayette Rd
Merion Station, PA 19066

From: Anna Tangi <tangianna@verizon.net>
Sent: Monday, January 4, 2021 10:58 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Anna Tangi
2642 S Alder St
Philadelphia, PA 19148

From: Diane M Calkins <calkinsdm5@yahoo.com>
Sent: Monday, January 4, 2021 10:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Diane M Calkins
5831 Drexel Rd
Philadelphia, PA 19131

From: Sarah Selph <all4myselph@yahoo.com>
Sent: Monday, January 4, 2021 9:45 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sarah Selph
757 Iris Ln
Media, PA 19063

From: Victoria English <eglish123ve@verizon.net>
Sent: Monday, January 4, 2021 7:09 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Victoria English
617 RADNOR VALLEY DR.
VILLANOVA, PA 19085

From: Walter Tsou <walter.tsou@verizon.net>
Sent: Monday, January 4, 2021 4:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I want to comment on the Evergreen cleanup of the former PES site. The depth of contamination is borderline criminal. As a private homeowner in Philadelphia, if I had as much contamination on my property, I would be both fined and ordered to fully clean up the contamination. Yes, it is zoned industrial, but seven generations from now, the residents of Philadelphia will not remember that an old refinery was on this site. But they will come down with the toxic effects of all of the residual oil and gas refined products.

There is a once in a generation to clean up this site before developers put buildings on this site. It really doesn't matter if it is light industrial. People still will be working at this site and walking on the soil. To protect future workers, we need to either cap the site or put several feet of clean fill on the site. And generations from now, people will be putting roads and streets through the site and risking breathing in the soil contaminants.

In short, the City has a vested interest in how the site is remediated for the sake of the city's future. Imagine if the site could be restored to near residential grade? The land would become so valuable that it will more than compensate for the cost of the clean up. I urge you to clean up the property to the highest extent possible.

Sincerely,
Walter Tsou
325 E Durham St
Philadelphia, PA 19119

From: Sanjeev Khanna <sakh123@yahoo.com>
Sent: Monday, January 4, 2021 4:16 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sanjeev Khanna
2505 Pine St
Philadelphia, PA 19103

From: Kevin Foskett <foskettkevin@gmail.com>
Sent: Tuesday, January 5, 2021 8:54 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kevin Foskett
112 Glenn Road
Ardmore, PA 19003

From: Gabriel Hohag <gabriel.hohag@gmail.com>
Sent: Tuesday, January 5, 2021 12:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gabriel Hohag
808 Dickinson St
Philadelphia, PA 19147

From: Linda Rubiano <linda_maritza@yahoo.com>
Sent: Tuesday, January 5, 2021 1:48 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linda Rubiano
6107 Chestnut Ave
Merchantville, NJ 08109

From: Robert DeCarolis <rdecarolis@gmail.com>
Sent: Tuesday, January 5, 2021 4:23 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Robert DeCarolis
2407 S Woodstock Street
Philadelphia, PA 19145

From: Gail Mershon <gaildmershon@gmail.com>
Sent: Tuesday, January 5, 2021 9:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Finally, please keep uppermost in your planning and when implementing the correct safety protocols that every single thing you do will impact the families, including children, parents, grandparents and all pregnant women who make up the surrounding communities.

Please take these comments seriously and make the necessary changes.

Sincerely,
Gail Mershon
614 W Sedgwick St
Philadelphia, PA 19119

From: CASSIDY BOULAN <casstech@umich.edu>
Sent: Tuesday, January 5, 2021 8:36 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
CASSIDY BOULAN
334 S 12th St
Philadelphia, PA 19107

From: Eric Larson <eclarson75@gmail.com>
Sent: Wednesday, January 6, 2021 7:16 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Eric Larson
5510 Henry Ave
Philadelphia, PA 19128

From: Timothy DeSimone <tdsoundproductions@gmail.com>
Sent: Wednesday, January 6, 2021 9:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Timothy DeSimone
1130 Johnston St
Philadelphia, PA 19148

From: Domenic Novelli <dnovelli23@gmail.com>
Sent: Wednesday, January 6, 2021 8:52 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Domenic Novelli
3213 Salerno Way
Philadelphia, PA 19145

From: Jason Curtis <jasonacurtis@gmail.com>
Sent: Thursday, January 7, 2021 9:42 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Sincerely,
Jason Curtis
2717 Poplar St.
Philadelphia, PA 19130

From: Denise Costello <denisecost627@gmail.com>
Sent: Thursday, January 7, 2021 9:50 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Denise Costello
1325 Wolf St
Philadelphia, PA 19148

From: Christina Rosan <tinarosan@gmail.com>
Sent: Thursday, January 7, 2021 9:58 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Christina Rosan
4405 Pine St
Philadelphia, PA 19104

From: Katherine Jueds <kcjueds@gmail.com>
Sent: Thursday, January 7, 2021 9:55 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Jueds
139 E Mount Pleasant Ave
Philadelphia, PA 19119

From: Tim Emmett-Rardin <timstuer@gmail.com>
Sent: Thursday, January 7, 2021 9:59 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Tim Emmett-Rardin
176 Glentay Ave
Lansdowne, PA 19050

From: Mary Ferrigno <maryferrigno@gmail.com>
Sent: Thursday, January 7, 2021 10:08 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Ferrigno
132 Watkins St.
Philadelphia, PA 19148

From: Elizabeth Lutes <elizabeth.lutes@gmail.com>
Sent: Thursday, January 7, 2021 10:07 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Lutes
1928 S ISEMINGER ST
PHILADELPHIA, PA 19148

From: Erich Everbach <ceverba1@swarthmore.edu>
Sent: Thursday, January 7, 2021 10:18 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Erich Everbach
212 Dogwood Ln
Wallingford, PA 19086

From: G. D. <gdeannuntis57@gmail.com>
Sent: Thursday, January 7, 2021 10:41 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
G. D.
5502 Houghton St,
Philadelphia, PA 19128

From: Nickole LaRussa <nikkila88@yahoo.com>
Sent: Wednesday, January 6, 2021 8:46 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nickole LaRussa
3200 Pietro way
Philadelphia, PA 19145

From: Louis Kyle <louisfkyle@yahoo.com>
Sent: Thursday, January 7, 2021 10:44 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Louis Kyle
8009 Navajo St
Philadelphia, PA 19118

From: Marta Guttenberg <martaguttenberg@comcast.net>
Sent: Thursday, January 7, 2021 10:40 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I have personally reviewed the documents available through the public library. They clearly show the persistence of toxins at the site and the failure of prior and recent mandated clean-ups.
Please read them, too!

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marta Guttenberg
226 West Rittenhouse Square
Philadelphia, PA 19103

From: Francis Fedoroff <vlv122@yahoo.com>
Sent: Thursday, January 7, 2021 10:26 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Francis Fedoroff
5935 Pulaski Avenue
Philadelphia, PA 19144

From: Megan White-Marley <meganwhitemarley@yahoo.com>
Sent: Thursday, January 7, 2021 10:14 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Megan White-Marley
114 Strathmore Rd
Havertown, PA 19083

From: Kristin Jaros <kristin30@verizon.net>
Sent: Thursday, January 7, 2021 9:54 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes. Protect our future water. It's so important. Thank you.

Sincerely,
Kristin Jaros
1214 65th Ave
Philadelphia, PA 19126

From: Jeanine LaFiora <Jeanine67@comcast.net>
Sent: Wednesday, January 6, 2021 10:17 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jeanine LaFiora
3212 Napoli Way
Philadelphia, PA 19145

From: Nydisha Williams <nydishaboyd@yahoo.com>
Sent: Wednesday, January 6, 2021 9:41 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nydisha Williams
3343 Pietro Way
Philadelphia, PA 19145

From: Daniel Leone <dleone302@verizon.net>
Sent: Wednesday, January 6, 2021 9:01 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Daniel Leone
3906 Gateway Drive C4
Philadelphia, PA 19145

From: Rachel Loke <rtr16@aol.com>
Sent: Wednesday, January 6, 2021 8:52 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rachel Loke
3306 Pietro Way
Philadelphia, PA 19145

From: Margaret Cristofalo <pegcristofalo@verizon.net>
Sent: Thursday, January 7, 2021 10:53 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Margaret Cristofalo
444 Haverford Ave
Narberth, PA 19072

From: Ryan McCormick <Ryan.in.philly@gmail.com>
Sent: Thursday, January 7, 2021 10:57 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Ryan McCormick
819 S Warnock Street
Philadelphia, PA 19147

From: Heather Knizhnik <heather.knizhnik@gmail.com>
Sent: Thursday, January 7, 2021 11:24 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Sincerely,
Heather Knizhnik
4715 Cedar Ave
Philadelphia, PA 19143

From: Michael Niles <mikeniles29@gmail.com>
Sent: Thursday, January 7, 2021 11:37 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Michael Niles
3906 Netherfield Road
Philadelphia, PA 19129

From: Louise Giugliano <giuglian@gwu.edu>
Sent: Thursday, January 7, 2021 11:49 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Louise Giugliano
225 N Essex Ave
Narberth, PA 19072

From: Doug Herren <dougherren@me.com>
Sent: Thursday, January 7, 2021 11:56 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Doug Herren
2132 N Hancock St
Philadelphia, PA 19122

From: Margaret Sayvetz <msayvetz@verizon.net>
Sent: Thursday, January 7, 2021 11:52 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Margaret Sayvetz
2401 Pennsylvania Ave Apt 10B24
Philadelphia, PA 19130

From: Pamela Selle <pamela.selle@gmail.com>
Sent: Thursday, January 7, 2021 12:05 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

The cleaning standards MUST be the highest possible (or better) -- the communities impacted by this pollution have been for so long, and the only just action is to truly approach the cleanup with the utmost vigor and enthusiasm. Don't let this slide, please!!

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Pamela Selle
1616 S Clarion St
Philadelphia, PA 19148

From: Chloe Wang <chloe.wang18@gmail.com>
Sent: Thursday, January 7, 2021 1:15 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Chloe Wang
4708 Cedar Ave
Philadelphia, PA 19143

From: Linda Clark <lindapat49@gmail.com>
Sent: Thursday, January 7, 2021 12:05 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linda Clark
221 Pelham Rd
Philadelphia, PA 19119

From: Peter Furcht <pfurcht@comcast.net>
Sent: Thursday, January 7, 2021 1:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Please don't propagate short-sighted solutions that will continue harming the environment and future residents in that area.

Thank you.

Sincerely,
Peter Furcht
920 Clinton St 2R
Philadelphia, PA 19107

From: Linda Granato <l_granato1@yahoo.com>
Sent: Thursday, January 7, 2021 2:04 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Linda Granato
2772 Maxwell St
Philadelphia, PA 19136

From: Barbara Sonies <philtrio@icloud.com>
Sent: Thursday, January 7, 2021 1:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Barbara Sonies
214 Avon Rd
Narberth, PA 19072

From: Matt Stern <matt.stern@gmail.com>
Sent: Thursday, January 7, 2021 1:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I own my home and live less than two miles away from the former refinery site. Please clean up the site as if you and your family lived nearby. Evergreen's proposal and approach does not met that standard.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Matt Stern
1839 South Mole St
Philadelphia, PA 19145

From: Diane Fuchs <dianejf@gmail.com>
Sent: Thursday, January 7, 2021 1:36 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children.

I am particularly concerned about my grandchildren who live in south Philadelphia and have serious allergies.

Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Thank you.

Sincerely,
Diane Fuchs
1929 Fitzwater St
Philadelphia, PA 19146

From: JULIE GREENBERG <JULIEGBERG@GMAIL.COM>
Sent: Thursday, January 7, 2021 3:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
JULIE GREENBERG
6445 GREENE ST
PHILADELPHIA, PA 19119

From: Paula Bowe <bowedream@comcast.net>
Sent: Thursday, January 7, 2021 4:12 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Paula Bowe
2311 Roma Drive
Philadelphia, PA 19145

From: Carl Gershenson <cgershenson@gmail.com>
Sent: Thursday, January 7, 2021 3:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carl Gershenson
2029 Saint Albans St
Philadelphia, PA 19146

From: Julie Shapiro <julieshapp@gmail.com>
Sent: Thursday, January 7, 2021 3:46 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Julie Shapiro
519 S 46th St
Philadelphia, PA 19143

From: S Weinberg <stevwei@aol.com>
Sent: Thursday, January 7, 2021 3:26 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
S Weinberg
111 W Mount Airy Ave
Philadelphia, PA 19119

From: jeffrey shuben <jeffreyshuben@yahoo.com>
Sent: Thursday, January 7, 2021 3:20 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
jeffrey shuben
46204 Delaire Landing Rd
Philadelphia, PA 19114

From: John Dulik <jadulik@verizon.net>
Sent: Thursday, January 7, 2021 3:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
John Dulik
209 Rex Ave
Philadelphia, PA 19118

From: Frank Romano <frankromano@temple.edu>
Sent: Friday, January 8, 2021 11:20 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Frank Romano
2330 MOUNTAIN ST
PHILADELPHIA, PA 19145

From: Janet Cavallo <squirrelbuddy@aol.com>
Sent: Friday, January 8, 2021 8:17 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Janet Cavallo
1276 Providence Road
Clifton Heights, PA 19018

From: Brittany Casile <brittanycasile@yahoo.com>
Sent: Friday, January 8, 2021 7:37 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Brittany Casile
3213 Salerno Way
Philadelphia, PA 19145

From: Patricia Libbey <patricia.libbey@verizon.net>
Sent: Friday, January 8, 2021 4:46 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Patricia Libbey
379 Ripka St Apt 3B
Philadelphia, PA 19128

From: Eugenia Ahern <eugenia.ahern@gmail.com>
Sent: Thursday, January 7, 2021 10:02 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Eugenia Ahern
7044 Horrocks Street
Philadelphia, PA 19149

From: Marjorie Greenfield <megesquire@yahoo.com>
Sent: Thursday, January 7, 2021 9:49 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Marjorie Greenfield
4109 Apalogen Rd
Philadelphia, PA 19129

From: Carol Blum <carol.blum191@gmail.com>
Sent: Thursday, January 7, 2021 7:38 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carol Blum
2446 Aspen St
Philadelphia, PA 19130

From: Fran Fulton <franfulton3579@gmail.com>
Sent: Thursday, January 7, 2021 6:31 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Fran Fulton
1919 Chestnut Street
Philadelphia, PA 19103

From: Jessica Krow <jbkrow@gmail.com>
Sent: Thursday, January 7, 2021 6:17 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Krow
3118 W Penn St
Philadelphia, PA 19129

From: Genie Ravital <geniebud@gmail.com>
Sent: Thursday, January 7, 2021 6:11 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Genie Ravital
647 W Ellet St
Philadelphia, PA 19119

From: Rob Hewitt <hewitt.robertm@gmail.com>
Sent: Thursday, January 7, 2021 6:07 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Rob Hewitt
447 Wellesley Rd
Philadelphia, PA 19119

From: Emma Sabin <emmasbn6@gmail.com>
Sent: Thursday, January 7, 2021 4:52 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Emma Sabin
8417 Shawnee Street
Philadelphia, PA 19118

From: Ogden Mitchell <aponic@m0m0.org>
Sent: Friday, January 8, 2021 6:01 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ogden Mitchell
4123 Spring Garden Street
Philadelphia, PA 19104

From: shawn sweeney <sms927@gmail.com>
Sent: Friday, January 8, 2021 4:43 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
shawn sweeney
1512 E Palmer Street
Philadelphia, PA 19125

From: Theresa Heinsler <heinslertr@gmail.com>
Sent: Saturday, January 9, 2021 9:27 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Theresa Heinsler
2527 Island Ave
Philadelphia, PA 19153

From: Joesph Bridy <josephbridy@aol.com>
Sent: Saturday, January 9, 2021 12:55 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

The proposed site-specific standard for toxic lead in the surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw Evergreen's proposal to set a site-specific standard of 2,240 mg/kg. The single use standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen has used a unsound assumption of blood lead level to protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. A level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children IS DANGEROUSLY HIGH. The current standard is likely set too high, but Evergreen should at least be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change, higher than average rainfall and flood plain maps based on the most recent precipitation and tide data as recorded over the last 50 years. These impacts could occur with soil and water contamination before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen's remedial investigation reports are over three years old and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Joesph Bridy
709 Morris St
Philadelphia, PA 19148

From: Will Fraser <wfraser@cleanair.org>
Sent: Monday, January 11, 2021 9:55 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Will Fraser
135 S 19th St
Philadelphia, PA 19103

From: Stephanie Tortorice <stortorice203@yahoo.com>
Sent: Sunday, January 10, 2021 7:59 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Stephanie Tortorice
3210 Pietro Way
Philadelphia, PA 19145

From: merian soto <meriansoto@gmail.com>
Sent: Saturday, January 9, 2021 6:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
merian soto
360 Pelham Rd
Philadelphia, PA 19119

From: Julia Baker <jbakeroca@msn.com>
Sent: Monday, January 11, 2021 12:40 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Julia Baker
2150 Sproul Rd.
Broomall, PA 19008

From: Eleanor Dill <eleanor.dill.2020@gmail.com>
Sent: Tuesday, January 12, 2021 1:12 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

As a former Environmental Public Health employee, I am shocked that Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes. This community has been over-exposed far to long.

Sincerely,
Eleanor Dill
27 E Browning Rd Apt B
Collingswood, NJ 08108

From: Aseel Rasheed <arasheed@bartramsgarden.org>
Sent: Monday, January 11, 2021 5:26 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Aseel Rasheed
Bartram's Garden, 5400 Lindbergh Blvd
Philadelphia, PA 19143

From: Eve Lukens-Day <elukensday17@gmail.com>
Sent: Wednesday, January 13, 2021 10:58 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Eve Lukens-Day
352 E Roumfort Rd
Philadelphia, PA 19119

From: Anna Tangi <tangianna@verizon.net>
Sent: Wednesday, January 13, 2021 11:14 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Anna Tangi
2642 S Alder St
Philadelphia, PA 19148

From: Conrad Miller <camiller79@gmail.com>
Sent: Wednesday, January 13, 2021 11:00 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.*

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Conrad Miller
2142 S Lambert St
Philadelphia, PA 19145

From: Russ Allen <rallen@writersstudio.com>
Sent: Wednesday, January 13, 2021 11:31 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Finally, Evergreen must include remediation for chemicals such as PFAS in its report.

Please take these comments seriously and make the necessary changes.

Sincerely,
Russ Allen
1510 Grove Av.
Jenkintown, PA 19046

From: Donna Ryan <der625@yahoo.com>
Sent: Wednesday, January 13, 2021 11:54 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Donna Ryan
1639 S. Clarion St
Philadelphia, PA 19148

From: Lynne Flaxman <lynneflax@gmail.com>
Sent: Wednesday, January 13, 2021 12:00 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lynne Flaxman
320 South Smedley Street
Philadelphia, PA 19103

From: Katherine Stratton <Kpstratton@gmail.com>
Sent: Wednesday, January 13, 2021 12:04 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Stratton
2407 Madison Square
Philadelphia, PA 19146

From: Bryn Stull <ltlblkmiata@uahoo.com>
Sent: Wednesday, January 13, 2021 12:17 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bryn Stull
2530 S Cleveland St
Philadelphia, PA 19145

From: Lori McKenna <lorimck114@Aol.com>
Sent: Wednesday, January 13, 2021 12:31 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lori McKenna
3349 pietro way
Philadelphia, PA 19145

From: William McKenna <riotact713@gmail.com>
Sent: Wednesday, January 13, 2021 12:33 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
William McKenna
3349 pietro way
Philadelphia, PA 19145

From: Britt Faulstick <befaulst@gmail.com>
Sent: Wednesday, January 13, 2021 12:57 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Britt Faulstick
2633 S. 17th St.
Philadelphia, PA 19145

From: Janet Lorenz <janetmlorenz@gmail.com>
Sent: Wednesday, January 13, 2021 12:57 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Janet Lorenz
2103 Fitzwater Street
Philadelphia, PA 19146

From: Dan Schupsky <dan.schupsky@gmail.com>
Sent: Wednesday, January 13, 2021 1:02 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Lastly, why was Evergreen so delinquent in doing the outreach associated with the legal/contracted obligations to this site? Until the massive explosion, the community at large had not heard from them in years and their outreach/engagement was pitiful.

Please take these comments seriously and make the necessary changes.

Sincerely,
Dan Schupsky
2213 Pemberton Street
Philadelphia, PA 19146

From: Joanne Kundrat <jzkundrat@gmail.com>
Sent: Wednesday, January 13, 2021 1:21 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

The current work cannot be evaluated until all analysis about the aquifers is completed. Without that information, the public does not have all of the information to evaluate decisions on soil and groundwater sampling.

Sincerely,
Joanne Kundrat
428 N 13 th St
Phildelphia, PA 19123

From: Ernie Mabrey <emabrey@verizon.net>
Sent: Wednesday, January 13, 2021 1:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Ernie Mabrey
1901 JFK Blvd., #808
Philadelphia, PA 19103

From: Allegra Armstrong <armstrongallegra@gmail.com>
Sent: Wednesday, January 13, 2021 1:43 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Allegra Armstrong
237 a 18th st
Philadelphia, PA 19103

From: Cameron Adamez <cameron@soycow.org>
Sent: Wednesday, January 13, 2021 1:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Cameron Adamez
1134 Mercy St
Philadelphia, PA 19148

From: Paul Greco <paul.w.greco@gmail.com>
Sent: Wednesday, January 13, 2021 2:01 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Paul Greco
18 Equestrian Lane
Blue Bell, PA 19422

From: Adrienne Brockwell <abrockwell01@comcast.net>
Sent: Wednesday, January 13, 2021 2:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Adrienne Brockwell
247 Wyncote Rd
Jenkintown, PA 19046

From: lalur Lane <laural65@gmail.com>
Sent: Tuesday, January 12, 2021 7:44 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergeen must use the highest standards for cleaning up this site.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Sincerely,
lalur Lane
303 St Peters Way
Philadelphia, PA 19106

From: barbara hague <family4751@msn.com>
Sent: Wednesday, January 13, 2021 10:48 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
barbara hague
2121 S 13th St
Philadelphia, PA 19148

From: Jason Crook <jcrook4art@yahoo.com>
Sent: Wednesday, January 13, 2021 10:42 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposal is irresponsible and does not properly take into account current scientific understanding.

The proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jason Crook
2711 Edgemont Street
Philadelphia, PA 19134

From: Cindy Veloric <chveloric@comcast.net>
Sent: Wednesday, January 13, 2021 10:06 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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On a more personal note, I have been advocating for better stewardship of our environment since the 1970s. I have seen progress and I have seen failures. At this point in time, with global health crises dramatically on the rise, every single potentially harmful site MUST be ameliorated if we are to have any chance of saving our planet.

CHV

Please take these comments seriously and make the necessary changes.

Sincerely,
Cindy Veloric
1165 Norsam Rd
Gladwyne, PA 19035

From: Arianne Allan <arianne314@gmail.com>
Sent: Wednesday, January 13, 2021 9:57 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Arianne Allan
12 Brookside Rd
Wallingford, PA 19086

From: Katie Moore <moore_katiem@hotmail.com>
Sent: Wednesday, January 13, 2021 9:54 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Katie Moore
717 Winton Street
Philadelphia, PA 19148

From: Sarah Elichko <selichko@gmail.com>
Sent: Wednesday, January 13, 2021 9:38 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Philadelphia residents and workers deserve an updated and accurate investigation into the environmental safety hazards at the former refinery site.

Evergreen completed its remedial investigation reports over three years ago. Given the fire incidents and other changes during that time, relying on older data seems questionable. Evergreen should provide evidence that data from these reports are still representative.

Evergreen has proposed a site-specific standard for surface soil lead levels (2,240 mg/kg). This is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen should be using the current science to set a site-specific standard that protects public health.

Given the expected rise in water levels along the Schuylkill, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. I'm particularly concerned about the migration of contaminants in the soil and groundwater.

I hope you'll take these concerns into account.

Sincerely,
Sarah Elichko
4643 Pine St C210
Philadelphia, PA 19143

From: susan patrone <susan.patrone@yahoo.com>
Sent: Wednesday, January 13, 2021 9:38 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site is not protective of public health.
• Evergreen made flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead.
• Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg).
• Evergreen is using a level that is twice the reference value used by the Centers for Disease Control and Prevention to address lead exposure in children.
Evergreen needs to revise its remedial investigation reports to adequately account for impacts of climate change from
• Storm surges
• Sea level rise
• Increased frequency and volume of super storms
These have major implications on the migration of contaminants in the soil and groundwater.
Evergreen completed its remedial investigation reports over three years ago.
It is not clear whether the data underlying the reports are still reliable.
Evergreen needs to provide evidence that data from these reports are still representative.
I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg.
Thank you.
Susan Patrone
1529 South 13th Street
Phila., PA 19147

Sincerely,
susan patrone
1529 S 13th St
Philadelphia, PA 19147

From: Jack Byerly <jackson.m.b.1234@gmail.com>
Sent: Wednesday, January 13, 2021 9:33 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jack Byerly
1234 S 7th St
Philadelphia, PA 19147

From: Saul Davis <barondz@gmail.com>
Sent: Wednesday, January 13, 2021 9:33 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Saul Davis
1929 Chestnut St., Apt 2F
Philadelphia, PA 19103

From: Dan Friedman <danfriedman2@gmail.com>
Sent: Wednesday, January 13, 2021 9:26 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Dan Friedman
118 Queen Street
Philadelphia, PA 19147

From: Rebecca Finkel <rfinkel712@gmail.com>
Sent: Wednesday, January 13, 2021 9:18 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

To Whom it May Concern:

I am a New Jersey resident who is extremely concerned about the potential for groundwater contamination at the PES refinery site and how it could affect my young child. The area has been highly contaminated for a century, and residents of both Pennsylvania and New Jersey are now well aware of the dangers posed by groundwater contamination, following high-profile cases in Tom's River, NJ, and the now-confirmed systemic drinking water contamination occurring as a result of fracking the Marcellus Shale.
Please follow the advice of experts at the Clean Air Council and perform an immediate and thorough and plan to identify and remediate contamination. The public is now very well aware of the carcinogenic threats posed by your project and will be watching.

Thank you,
Rebecca Finkel

Sincerely,
Rebecca Finkel
916 PARK AVE
Collingswood, NJ 08108

From: Janean Clare <janean211@verizon.net>
Sent: Wednesday, January 13, 2021 9:03 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Janean Clare
211 Bridge St
Morton, PA 19070

From: Aaron Bauman <aaronbauman@gmail.com>
Sent: Wednesday, January 13, 2021 8:45 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Aaron Bauman
1411 S Franklin St
Philadelphia, PA 19147

From: Stuart Claire <stuart.claire@gmail.com>
Sent: Wednesday, January 13, 2021 8:42 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

As an environmental attorney, I am astounded that the DEP would even consider lead levels this high given what we are seeing in Detroit. We are doing the right thing by cleaning this up but do it the right way and protect our residents, future residents and our environment.

Sincerely,
Stuart Claire
2324 Catharine St
Philadelphia, PA 19146

From: Nathan Fried <nate.t.fried@gmail.com>
Sent: Wednesday, January 13, 2021 8:21 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg.

We just moved down here to south philly, are planning to be married this weekend and start a family. However, it's come to my attention the issues with this refinery clean up that negatively impact the health of my future family.

Should I stay and risk this? I dunno, but a thorough analysis of the site will go a long way to assuage resident concerns and protect the growth of philly's tax base, ya know?

Sincerely,
Nathan Fried
1418 Moore st
Puiladelphia, PA 19145

From: Sharon Furlong <sfurlong5@verizon.net>
Sent: Wednesday, January 13, 2021 7:51 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I live inBucks County, commonly called a “collar county” in our area. This issue deeply concerns me. We are all inhabitants of this region and not only what goes on but how it goes affects us all.

Evergreen’s proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I demand that you withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen’s proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Once again, you are dealing with a corporate entity not dedicated to much beyond its profits and quite willing to put the health of its workers and the public at risk. The way this corporation has divided its reports, delayed releasing updates, promises to report later regarding crucial elements of the project that are needed to make a final decision is NOT the kind of behavior we want to see in our region. I find this appalling and needs to be separately addressed.

Please take these comments seriously and make the necessary changes.

Sincerely,
Sharon Furlong
133 E. Bristol Road
Feasterville, PA 19053

From: Mary Ambros <ambrosm123@gmail.com>
Sent: Wednesday, January 13, 2021 7:36 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Ambros
6 Windsor Ave
Elkins Park, PA 19027

From: Cheryl Pyrch <cpyrch@summitpres.net>
Sent: Tuesday, January 12, 2021 9:11 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I am writing on behalf of the Philadelphia Chapter of Pennsylvania Interfaith Power & Light, people of faith concerned about climate change as a moral issue. We were involved in the movement to close the refinery and are very glad that it will no longer be a fossil-fuel production site.

However, the clean up must be thorough if we are to live out our call to be good stewards of the environment and just to the nearby community which bore the brunt of the refinery's pollution. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site is not sufficient. We strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, any plan that does not take into account the effects of climate change is not reality based. It shirks our responsibility to future generations. We ask that Evergreen rewrite the proposal to take into account rising sea levels, more intense storms, and other climate-related factors.

We understand that over 100 years of refining oil has caused great damage to the site. But now is not a time to cut corners. It is time to take care, to think about the future, and to do what is needed so that the site will be life-supporting for all of Philadelphia for years to come. Thank you.

Sincerely,
Cheryl Pyrch
229 W. Upsal St. #105
Philadelphia, PA 19119

From: Elizabeth Hamann <eliz.hamann@gmail.com>
Sent: Wednesday, January 13, 2021 4:22 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Make good on your promise to safely repair this scar in our city

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elizabeth Hamann
732 S 21st Street
Philadelphia, PA 19146

From: Jessica Walker <jessicawalker122@gmail.com>
Sent: Thursday, January 14, 2021 7:22 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Walker
1215 S 19th St
Philadelphia, PA 19146

From: hugh kennedy <kennedyh@umich.edu>
Sent: Thursday, January 14, 2021 7:03 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
hugh kennedy
204 Carpenter St
Philadelphia, PA 19147

From: Sara D'Andrea <saradandrea22@yahoo.com>
Sent: Thursday, January 14, 2021 12:04 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sara D'Andrea
130 Meyers Street
Kingston, PA 18704

From: David Szczepanik <davidszcz@gmail.com>
Sent: Wednesday, January 13, 2021 11:32 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
David Szczepanik
1552 s Dover st
Philadelphia, PA 19146

From: Sara Labrum <sarajlabrum@gmail.com>
Sent: Wednesday, January 13, 2021 10:48 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes in the interest of public health.

Sincerely,
Sara Labrum
2037 Catharine St
Philadelphia, PA 19096

From: Melissa Mankin <mmankin192@gmail.com>
Sent: Wednesday, January 13, 2021 10:37 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melissa Mankin
2236 S. 21st Street
Philadelphia, PA 19145

From: Dimitra Tsekoura <mika@sas.upenn.edu>
Sent: Wednesday, January 13, 2021 10:33 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Dimitra Tsekoura
219 S Bonsall St
Philadelphia, PA 19103

From: Roxanne Trachtenberg <roxietrach@gmail.com>
Sent: Wednesday, January 13, 2021 10:27 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Roxanne Trachtenberg
39 Charles St Apt 4
Boston, MA 02114

From: Korin Tangtrakul <korin.tangtrakul@gmail.com>
Sent: Wednesday, January 13, 2021 10:14 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

As a Philadelphia resident and concerned citizen, I've been disturbed and frustrated to learn about the former PES refinery site and the legacy of toxins and pollutants it has left on the environmental justice community that surrounds the refinery. The opportunity to clean up and redevelop the refinery is a once in a lifetime chance to repair the biggest blight of our region. And as greenhouse gas emissions continue to rise and we know sea level rise, storm surge and precipitation events will continue to worsen. Evergreen must ensure its remedial investigation adequately addresses these future climate change conditions. For the +150 years this community has suffered from the presence of this refinery, we owe it to this community to ensure their health will be protected once this site is finally cleaned up.

Sincerely,
Korin Tangtrakul
2611 W Seybert St
Philadelphia, PA 19121

From: John Londres <dlondres@gmail.com>
Sent: Wednesday, January 13, 2021 9:50 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
John Londres
1313 S Chadwick St
Philadelphia, PA 19146

From: Peter Patton <pmp1955@yahoo.com>
Sent: Wednesday, January 13, 2021 9:35 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Peter Patton
703 Grove Pl
Havertown, PA 19083

From: Katie Burrell <katie.masi@gmail.com>
Sent: Wednesday, January 13, 2021 9:14 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katie Burrell
2242 Pemberton Street
Philadelphia, PA 19146

From: Mary-Angela Papalaskari <map@villanova.edu>
Sent: Wednesday, January 13, 2021 9:12 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I would like to thank the Evergreen group for taking up the monumental task of cleaning up the refinery. I am encouraged that this work is underway and urge Evergreen to address more thoroughly the concerns brought up by many scientists and environmentalists regarding the cleanup at the former refinery site. For example:
1) Evergreen's proposed lead standards for surface soil are not in line with current science or with the governor's Lead Free PA initiative. Allowing the PES site to apply a lead standard that is twice the current value for non-residential soil (as well as the proposed revised one in the suggested update to the PA Dept of Environmental Protection regulations), and four times higher than the one required for soils that are near groundwater (as some of the site is) does not agree with these goals.
2) The PA Dept of Environmental Protection has added Per- and polyfluoroalkyl substances (PFAS) to the recent regulations for contaminants—likely present in refineries, since they are used in firefighting foams. Indeed, other states such as Alaska, Michigan, Colorado and Wisconsin found PFAS contamination in refineries, and are requiring or undergoing remediation of those sites. The site should be tested for these contaminants and required to address the contamination.
3) Evergreen needs to revise its remedial investigation reports to conform both with evolving scientific knowledge AND with the evolving state of our world due (at least in part) to changes brought on by climate change.
The reluctance to address changing standards is understandable. However, when dealing with a situation brought on by lax oversight in the first place, there is no excuse for lack of a full and thorough consideration of current scientific knowledge. Evergreen cannot operate under outdated rules or behind the times!
Evergreen's mission is too important. In the words of Pope Francis:
"There is a growing jurisprudence dealing with the reduction of pollution by business activities. But political and institutional frameworks do not exist simply to avoid bad practice, but also to promote best practice, to stimulate creativity in seeking new solutions and to encourage individual or group initiatives."
- Laudato Si (177)
I sincerely hope Evergreen will do the right thing and be part of the solution for all of us.

Sincerely,
Mary-Angela Papalaskari
2042 Pine Street
Philadelphia, PA 19103

From: Mia Johnson <johnson.mia@gmail.com>
Sent: Wednesday, January 13, 2021 9:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mia Johnson
426 MCclellan St.
Philadelphia, PA 19148

From: david keiling <davidkeiling@comcast.net>
Sent: Wednesday, January 13, 2021 8:06 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
david keiling
1510 S 15th St
philadelphia, PA 19146

From: Melissa Curry <Mkc146psu@yahoo.com>
Sent: Wednesday, January 13, 2021 7:43 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melissa Curry
1536 S Woodstock St
Philadelphia, PA 19146

From: Bailey Tracy <baileytracy82@gmail.com>
Sent: Wednesday, January 13, 2021 7:27 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Bailey Tracy
81 Cottage St
Doylestown, PA 18901

From: Mitchell Bloom <bloommitchell@gmail.com>
Sent: Wednesday, January 13, 2021 7:20 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mitchell Bloom
2042 South Colorado Street
Philadelphia, PA 19145

From: Max Shmidheiser <maxshm1979@yahoo.com>
Sent: Wednesday, January 13, 2021 7:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Max Shmidheiser
411 Shortridge Dr
Wynnewood, PA 19096

From: Ann Dixon <anndixon4523@gmail.com>
Sent: Wednesday, January 13, 2021 7:18 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Sincerely,
Ann Dixon
4523 Osage Avenue
Philadelphia, PA 19143

From: Neil Kurtz <theneilson@gmail.com>
Sent: Wednesday, January 13, 2021 7:09 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations, and Evergreen and Sunoco can do better than what they've proposed. Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site, much less a long-term resident of any proposed construction -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the CDC uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Your multi-billion dollar, multi-national company has the wherewithal to give Philadelphians who would be living and working on or near this site the due diligence of a proper site survey, not to mention the proper remediation for the contamination that your company has left behind! We have tolerated the pollution that was generated on this site while it was operational, and should be given the decency of a place left in better condition than it was found.

Do the right thing, not just for today, but for tomorrow and the days, weeks, months and years that follow.

Thank you.

Sincerely,
Neil Kurtz
364 Winton St
PHILADELPHIA, PA 19148

From: Patrick Danas <danaspatrick323@gmail.com>
Sent: Wednesday, January 13, 2021 7:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Patrick Danas
1814 N bouvier st
Philadelphia, PA 19121

From: Kelly Walsh <walshkelly5190@gmail.com>
Sent: Wednesday, January 13, 2021 6:36 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kelly Walsh
3417 Mount Vernon St.
Philadelphia, PA 19104

From: Will Herzog <wherzo@gmail.com>
Sent: Wednesday, January 13, 2021 6:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Will Herzog
75 Church Road
Malvern, PA 19355

From: Taylor Sexton <taylor.sexton47@gmail.com>
Sent: Wednesday, January 13, 2021 6:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Taylor Sexton
3452 Division St
Philadelphia, PA 19129

From: Kevin Zabel <kzabe41@gmail.com>
Sent: Wednesday, January 13, 2021 6:17 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kevin Zabel
601 n 4th Street
Philadelphia, PA 19123

From: Benjamin Aitoumeziane <benjaminoait@gmail.com>
Sent: Wednesday, January 13, 2021 6:16 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Benjamin Aitoumeziane
601 N 4th St.
Philadelphia, PA 19123

From: Karen McGovern <rittenhousesport@aol.com>
Sent: Wednesday, January 13, 2021 6:12 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Karen McGovern
2607 Brown St
Phila, PA 19130

From: Katherine Canter <katcanter11@gmail.com>
Sent: Wednesday, January 13, 2021 6:02 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Katherine Canter
3452 division street
Philadelphia, PA 19129

From: Teora Milson <Teora.milson@gmail.com>
Sent: Wednesday, January 13, 2021 6:00 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Teora Milson
266 W. Rittenhouse st.
Philadelphia, PA 19144

From: Sophie De Lancie <sophie@delancie.org>
Sent: Wednesday, January 13, 2021 6:00 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sophie De Lancie
157 N 21st Street
Philadelphia, PA 19103

From: Joanna Roy <joa846@gmail.com>
Sent: Wednesday, January 13, 2021 5:49 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Joanna Roy
917 S. 23rd Street
Philadelphia, PA 19146

From: Catherine Ellenberg <caterina.barr90@gmail.com>
Sent: Wednesday, January 13, 2021 5:47 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Finally, it is my understanding that Evergreen has not conducted any sampling of the deep aquifer which supports sources of drinking water for New Jersey. Evergreen should expand their investigation to more thoroughly consider the potential for off-site groundwater contamination and the impacts on neighboring communities not limited to Philadelphia County.

Please take these comments seriously and make the necessary changes.

Sincerely,
Catherine Ellenberg
270 Genesee Road
Clarksboro, NJ 08020

From: Joanna Roy <joa846@gmail.com>
Sent: Wednesday, January 13, 2021 5:44 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Joanna Roy
917 S. 23rd Street
Philadelphia, PA 19146

From: Cecily Kihn <cecily@cecilykihn.us>
Sent: Wednesday, January 13, 2021 5:41 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Cecily Kihn
2223 Delancey Place
Philadelphia, PA 19103

From: Dana Dentice <ddentice@pennhort.org>
Sent: Wednesday, January 13, 2021 5:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health or equity for existing and future neighbors and users of the site.

I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes. We owe it to this community to protect their health to the maximum extent possible after decades of environmental and social injustice.

Thank you,
Dana Dentice

Sincerely,
Dana Dentice
920 S Saint Bernard St
Philadelphia, PA 19143

From: Nathaniel Philip <ngp39@drexel.edu>
Sent: Wednesday, January 13, 2021 5:39 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nathaniel Philip
4909 Pine Street
Philadelphia, PA 19143

From: Gianna Goldey <giannagoldey29@gmail.com>
Sent: Wednesday, January 13, 2021 5:30 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gianna Goldey
327 Belgrade St.
Philadelphia, PA 19125

From: Sarah Dennin <sdennin1121@gmail.com>
Sent: Wednesday, January 13, 2021 5:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Sarah Dennin
1102 North Street
Philadelphia, PA 19121

From: Brodie Weigelt <brodieweigelt@gmail.com>
Sent: Wednesday, January 13, 2021 5:13 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Brodie Weigelt
201 s 25th street
Philadelphia, PA 19103

From: Daniel Flinchbaugh <dflinch@upenn.edu>
Sent: Wednesday, January 13, 2021 5:06 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Daniel Flinchbaugh
252 S. 45th St
PHILADELPHIA, PA 19107

From: Mary Loesch <magsloesch@gmail.com>
Sent: Wednesday, January 13, 2021 5:06 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Loesch
1525 W Norris St Unit B
Philadelphia, NJ 19121

From: Jaime Wouters <jaimewouters@gmail.com>
Sent: Wednesday, January 13, 2021 5:03 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jaime Wouters
35 Campbell Rd
Hillsborough, NJ 08844

From: Lauren Duhigg <lduhigg@gmail.com>
Sent: Wednesday, January 13, 2021 5:02 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lauren Duhigg
778 South Front Street
Philadelphia, PA 19147

From: Annalyse Solitario <annalysesolitario@gmail.com>
Sent: Wednesday, January 13, 2021 4:59 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Annalyse Solitario
604 S. Clifton street
Philadelphia, PA 19147

From: Rebecca Crane <becca.crane@gmail.com>
Sent: Wednesday, January 13, 2021 4:57 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health nor does it consider environmental injustices to Philadelphia communities in the area and downstream.

I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Kindly,
Rebecca

Sincerely,
Rebecca Crane
1327 N Dover St
Philadelphia, PA 19121

From: Maria Kiernan <mkk5@icloud.com>
Sent: Wednesday, January 13, 2021 4:57 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Maria Kiernan
326 Wellington Terrace
Jenkintown, PA 19046

From: Leah Martino <leahcmartino@gmail.com>
Sent: Wednesday, January 13, 2021 4:56 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Leah Martino
327 Belgrade St
Philadelphia, PA 19125

From: MARY EBELING <maryebeling@yahoo.com>
Sent: Wednesday, January 13, 2021 4:55 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
MARY EBELING
4217 Regent Square
Philadelphia, PA 19104

From: Jude Smithey <jude.smithey@yahoo.com>
Sent: Wednesday, January 13, 2021 4:46 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

The people of South Philly have suffered devasting health impacts for too long. Please fix this.

Sincerely,
Jude Smithey
218 Linden Ave
Rutledge, PA 19070

From: Kate Mead <kate.b.mead@gmail.com>
Sent: Thursday, January 14, 2021 7:59 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kate Mead
1811 Fitzwater Street Unit E
Philadelphia, PA 19146

From: Nicole Mount <nicolebmount@gmail.com>
Sent: Thursday, January 14, 2021 9:08 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Nicole Mount
910 New Market Street
Philadelphia, PA 19123

From: VICTORIA E <ENGLISH123VE@VERIZON.NET>
Sent: Thursday, January 14, 2021 8:36 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
VICTORIA E
617 RADNOR VALLEY DR.
VILLANOVA, PA 19085

From: Lyndon DeSalvo <lyndon.desalvo@gmail.com>
Sent: Thursday, January 14, 2021 8:06 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Lyndon DeSalvo
2625 PARRISH ST
Philadelphia, PA 19130

From: Carly Frintner <cfrintner@gmail.com>
Sent: Thursday, January 14, 2021 6:49 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Carly Frintner
1633 South Dover St.
Philadelphia, PA 19145

From: John Lehman <jtl@lehman-navarch.com>
Sent: Thursday, January 14, 2021 4:30 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

As a resident of southwest center city for over 30 years, raising a family, and looking forward to future other families in these neighborhoods, a full and accurate site analysis and thorough remediation is vitally important before the refinery site is left for posterity.

While I recognize the century-long industrial use and the benefits of lesser environmental standards for brown-field development of such sites, several issues have been neglected thus far:
1) reportedly, the site-wide analysis has not included PFAS chemicals, well known as toxic;
2) potential groundwater pollution, whether shallow or deep, has not been fully investigated, and obviously, the migration characteristics of groundwater and its drinking water use makes a complete investigation vital;
3) Potential site pollutant migration into the Schuylkill River must be fully evaluated;
4) Accepting lead soil contamination at a level twice that of the Pennsylvania state nonresidential standard would be criminal.
5) Future pollutant spread through projected sea level rise must also be evaluated and addressed.

Now is the time to execute the remediation of the site thoroughly for the health of future Philadelphians, Pennsylvanians, and even New Jerseyans.
Respectfully,
John T. Lehman
Philadelphia

Sincerely,
John Lehman
1729 Bainbridge St
Philadelphia, PA 19146

From: Peter Winslow <pjwinslow@gmail.com>
Sent: Thursday, January 14, 2021 4:28 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

The refinery site is adjacent to a dense urban area that is an environmental justice zone. Standards for remediation should be no less stringent than the statewide standards for lead and all other contaminants.

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Peter Winslow
7034 Marion Ln
Philadelphia, PA 19119

From: Robert Stanley <rstanley@temple.edu>
Sent: Thursday, January 14, 2021 3:24 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Robert Stanley
549 Rutgers Ave
Swarthmore, PA 19081

From: Al Kan <catlover4488@verizon.net>
Sent: Thursday, January 14, 2021 2:51 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Ignoring this major issue of public health and safety, as well as massive environmental concern, is disgusting and deplorable. The strictest actions and rules need to be taken in response to this emergency. Philadelphia citizens will hold you to this.

Sincerely,
Al Kan
902 Spruce st
Philadelphia, PA 19107

From: Walter Bilderback <walterturg@gmail.com>
Sent: Thursday, January 14, 2021 2:47 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Walter Bilderback
321 S. 43rd St.
Philadelphia, PA 19104

From: Ian Snyder <ian.h.snyder@gmail.com>
Sent: Thursday, January 14, 2021 2:31 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ian Snyder
1809 Pine Street
Philadelphia, PA 19103

From: Bria Feaster <briafeaster346@gmail.com>
Sent: Thursday, January 14, 2021 2:17 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Bria Feaster
6421 Chelwynde Ave Apt B
Philadelphia, PA 19142

From: Noah Gans-Pfister <nganspfister@gmail.com>
Sent: Thursday, January 14, 2021 1:55 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Noah Gans-Pfister
700 South 10 Strret #1B
Philadelphia, PA 19147

From: Jessica Silverman <paperfrau@gmail.com>
Sent: Thursday, January 14, 2021 1:33 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Silverman
6421 Chelwynde Ave
Philadelphia, PA 19142

From: Arjun Yodh <yodh@physics.upenn.edu>
Sent: Thursday, January 14, 2021 1:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Arjun Yodh
209 South 33rd Street
Philadelphia, PA 19104

From: Gino Segre <segre@dept.physics.upenn.edu>
Sent: Thursday, January 14, 2021 12:32 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

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Please take these comments seriously and make the necessary changes.

Sincerely,
Gino Segre
239 Rex Ave.
Philadelphia, PA 19118

From: Andrea Liu <ajliu@me.com>
Sent: Thursday, January 14, 2021 12:19 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

I am seriously disturbed by Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site. It will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Andrea J. Liu
Hepburn Professor of Physics
University of Pennsylvania

Sincerely,
Andrea Liu
524 Cedar Ln
Swarthmore, PA 19081

From: George Claflen <gclaflen@claflenassociates.com>
Sent: Thursday, January 14, 2021 11:43 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
George Claflen
2201 Pennsylvania Ave
Philadelphia, PA 19130

From: Scott Weinstein <weinstein@cis.upenn.edu>
Sent: Thursday, January 14, 2021 11:26 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Scott Weinstein
2042 Pine Street
Philadelphia, PA 19103

From: Melanie Caltabiano <melanie.caltabiano11@gmail.com>
Sent: Thursday, January 14, 2021 11:24 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Melanie Caltabiano
1023 Emily st
Philanthropy, PA 19148

From: Franco Montalto <fmontalto1@drexel.edu>
Sent: Thursday, January 14, 2021 11:15 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

In its remedial investigation, Evergreen should adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater to the river, and into adjacent residential neighborhoods.

Please take these comments seriously and make the necessary changes.

Sincerely,
Franco Montalto
1412 South 13th street
Philadelphia, PA 19104

From: Mary Marcopul <mapandya@ymail.com>
Sent: Thursday, January 14, 2021 11:10 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Mary Marcopul
300 Penwyllt Court
Exton, PA 19341

From: Elliot Lipeles <elliot.lipeles@gmail.com>
Sent: Thursday, January 14, 2021 11:01 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Elliot Lipeles
236 Queen St Unit B
Philadelphia, PA 19147

From: Kelli Boyles <klboyles@alumni.princeton.edu>
Sent: Thursday, January 14, 2021 10:43 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kelli Boyles
210 Church St. Unit E
Philadelphia, PA 19106

From: Mark Goulian <goulian@sas.upenn.edu>
Sent: Thursday, January 14, 2021 10:37 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Mark Goulian
210 Church St. Unit E
Philadelphia, PA 19106

From: Randall Kamien <kamien@upenn.edu>
Sent: Thursday, January 14, 2021 10:32 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Randall D. Kamien
Vicki and William Abrams Professor in the Natural Sciences
University of Pennsylvania

Sincerely,
Randall Kamien
79 E Bells Mill Rd
Philadelphia, PA 19118

From: Louis Weil <louis.alan.weil@gmail.com>
Sent: Thursday, January 14, 2021 10:26 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Sincerely,
Louis Weil
1807 Gladstone Street
Philadelphia, PA 19145

From: Ravi Sheth <shethrk@upenn.edu>
Sent: Thursday, January 14, 2021 10:24 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Please take these comments seriously and make the necessary changes.

Ravi K Sheth
Professor of Physics and Astronomy
University of Pennsylvania

Sincerely,
Ravi Sheth
2001 Hamilton St Unit 1608
Philadelphia, PA 19130

From: Philip Nelson <dbernoulli@comcast.net>
Sent: Thursday, January 14, 2021 10:18 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

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Thank you
Prof Philip Nelson, University of Pennsylvanhia

Sincerely,
Philip Nelson
405 South 21st St
Philadelphia, PA 19146

From: Allison Amodea <allisonamodea@gmail.com>
Sent: Thursday, January 14, 2021 9:59 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

Please take these comments seriously and make the necessary changes.

Sincerely,
Allison Amodea
1125 Lemon St
Philadelphia, PA 19123

From: Kelsey Lamelza <lamelza28@gmail.com>
Sent: Sunday, January 17, 2021 11:42 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Kelsey Lamelza
5114 Kelly drive
Norristown, PA 19401

From: Ursula Tooley <utooley@gmail.com>
Sent: Monday, January 18, 2021 5:29 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Ursula Tooley
2126 Christian St
Philadelphia, PA 19146

From: Emily Bunker <emilyjohannabunker@gmail.com>
Sent: Tuesday, January 19, 2021 1:53 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Emily Bunker
433 N 41 St
Philadelphia, PA 19104

From: Jessica Nami <jessica.nami@gmail.com>
Sent: Saturday, January 23, 2021 8:41 PM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Ragesh Patel,

Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. I strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

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Please take these comments seriously and make the necessary changes.

Sincerely,
Jessica Nami
7932 GERMANTOWN AVE
Philadelphia, PA 19118

From:	Charles Homler
To:	Philly Refinery Cleanup
Subject:	Parcel AOI-10 - West Yard
Date:	Tuesday, January 5, 2021 5:09:51 PM
Attachments:	bartrams list.csv FDR Park.csv

To Whom It May Concern,

My name is Chuck Homler and I am a local wildlife photographer. Every spring I head to Bartram's Gardens for birdwatching and photography. I also visit a number of other locations in the area, some that are also on the banks of the Schuylkill River. The Schuylkill, being tidally influenced from where the Fairmount Waterworks to the Delaware River, is much cleaner above the falls. Oil slicks are visible along the banks of Bartram's Garden and even from the Schuylkill Banks trails installed between South Street and the Art Museum.

In the water, asides from waterfowl and gulls, I've seen muskrats and a beaver was spotted there a few times last year, close to 676.

With the closing of PES an opportunity to restore wetland habitat to the river shouldn't be overlooked. Wetlands purify water and remove contaminants. They also provide habitat for wildlife. And wildlife habitat with accessibility attracts people and helps expose kids to ecology.

https://sciencing.com/do-wetlands-purify-water-7585568.html
https://www.nps.gov/keaq/learn/education/water-filtering-of-wetlands.htm
https://pubmed.ncbi.nlm.nih.gov/19589001/

With that being said - Parcel AOI-10, the West Yard, is just downstream from Bartram's Gardens and is cutoff from the PES facilities on the eastern banks of the river. While river access for barges or boats may be attractive for the future development, creating habitat along the banks of the river, will not only clean and beautify the area, but could also protect the redevelopment from flooding or water damage.

Attached are two lists of birds that I have observed at Bartram's Gardens and nearby in FDR Park.

If it would help, I can also share images and experiences with the wildlife on the Schuylkill.

My Best,
Chuck Homler

www.focusonwildlife.me
facebook.com/focusonwildlife

From:	Brown, C David
To:	DOERR, TIFFANI L
Cc:	Colleen Costello; phillyrefinerycleanup@ghd.com
Subject:	FW: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site
Date:	Tuesday, January 19, 2021 5:19:15 PM
Attachments:	image001.png 2020 01 Refinery remediation lead standard comments.pdf

Tiffani,

DEP received the attached comments.

C. David Brown P.G. | Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5792 | Fax: 484.250.5961
www.dep.pa.gov

From: Abby Jones <jones@pennfuture.org>
Sent: Tuesday, January 19, 2021 5:08 PM
To: Brown, C David <cdbrown@pa.gov>
Cc: Patel, Ragesh <rapatel@pa.gov>
Subject: RE: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Mr. Brown,

Thank you for alerting me to that and please accept my sincerest apologies. Our comments are now attached.

Sincerely,
Abby

Abigail M. Jones
Vice President of Legal and Policy
(she, her, hers)

H: 570-730-4149
C: 610-639-7740
jones@pennfuture.org

From: Brown, C David <cdbrown@pa.gov>
Sent: Tuesday, January 19, 2021 4:56 PM
To: Abby Jones <jones@pennfuture.org>
Cc: Patel, Ragesh <rapatel@pa.gov>
Subject: RE: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Ms. Jones,

DEP did not receive an attachment to this email.

C. David Brown P.G. | Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Department of Environmental Protection | Southeast Regional Office
2 East Main Street | Norristown, PA 19401
Phone: 484.250.5792 | Fax: 484.250.5961
www.dep.pa.gov

-----Original Message-----
From: Abby Jones <jones@pennfuture.org>
Sent: Thursday, January 14, 2021 8:46 AM
To: Patel, Ragesh <rapatel@pa.gov>
Subject: [External] Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Mr. Patel:

On behalf of Citizens for Pennsylvania's Future (PennFuture) and our members, please accept the attached comments on Evergreen Resources Group, LLC's proposed site-specific standard for lead and remedial investigation reports for the former Philadelphia Energy Solutions refinery site.

Sincerely,

Abigail M. Jones

Vice President of Legal and Policy

(she, her, hers)

425 Carlton Road, Suite 1

Mt. Pocono, PA 18344

570-216-3313

jones@pennfuture.org <mailto:jones@pennfuture.org>

www.pennfuture.org <https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Furldefense.proofpoint.com%2Fv2%2Furl%3Fu%3Dhttp-3A__www.pennfuture.org%26d%3DDwQFAg%26c%3DeuGZstcaTDllvimEN8b7jXrwqOf-v5A_CdpgnVfiiMM%26r%3DKUKBEIzH--jhEzgvlb2K3dP79p15X3iMOfYB85d6r4s%26m%3D_-R2fZ8pSbpnoY-7aqTwjpS6IaIs7ovwIGbijOXroeY%26s%3Dws-hAo0K1jLG6hM5TeeOgOkgEDvWnmtGML1dMbpunDE%26e%3D&data=04%7C01%7Crapatel%40pa.gov%7Cea4e6c350b1149d1f57908d8b892cad4%7C418e284101284dd59b6c47fc5a9a1bde%7C0%7C0%7C637462288494737313%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0&sdata=pRwB3P5fl2Jw2CZ0FWT9CYUjcxGKKrDsHVTZIBC9xNo%3D&reserved=0>

report this email as spam.

PennFuture

January 14, 2021

Sent via email

Ragesh Patel
Program Manager
Environmental Cleanup and Brownfields
PA DEP, Southeast Regional Office
2 East Main St.
Norristown, PA 19401
rapatel@pa.gov

Re: Comment on the Site-Specific Standard for Lead and Remedial Investigation Reports for the Former Refinery Site

Dear Mr. Patel:

On behalf of Citizens for Pennsylvania's Future (PennFuture) and our members, please accept these comments on Evergreen Resources Group, LLC's (Evergreen) proposed site-specific standard for lead and remedial investigation reports for the former Philadelphia Energy Solutions refinery site. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site will not be protective of public health. The Department must therefore withdraw the proposal to set a site-specific standard of 2,240 mg/kg, which is more than twice the direct contact numeric value in state regulations (1,000 mg/kg), and set a lead standard that is protective of human health.

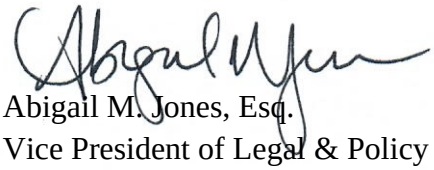
Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site – an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, Evergreen should revise its remedial investigation reports to adequately account for the impacts of climate change on existing soil and water contamination. These impacts could occur before, during, and after remediation. Sea-level rise, storm surges, and the increased frequency and volume of events like superstorms could have major implications on the migration of contaminants in the soil and groundwater. In addition, Evergreen completed its remedial

investigation reports over three years ago and it is not clear whether the data underlying the reports are still reliable. Evergreen should provide evidence that data from these reports are still representative.

In conclusion, the Department must make these necessary changes to protect human health and the environment as is its duty.

Respectfully submitted,



Abigail M. Jones, Esq.
Vice President of Legal & Policy
PennFuture
570-216-3313
jones@pennfuture.org

From:	Cheryl Pyrch
To:	Philly Refinery Cleanup
Subject:	Comment
Date:	Tuesday, January 12, 2021 9:16:35 PM
Attachments:	Comment on Refinery PAIPL.docx

Hi,

Just sent a comment through the website but it's attached as well. Cheryl Pyrch, chair Philadelphia Chapter of PA IPL, 646-319-8720

I am writing on behalf of the Philadelphia Chapter of Pennsylvania Interfaith Power & Light, people of faith concerned about climate change as a moral issue. We were involved in the movement to close the refinery and are very glad that it will no longer be a fossil-fuel production site.

However, the clean up must be thorough if we are to live out our call to be good stewards of the environment and just to the nearby community which bore the brunt of the refinery's pollution. Evergreen's proposed site-specific standard for lead in surface soil at the former refinery site is not sufficient. We strongly urge you to withdraw the proposal to set a site-specific standard of 2,240 mg/kg. Evergreen's proposed site-specific standard is more than twice the direct contact numeric value in state regulations (1,000 mg/kg). Evergreen made a flawed assumption about the target blood lead level to adequately protect a fetus of a worker at the site -- an important factor in determining the site-specific standard for lead. It used a level that is twice the reference value that the Centers for Disease Control and Prevention uses to address lead exposure in children. Evergreen should be using the current science to set a site-specific standard for this site.

In addition, any plan that does not take into account the effects of climate change is not reality based. It shirks our responsibility to future generations. We ask that Evergreen rewrite the proposal to take into account rising sea levels, more intense storms, and other climate-related factors.

We understand that over 100 years of refining oil has caused great damage to the site. But now is not a time to cut corners. It is time to take care, to think about the future, and to do what is needed so that the site will be life-supporting for all of Philadelphia for years to come. Thank you.

Rev. Cheryl Pyrch
Chair, Philadelphia Chapter of Pennsylvania Interfaith Power & LIght