REMEDIAL INVESTIGATION REPORT
AREA OF INTEREST 9

PHILADELPHIA ENERGY SOLUTIONS REFINING & MARKETING, LLC
PHILADELPHIA REFINERY
PHILADELPHIA, PENNSYLVANIA

Prepared for:

Philadelphia Refinery Operations,
A series of Evergreen Resources Group, LLC
2 Righter Parkway
Suite 200
Wilmington, Delaware 19803

Prepared by:

Langan Engineering & Environmental, Inc.
30 South 17th Street
Suite 1300
Philadelphia, Pennsylvania 19103

December 31, 2015
2574602

LANGAN

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Prepared by:

Langan Engineering & Environmental Services, Inc.
30 South 17th Street
Suite 1300
Philadelphia, Pennsylvania 19103

and

Aquaterra Technologies, Inc.
122 South Church Street
West Chester, PA 19382

Tiffani L. Doerr, P.G.
Senior Hydrogeologist
Aquaterra Technologies, Inc.
PG00457

Kevin McKeever, P.E., P.G.
Senior Project Manager
PG004806

December 31, 2015
2574602

LANGAN

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1.0 INTRODUCTION

This Remedial Investigation Report (RIR) has been prepared for Area of Interest (AOI) 9, also known as the Schuylkill River Tank Farm, at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) 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 as described below. The facility has operated, and is planned to continue operating, as an oil refinery, marketing terminal and petrochemical complex.

Regulatory 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 completed site characterization activities at all 11 AOIs in accordance with the 2003 CO&A. For each AOI that has been characterized, Sunoco prepared and submitted a corresponding Site Characterization Report (SCR) 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 again to the PADEP in November 2014. On November 2011, the facility was formally entered into the PA One Cleanup Program between the United States Environmental Protection Agency (EPA) – 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) to

document the Sitewide remedial approach extending beyond the requirements of the 2003 CO&A.

Sunoco submitted a Site Characterization Work Plan (Work Plan) for AOI 9 on May 21, 2009, to the PADEP and EPA. This Work Plan summarized proposed activities to be completed to characterize AOI 9 in accordance with the objectives of the CCR. The Work Plan was implemented between May and October 2009 and the results were summarized in a SCR submitted to PADEP and EPA on October 30, 2009. The PADEP responded to the submittal of the SCR with a combined AOI comment letter dated April 11, 2011 that included specific comments regarding the AOI 9 SCR.

In April 2015, Evergreen submitted to the PADEP and EPA documents describing additional AOI 9 characterization activities to be conducted. On April 17, 2015, PADEP, Evergreen and Langan met to discuss proposed additional characterization activities. A subsequent conference call was conducted between PADEP, EPA and Evergreen on May 28, 2015 to discuss the investigation of historical leaded tank bottom, leaded sludge, and oily sludge holding lagoon areas. These areas were recently discovered within a historical document dated June 3, 1981, which notified EPA of potential hazardous waste areas within AOI 9.

In accordance with the Work Plan for Sitewide Approach, Evergreen is submitting this RIR for AOI 9 to formerly satisfy the requirements of Act 2. This report describes site characterization work included in the 2009 AOI 9 SCR, as well as additional site characterization work completed in 2015 to supplement the previous work. The supplemental work was completed to:

- Further characterize quality of surface (0-2 feet interval) and subsurface (2-15 feet interval) soil,
- Address regulated storage tank incidents for certain tanks in AOI 9,
- Delineate horizontal and vertical impacts in soils,
- Further characterize groundwater samples that were previously above their respective screening criteria,
- Delineate light non-aqueous phase liquid (LNAPL),
- Investigate the potential vapor intrusion to indoor air pathway at occupied buildings,
- Further evaluate geology and hydrogeology, and
- Further evaluate contaminant fate and transport qualitatively.

The supplemental characterization work considered PADEP's and EPA's comments to previous

work performed, addressed incidents related to Evergreen's operational history not addressed through the PADEP's Tank Program, and PADEP inspection issues that were identified after the 2009 SCR was prepared.

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.

1.1 Facility Description

The facility is located in southwest Philadelphia. AOI 9 is located in the southwestern most portion of the facility and is referred to as the Schuylkill River Tank Farm (SRTF). AOI 9 is located on the west side of the Schuylkill River and is separated from the main portion of the facility. AOI 9 is bound by the Mingo Creek Flood Control Basin to the south, the Schuylkill River to the east, and commercial and light industrial properties to the north and west (Figures 1 and 2). A vegetated strip of land exists between the former railroad right-of-way (ROW) and the Schuylkill River (Figure 2). This portion of AOI 9 has not been characterized by Evergreen, is not currently in use or planned for future use. Evergreen acknowledges that no relief of liability can be granted for this property since no characterization has been completed to date.

AOI 9 encompasses approximately 211 acres and is bisected by a former railroad ROW. A portion of the ROW is currently used by a local auto salvage business. Institutional controls (i.e. permits governing excavations, Occupation Safety and Health Administration (OSHA) restrictions, etc.) apply to AOI 9 similarly as they do to the remainder of the PES facility. Access to the refinery-operation areas of AOI 9 is restricted by fencing and security gates.

The SRTF was purchased by Sunoco, Inc. from Chevron USA, Inc. (Chevron) who acquired the facility from the Gulf Oil Company merger in 1982. The facility was purchased by Sunoco in 1994 and transferred to PES in 2012.

1.2 Facility and AOI 9 Operational History

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 established an oil distribution center. In the 1900s, crude oil processing began followed by full-scale gasoline production 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.

Based on aerial photographs, AOI 9 consisted of unimproved land and some roadways prior to the 1960s. During the 1960s, AOI 9 was used for storage and blending of refined petroleum products. Dames & Moore (Dames & Moore, 1993) reported that vegetated area located between the former railroad ROW and the Schuylkill River was historically used for disposal of municipal waste.

1.3 AOI 9 Current Use

Currently, AOI 9 is used by PES for storage and blending of refined petroleum products. Approximately 37 above ground storage tanks (ASTs) and numerous liquefied petroleum gas (LPG) tanks are currently in operation. The facility has access to the Colonial Pipeline supply system and is connected to the PES Girard Point portion of the facility by pipelines running beneath the Schuylkill River.

Much of AOI 9 is unimproved and the majority of the land surface in AOI 9 is not covered by impervious surfaces (See Figure in Appendix B). The current and historic use figures from the previous AOI 9 SCR were updated to reflect present day conditions/usage (see figures in Appendix B).

The existing monitoring well network in AOI 9 includes 60 monitoring wells and three inactive recovery wells. Twenty-six of the monitoring wells were installed prior to 2009. Twenty-nine of the monitoring wells were installed in 2009 as part of the site characterization in AOI 9. An additional 5 monitoring wells were installed in 2015 to serve as fate and transport calibration wells and also to further evaluate groundwater conditions. The wells in AOI 9 are shown in Figure 3.

Groundwater gauging and sampling of select monitoring wells in AOI 9 occurs on an annual basis during the fourth quarter of each year. This monitoring is completed by Stantec Consulting Corporation (Stantec) on behalf of Evergreen. Annual gauging activities and

groundwater results are reported to the PADEP and EPA in Quarterly Reports prepared by Evergreen. The Quarterly Reports also include the results of Evergreen's annual perimeter monitoring well sampling program.

1.4 Selection of Constituents of Concern and Screening Rationale

The constituents of concern (COCs) for soil and groundwater in AOI 9 are listed in Table 1 of this report. The COCs for the completed activities include all current constituents from the Pennsylvania Corrective Action Program 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 since waste oil is only stored in small tanks within the facility maintenance garages. In May 2009, two additional COCs, 1,2,4-trimethylbenze (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs by Sunoco 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 match the soil COC list. 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.

Media of Concern

The media of concern for AOI 9 include soil and groundwater. The potential vapor intrusion into indoor air exposure pathway was evaluated by completing a site-specific indoor air evaluation. Surface water was evaluated as a receptor in relation to facility activities.

Surface Soil – 0 to 2 Feet Interval

Surface or shallow (0-2 feet) soil samples were collected at each soil boring/monitoring well location that represents a potentially complete direct contact exposure pathway to facility workers. These surface soil results were screened against the PADEP non-residential soil medium specific concentrations (MSCs) and the established site-specific standard (SSS) for lead. The SSS for lead was submitted in the Human Health Risk Assessment (HHRA) by Langan in 2015 and was approved by the PADEP on May 6, 2015.

Subsurface Soil – 2 to 15 Feet Interval

Subsurface or deep (2-15 feet) soil samples were collected at several locations to either vertically delineate surface soil exceedances or to characterize subsurface soils where only a surface sample was previously collected. These subsurface soil results were screened against the PADEP non-residential soil MSCs.

Groundwater

Groundwater sample results were screened against the PADEP non-residential, used-aquifer (total dissolved solids (TDS)<2,500) statewide health groundwater MSCs.

Vapor Intrusion into Indoor Air

To evaluate the potential vapor intrusion into indoor air exposure pathway, indoor air sample results were screened against the OSHA Permissible Exposure Limits (PELs) and the EPA industrial regional screening levels (RSLs) since PES considers these buildings regulated by OSHA.

1.5 Overview of Investigative Framework and Remedial Approach for AOI 9

The current remediation program for the facility is described in the 2003 CO&A between PADEP and Sunoco, and the Work Plan for Sitewide Approach. Below is a general summary of the regulatory frame work for the facility:

- In April 2004, the PADEP and EPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or One-Cleanup Program)," which clarifies how sites remediated under Pennsylvania's Act 2 program may satisfy RCRA corrective action requirements through characterization and attainment of Act 2 remediation standards pursuant to Pennsylvania's Act 2.
- In 2005, PADEP, EPA, 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.
- In October 2006, Sunoco submitted a NIR to the PADEP for the refinery entering the refinery into the Act 2 program, excluding the Belmont Terminal.
- In September 2007, Sunoco held a public involvement meeting in South Philadelphia, Pennsylvania.
- On May 21, 2009 Sunoco submitted a Work Plan for Site Characterization for

AOI 9 in accordance with the Phase II Corrective Action Schedule.

- On July 7, 2009, the PADEP provided comments on the Work Plan for Site Characterization for AOI 9. Comments were in relation to the June 24, 2009 inspection of the Schuylkill River Tank Farm and noted four discreet locations where petroleum impacts were evident.
- Between July and October 2009, Sunoco performed interim remedial measures (IRMs) to address the four discreet locations from the June 24, 2009 PADEP inspection.
- On October 30, 2009, Sunoco submitted the AOI 9 SCR to the PADEP for review.
- On April 11, 2011, PADEP provided their comments to the AOI 9 SCR. Comments included a recommendation for further characterization work to be completed and presented in report addendum. These recommended additional characterization activities included: further evaluation of the vapor intrusion pathway for the blending building area, installation of additional monitoring wells, further evaluation of the dissolved organic compound plume at the western site boundary, if necessary, evaluation of contaminant migration off-site beyond the western boundary and further evaluation of lead in groundwater and its mobility.
- On November 8, 2011, the EPA provided an acknowledgment letter to Sunoco formerly accepting the Sunoco Facility into the One Cleanup Program.
- On November 30, 2011, Sunoco submitted a revised *Work Plan for Sitewide Approach Under the One Cleanup Program* (Work Plan for Sitewide Approach), to document the Sitewide remedial approach extending beyond the requirements of the 2003 CO&A. PADEP and EPA reviewed and provided input to this report. Sunoco submitted a letter of commitment stating the facility will be remediated according to the Work Plan for Sitewide Approach.
- In November 2014, Evergreen submitted an updated NIR to the PADEP for the facility, excluding the Belmont Terminal.
- On February 24, 2015, Langan, on behalf of Evergreen, submitted an HHRA report for a SSS of lead in soil for the PES Refinery, the Sunoco Partners Marketing & Terminals, LP Belmont Terminal (Belmont Terminal) and the Sunoco Partners Marketing & Terminals, LP Marcus Hook Industrial Complex (MHIC) (Langan 2015). This HHRA was approved by the PADEP in a letter dated May 6, 2015.
- On April 17, 2015, a meeting was conducted to discuss Evergreen's Work Plans for AOI 9 between PADEP, Evergreen and Langan personeel. Discussions

included well installation, groundwater sampling, indoor air sampling, soil delineation sampling, and open storage tank incidents requiring action. David Brown of PADEP provided a summary of notes from the meeting and email summary April 30, 2015.

- No RCRA Corrective Action investigations have been performed in AOI 9 to date. On May 28, 2015, Evergreen provided PADEP and the EPA with a recently discovered historical document dated June 3, 1981, which notified EPA of potential hazardous waste areas within AOI 9. On the same day, PADEP and Evergreen confirmed the methodology for leaded tank bottom sampling and discussed where the samples should be collected in AOI 9.
- On June 30, 2015, PADEP conducted a site investigation to observe two areas that had been identified in the June 24, 2009 inspection. Observation of the on-going soil sampling activities and newly installed monitoring wells were conducted.

2.0 SITE DESCRIPTION

2.1 Geology

The facility lies at the westernmost extent of the Atlantic Coastal Plain. Near Philadelphia, Pennsylvania the Atlantic Coastal Plain primarily consists of a "wedge" of unconsolidated sediments that thickens to the southeast. The "wedge" is made up of a series of vertically alternating aquifers and confining units called the Potomac-Raritan-Magothy (PRM) aquifer system. Each of the geological units of the PRM progressively pinches-out to the northwest. The PRM aquifer system consists of six units:

- Upper Clay unit;
- Upper Sand unit;
- Middle Clay unit;
- Middle Sand unit;
- Lower Clay unit, and
- Lower Sand unit.

Located above the PRM units at the Philadelphia refinery are anthropogenic fill and alluvial deposits of Quaternary age. Beneath the PRM aquifer system at the Philadelphia refinery is the Wissahickon Schist bedrock.

Since 2009, 32 shallow monitoring wells ranging between 12 to 20 feet below ground surface (bgs), six deep monitoring wells ranging from 35 to 90 feet bgs, two deep soil borings to approximately 36 feet bgs, and 162 shallower soil borings were completed to further characterize geology in AOI 9. Twenty-four of the 162 soil borings were advanced in 2009 and 138 were advanced in 2015. Each monitoring well and soil boring location was continually logged by a field geologist. Monitoring well construction details for the AOI 9 monitoring wells are provided in Table 2 and boring/monitoring well construction logs for the newly-installed and existing monitoring wells are provided in Appendix C of this report.

Subsurface lithology from the numerous borings completed in AOI 9 was used to characterize AOI 9 geology conditions beneath AOI 9. To illustrate the extent of the Lower/Middle Clay beneath AOI 9, Figure 4 was created. The extent of the Lower/Middle Clay as shown in Figure 4 differs from that depicted in the 2009 SCR because of supplemental subsurface data obtained since 2009. Two geologic cross sections trending north-south and east-west were also prepared using historic and recently completed boring/monitoring well logs. The plan view key for the cross sections is provided as Figure 5 and the geologic cross sections are provided as Figures 6a and 6b.

The following paragraphs describe the primary geologic units beneath AOI 9 beginning with the deepest units to the shallowest units:

Wissahickon Formation – Bedrock beneath the refinery and AOI 9 is identified as the Wissahickon Schist. This formation is a metamorphosed greenish-gray micaceous schist and quartzite. The competent bedrock of the Wissahickon Formation is overlain by weathered bedrock consisting of micaceous clay, which becomes increasingly sandy as the degree of weathering lessens and competent bedrock is encountered. Based on historic deep monitoring wells and soil borings completed in AOI 9, the Wissahickon Schist is located approximately 90 feet bgs (Greenman, et al, 1961). The bedrock depth is illustrated in Figures 6a and 6b. The depth of bedrock shown on the cross sections is interpolated using a cross section through AOI 9 prepared by Dames and Moore in 1992 (included in the CCR).

Lower Sand Unit of the PRM – Throughout the majority of the facility, the WissahickonFormation is overlain by the Lower Sand, which is the lowest member of the Potomac-Raritan Magothy (PRM) Aquifer System. As shown in Figures 6a and 6b, the

Lower Sand overlies bedrock in AOI 9.

The Lower Sand beneath AOI 9 is fine to course gravel and fine to course sand that grades upward into medium-to-fine sands and contains layers of silts and clay. The Lower Sand is located approximately 15 to 20 feet bgs and ranges in thickness between 50 to 70 feet. The extent of the Lower Sand beneath AOI 9 is generally consistent with the extent illustrated by USGS (USGS, 1961) and also with the generalized cross section prepared in 1992 by Dames and More presented in the CCR.

A total of three deep (Lower Sand) groundwater monitoring wells (S-74D1SRTF, S-76DSRTF, and S-106DSRTF) existed in AOI 9 prior to the recent characterization work. A total of two deep groundwater monitoring wells (S-74D2SRTF and S-120DSRTF) and two deep borings (S-77DSRTF and S-114DSRTF) were installed in AOI 9 as part of the 2009 site characterization activities. A total of three deep groundwater monitoring wells (S-110DSRTF, S-115DSRTF and S-118DSRTF) were installed in AOI 9 as part of the 2015 site characterization activities. The purpose of the three additional deep monitoring wells in 2015 was to obtain geologic information to refine the conceptual site model, and to further evaluate groundwater quality data in the Lower Sand unit. Based on interpretation of geology as shown in Figures 4, 6a and 6b, some shallow wells in the western portion of AOI 9 are screened into the Lower Sand where the Lower/Middle Clay is absent.

Lower/Middle Clay – The Lower/Middle Clay, where present in AOI 9, is characterized by very low permeability reddish-brown, brown or gray clays, sandy clays, with trace amounts of organic matter. Near AOI 9, lenses of middle and/or lower clay may be present under thick alluvium deposits. Where present, the Lower/Middle Clay overlies the Lower sand as shown in Figure 4. In the west-central portion of AOI 9, the Lower/Middle Clay appears to have been removed possibly due to erosion, creating an area where the Lower/Middle clay is absent. This area has been explicitly identified in soil borings S-76SRTF, S-77SRTF, S-78SRTF (Figure 4) but its presence is also implied hydraulically at other well locations that lack direct shallow geological information. Within the area where the clay is absent, the fill/alluvium/Trenton gravel is in direct contact with the Lower Sand. The USGS (USGS, 1961) interpreted that a depositional trough (shown in Figure 3 of the USGS publication) is located near AOI 9 and notes that, near the heads of these troughs of deposition, the clay members have been removed.

The extent of the clay beneath AOI 9 as shown in Figure 4 is generally consistent with the extent illustrated by USGS (USGS, 1961). Plate 20 of the USGS publication includes a geologic cross section of the coastal plain deposits near AOI 9. This plate is provided in Appendix C of the 2009 SCR.

As shown in Figures 6a and 6b, the clay, where present, ranges in thickness from approximately 5 feet along the most western extent to approximately 25 feet in the central portion of AOI 9.

Trenton Gravel – Throughout most of the facility, the Trenton Gravel typically overlies the Lower/Middle Clay and Lower Sand with thicknesses up to 30 feet. The Trenton Gravel is of Pleistocene Age (Ice Age; less than 2 million years) and is a very heterogeneous unit comprised of a predominant brown to gray sand, gravel and minor amounts of clay (Owens and Minard, 1979). As shown in Figures 6a and 6b, the Trenton Gravel is undifferentiated with the Fill/Alluvium in AOI 9. A total of 29 monitoring wells were advanced into the Fill/Alluvium and Trenton Gravel as part of the site characterization activities. Generally the Trenton Gravel ranged is about 40 feet thick across AOI 9.

Recent Fill/Alluvium - Fill material generally consisted of various sands and gravels, cinder ash, brick, wood, and glass. The Alluvium deposits in AOI 9 generally consist of dark brown silts and sands, with trace amounts of clay. Lesser amounts of fill material were encountered towards the central portion of AOI 9. As shown in Figures 6a and 6b Fill/Alluvium deposits exist throughout AOI 9 and range in thickness between 5 and 20 feet.

2.2 Hydrogeology

The hydrogeologic frame work is defined by grouping geologic units that are laterally extensive and have similar hydrogeologic properties. The generalized hydrostratigraphy of the Philadelphia refinery consists of seven layers (Schreffler, 2001, Sloto 2012). Site-wide hydrostratigrapghy consist of:

- Layer 1: combined anthropogenic fill, Holocene alluvium and Trenton gravel
- Layer 2: upper clay unit of the PRM
- Layer 3: upper sand unit of the PRM
- Layer 4: middle clay unit of the PRM
- Layer 5: middle sand unit of the PRM

- Layer 6: lower clay unit of the PRM, and
- Layer 7: lower sand unit of the PRM.

Within AOI 9, the hydrogeologic framework consists of the combined anthropogenic fill, Holocene alluvium and Trenton Gravel (referred to as alluvium which makes up the unconfined or water table aquifer (Appendix I, Figure I-1). Beneath the alluvium is the combined Middle/Lower Clay confining unit (referred to as the clay aquitard). Beneath the clay aquitard is the Lower Sand which is a semi-confined to confined aquifer except where the clay aquitard is absent. The Lower Sand lies above the Wissahickon Schist bedrock

Groundwater elevation trend graphs were evaluated to better understand site hydrogeology. A comparison of elevation trends for wells screened above and below the clay aquitard can give an indication of whether the deep aquifer is semi or fully confined. Groundwater elevation trends were also used to infer presence/absence of the clay aquitard where shallow geological information is lacking (top ten feet lithology was not logged due to soft digging). In the shallow aquifer monitoring wells, the groundwater elevation trends (Figure 3 of Appendix I) are all similar. For monitoring wells screened in the deep aquifer groundwater, the elevation trends (Figure 3 of Appendix I) are all similar to each other but differ from those in the shallow aquifer due to the confining effects of the clay aquitard. Where the clay aquitard is absent in AOI 9, groundwater elevation trends in shallow and deep wells are similar, which indicates connectivity between the shallow and deep zones. Using this information, the extent of the area where the Lower/Middle clay is absent was extended to the south (Figure 4). The refined extent of the Lower/Middle Clay unit has allowed for a better understanding the hydrogeologic connectivity within the aquifers underlying AOI 9.

2.2.1 Porosity

In 2015, two soil samples in the shallow soils of AOI 9 were collected to determine soil properties (Appendix J). Soil sample AOI-9-S-110DSRTF was collected at a depth of 10 to 12 feet bgs. A deeper soil sample, AOI-9-S-118DSRTF, was collected at a depth of 42 to 44 feet bgs. For the shallow soil sample, described as sand and gravel, the total porosity is 0.281 and the effective porosity is 0.225. For the deeper soil sample, also described as sand

and gravel, the total porosity is 0.355 and the effective porosity is 0.282. The average total and effective porosities of the two samples are 0.32 and 0.25, respectively. In the calibrated groundwater flow model created by the USGS (Schreffler, 2001), a porosity of 0.3 was used for the shallow aquifer and the Lower Sand which is similar to the geotechnical soil analysis results. This data will be used as part of the future quantitative fate and transport model for the PES facility.

2.2.2 Shallow Aquifer Groundwater Occurrence and Flow

As defined above, the shallow aquifer is the combined fill/alluvium/Trenton Gravel which make up the unconfined or water table aquifer. Groundwater gauging data collected by Aquaterra Technologies, Inc. (Aquaterra) in August and November of 2015 were used to generate groundwater flow figures for the shallow aquifer (Figures 8 and 10). The groundwater elevation data from these gauging events is provided in Tables 3a and 3b. Monitoring well construction details for these monitoring wells installed in both aquifers are provided in Table 2 and all available logs for wells installed in AOI 9 are provided Appendix C of this report. Based on the groundwater elevations as shown in Figures 8 and 10, the following observations can be made:

- Most groundwater flow in the shallow aquifer converges on the area where the Lower/Middle clay is absent at the center of the site. Within the this area, groundwater shallow aquifer enters a mixing zone and gradually recharges the deep aquifer.
- To a lesser extent, groundwater flow is generally from east to west.
- Groundwater flow patterns are generally consistent with limited seasonal variation.
- In the southern portion of AOI 9, a variable groundwater mound has been observed adjacent to Mingo Creek Flood Control Basin. This groundwater mound and its variation of size and extent is most likely attributable to the influence of the water elevation fluctuation in the adjacent Mingo Creek Flood Control Basin. As reported by Dames & Moore (Dames & Moore, 1991), water levels in the Mingo Creek Flood Control Basin are maintained

below the surface level of the Schuylkill River at all times by large-capacity pumps used for flood control.

2.2.3 Deep Aquifer Groundwater Occurrence and Flow

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.

2.3 Surface Water

The Schuylkill River defines the eastern border of AOI 9, beyond the vegetated are that lies between the former railroad ROW and the river. The Mingo Creek Flood Control Basin is located adjacent south of AOI 9. The flood control basin contains stormwater that the city pumps into the Schuylkill River.

3.0 SITE CHARACTERIZATION ACTIVITIES

Initial site characterization activities in AOI 9 were performed between May and October 2009 and the results were summarized in the 2009 SCR. The following sections summarize the supplemental site characterization activities completed in AOI 9 since the submittal of the 2009 SCR. Based on the findings of the SCR, additional site characterization activities were completed between March and December 2015. Site characterization activities were completed by Aquaterra and Langan in coordination with Evergreen. These activities were executed in accordance with the AOI 9 Work Plan documents.

3.1 PADEP Inspection Investigation

On June 24, 2009, the PADEP conducted an inspection of AOI 9. The PADEP inspector

observed four discrete locations where petroleum impacts were evident on the ground surface. Figure 3 depicts the locations of these four locations. A summary of each area is provided below and in Tables 4a and 4b.

- **Area A** (Line #8 - Corner of Control Room) – Area A is a location where a leak of vacuum gas oil (VGO) was reportedly discovered by Sunoco in late March 2009. An unknown quantity of this oil was reported to have leaked from a pipeline called the #8 Line. The PADEP inspector observed oil-stained surface soil in an area beneath the reported site of the leak and surrounding the nearby stormwater inlet.

- **Area B** (Along the west side of 2nd Street/south of Main Street) – Area B is a location where oil and oily stormwater was reported to have overflowed from a stormwater inlet and beneath some pipelines. The PADEP inspector observed oil-impacted surface soil in the area.

- **Area C** (Pump House #3 along the west side of 2nd Street south of Area B located near two heavy oil pumps) – Area C is a location where oil had reportedly been spilled onto the ground surface outside of the containment area from an unknown source.

- **Area D** (Butane Compressor Area) – Area D is a location where lube oil reportedly leaked from compressor equipment for the butane system for an unknown period of time. Lube oil had reached beyond the containment area.

Sunoco performed IRMs to quickly investigate and cleanup the above-mentioned impacted areas. A summary of the IRMs is provided below.

- **Area A** – Sunoco vacuumed out the sewer box, excavated and disposed the oil-stained gravel. Following the removal of the oil-stained gravel, the area was re-graded.

- **Area B** – Sunoco began a program to routinely vacuum out sewer junction boxes along 2nd and 1st Streets. Sunoco excavated and removed the oil-stained gravel and re-graded the area.

- **Area C** – Sunoco removed free-standing oil and excavated oil-stained gravel under pipes and around the outside of the pump containment pad. Sunoco excavated and removed the oil-stained gravel and re-graded the area. In addition, Sunoco vacuumed out the sewer box.

- **Area D** – Sunoco removed maintenance materials, scaffolds and drums in the area. Sunoco removed the standing lube oil and excavated and removed the oil-stained gravel and re-graded the area. In addition, Sunoco power-washed the concrete, cleaned the grating, sealed concrete in the pit, and built troughs around compressors.

To characterize the areas after the IRMs were implemented, Sunoco and Aquaterra completed soil investigation activities in the areas. The soil investigation activities were completed in addition to the overall site characterization activities as documented in the Work Plan. Groundwater was evaluated on a site wide basis as part of the Work Plan activities and data from select monitoring wells in the areas of the releases were evaluated.

A summary of the additional site characterization activities is provided below:

- **Area A** – Completed three soil borings (BHSRTF-09-10a, 10b, and 10c) through the excavated area and evaluated groundwater in existing nearby monitoring wells S-78SRTF, S-122SRTF, and S-123SRTF.

- **Area B** – Completed four soil borings (BHSRTF-09-11a, 11b, 11c, and 11d) through the excavated area and evaluated groundwater in existing nearby monitoring wells along 1st and 2nd Streets including S-79SRTF, S-121SRTF, and S-80SRTF.

- **Area C** - Completed three soil borings (BHSRTF-09-12a, 12b, and 12c) through the excavated area and evaluated groundwater through existing nearby monitoring wells S-79SRTF, S-121SRTF, and S-80SRTF.

- **Area D** – Completed two soil borings (BHSRTF-09-13a and 13b) through the excavated area and evaluated groundwater through existing nearby monitoring well S-128SRTF.

A location of the monitoring wells evaluated as part of the four inspection areas and their exceedances of the MSCs are included in Table 4b.

Soil and groundwater samples collected as part of the characterization activities were submitted to Lancaster Laboratories, Inc. (LLI) of Lancaster, Pennsylvania for analysis of Fuel Oil Nos. 4, 5, 6, and Lubricating Oils and Fluids in accordance with the PADEP's Closure Requirements for Storage Tank Systems, effective April 1, 1998 and the March 18, 2008 revised PADEP Petroleum Short List. A list of the COCs is provided in Table 1. A summary of the soil analytical and groundwater results screened against their respective PADEP non-residential MSCs are provided in Tables 4a and 4b.

On June 30, 2015, Mr. David Brown of the PADEP examined the previous PADEP inspection areas that had been identified in the 2009 inspection.

3.2 Surface Soil Borings and Sampling

In 2009, a total of 48 surface soil samples were collected for analysis of site COCs from areas within AOI 9. Twelve of the soil samples were collected as part of a soil investigation following implementation of IRMs in AOI 9, 25 soil samples were collected during the advancement of monitoring wells within AOI 9 and the remaining 11 soil samples were to further characterize soils in AOI 9.

After the submission of the SCR in October 2009, additional surface soil characterization work was performed in AOI 9. In June 2015, to further delineate benzo(a)pyrene and lead exceedances above the PADEP non-residential soil MSC, a total of 34 delineation surface soil samples were collected for analysis of site COCs. Fifty shallow soil samples were collected to investigate potential leaded tank bottom and lead/oily sludge areas within AOI 9 as discussed in Section 3.3. Nineteen surface soil samples were collected for use in future tank site characterization reports as discussed in Section 3.6.

A second surface soil sampling event was conducted in November 2015 and included collection of 15 surface soil samples. Soil samples were collected to further delineate the following surface soil locations with exceedances during the June 2015 soil sampling event. The locations of all soil borings are shown on Figure 3. All soil samples were collected using stainless steel hand augers. Soil borings were advanced to a maximum depth of two feet bgs at each location in accordance with the Work Plan documents. Due to shallow groundwater conditions in some areas of AOI 9 (less than 2 feet bgs), some surface samples were unable to be collected during the 2015 soil investigation; however, these areas were delineated with other surface soil samples.

Surface soil samples from 2009 were submitted to LLI for analysis of site COCs. The soil samples collected in 2015 were submitted to Pace Analytical Services (Pace) of Pittsburgh, Pennsylvania, for analysis of site COCs. A summary of the soil analytical results screened against the PADEP non-residential soil MSCs is provided as Table 5 and the results are discussed in Section 5. A summary of the non-residential soil MSC exceedances are illustrated in Figure 11. Additional toxicity characteristic leaching procedure (TCLP) lead analyses were performed on any soil sample with a lead result greater than 2,240 milligrams per kilogram (mg/kg). All TCLP lead results are provided in Table 7. The laboratory analytical reports are provided as Appendix D.

3.3 Subsurface Soil Borings and Sampling

In accordance with the Work Plan documents, no subsurface soil samples were collected during the 2009 investigation in AOI 9. Where shallow groundwater was observed in AOI 9, some subsurface soil samples were unable to be collected.

Between June and August 2015, a total of 52 subsurface soil samples were collected to characterize subsurface soil and to vertically delineate previously identified benzo(a)pyrene and lead exceedances in surface soil above the PADEP non-residential soil MSC. Fourty nine additional subsurface samples were to investigate potential leaded tank bottom and lead/oily sludge areas within AOI 9, as discussed in Section 3.5. Nineteen subsurface soil samples were collected for use in future tank site characterization reports as discussed in Section 3.6.

The locations of all soil borings are shown on Figure 3. All soil samples were collected utilizing a stainless steel hand auger. Soil borings were advanced to between 2 feet below

grade and the soil water interface in accordance with the Work Plan documents.

Subsurface soil samples from 2015 were submitted to Pace for analysis of site COCs. A summary of the soil analytical results screened against the PADEP non-residential soil MSCs is provided as Table 6 and the results are discussed in Section 5. A summary of the non-residential soil MSC exceedances are illustrated in Figure 12. TCLP lead results are provided in Table 7. The laboratory analytical reports are provided as Appendix D.

3.4 Surface Soil Borings at Suspect Leaded Tank Bottom and Sludge Areas

The historical document dated June 3, 1981, identified several areas in AOI 9 that required further characterization (Gulf Oil Company, 1981). The document consisted of forms for Notification of Hazardous Waste Sites for Gulf Oil Corporation's Philadelphia Refinery, Schuylkill River Tank Farm. These areas were suspected of containing either leaded tank bottoms or leaded/oily sludge. These suspect areas are displayed in Figure 3.

3.4.1 Leaded Tank Bottom Area

The 1981 document referenced the eastern tank areas as being past disposal areas for leaded tank bottoms. From previous investigations, leaded tank bottom material was described as containing materials distinguished by distinctive rust/red to black, metallic, mostly oxidized scale materials, sometimes in a matrix of petroleum wax sludge. During June 2015, a total of 27 surface soil samples were collected from a total of 42 borings in leaded tank bottom areas based on visual observation of potential leaded tank bottom material in the subsurface. If the samples collected had a lead result over the SSS (2,240 mg/kg) TCLP analysis was also conducted. This procedure was followed for all samples in potential leaded tank bottom, leaded sludge, or oily sludge areas as follows:

- Two areas barricaded with bollards and chain were noted west of Tank SR20 in the area of past leaded tank bottom disposal from the 1981 document. One of these areas was labeled with a warning sign noting buried leaded sludge. Eleven surface soil samples were collected to investigate the chained areas for evidence of leaded sludge. Soil samples were biased to visual observation of leaded sludge material or petroleum impacts.

- A second surface soil sampling event was completed in November 2015 to further delineate the lead exceedance in surface soil from boring BH-15-82, completed during the June 2015 sampling. The sampling included the collection of three additional surface soil samples.
- A third surface soil sampling event was completed in late November 2015 to further delineate the lead exceedance in surface soil from boring BH-15-146, completed during the November 2015 sampling. The sampling included the collection of two additional surface soil samples.
- The locations of all soil borings are shown on Figure 3 and the boring logs are provided in Appendix C. The soil samples were submitted to Pace for analysis of lead and/or VOCs.

A summary of the surface soil analytical results is provided in Table 5 and the results are discussed in Section 5. The laboratory analytical reports are provided as Appendix D.

3.4.2 Leaded Sludge Area

The northwest corner of the AOI 9 was identified in the 1981 document as being a past disposal area for leaded sludge (Gulf Oil Company, 1981). This area of AOI 9 consists of dense vegetation and shallow groundwater table (approximately 2 feet bgs). During the June 2015 investigation, surface samples were collected from the 12 borings based on the visual observation of potential leaded sludge. Soil samples were biased to visual observation of leaded sludge material or petroleum impacts.

3.4.3 Oily Sludge Area

The 1981 document referenced the area directly east of the northwest corner AOI 9 as being a past oily sludge holding lagoon (Gulf Oil Company, 1981). This is the area near monitoring well S-108SRTF and west of the oil water separator. The AOI 9 2015 Work Plan proposed one boring to investigate soil in this area for evidence of oily sludge. During the June 2015 investigation, one surface soil sample was collected based on the visual observation of potential oily sludge in the boring. Soil samples were biased to visual observation of oily sludge material or petroleum impacts.

3.5 Subsurface Soil Borings at Suspect Leaded Tank Bottom and Sludge Areas

Between June and August 2015, 49 subsurface samples were collected to further vertically delineate the potential presence of leaded tank bottoms or leaded/oil sludge in AOI 9. Due to shallow groundwater conditions in some areas of AOI 9 (less than 2 feet bgs), some subsurface samples were unable to be collected during the 2015 soil investigation.

The locations of all subsurface soil borings are shown on Figure 3 and the boring logs are provided in Appendix C. Utilizing a stainless steel hand auger, soil borings were advanced to a minimum depth between 2 feet bgs and the soil water interface at each location in accordance with the AOI 9 2015 Work Plan documents. The soil samples were submitted to Pace for analysis. A summary of the subsurface soil analytical results is provided in Table 6 and the results are discussed in Section 5. The laboratory analytical reports are provided as Appendix D.

3.5.1 Leaded Tank Bottom Area

During the June 2015 investigation, a total of 30 subsurface soil samples were collected based on the visual observation of leaded tank bottom materials or petroleum impacts. Eight subsurface soil samples were collected from the chained areas for evidence of leaded sludge.

3.5.2 Leaded Sludge Area

A total of 10 subsurface soil samples were collected during the June 2015 investigation based on the visual observation of potential leaded sludge.

3.5.3 Oily Sludge Area

During the June 2015 investigation, one subsurface soil sample was collected based on the visual observation of potential oily sludge.

3.6 Storage Tank Closure and Release Incident Investigation Soil Borings

Numerous ASTs were removed from AOI 9 prior to August 5, 1989. Conditions in tank areas where tanks were removed prior to August 5, 1989 are being characterized under the PA One Cleanup Program investigation and are discussed in this AOI 9 RIR.

Tanks in AOI 9 that have been closed or have exhibited a documented release that are being addressed by the Tank Program are not included in the AOI 9 RIR, since August 5, 1989 are summarized in the following table.

Summary of Regulated Storage Tanks in AOI 9
With Documented Releases or Closed-In-Place Since August 5, 1989
PES Facility, Philadelphia, PA

Tank No.	Status	Documented Release (Yes or No)	Additional Comments
SR-7	In Service	Yes	PADEP approval received November 2015 for July 2004 site assessment report.
SR-16	In Service	Yes	December 2012 SCR approved.
SR-26	Closed in Place	No	April 2012 SCR submitted with no PADEP response. Additional Surface soil characterization performed. Groundwater monitoring well installed.
SR-33	Out of Service	Yes	No closure report issued. Surface and subsurface soil characterization performed.
SR-34	In Service	Yes	April 2004 SCR/RACR approved by PADEP.
SR-59	In Service	Yes	Soil investigation in 1994, but no closure report issued. Surface and subsurface soil characterization performed.
SR-90	In Service	Yes	December 2003 site assessment report submitted with no PADEP response. 2005 incident closed with SCR/RACR submission. Evergreen to proved requested disposal documentation to receive final closure.

Based on the summary table above, one tank in AOI 9 (SR-26) has been closed-in-place. Closure and corrective action documentation for this tank, consistent with requirements of 25 Pa Code §245.561, was previously submitted to the PADEP by Stantec. Corrective action documentation was submitted for the open release incidents associated with Tanks SR-7, SR-16, SR-34, and SR-90. Corrective action documentation was not submitted for the open release incidents associated with tanks SR-33 and SR-59. The reported release documentation is provided in Appendix E of this report.

Soil borings were advanced at these specified tank dike areas and samples were collected to assist with the general site characterization activities described in this RIR. Soil analytical results from these borings are presented in this RIR for informational purposes only and will be used in separately prepared tank SCRs for either closed-in-place tanks or open releases associated with tanks SR-26, SR-33, and SR-59. These SCRs will be submitted under separate cover to the PADEP in accordance with 25 Pa Code §245 regulations. Eight soil borings were completed for tanks SR-26, SR-33, and SR-59 with collection of surface and/or subsurface soil samples.

Designated boring locations for these incidents are displayed on Figure 3 and the boring logs are provided in Appendix C. Utilizing a stainless steel hand auger, soil borings were advanced to a minimum depth between 2 feet bgs and the soil water interface at each location in accordance with the AOI 9 Work Plan. The soil samples were submitted to Pace For analysis. A summary of the surface and subsurface soil analytical results are provided in Tables 5 and 6, respectively, and the results are discussed in Section 5. The laboratory analytical reports are provided as Appendix D.

3.7 Soil Borings at Other Open Incident Release Investigation Areas

Other previously reported open release incidents (not associated with regulated storage tank releases) in AOI 9 were investigated as part of the supplemental site characterization activities. These incidents were either previously reported to the PADEP or were discovered within historical facility owner documents. The referenced release documents are provided in Appendix E. The following is a listing of the open incidents areas that were investigated as part of the supplemental site characterization activities:

- T-100 Process Vessel (Blending Building Area)
  On May 7 and 8, 1994, approximately 21 gallons of gasoline was spilled onto the ground surface due to a malfunctioning sump pump within T-100.
- T-100 Process Vessel (Blending Building Area)
  On August 9, 1997, approximately 100 gallons of gasoline was spilled onto the ground surface due to a malfunctioning sump pump within T-100.
- Maintenance Building
  On March 12, 1994, an undisclosed volume of product leaked from a distribution pipe from behind the Maintenance Building.

The investigative soil borings completed in these open incident releases are described below:

- T-100 (Blending Building Area)
  Nine soil borings were advanced within the T-100 area, near the Blending Building, to delineate two separate release incidents. Surface and subsurface soil samples were collected from the soil borings and were analyzed for the site COC list.
- Maintenance Building
  Three soil borings were advanced in the rear of the Maintenance Building area to investigate the previous release incident. Surface and subsurface soil samples were collected from the soil borings and were analyzed for site COC list.

The borings advanced in these areas are shown on Figure 3 and the boring logs are provided in Appendix C. Utilizing a stainless steel hand auger, soil borings were advanced to a minimum depth between 2 feet bgs and the soil water interface at each location in accordance with the AOI 9 Work Plan. The soil samples were submitted to Pace for analysis. A summary of the surface and subsurface soil analytical results are provided in Tables 5 and 6, respectively, and the results are discussed in Section 5. The laboratory analytical reports are provided as Appendix D.

3.8 Installation of Groundwater Monitoring Wells

As part of the 2009 AOI 9 characterization activities, groundwater monitoring well installation activities were performed June through July, 2009 by Total Quality Drilling, L.L.C. (Total Quality Drilling) of Mullica Hills, New Jersey under direct supervision of Aquaterra in coordination with Sunoco. Twenty-seven shallow monitoring wells and two deep monitoring wells were installed to characterize both shallow and deep groundwater in AOI 9.

During July 2015, groundwater monitoring well installation activities were performed by Parrat Wolff, Inc. (Parrat Wolff) of Syracuse, New York under direct supervision of Aquaterra in coordination with Evergreen. Two shallow monitoring wells (S-135SRTF and S-136SRTF) were installed to characterize shallow groundwater and boundary conditions in AOI 9. Three deep monitoring wells (S-110DSRTF, S-115DSRTF, and S-118DSRTF) were installed to characterize deep groundwater and boundary conditions. In addition, S-118DSRTF was

installed to delineate benzo(a)pyrene exceedances in S-118SRTF_1-2 shallow soil sample. The locations of all monitoring wells are shown on Figure 3.

Shelby Tube samples were obtained during the well installation of S-118DSRTF and S-110DSRTF on June 16 and June 22, 2015, respectively. The Shelby Tubes were collected to obtain soil parameters including bulk density, dry density, effective porosity, total porosity, and fraction of organic carbon. The laboratory results for these Shelby Tube are provided in Appendix J.

Prior to the installation of monitoring wells, each well location was cleared for subsurface utilities to 8 feet bgs with a back hoe, with the exception of S-136SRTF, which was cleared with a hydroexcavator. During clearing of each location, soil samples were collected by advancing a hand auger ahead of the hydroexcavator or directly from the backhoe bucket. Samples were then screened with a photoionization detector (PID) and were collected in accordance with the Work Plan procedure. Shallow monitoring wells advanced by the drilling subcontractors utilized split spoon samplers to record lithology. Deep monitoring wells were also advanced using hollow stem augers, with the exception of S-118D, which used mud rotary in addition. Monitoring wells were constructed with a stickup steel protective casing. Following construction, the monitoring wells were developed in accordance with the Work Plan. Well construction details are provided in Table 2. Boring logs depicting monitoring well construction details and lithology are provided as Appendix C.

3.9 Groundwater Monitoring

Monitoring well gauging activities to collect liquid levels from shallow and deep monitoring wells within AOI 9 were performed in August 2009 by Aquaterra, in March 2015 by Langan and again in August and October 2015 by Aquaterra. Monitoring wells were gauged for depth-to-water, and if applicable, depth-to-product in accordance with the AOI 9 Work Plan. All well gauging readings are summarized in Tables 3a and 3b.

The groundwater monitoring data from Tables 3a and 3b was used to generate the groundwater flow maps provided as Figures 6 through 9.

3.10 Groundwater Sampling

As part of the 2009 site characterization activities, Aquaterra performed a complete round of groundwater sampling from all accessible monitoring wells in AOI 9 in August 2009. Three rounds of groundwater sampling were conducted in 2015 as part of the supplemental activities (Langan in March 2015 and Aquaterra in August and October 2015). All groundwater sampling activities were completed in accordance with the 2009 AOI 9 Work Plan documents. The monitoring well sampling summary data sheets are provided as Appendix C.

All groundwater analytical results are provided in Table 8. The laboratory analytical reports are included as Appendix D.

3.10.1 Sampling Beneath LNAPL

During the November 2015 groundwater sampling event, groundwater was obtained from the water column beneath LNAPL in monitoring well MW-1SRTF to respond to a PADEP request in 2014. This was conducted to obtain dissolved COC data in groundwater in wells with LNAPL, and to use this data for the future fate and transport site-wide quantitative modeling. The sampling methodology is described below. The monitoring well sampling summary data sheets are provided in Appendix C. The results of the groundwater sampling beneath LNAPL are displayed on Figure 13 and provided in Table 8.

In order to obtain groundwater samples from monitoring wells that contain LNAPL, Aquaterra employed the following methodology. The LNAPL thickness was first determined using an optical interface probe. Field personnel then deployed a 1.5-inch polyvinyl chloride (PVC) pipe (drop tube), with an attached end cap, through the LNAPL layer. The drop tube was lowered until the bottom of the tube was approximately two feet into the water column below the bottom of the LNAPL. The end cap is then removed by inserting a 0.5-inch PVC rod into the drop tube and pushing on the cap until the lid was removed. The cap was tethered to the PVC tube and was removed along with the tube upon completion of sampling.

Once the drop tube was secured to the well, 0.25-inch low-density polyethylene

(LDPE) tubing was placed through the 1.5-inch drop tube into the water column. The tubing was connected to a peristaltic pump for groundwater retrieval. The pump was generally set to the lowest pumping rate so that the LNAPL was not drawn into the tubing. Pumping continued until enough volume was obtained for all bottleware needed. The well was not purged of three well volumes to prevent the chance of drawing LNAPL into the sample and to sample steady-state groundwater conditions beneath the LNAPL. Dedicated tubing was used at each well location to avoid cross-contamination between wells. The only AOI-9 monitoring well that contains LNAPL is MW-1SRTF and was therefore sampled for groundwater beneath the LNAPL layer.

The groundwater analytical results are presented in Table 8 and discussed in Section 5.7. The laboratory analytical reports are included in Appendix D.

3.11 Indoor Air Sampling

Stantec collected two indoor air samples and one ambient air sample in 2012 as part of the Sunoco, Inc. (R&M) Philadelphia Refinery Remediation Program indoor air sampling report (Stantec, 2013) A copy of the Stantec 2012 indoor air sampling report is provided in Appendix F. The two indoor air samples were collected from the SRTF Main Pump House and the SRTF Propane Loading Building (both occupied buildings within AOI 9 not under positive pressure). These buildings are shown in Figure 3. The one ambient air sample was collected from outside the SRTF Main Pump House. The results of the air samples were compared to the OSHA PELs because the facility and these buildings are regulated by OSHA.

In 2015, PES and Evergreen re-assessed occupied buildings in AOI 9 that were not under positive pressure. The following AOI 9 buildings were identified:

- SRTF Main Pump House first floor;
- SRTF Main Pump House basement (motor room and pump room);
- SRTF Blending Building; and
- SRTF Maintenance Building.

The occupied buildings within AOI 9 are shown on Figure 14 and are operated by PES and regulated by OSHA. On March 11, 2015, Langan conducted indoor and ambient air

sampling at the above-listed occupied buildings in AOI 9. A second round of sampling was completed August 5, 2015. During each sampling event, in addition to indoor air samples, ambient air samples were also collected at each building location.

The samples were submitted to Pace for analysis of VOCs by EPA TO-15 method. The results of the samples are provided in Table 9 and are discussed in Section 5.7. The laboratory analytical report for the samples is provided in Appendix D.

3.12 LNAPL Sampling

During the 2009 gauging events for AOI 9, only one monitoring well (MW-1SRTF) had measurable (greater than 0.01 feet) light non-aqueous phase liquid (LNAPL). MW-1SRTF was formerly a recovery well and recovery was shutdown in 2004 due to the lack of recoverable LNAPL in the area.

On September 22, 2009, Aquaterra gauged MW-1SRTF and measured 0.09 feet of LNAPL in the monitoring well. An LNAPL sample from this monitoring well was previously collected and characterized as part of the 2003 CCR. This sample was collected using a direct sampling or swabbing method in accordance with the 2009 AOI 9 Work Plan. The LNAPL sample was sent to Torkelson Laboratories (Torkelson) of Tulsa, Oklahoma for characterization. LNAPL characterization data included product types, density, proportions of product, degree of weathering, and similarities to other samples. Based on the LNAPL characterization performed by Torkelson, LNAPL in MW-1SRTF is comprised of 2% crude oil and 98% gasoline. Appendix G summarizes the LNAPL characterization results from the CCR.

During the November 2015 groundwater sampling event, groundwater samples were collected from beneath the LNAPL in MW-1SRTF and the results are discussed in Section 5.7.

3.13 Surveying Activities

Following completion of monitoring well installation and soil boring activities, the newly-installed monitoring wells and soil boring locations were surveyed by Langan. Monitoring wells were surveyed to establish the location and elevation of the inner and outer casing

and ground surface at each point. All well elevations were determined to the nearest 0.01 foot relative to mean sea level. All survey activities were overseen by a Pennsylvania licensed surveyor and tied to the NAD 83 state plane horizontal datum and NAVD 88 vertical datum. The survey data for the monitoring wells is presented in Table 2. This survey data was used to update the Geographic Information System (GIS) and site wide database for the facility and for calculations involving groundwater or LNAPL measurements.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Sample results for AOI 9 supplemental activities were summarized in 41 sample delivery groups provided by Accutest Laboratories and Pace Laboratories and the results were evaluated for usability. The laboratory performed quality assurance and quality control (QA/QC) analyses, including analysis of LCS/LCSDs, MS/MSDs, laboratory duplicates, surrogate spikes, initial and continuing calibrations, serial dilutions, instrument tunes, interference check samples, internal standard area counts and method blanks. Laboratory QA/QC summaries are provided in each data package, where available. The analytical data, data qualifiers, and QA/QC results provided in these reports were evaluated to determine whether AOC 9 groundwater, air and soil data met data quality objectives and could be used in the decision-making process.

Several trip blank samples were collected during the soil and groundwater sampling events, and were non-detect for target analytes. All samples were properly preserved and were extracted/prepared, and analyzed within sample hold times with the exceptions noted above. Target compounds were detected in the laboratory method blanks which resulted in potential high bias for the compounds listed above. Recoveries in LCS/LCSDs were within acceptable recovery control limits with the exceptions listed above. Multiple surrogates and MS/SDs recovered outside of the acceptable range as described in detail above.

Based on the QA/QC evaluation of the laboratory data, the groundwater, air and soil data collected during the site characterization activities are considered usable for characterizing the site, identifying compounds of concern, and delineating potential impacts. A more detailed summary of the data quality evaluation is included in Appendix H.

5.0 SITE CHARACTERIZATION ANALYTICAL RESULTS

The following sections discuss the analytical results of the supplemental site characterization activities performed in AOI 9.

5.1 PADEP Inspection Investigation Results

The following discusses the soil and groundwater analytical results of the site characterization activities performed August of 2009 in response to the PADEP 2009 inspection regarding the four release areas.

The results of the soil samples collected are provided in Table 4a. The soil samples were collected between zero and two feet below the base of the excavation areas. The soil sample results were screened against the PADEP non-residential MSCs for soil. The sample locations for each area are shown in Figure 3. All results for soil samples collected were below the non-residential soil MSCs.

The results of the groundwater samples collected are provided in Table 4b. Groundwater samples were collected on a site wide basis as part of the Work Plan activities. The groundwater samples were screened against the PADEP non-residential used aquifer (TDS<2,500) groundwater MSCs. Below is a summary of COCs detected in groundwater at concentrations exceeding the non-residential MSCs in wells proximal to the PADEP inspection areas:

- S-78SRTF – Exhibited exceedances of benzene and MTBE;
- S-122SRTF – Exhibited exceedances of lead, benzene, 1,3,5-TMB, methyl tertiary butyl ether (MTBE), and naphthalene;
- S-123SRTF – Exhibited exceedances of benzene, 1,2,4- TMB, 1,3,5-TMB, and naphthalene; and
- The four additional wells (S-79, S-80, S-121, and S-128) did not exhibit exceedances of site COCs.

The above-mentioned groundwater exceedances were further evaluated in the characterization activities conducted in 2015.

PADEP completed a follow-up inspection on June 30, 2015, of the 2009 inspection areas

and the PADEP notes from the 2015 inspection are included in Appendix A.

5.2 Surface Soil Analytical Results

The results of the surface soil samples collected in AOI 9 as part of the 2009 characterization activities, as well as the supplemental characterization activities are provided in Table 5. All of the soil samples were collected between the ground surface and two feet bgs and no saturated soils were observed at these depths. The soil sample results were screened against the PADEP non-residential MSCs and the PADEP-approved SSS for lead (2,240 mg/kg). Sample locations and exceedances of the MSCs or SSS for lead are shown in Figure 11.

During the sampling events, if the total lead results for surface samples were above the SSS for lead, then samples were analyzed for lead via TCLP, EPA Test Method 1311 to determine if the soil is hazardous for lead. Based on results, no hazardous lead soils were identified.

Below is a general summary of the surface soil screening results for the 2009 soil sampling activities:

- COCs detected in surface soil exceeding their respective non-residential MSCs include: benzene, 1,2,4-TMB, 1,3,5-TMB, naphthalene, and benzo(a)pyrene. The SSS for lead was exceeded in seven locations.
- Toluene, ethyl benzene, ethylene dibromide, 1,2-dichloroethane, total xylenes, MTBE, cumene, anthracene, pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, chrysene, benzo(a)anthracene, phenanthrene, and fluorene were not detected in AOI 9 soil samples at concentrations exceeding their respective non-residential MSCs.

Below is a general summary of the surface soil screening results for the June 2015 soil sampling activities:

- 1,2,4-TMB, 1,3,5-TMB, benzene, ethyl benzene, lead, naphthalene, and toluene were detected above their respective PADEP non-residential soil MSCs or SSS for lead.
- Lead was detected above the SSS in one delineation surface soil sample (BH-15-6)

at a concentration of 2,390 mg/kg. The TCLP result for this sample was 0.41 milligrams per liter (mg/L), below the EPA maximum concentration of lead for toxicity characteristic of 5 mg/L.

- 1,2-dichloroethane, ethylene dibromide (EDB), MTBE, xylenes (total), anthracene, benzo(a)anthracene, benzo(b)flouranthene, benzo(g,h,i)perylene, chrysene, fluorene, phenanthrene, and pyrene were not detected above their respective PADEP non-residential soil MSCs.

Below is a general summary of the surface soil screening results for the November 2015 surface soil characterization activities:

- Benzo(a)pyrene was not detected above the respective PADEP non-residential direct contact standard in the four surface soil delineation samples around boring S-133SRTF.

5.3 Subsurface Soil Results

No subsurface soil samples were collected during the June 2009 soil sampling event. The results of the 2015 subsurface soil samples collected in AOI-9 are provided in Table 6. All of the subsurface soil samples were collected between two feet bgs and the soil-to-groundwater interface. The soil sample results were screened against the PADEP non-residential MSCs and the SSS for lead. Sample locations and exceedances of the MSCs or SSS for lead are shown in Figure 12. Two rounds of subsurface soil sampling were conducted in 2015. If the total lead results for subsurface samples were above the SSS for lead (2,240 mg/kg), then samples were analyzed for lead via TCLP, EPA Test Method 1311.

Below is a general summary of the June 2015 subsurface soil screening results:

- 1,2,4-TMB, 1,3,5-TMB, benzene, ethyl benzene, lead, naphthalene toluene, and xylenes (total), were detected above their respective PADEP non-residential soil MSCs.
- 1,2,4-TMB was the only site COC detected above its respective PADEP non-residential direct contact standard (2-15 feet) in two subsurface samples near the blending building.
- Three subsurface soil samples exhibited TCLP results exceeding the EPA maximum concentration of lead for toxicity characteristic of 5 mg/L. No suspect leaded tank

bottom material was noted in any of the soil boring logs.

- 1,2-dichloroethane, EDB, MTBE, anthracene, benzo(a)anthracene, benzo(b)flouranthene, benzo(g,h,i)perylene, chrysene, fluorene, phenanthrene, and pyrene were not detected above their respective PADEP non-residential soil MSCs.

5.4 Surface Soil Results at Suspect Leaded Tank Bottom and Sludge Areas

The results of the surface soil samples collected within suspect leaded tank bottom and sludge areas in the western portion of AOI 9 are included in Table 5. All of the soil samples were collected between the ground surface and two feet bgs and no saturated soils were observed at these depths. The soil sample results were screened against the PADEP non-residential MSCs. Sample locations and exceedances of the MSCs or SSS for lead are shown in Figure 11.

As stated in Section 3.4 above, if suspect materials were encountered in surface soil (0-2 feet) within leaded tank bottom areas or sludge areas during investigation activities matching the physical description of the leaded tank bottom materials, then samples were collected for total lead. If the total lead results were above the SSS for lead (2,240 mg/kg), then samples were analyzed for lead via TCLP, EPA Test Method 1311. This sampling methodology was performed to identify if leaded tank bottom materials were present in soil.

5.4.1 Leaded Tank Bottom Area

Below is a general summary of the soil screening results for the June 2015 surface soil samples collected in the suspected leaded tank bottom area:

- 1,2,4-TMB, 1,3,5-TMB, benzene, ethyl benzene, lead, naphthalene, and toluene were detected above their respective PADEP non-residential soil MSCs.
- No Site COCs were detected above its respective PADEP non-residential direct contact MSC.
- One surface soil sample displayed characteristics of suspect leaded tank bottom material, BH-15-106. The surface soil sample collected at this location exhibited a lead result below the SSS.
- One surface soil sample, from boring BH-15-82, exhibited a lead

detection above the site SSS for lead at 3,520 mg/kg. The TCLP result of the sample, 7.6 mg/L, exceeded the EPA maximum concentration of lead for toxicity characteristic. No suspect leaded tank bottom material was noted in the soil boring log.

- 1,2-dichloroethane, EDB, MTBE, anthracene, benzo(a)anthracene, benzo(b)flouranthene, benzo(g,h,i)perylene, chrysene, fluorene, phenanthrene, pyrene, and xylenes (total) were not detected above their respective PADEP non-residential soil MSCs.

Below is a general summary of the soil screening results for the November 2015 surface soil samples collected in the suspected leaded tank bottom area:

- Soil boring BH-15-146, one of the delineation samples for BH-15-82, exhibited a lead detection above the site SSS at 3,350 mg/kg. The TCLP result, 65.6 mg/L (65,600 ug/L) exceeded the EPA maximum concentration of lead for toxicity characteristic. Suspect leaded tank bottom material was noted in the soil boring log.

Below is a general summary of the soil screening results for the second November 2015 surface soil sampling event in the suspected leaded tank bottom area:

- Two surface soil samples were collected to delineate the lead exceedance in BH-15-146. Neither soil sample exceeded the SSS for lead.
- All of the surface soil exceedances of the SSS for lead in the leaded tank bottom areas have been delineated.

5.4.2 Leaded Sludge Area

- One surface soil sample, BH-15-126, displayed characteristics of suspect leaded tank bottom/leaded sludge material. The surface soil sample collected at this location exhibited a lead result below the SSS.
- No surface soil samples in the leaded sludge areas exceeded the PADEP non-residential MSCs or SSS for lead.

5.4.3 Oily Sludge Area

- During the soil sampling activities, soil from boring BH-156-122 displayed characteristics of potential oily sludge in surface soil.
- Site COCs in the surface soil sample were not detected above PADEP non-residential MSCs or the SSS for lead.

5.5 Subsurface Soil Results at Suspect Leaded Tank Bottom and Sludge Areas

The results of the subsurface soil samples collected in the leaded tank bottom and sludge areas in the western portion of AOI 9 are provided in Table 6. All of the subsurface soil samples were collected between two feet bgs and the soil-to-groundwater interface. The soil sample results were screened against the PADEP non-residential MSCs and the SSS for lead. Sample locations and exceedances of the MSCs or SSS for lead are shown in Figure 12.

As stated in Section 3.4 above, if suspect materials were encountered in subsurface soil (below 2 feet) within leaded tank bottom areas or sludge areas during investigation activities matching the physical description of the leaded tank bottom materials, then samples were collected for total lead. If the total lead results were above the SSS for lead (2,240 mg/kg), then samples were analyzed for lead via TCLP, EPA Test Method 1311. This sampling methodology was performed to determine if leaded tank bottom materials were present in soil.

5.5.1 Leaded Tank Bottom Area

- 1,2,4-TMB, 1,3,5-TMB, benzene, ethyl benzene, lead, naphthalene, and toluene were detected above their respective PADEP non-residential soil MSCs.
- No Site COCs were detected above its respective PADEP non-residential direct contact standard (2-15 feet).
- Three subsurface soil samples displayed characteristics of leaded tank bottom material. Subsurface soil from BH-15-90, located in the chained off buried sludge area, exhibited characteristics resembling potential leaded sludge. Subsurface soil from BH-15-100 and BH-15-105 exhibited characteristic of potential leaded tank bottom material. None of the subsurface soil samples collected from these borings exceeded the MSC

for lead.

- 1,2-dichloroethane, EDB, MTBE, anthracene, benzo(a)anthracene, benzo(b)flouranthene, benzo(g,h,i)perylene, chrysene, fluorene, phenanthrene, pyrene, and xylenes (total) were not detected above their respective PADEP non-residential soil MSCs.

5.5.2 Leaded Sludge Area

- No subsurface samples containted material that resembled leaded sludges.
- No subsurface soil samples in the leaded sludge areas exceeded the PADEP non-residential MSCs, including lead.

5.5.3 Oily Sludge Area

- No subsurface samples contained matrial that resembled oily sludge material.
- Site COCs in the subsurface soil sample collected from the oily sludge area were not detected above PADEP non-residential MSCs, including lead.

5.6 Storage Tank Closure and Release Incident Investigation Soil Borings

The results of the surface and subsurface soil samples collected as part of the storage tank closure and release incidents in AOI 9 are provided in Table 5 and Table 6. All of the surface soil samples were collected between the ground surface and two feet bgs and no saturated soils were observed at these depths. All of the subsurface soil samples were collected between two feet bgs and the soil-to-groundwater interface. The soil sample results were screened against the PADEP non-residential MSCs and the SSS for lead. Sample locations and exceedances of the MSCs or SSS for lead are shown in Figures 11 and 12.

Below are summaries of the soil sample results by area:

<u>Tank SR-26</u>

The surface soil sample collected from boring BH-15-61 between June and August 2015 to investigate a lead exceedance at Tank SR-26 had 1,2,4-TMB, 1,3,5-TMB, and

benzene results exceeded their corresponding PADEP non-residential soil MSCs. None of the COCs were detected above the non-residential soil direct contact MSCs.

Tank SR-33

Four surface soil samples were collected between June and August to investigate the release at Tank SR-33. The sample collected from soil boring BH-15-58 exhibited a lead result of 3,540 mg/kg, exceeding the SSS. The TCLP result of the sample, 0.4 mg/L, did not exceed the EPA maximum concentration of lead for toxicity characteristic.

Three additional surface soil samples were collected in October 2015 to further delineate the lead exceedance for BH-15-58. Lead was not detected above the SSS in any of the additional surface soil samples.

Tank SR-59

Three surface samples were collected between June and August 2015 to investigate the release at tank SR-59. None of the COCs from these samples were detected above the non-residential soil direct contact MSCs.

As stated in Section 3.6 above, the analytical data for these borings is presented in this RIR for informational purposes only and will be used in separately prepared SCRs for open releases associated with tanks SR-26, SR-33, and SR-59. These SCRs will be submitted under separate cover to the PADEP in accordance with 25 Pa Code §245 regulations.

Soil Borings at Other Open Incident Release Investigation Areas:

The results of the surface and subsurface soil samples collected as part of the other (non-regulated tank releases) open release incidents in AOI 9 are provided in Table 5 and Table 6. All of the surface soil samples were collected between the ground surface and two feet bgs and no saturated soils were observed at these depths. All of the subsurface soil samples were collected between two feet bgs and the soil-to-groundwater interface. The soil sample results were screened against the PADEP non-residential MSCs and the SSS for lead. Sample locations and exceedances of the MSCs or SSS for lead are shown in Figures 11 and 12.

The soil sample analytical results for the other open incident releases are summarized below:

- T-100 (Blending Building Area)
  Nine surface and subsurface samples were collected to investigate soil around the maintenance building area. Three surface soil samples exceeded the non-residential soil MSCs for COCs including 1,2,4-TMB, 1,3,5-TMB, benzene, MTBE, and ethyl benzene. None of the surface samples exceeded the non-residential direct contact soil MSCs. Five subsurface soil samples exceeded non-residential soil MSCs for COCs, including 1,2,4-TMB, 1,3,5-TMB, benzene, ethyl benzene, xylenes(total), naphthalene, and toluene. Two of these subsurface soil samples also exceeded the non-residential soil direct contact MSC for 1,2,4-TMB.

- Maintenance Building
  Three surface and subsurface samples were collected to investigate soil around the maintenance building area. None of the COCs from the surface or subsurface samples were detected above the non-residential soil direct contact MSCs or SSS for lead.

5.7 Groundwater Results

The results of the shallow and deep groundwater samples collected from monitoring wells during 2009 and 2015 are provided in Table 8. The results were screened against the PADEP non-residential used aquifer (TDS<2,500) groundwater MSCs. Figure 13 illustrates the locations where concentrations of COCs were detected above the groundwater MSCs. A summary of the COC concentrations that were above their respective PADEP non-residential groundwater MSCs are presented below.

- In 2009, the following COCs have been detected in the shallow groundwater within monitoring wells at concentrations exceeding their respective PADEP non-residential groundwater MSCs: lead, 1,2,4-TMB, 1,3,5-TMB, benzene, benzo(a)pyrene, benzo(g,h,i)perylene, ethyl benzene, MTBE, naphthalene, toluene, and xylenes (total).
- In 2009, the COCs 1,2-dibromoethane, 1,2-dichloroethane, 1-bromo-4-fluorobenzene, 2-bromo-1-chloropropane, dibromofluoromethane cumene, 2-fluorobiphenyl, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, fluorene, pyrene, and phenanthrene have not been detected in AOI 9 shallow groundwater above their respective PADEP non-residential groundwater MSCs.

- 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 March 2015 and August 2015 sampling events, the same COCs with historic exceedances listed above were detected with concentrations in shallow groundwater exceeding their respective PADEP non-residential groundwater MSCs, with the exception of xylenes (total), which did not exceed the MSC in any of the wells sampled. During the November 2015 sampling event, shallow groundwater had the same COCs exceeding MSCs with the exception of xylenes (total) and benzo(g,h,i)perylene.
- 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.

Elevated VOC results from the S-74D1 groundwater sample collected during the November 2015 sampling event were inconsistent with historical data. The well was resampled on December 3, 2015 for VOCs. The December 2015 sample did not exhibit COC concentrations above the MSCs. Based on this, the November 2015 results are considered an anomaly and were not used for data interpretation, fate and transport analysis, or the conceptual site model.

5.8 Indoor Air Sampling Results

Stantec collected two indoor air samples and one ambient air sample in 2012 as detailed in their 2012 indoor air sampling report provided in Appendix F. The two indoor air samples were collected from the SRTF Main Pump House and the SRTF Propane Loading Building (both occupied buildings within AOI 9 not under positive pressure). The one ambient air sample was collected from outside the SRTF Main Pump House. The results of the air samples were compared to the OSHA PELs because the facility and these buildings are regulated by OSHA. The results are discussed below:

- The SRTF Main Pump House indoor air sample exhibited concentrations of benzene, toluene, and total xylene, above the reporting limit but below their corresponding OSHA PELs and EPA Industrial RSLs;

- The SRTF Main Pump House Office outdoor ambient air sample exhibited concentrations of benzene and toluene above the reporting limit but below the corresponding OSHA PELs, EPA Industrial RSLs and PADEP IAQ criteria; and
- The SRTF Propane Loading Building indoor air sample exhibited concentrations of benzene, toluene, ethyl benzene, total xylene, cumene and 1,2,4-TMB above the reporting limit but below their corresponding OSHA PELs and EPA Industrial RSLs.

In 2015, PES and Evergreen re-assessed occupied buildings in AOI 9 that were not under positive pressure. The following AOI 9 buildings were identified:

- SRTF Main Pump House first floor;
- SRTF Main Pump House basement (motor room and pump room);
- SRTF Blending Building; and
- SRTF Maintenance Building.

Langan completed two additional rounds of indoor air sampling events in March 2015 and August 2015 for the occupied buildings above. Ambient air samples were also collected during both sampling events. The results of these air samples are discussed below.

SRTF Blending Building

- In March 2015, the indoor air sample exhibited a benzene concentration above the EPA RSL but below the corresponding OSHA PEL. All other constituent results were below the respective standards. The ambient air sample did not exhibit results above corresponding EPA RSLs or OSHA PELs.
- In August 2015, the indoor air sample exhibited a benzene concentration above the EPA RSL, but below the corresponding OSHA PEL. The ambient air sample exhibited benzene and chloroform results above the respective EPA RSLs for benzene and chloroform but below the OSHA PELs. All other constituent results were below the respective standards.

SRTF Maintenance Building

- In March 2015, the indoor and ambient air samples exhibited benzene concentrations above the EPA RSL, but below the corresponding OSHA PEL. All other constituent results were below the respective standards.
- In August 2015, the indoor air sample did not exhibit any results above the respective EPA RSLs or OSHA PELs. The ambient air sample exhibited a chloroform result above the EPA RSL, but below the corresponding OSHA PEL.

SRTF Main Pump House

- In March 2015, the Office indoor air sample did not exhibit concentrations above OSHA PELs or EPA Industrial RSLs. The Pump Room indoor sample exhibited 1,2,4-TMB, benzene, and ethyl benzene results above the EPA RSLs, but below the respective OSHA PELs. The Engine Room indoor air sample exhibited a benzene result above the corresponding EPA RSL, but below the OSHA PEL. The ambient air sample exhibited a benzene result above the corresponding EPA RSL, but below the OSHA PEL.

- In August 2015, the Office indoor air sample did not exhibit concentrations above OSHA PELs or EPA Industrial RSLs. The Pump Room indoor sample exhibited 1,2,4-TMB, benzene, and ethyl benzene results above the EPA RSL, but below the respective OSHA PELs. The Engine Room air sample did not exhibit concentrations above OSHA PELs or EPA Industrial RSLs. The ambient air sample exhibited a chloroform result above the corresponding EPA RSL, but below the OSHA PEL.

Based on the Langan 2015 indoor and ambient air samples collected from targeted occupied buildings in AOI 9, all results are below OSHA PELs for the protection of worker health. The Langan air sampling results are provided in Table 9 and building sample locations are displayed in Figure 14.

5.9 LNAPL Characterization Results

The previous LNAPL characterization data for well MW-1, obtained as part of the CCR, is provided in Appendix G. Based on the LNAPL characterization performed by Torkelson, LNAPL in MW-1 is comprised of 2% crude oil and 98% gasoline. On September 22, 2009, Aquaterra gauged MW-1 and measured 0.09 feet of product in the monitoring well.

Based on the absence of LNAPL in monitoring wells surrounding MW-1 and the occurrence of LNAPL in MW-1 over time, it appears the LNAPL in MW-1 continues to remain stable and immobile. Therefore, no additional LNAPL modeling was completed for AOI 9 as part of the supplemental characterization activities.

6.0 FATE AND TRANSPORT EVALUATION

The following sections describe fate and transport modeling activities performed as part of AOI 9 site characterization.

6.1 Soil

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.

6.2 Groundwater

In September 2015, representatives from Evergreen's team, PADEP and EPA met to discuss the F&T approach for the facility. It was agreed upon during the meeting that initial AOI RIRs would contain a summary of the groundwater characterization results and identify where the groundwater MSCs were exceeded throughout the Site, not only at the Point of Compliance. To achieve this, the RIR would include an evaluation of groundwater analytical data, groundwater flow direction and groundwater velocity, to evaluate the potential for groundwater in exceedance of the MSC to migrate off-site. In addition, Evergreen agreed to a conservative approach to demonstrate groundwater characterization in the RIR and to also include all groundwater locations that exceeded the MSCs in the Cleanup Plan to determine the appropriate remedial approach through a site-wide quantitative groundwater model to support attainment in the Final Report. A qualitative assessment of F&T of COCs in groundwater in AOI 9 is provided in Appendix I. The qualitative assessment includes information regarding the following conditions in AOI 9:

- Geologic framework;
- Hydrogeologic conditions;
- Hydrologic conditions;
- Anthropogenic features (such as the adjacent Mingo Creek Flood Control System); and
- COC temporal trends and spatial distribution.

6.3 LNAPL

MW-1SRTF is the only well in AOI 9 that contains LNAPL. MW-1 was formerly a recovery well and was shut down in 2004 based on the lack of recoverable LNAPL in the area.

Based on the absence of LNAPL in monitoring wells surrounding MW-1SRTF, the LNAPL modeling performed as part of the CCR, and the occurrence of LNAPL in MW-1 over time, it appears the LNAPL in MW-1 remains stable and immobile. Therefore, no additional LNAPL modeling was completed as part of the supplemental site characterization activities.

7.0 CONCEPTUAL SITE MODEL

A preliminary conceptual site model (CSM) for the facility, including AOI 9, was presented in the CCR. The CSM for AOI 9 was later refined as part of the 2009 AOI 9 SCR. Data collected from site characterization activities completed since the submittal of the 2009 AOI 9 SCR were used to further refine the CSM. The current CSM for AOI 9 is described in the following sections:

7.1 Description and Site Use

AOI 9 is the western most area of the PES facility and is bound by the Mingo Creek Flood Control Basin to the south, the Schuylkill River to the east (beyond the vegetated area), and commercial and light industrial properties to the north, and west. AOI 9 encompasses approximately 211 acres. AOI 9 is currently used by PES to store and blend the refined petroleum products purchased for or produced in other areas of the facility. Approximately 36 ASTs and numerous LPG tanks are currently in operation.

AOI 9 is located within a fenced and secured area to prevent unauthorized access. Prior to any work being completed within AOI 9, appropriate work permits, safety and security measures must be approved by PES Refinery personnel. AOI 9 is under the control of PES's health and safety administrative procedures and is regulated by OSHA.

7.2 Geology and Hydrogeology

The following describes geologic and hydrogeologic conditions in AOI 9:

- The depth to bedrock beneath AOI 9 is estimated to be approximately 80 ft bgs;
- The Lower Sand overlies bedrock throughout AOI 9;
- The Fill/Alluvium materials are present throughout the AOI. General thickness across the site ranges from 5 to 20 feet bgs;
- Trenton Gravel is undifferentiated with the Fill/Alluvium throughout AOI 9;
- In the west central portion of AOI 9, the Lower/Middle Clay appears to be absent and the Fill/Alluvium and Trenton Gravel appear to be in direct contact with the Lower Sand;
- The hydrogeologic framework for AOI 9 consists of three layers. Layer one is the combined fill/alluvium/Trenton gravel (shallow aquifer) which contain the unconfined or water table aquifer. Layer two is the Middle/Lower Clay (clay aquitard) confining unit which is absent across portions of the AOI. Layer three is the Lower Sand (deep aquifer) which is contains a semi-confined to confined aquifer, except where the clay aquitard is missing.
- Most groundwater flow in the shallow aquifer converges on the area where the Lower/Middle clay is absent at the center of the site. Within this area, the shallow groundwater aquifer recharges the deep aquifer.
- In the southern portion of AOI 9, a variable groundwater mound exists. This groundwater mound and its variation of size and extent is most likely attributable to the influence of the fluctuating water elevation in the adjacent Mingo Creek Flood Control Basin; and
- Groundwater flow in the deep aquifer is radially away from the area where the Lower/Middle clay is absent. Radial flow away from this area in the Lower Sand indicates there is gradual vertical groundwater migration through the area where the Lower/Middle clay is absent from the shallow aquifer. Following the radial recharge from the shallow aquifer, groundwater generally flows towards the southwest in the direction of regional flow patterns.

7.3 Compounds of Concern

The following summarizes relevant information concerning COCs by media in AOI 9:

Soil

- Benzene, 1,2,4-TMB, 1,3,5-TMB, ethyl benzene, naphthalene, benzo(a)pyrene, toluene, and lead are the only COCs in surface soil were reported above the PADEP non-residential soil MSCs. These compounds have been delineated where soil boring results were above the soil direct contact MSC or the SSS for lead.
- Lead, 1,2,4-TMB, 1,3,5-TMB, ethyl benzene, total xylenes, naphthalene, toluene, and benzene are the only COCs in subsurface soil were reported above the PADEP non-residential soil MSC or direct contact MSC.

Groundwater

- Benzene, 1,2,4-TMB, 1,3,5-TMB, ethyl benzene, MTBE, toluene, total xylenes, naphthalene, benzo(a)pyrene, benzo(g,h,i)perylene, and lead are the COCs in shallow groundwater that were above their respective PADEP non-residential groundwater MSCs.
- Benzene and MTBE are the only COCs in the Lower Sand that were above their respective PADEP non-residential groundwater MSC.

Indoor Air

- 1,2,4-TMB, benzene, and ethyl benzene are the COCs in indoor air that were detected above EPA Industrial RSLs, but below OSHA PELs during the 2015 indoor air sampling events.

7.4 LNAPL Distribution and LNAPL Mobility

The following summarizes relevant information concerning LNAPL distribution in AOI 9:

- MW-1SRTF is the only monitoring well in AOI 9 with measurable LNAPL. The LNAPL was characterized as moderately weathered gasoline (98% by content) and crude oil (2% by content). MW-1SRTF is a recovery well that was turned off

in 2004 based on the absence of recoverable LNAPL and the absence of LNAPL in surrounding wells.

- The occurrence of LNAPL in MW-1 correlates with the COC concentrations which exceeded MSCs in shallow groundwater in this area.
- Based on the absence of LNAPL in monitoring wells surrounding MW-1, and the LNAPL mobility modeling performed as part of the CCR, the LNAPL is considered to be stable and immobile.

7.5 Fate and Transport of COCs

- No fate and transport modeling was completed for the soil analytical results. The soil-to-groundwater pathway is evaluated through groundwater data.
- A qualitative assessment was completed to assess the potential fate and transport of dissolved petroleum impacts and refine the current CSM for AOI 9.
- For the AOI 9 CSM plume stability assessment, benzene and MTBE, the most mobile of the COCs, were the focus of the evaluation. The plume stability assessments for these compounds indicate that their plumes are either decreasing or stable. See Appendix I.
- Two areas in AOI 9 have been identified as potential source areas for groundwater petroleum impacts. Plume 1 consists of residual LNAPL in soil near several historical recovery wells in the Blending Area located near the southern property boundary. Based on the limited extent of any detected dissolved plume from Plume 1, limited LNAPL mobility, and presence of an underlying clay aquitard, contamination from this area is unlikely to migrate any further to reach any potential receptors.
- Plume 2 is a historically undefined source located in the west-central part of AOI 9. Based on the average groundwater flow direction map and isoconcentration maps for benzene and MTBE a portion of the Plume 2 dissolved plume has migrated to the west beyond the AOI 9 property boundary. However, based on typical groundwater flow conditions, most impacted groundwater from Plume 2 migrates east towards an area where the Lower/Middle clay is absent. As impacted groundwater migrates towards area where the Lower/Middle clay is

absent, the benzene/MTBE impacted groundwater then gradually moves through this area and into the Lower Sand where it migrates to the southwest.

7.6 Potential Migration Pathways and Site Receptors

The following summarizes potential migration pathways and site receptors for AOI 9.

- AOI 9 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 protect against 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 prevent exposure to groundwater that may be encountered in excavations.
- COC concentrations in indoor air of occupied buildings not under positive pressure are below the OSHA PELs.
- LNAPL is contained within the boundaries of AOI 9. The potential direct contact pathway to LNAPL is deemed incomplete based on PES's on-site permit and PPE procedures which prevent exposure to groundwater that may be encountered in excavations.
- Dissolved phase COCs above the groundwater MSCs are not contained within the boundary of AOI 9 or the facility.
- The areas with surface soil concentrations above COC direct contact MSCs and lead above the SSS will be remediated by Evergreen to eliminate the potential exposure pathway. The remediation activities will be discussed in a separate Facility-Wide Cleanup Plan.

8.0 REMEDIAL SYSTEM UPDATE

The SRTF Total Fluids Recovery System in AOI 9 is comprised of three recovery wells (RW-A, RW-B and MW-1). The recovery wells are equipped with pneumatic total fluids pumps. The recovery system was taken off-line in the November 2004 due to the absence of recoverable LNAPL.

9.0 EXPOSURE ASSESSMENT

9.1 Human Health

Evergreen and the EPA previously agreed due to the use of the expected remedies that a human health risk assessment would not be completed for AOI 9 or the facility. A human health risk assessment has been completed for lead in site soils, as summarized in Section 1.4. Soil results that exceed the SSS for lead, or the non-residential statewide health standard (SHS) MSC for the other COCs, are to be addressed through pathway elimination under the SSS or through engineering controls, the details of which will be identified in the Facility-Wide Cleanup Plan. Groundwater results that exceed the non-residential MSC at the point of compliance will be addressed through engineering controls or by pathway elimination under the SSS, and will also be identified in the Facility-Wide Cleanup Plan. Therefore, a human health risk assessment is not anticipated for AOI 9.

9.2 Ecological

The majority of AOI 9 is covered with impervious surfaces as shown in Appendix B. Some areas are covered by soil and gravel; however, they are not likely to serve as a breeding area, migratory stopover, or primary habitat for wildlife. In September 2015, a request was submitted to the Pennsylvania Natural Diversity Inventory (PNDI) database to identify potential endangered, threatened and special concern wildlife near the project area. The PNDI search from September 2015 identified "Potential Impacts" and "Further Review Is Required" with PA Department of Conservation and Natural Resources (DCNR) and the PA Fish & Boat Commission (PAFBC). Langan's coordination and correspondence with the DCNR resulted in a response letter dated November 5, 2015, from the PA DCNR indicating "No Impact Anticipated." AECOM evaluated potential habitats within AOI 9 and along the borders with the Schuylkill River and Mingo Creek. AECOM's coordination and correspondence with the PAFBC resulted in a response letter dated November 10, 2015, from the PAFBC indicating "no direct or indirect impacts to the Mingo Creek or Schuylkill River". The PAFBC response resulted in a "no impact" determination to the Eastern Mudminnow or the Eastern Redbelly Turtle. The DCNR and PAFBC's November 2015 responses are valid for two years, making them valid through November 2017.

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 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, 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.

11.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the completed activities, the following conclusions and recommendations have been developed for AOI 9:

SOIL

- Thirteen surface soil locations exhibited lead concentrations above the SSS or benzo(a)pyrene concentrations above the non-residential soil direct contact MSC. Additional surface soil samples were collected to delineate these locations to below the SSS or MSCs. These areas of surface soil exceedances are delineated and will be further evaluated by Evergreen as part of the forthcoming Facility-wide Cleanup Plan.
- One surface soil sample in the suspected leaded tank bottom area had a result above the SSS for lead. The TCLP result for this sample (BH-15-82) exceeded the EPA maximum concentration of lead for toxicity characteristic. One of four delineation borings for this sample (BH-15-146) exceeded the SSS for lead and TCLP result exceeded the EPA maximum concentration of lead for toxicity characteristic.

This area of surface soil exceedance and subsequent leaded tank bottom material designation is delineated and will be further evaluated by Evergreen as part of the forthcoming Facility-wide Cleanup Plan.

- With regard to the potential direct-contact pathway to deeper subsurface soil (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 facility is considered incomplete because of on-site procedures and PPE requirements that protect onsite workers from exposure. These site requirements will be documented in the Uniform Environmental Covenants Act (UECA) document for the facility or AOI 9.

GROUNDWATER

- Groundwater flow in the alluvium includes a local flow convergence to the center of AOI 9 where the Lower/Middle clay is absent and the surface alluvium is in direct contact with the Lower Sand. On the eastern side of AOI 9, groundwater flow in the alluvium is toward the east and the Schuylkill River. Average groundwater flow in the south side of AOI 9, near the Mingo Creek Flood Control Basin, is away from the basin. Average shallow groundwater flow in the northwest corner of AOI 9 is to the west towards a marshy area at the northwest corner of AOI 9. Groundwater flow in the Lower Sand is generally to the southwest. Slight groundwater mounding in the Lower Sand coincident with the area where the Lower/Middle clay is absent indicates vertical groundwater migration through this area from the alluvium.

- Twelve COCs (lead, 1,2,4-TMB, 1,3,5-TMB, 1,2-dichloroethane, benzene, benzo(a)pyrene, benzo(g,h,i)perylene, ethyl benzene, MTBE, naphthalene, toluene, and xylenes (total)) were detected in groundwater from August 2009 to December 2015 groundwater sampling events at concentrations above their respective used-aquifer, non-residential groundwater MSCs.

- Based on the limited extent of any detected dissolved COCs from Plume 1, limited LNAPL mobility, and presence of an underlying clay aquitard, contamination from this area is unlikely to migrate any further to reach any potential receptors.

- Based on the interpreted average groundwater flow directions and benzene iso-concentration maps from 2009 and 2015, benzene in Plume 2 has likely migrated to

the west beyond the AOI 9 property boundary in both the alluvium and Lower Sand. Benzene migration into the lower sand is due to gradual downward groundwater migration through the area where the Middle/Lower clay is absent and the alluvium is in contact with the Lower Sand.

- Based on the interpreted average groundwater flow directions MTBE iso-concentration maps, MTBE in Plume 2 has likely migrated to the west beyond the AOI 9 property boundary in the Lower Sand after gradually migrating vertically through the area where the Lower/Middle clay is absent.

- Excavations in AOI 9 are governed by PES's permitting procedures which protect against potential exposures to groundwater that could be encountered in an excavation. These site procedures will be recorded in the UECA for the refinery or AOI 9.

VAPOR

- Based on the results of the March and August 2015 indoor and ambient air samples collected from targeted occupied buildings in AOI 9, all COCs in the air samples are below OSHA PELs for the protection of worker health. No additional vapor intrusion indoor air sampling is proposed.

LNAPL

- Based on the absence of LNAPL in monitoring wells surrounding MW-1SRTF, the LNAPL modeling performed as part of the CCR, and the occurrence of LNAPL in MW-1 over time, it appears the LNAPL in MW-1 is stable and immobile. Therefore, no additional LNAPL modeling was completed as part of this RIR.

- The horizontal extent of the LNAPL within AOI 9, relative to the facility boundaries, has been delineated. Based on the LNAPL type, LNAPL modeling results and historic groundwater gauging activities, LNAPL present in AOI 9 is stable and relatively immobile. LNAPL does not appear to have the potential to migrate off-site. LNAPL sheens have not been observed in the Schuylkill River or in the Mingo Creek Flood Control Basin.

- There are no complete direct contact exposure pathway for LNAPL within AOI 9 because of on-site permitting procedures and required PPE.

12.0 LIST OF CONTACTS

Below is the list of contacts associated with the RIR:

Project Manager Responsible for Submittal of RIR:

James Oppenheim, P.E.
Evergreen Resources Management Group, LLC
2 Righter Parkway, Suite 200,
Wilmington, DE 19803
Phone #: 302.477.0192

Lead Consultants Responsible for Submittal of RIR:

Kevin J. McKeever, P.E., P.G.
Langan Engineering and Environmental Services
30 South 17th Street, Suite 1300
Philadelphia, PA 19103
Phone #: 215.491.6500

Tiffani L. Doerr, P.G.
Aquaterra Technologies, Inc.
122 S Church Street,
West Chester, PA 19382
Phone #: 610.431.5733

13.0 SIGNATURES

The following parties are participating in the remediation at this time and are seeking relief from liability under Act 2 of 1995:



James Oppenheim
Evergreen Resources Management Group, LLC

This Act 2 RIR has been prepared in accordance with the final provisions of Act 2 and the June 8, 2002 Land Recycling Program Technical Guidance Manual.

14.0 REFERENCES

Greenman, W.A., Rima, D.R., Lockwood, W.N., and Meisler, H, 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania. Pennsylvania Geological Survey Bulletin W 13, Fourth Series

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Pennsylvania Department of Environmental Protection, 2003, Document Number 253-0300-100, Land Recycling Program Technical Guidance Manual – Section IV.A.4. Vapor Intrusion Into Buildings From Groundwater and Soil Under the Act 2 Statewide Health Standard.

Langan, August 24, 2007, Site Characterization Report AOI 9, Philadelphia Refinery, Sunoco, Inc. (R&M), Philadelphia, Pennsylvania.

Langan, December 11, 2011, Site Characterization/Remedial Investigation Report/Cleanup Plan AOI 9, Philadelphia Refinery, Sunoco, Inc. (R&M), Philadelphia, Pennsylvania.

Stantec, March 20, 2013, Evaluation of Specific Volatile Organic Compounds in Occupied buildings at the Former Sunoco Philadelphia Refinery, Philadelphia, Pennsylvania.

Langan, February 24, 2015, Human Health Risk Assessment Report, Philadelphia Energy Solutions Refining & Marketing, LLC, Sunoco Partners Marketing & Terminals, LP, and Marcus Hook Industrial Complex.

TABLES

Table 1
Constituents of Concern
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

METALS	CAS No.
Lead (Total)	7439-92-1

VOCs	CAS No.
1,2-Dichloroethane	107-06-2
1,2,4-Trimethylbenzene	95-63-6
1,3,5-Trimethylbenzene	108-67-8
Benzene	71-43-2
Cumene	98-82-8
Ethylbenzene	100-41-4
Ethylene Dibromide (EDB)	106-93-4
Methyl Tertiary Butyl Ether	1634-04-4
Toluene	108-88-3
Xylene (Total)	1330-20-7

SVOCs/ PAHs	CAS No.
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Chrysene	218-01-9
Fluorene	86-73-7
Naphthalene	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0

Notes:

1. Constituents are from Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E (pgs. 29-30) of PADEP Document, Closure Requirements for Underground Storage Tank Systems, effective April 1, 1998 and the March 18, 2008 revised PADEP Petroleum Short List. In May 2009, two additional COCs, 1,2,4-trimethylbenze (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs by Evergreen 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.

Table 2
Existing Well Summary
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Well ID	Former Well ID[2]	AOI #	Northing	Easting	Well Type[3]	Well Classification (Shallow, Intermediate, Deep)	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[1]							
										Well Completion Depth (ft. bgs)	Well Diameter (in)	Top of Inner Casing Elevation (ft. msl) (NAVD88)	Ground Surface Elevation[1] (ft.) (NAVD88)	Top of Screen Elevation (ft) (NAVD88)	Bottom of Screen Elevation (ft) (NAVD88)	Depth to Screen (ft. bgs)	Screen Length (ft.)
AOI - 9 (Schuylkill River Tank Farm)																	
S-27 SRTF	S-27	9	--	--	Monitoring Well	Shallow/Intermediate	--	--	--	--	--	--	--	--	--	--	--
S-74 SRTF	S-74	9	216177.890	2679161.000	Monitoring Well	Shallow/Intermediate	Y	Y	2/21/86	14	4	14.54	11.99	7.99	-2.01	4	10
S-74D1 SRTF	--	9	216087.004	2679175.318	Monitoring Well	Deep	--	--	--	86.6[6]	4[6]	12.582	10.851	--	--	--	--
S-74D2 SRTF	--	9	216095.384	2679122.082	Monitoring Well	Deep	Y	Y	7/14/09	42	4	13.281	10.669	-21.331	-31.331	32	10
S-75 SRTF	S-75	9	215842.410	2678408.230	Monitoring Well	Shallow/Intermediate	Y	Y	2/21/86	15.5	4	11.53	11.05	5.55	-4.45	5.5	10
S-76 SRTF	S-76	9	216803.700	2678250.170	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/21/86	14	4	6.96	6.64	2.64	-7.36	4	10
S-76D SRTF	--	9	216806.470	2678240.930	Monitoring Well	Deep	--	--	--	83.5[6]	2[6]	8.63	6.51	--	--	--	--
S-77 SRTF	S-77	9	217723.800	2678019.110	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/20/86	15	4	4.35	3.45	-1.55	-11.55	5	10
S-78 SRTF	S-78	9	216834.250	2677723.940	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/21/86	14	4	1.5	0.64	-3.36	-13.36	4	10
S-79 SRTF	S-79	9	215991.820	2677551.200	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/21/86	14.5	4	1.84	1.69	-2.81	-12.81	4.5	10
S-80 SRTF	S-80	9	215206.980	2677375.750	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/21/86	15	4	2.57	1.04	-3.71	-13.71	4.75	10
S-81 SRTF	S-81	9	216805.680	2677041.990	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/21/86	13.25	4	1.46	-0.59	-3.84	-13.84	3.25	10
S-82 SRTF	S-82	9	217918.130	2677316.360	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/25/86	13	4	1.11	-0.07	-3.07	-13.07	3	10
S-83 SRTF	S-83	9	218241.390	2677509.710	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	2/22/86	13	4	2.38	1.27	-1.73	-11.73	3	10
S-109 SRTF	--	9	217894.451	2677084.468	Monitoring Well	Shallow/Intermediate	Y	Y	7/1/09	12	2	2.353	0.241	-1.759	-11.759	2	10
S-110 SRTF	--	9	217259.253	2676977.149	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/22/09	12	4	3.494	0.941	-1.059	-11.059	2	10
S-114 SRTF	--	9	216434.573	2676977.571	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/30/09	15	4	2.159	-0.441	-5.441	-15.441	5	10
S-122 SRTF	--	9	216572.738	2677653.397	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	7/1/09	15	4	2.420	1.041	-1.959	-13.959	3	12
S-129 SRTF	--	9	216640.251	2678837.061	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/24/09	15	4	11.346	8.399	3.399	-6.601	5	10
S-104 SRTF	S-104	9	--	--	Monitoring Well	Shallow/Intermediate	Y	Y	10/3/86	15	4	11.97	15.05	10.05	0.05	5	10
S-105 SRTF	S-105	9	215474.480	2676792.830	Monitoring Well	Shallow/Intermediate	Y	Y	10/7/86	12.5	4	1.95	-1.21	-3.71	-13.71	2.5	10
S-106 SRTF	S-106	9	214765.250	2677605.420	Monitoring Well	Shallow/Intermediate	Y	Y	10/2/86	13	4	10.02	7.17	4.17	-5.83	3	10
S-106D SRTF	--	9	214778.370	2677609.520	Monitoring Well	Deep	--	--	--	91[6]	2[6]	9.46	7.37	--	--	--	--
S-107 SRTF	S-107	9	--	--	Monitoring Well	Shallow/Intermediate	Y	Y	11/10/94	15	4	14.48	11.31	6.31	-3.69	5	10
S-108 SRTF	--	9	218321.234	2677666.572	Monitoring Well	Shallow/Intermediate	Y	Y	6/17/09	12	4	4.313	1.066	-0.934	-10.934	2	10
S-110D SRTF	--	9	217259.296	2676986.318	Monitoring Well	Deep	Y	Y	6/23/15	60	4	2.670	0.319	-39.681	-59.681	40	20
S-111 SRTF	--	9	217432.087	2677273.189	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/23/09	15	4	0.776	1.355	-3.645	-13.645	5	10
S-112 SRTF	--	9	216983.650	2677255.771	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/22/09	12	4	1.515	1.407	-3.407	-13.407	2	10
S-113 SRTF	--	9	216800.094	2676914.895	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/19/09	15	4	3.020	0.433	-4.567	-14.567	5	10
S-115 SRTF	--	9	216194.161	2676754.377	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/4/09	15	4	2.748	0.200	-4.8	-14.8	5	10
S-115D SRTF	--	9	216206.278	2676754.860	Monitoring Well	Deep	Y	Y	6/12/15	58	4	2.416	-0.300	-38.2995	-96.2995	38	58
S-116 SRTF	--	9	215941.827	2676903.275	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/4/09	15	4	0.866	-1.682	-6.682	-16.682	5	10
S-117 SRTF	--	9	215734.945	2676674.754	Monitoring Well	Shallow/Intermediate	Y	Y	6/3/09	15	4	2.873	0.523	-4.477	-14.477	5	10
S-118 SRTF	--	9	215161.136	2676677.720	Monitoring Well	Shallow/Intermediate	Y	Y	6/3/09	15	4	3.632	1.022	-3.978	-13.978	5	10
S-118D SRTF	--	9	215159.799	2676690.243	Monitoring Well	Deep	Y	Y	6/19/15	79.5	4	3.006	0.659	-58.8413	-138.3413	59.5	79.5
S-119 SRTF	--	9	214808.507	2676922.941	Monitoring Well	Shallow/Intermediate	Y	Y	6/11/09	12	4	2.355	-0.619	-1.619	-12.619	1	11
S-120 SRTF	--	9	215265.133	2677550.794	Monitoring Well	Shallow/Intermediate	Y	Y	6/5/09	15	4	12.068	9.457	4.457	-5.543	5	10
S-120D SRTF	--	9	215267.387	2677542.246	Monitoring Well	Deep	Y	Y	6/12/09	35	4	12.366	9.350	-15.65	-25.65	25	10
S-121 SRTF	--	9	215710.024	2677485.962	Monitoring Well	Shallow/Intermediate	Y	Y	6/24/09	15	4	1.009	1.463	-3.537	-13.537	5	10
S-123 SRTF	--	9	216789.990	2677861.259	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/29/09	15	4	2.420	2.944	0.944	-12.056	2	13
S-124 SRTF	--	9	216398.433	2677901.078	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/11/09	12	4	7.876	4.938	2.938	-7.062	2	10
S-125 SRTF	--	9	216114.464	2677820.289	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/30/09	12	4	7.181	4.626	2.626	-7.374	2	10
S-126 SRTF	--	9	215066.858	2677909.915	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/4/09	15	4	11.829	9.210	4.21	-5.79	5	10
S-127 SRTF	--	9	215607.335	2678537.389	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/10/09	15	4	12.128	9.541	6.541	-5.459	3	12
S-128 SRTF	--	9	216040.095	2678633.585	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/10/09	15	4	13.314	10.341	7.341	-4.659	3	12
S-130 SRTF	--	9	215534.299	2678986.149	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/29/09	12	4	11.413	8.539	6.539	-3.461	2	10
S-131 SRTF	--	9	215919.278	2679372.329	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	7/20/09	16	4	8.805	6.468	0.468	-9.532	6	10
S-132 SRTF	--	9	216093.960	2679907.044	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/25/09	12	4	8.703	5.969	3.969	-6.031	2	10
S-133 SRTF	--	9	218139.769	2678047.078	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/8/09	15	4	4.677	2.058	-2.942	-12.942	5	10
S-134 SRTF	--	9	217578.495	2678432.568	Monitoring Well	Shallow/Intermediate/Deep	Y	Y	6/18/09	15	4	10.335	10.676	5.676	-4.324	5	10
S-135 SRTF	--	9	216461.823	2676810.093	Monitoring Well	Shallow	Y	Y	6/16/15	20	4	2.178	-0.589	-5.5886	-25.5886	5	20
S-136 SRTF	--	9	218406.192	2677243.791	Monitoring Well	Shallow	Y	Y	7/27/15	15	2	4.951	1.549	0.5489	-14.4511	1	15
MW-1 SRTF	MW-1	9	215031.720	2677759.010	Monitoring Well	Shallow/Intermediate	--	--	--	16.6[6]	4[6]	10.08	8.1	--	--	--	--
MW-2 SRTF	MW-2	9	215020.030	2677732.090	Monitoring Well	Shallow/Intermediate	--	--	--	12[6]	4[6]	7.33	7.71	--	--	--	--
MW-3 SRTF	MW-3	9	215010.900	2677753.470	Monitoring Well	Shallow/Intermediate	--	--	--	--	--	9.88	7.22	--	--	--	--
RW-A	--	9	215502.450	2676803.040	Recovery Well - Inactive	Shallow/Intermediate				11.6[6]	6[6]	-1.87	-1.42				
RW-B	--	9	215039.530	2677745.510	Recovery Well - Active	Shallow/Intermediate	--	--	--	12.6[6]	6[6]	7.4	7.78	--	--	--	--
RW-B5	--	9	215112.490	2677731.800	Recovery Well - Inactive	Shallow/Intermediate	--	--	--	13.6[6]	4[6]	7.84	8.52	--	--	--	--
WP-1	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/9/92	15	4	5.79	--	--	--	4	10
WP-10	--	9	215290.938	2682063.085	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/9/92	15	2	10.16	--	--	--	5	10
WP-2	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/9/92	15	4	5.83	--	--	--	5	10
WP-3	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/3/92	15	2	5.16	--	--	--	3	11
WP-4	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/3/92	13	2	--	--	--	--	2	10
WP-5	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/3/92	15	2	--	--	--	--	5	9
WP-6	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	5/28/92	15	2	--	--	--	--	5	9
WP-7	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/3/92	15	2	--	--	--	--	5	10
WP-8	--	9	215136.674	2682440.816	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/9/92	15	2	6.99	--	--	--	5	10
WP-9	--	9	215223.177	2682225.999	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	6/3/92	15	2	8.57	--	--	--	5	10
WPA-1	--	9	215456.360	2676796.560	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/16/93	12	2	2.73	-1.03	-2.53	-12.53	1.5	10
WPA-2	--	9	215475.790	2676772.670	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/16/93	12	2	2.69	-1.93	-3.43	-13.43	1.5	10
WPA-3	--	9	215490.960	2676782.800	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/16/93	12	2	3.25	-1.94	-3.44	-13.44	1.5	10
WPA-5	--	9	215578.500	2676815.810	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/16/93	12	2	2.48	-1.67	-2.67	-12.67	1	10
WPB-1	--	9	--	--	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/17/93	10.5	2	13.61	--	--	--	0.5	10
WPB-2	--	9	215057.330	2677705.610	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/17/93	12	2	11.3	7.91	5.91	-4.09	2	10
WPB-3	--	9	214997.260	2677732.580	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/17/93	12	2	7.16	7.35	5.35	-4.65	2	10
WPB-4	--	9	214999.490	2677774.580	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/18/93	12	2	12.9	7.51	5.51	-4.49	2	10
WPB-5	--	9	215114.050	2677727.880	Monitoring Well Point Location	Shallow/Intermediate	Y	Y	2/22/93	12	2	12.32	8.23	6.23	-63.77	2	70
WPB-6	--	9	--	--	Monitoring Well Point Location	--	--	--	--	--	--	--	11.81	--	--	--	--
WPB-7	--	9	--	--	Monitoring Well Point Location	--	--	--	--	--	--	--	11.52	--	--	--	--

-- Data could not be located or determined based on available reports

Abandoned/destroyed wells.

NOTES:

AOI - Area of Interest
ft. - feet
bgs - below ground surface
in. - inches
msl - elevation relative to mean sea level

1. Well construction details were taken directly from well boring logs provided by Handex, Secor, Aquaterra or collected from available historic reports. Where no well boring logs exist, no well construction or lithologic data is listed.
2. Former well IDs were derived from handwritten notes on the logs themselves or the referenced report.
3. Well type was chosen based on the formation in which the well was screened. Shallow = screened in Fill/Alluvium; Intermediate = screened in Trenton Gravel; Deep = screened in Farrington Sand
4. Wells unable to be located.
5. Wells damaged.
6. Well completion depth and well diameter obtained from Aquaterras August 2009 gauging event.

Table 3a
Summary of AOI 9 Groundwater and LNAPL Elevations August 2015
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Monitoring Point ID	AOI	Well Classification	Specific Gravity (g/cc) Used for Correction		Notes	Total Well Depth (ft btic)	Depth to Product (ft btic)	Depth to Water[2] (ft btic)	LNAPL Thickness (ft)	LNAPL Elevation (ft amsl)	GW Elevation (ft amsl)	Corrected GWElevation (ft amsl)	TIC (ft amsl)
			S.G.[1]	Source									
AOI 9													
MW-1SRTF	AOI 9	Shallow/Intermediate	**0.7705**	MW-1SRTF		16.60	3.11	3.14	0.03	4.45	4.42	4.44	7.56
MW-2SRTF	AOI 9	Shallow/Intermediate				12.00	NP	3.44			3.89	3.89	7.33
MW-3SRTF	AOI 9	Shallow/Intermediate				NM	NP	2.98			4.01	4.01	6.99
RW-A	AOI 9	Shallow/Intermediate				11.60	NP	NM			NM	NM	-1.87
RW-B	AOI 9	Shallow/Intermediate				12.60	NP	3.48			3.92	3.92	7.40
RW-B5	AOI 9	Shallow/Intermediate				13.60	NP	NM			NM	NM	7.84
S-74SRTF	AOI 9	Shallow/Intermediate				16.00	NP	NM			NM	NM	14.54
S-74D2SRTF	AOI 9	Deep				44.40	NP	17.61			-4.52	-4.52	13.09
S-74D1SRTF	AOI 9	Deep				83.60	NP	21.08			-8.34	-8.34	12.74
S-75SRTF	AOI 9	Shallow/Intermediate				17.00	NP	8.54			2.99	2.99	11.53
S-76SRTF	AOI 9	Shallow/Intermediate				13.60	NP	7.35			-0.39	-0.39	6.96
S-76DSRTF	AOI 9	Deep				83.50	NP	17.07			-8.44	-8.44	8.63
S-77SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	12.52			-8.17	-8.17	4.35
S-78SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	10.11			-8.61	-8.61	1.50
S-79SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	9.30			-7.46	-7.46	1.84
S-80SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	4.10			-1.53	-1.53	2.57
S-81SRTF	AOI 9	Shallow/Intermediate/Deep				13.00	NP	9.95			-8.49	-8.49	1.46
S-82SRTF	AOI 9	Shallow/Intermediate/Deep				13.00	NP	1.05			0.06	0.06	1.11
S-83SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	6.62			-4.24	-4.24	2.38
S-105SRTF	AOI 9	Shallow/Intermediate				15.00	NP	7.92			-5.97	-5.97	1.95
S-106SRTF	AOI 9	Shallow/Intermediate				16.00	NP	6.04			3.98	3.98	10.02
S-106DSRTF	AOI 9	Deep				91.00	NP	18.61			-9.15	-9.15	9.46
WPA-1	AOI 9	Shallow/Intermediate				7.60	NP	NM			NM	NM	2.73
WPA-2	AOI 9	Shallow/Intermediate				13.60	NP	NM			NM	NM	2.69
WPA-3	AOI 9	Shallow/Intermediate				13.00	NP	NM			NM	NM	3.25
WPA-5	AOI 9	Shallow/Intermediate				8.40	NP	NM			NM	NM	2.48
WPB-2	AOI 9	Shallow/Intermediate				9.00	NP	NM			NM	NM	11.30
WPB-4	AOI 9	Shallow/Intermediate				14.00	NP	3.98			4.06	4.06	8.04
WPB-5	AOI 9	Shallow/Intermediate				13.00	NP	NM			NM	NM	12.32
S-108SRTF	AOI 9	Shallow/Intermediate				16.40	NP	6.25			-1.94	-1.94	4.31
S-109SRTF	AOI 9	Shallow/Intermediate				15.10	NP	NM			NM	NM	2.35
S-110SRTF	AOI 9	Shallow/Intermediate/Deep				13.30	NP	11.00			-7.51	-7.51	3.49
S-110DSRTF	AOI 9	Deep				65.00	NP	11.2			-8.53	-8.53	2.67
S-111SRTF	AOI 9	Shallow/Intermediate/Deep				15.90	NP	8.94			-8.16	-8.16	0.78
S-112SRTF	AOI 9	Shallow/Intermediate/Deep				18.50	NP	10.21			-8.70	-8.70	1.52
S-113SRTF	AOI 9	Shallow/Intermediate/Deep				18.20	NP	11.85			-8.83	-8.83	3.02
S-114SRTF	AOI 9	Shallow/Intermediate/Deep				19.10	NP	10.90			-8.74	-8.74	2.16
S-115SRTF	AOI 9	Shallow/Intermediate/Deep				19.20	NP	11.77			-9.02	-9.02	2.75
S-115DSRTF	AOI 9	Deep				61.00	NP	11.38			-8.96	-8.96	2.42
S-116SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	9.85			-8.98	-8.98	0.87
S-117SRTF	AOI 9	Shallow/Intermediate				17.40	NP	11.61			-8.74	-8.74	2.87
S-118SRTF	AOI 9	Shallow/Intermediate				17.20	NP	12.50			-8.87	-8.87	3.63
S-118DSRTF	AOI 9	Deep				78.00	NP	12.35			-9.34	-9.34	3.01
S-119SRTF	AOI 9	Shallow/Intermediate				14.50	NP	4.16			-1.81	-1.81	2.36
S-120SRTF	AOI 9	Shallow/Intermediate				18.50	NP	9.38			2.69	2.69	12.07
S-120DSRTF	AOI 9	Deep				36.00	NP	21.45			-9.08	-9.08	12.37
S-121SRTF	AOI 9	Shallow/Intermediate				14.50	NP	9.97			-8.96	-8.96	1.01
S-122SRTF	AOI 9	Shallow/Intermediate/Deep				15.50	NP	9.21			-6.79	-6.79	2.42
S-123SRTF	AOI 9	Shallow/Intermediate/Deep				15.50	NP	NM			NM	NM	2.42
S-124SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	7.42			0.46	0.46	7.88
S-125SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	5.74			1.44	1.44	7.18
S-126SRTF	AOI 9	Shallow/Intermediate/Deep				18.00	NP	7.54			4.29	4.29	11.83
S-127SRTF	AOI 9	Shallow/Intermediate/Deep				18.00	NP	8.42			3.71	3.71	12.13
S-128SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	10.41			2.90	2.90	13.31
S-129SRTF	AOI 9	Shallow/Intermediate/Deep				19.00	NP	7.94			3.41	3.41	11.35
S-130SRTF	AOI 9	Shallow/Intermediate/Deep				16.90	NP	9.09			2.32	2.32	11.41
S-131SRTF	AOI 9	Shallow/Intermediate/Deep				18.10	NP	4.71			4.10	4.10	8.81
S-132SRTF	AOI 9	Shallow/Intermediate/Deep				15.30	NP	6.44			2.26	2.26	8.70
S-133SRTF	AOI 9	Shallow/Intermediate/Deep				8.20	NP	4.40			0.28	0.28	4.68
S-134SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	9.47			0.87	0.87	10.34
S-135SRTF	AOI 9	Shallow/Intermediate				22.58	NP	10.89			-8.71	-8.71	2.18
S-136SRTF	AOI 9	Shallow/Intermediate				17.60	NP	6.98			-2.03	-2.03	4.95

Notes:
1. Specific Gravity (S.G.) values were determined from LNAPL samples taken by Aquaterra in 2008 or from samples collected by SECOR in 1999-2000.
2. Depth to water and depth to LNAPL provided by Aquaterra August 2009.
3. Well was regauged on September 23, 2009 to confirm product thickness.

AOI = Area of Interest
g/cc = grams per cubic centimeter
LNAPL = Light Non-Aqueous Phase Liquid
ft amsl = Feet Above Mean Sea Level
GW = Groundwater
NM = Not Measured
NP = No Product
ft btic = Feet Below Top of Inner Casing

Table 3b
Summary of AOI 9 Groundwater and LNAPL Elevations November 2015
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Monitoring Point ID	AOI	Well Classification	Specific Gravity (g/cc) Used for Correction		Notes	Total Well Depth (ft btic)	Depth to Product (ft btic)	Depth to Water[2] (ft btic)	LNAPL Thickness (ft)	LNAPL Elevation (ft amsl)	GW Elevation (ft amsl)	Corrected GWElevation (ft amsl)	TIC (ft amsl)
			S.G.[1]	Source									
AOI 9													
MW-1SRTF	AOI 9	Shallow/Intermediate	**0.7705**	MW-1SRTF		16.60	3.55	3.96	0.41	4.01	3.60	3.92	7.56
MW-2SRTF	AOI 9	Shallow/Intermediate				12.00	NP	3.81			3.52	3.52	7.33
MW-3SRTF	AOI 9	Shallow/Intermediate				NA	NP	3.54			3.45	3.45	6.99
RW-A	AOI 9	Shallow/Intermediate				11.60	NP	0.67			-2.54	-2.54	-1.87
RW-B	AOI 9	Shallow/Intermediate				12.60	NP	4.02			3.38	3.38	7.40
RW-B5	AOI 9	Shallow/Intermediate				13.60	NP	4.41			3.43	3.43	7.84
S-74SRTF	AOI 9	Shallow/Intermediate				16.00	NP	NM			NM	NM	14.54
S-74D2SRTF	AOI 9	Deep				44.40	NP	NM			NM	NM	13.09
S-74D1SRTF	AOI 9	Deep				83.60	NP	21.72			-8.98	-8.98	12.74
S-75SRTF	AOI 9	Shallow/Intermediate				17.00	NP	NM			NM	NM	11.53
S-76SRTF	AOI 9	Shallow/Intermediate				13.60	NP	NM			NM	NM	6.96
S-76DSRTF	AOI 9	Deep				83.50	NP	17.4			-8.77	-8.77	8.63
S-77SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	12.9			-8.55	-8.55	4.35
S-78SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	10.4			-8.90	-8.90	1.50
S-79SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	9.29			-7.45	-7.45	1.84
S-80SRTF	AOI 9	Shallow/Intermediate/Deep				15.00	NP	3.91			-1.34	-1.34	2.57
S-81SRTF	AOI 9	Shallow/Intermediate/Deep				13.00	NP	10.3			-8.84	-8.84	1.46
S-82SRTF	AOI 9	Shallow/Intermediate/Deep				13.00	NP	1.35			-0.24	-0.24	1.11
S-83SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	4.50			-2.12	-2.12	2.38
S-105SRTF	AOI 9	Shallow/Intermediate				15.00	NP	4.37			-2.42	-2.42	1.95
S-106SRTF	AOI 9	Shallow/Intermediate				16.00	NP	6.35			3.67	3.67	10.02
S-106DSRTF	AOI 9	Deep				91.00	NP	19			-9.54	-9.54	9.46
WPA-1	AOI 9	Shallow/Intermediate				7.60	NP	5.67			-2.94	-2.94	2.73
WPA-2	AOI 9	Shallow/Intermediate				13.60	NP	4.93			-2.24	-2.24	2.69
WPA-3	AOI 9	Shallow/Intermediate				13.00	NP	5.89			-2.64	-2.64	3.25
WPA-5	AOI 9	Shallow/Intermediate				8.40	NP	4.82			-2.34	-2.34	2.48
WPB-2	AOI 9	Shallow/Intermediate				9.00	NP	7.81			3.49	3.49	11.30
WPB-4	AOI 9	Shallow/Intermediate				14.00	NP	4.69			3.35	3.35	8.04
WPB-5	AOI 9	Shallow/Intermediate				13.00	NP	9.11			3.21	3.21	12.32
S-108SRTF	AOI 9	Shallow/Intermediate				16.40	NP	5.09			-0.78	-0.78	4.31
S-109SRTF	AOI 9	Shallow/Intermediate				15.10	NP	3.1			-0.75	-0.75	2.35
S-110SRTF	AOI 9	Shallow/Intermediate/Deep				13.30	NP	11.47			-7.98	-7.98	3.49
S-110DSRTF	AOI 9	Deep				65.00	NP	11.53			-8.86	-8.86	2.67
S-111SRTF	AOI 9	Shallow/Intermediate/Deep				15.90	NP	9.43			-8.65	-8.65	0.78
S-112SRTF	AOI 9	Shallow/Intermediate/Deep				18.50	NP	10.63			-9.12	-9.12	1.52
S-113SRTF	AOI 9	Shallow/Intermediate/Deep				18.20	NP	12.10			-9.08	-9.08	3.02
S-114SRTF	AOI 9	Shallow/Intermediate/Deep				19.10	NP	11.27			-9.11	-9.11	2.16
S-115SRTF	AOI 9	Shallow/Intermediate/Deep				19.20	NP	11.98			-9.23	-9.23	2.75
S-115DSRTF	AOI 9	Deep				61.00	NP	11.65			-9.23	-9.23	2.42
S-116SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	10.08			-9.21	-9.21	0.87
S-117SRTF	AOI 9	Shallow/Intermediate				17.40	NP	11.05			-8.18	-8.18	2.87
S-118SRTF	AOI 9	Shallow/Intermediate				17.20	NP	12.36			-8.73	-8.73	3.63
S-118DSRTF	AOI 9	Deep				78.00	NP	12.6			-9.59	-9.59	3.01
S-119SRTF	AOI 9	Shallow/Intermediate				14.50	NP	3.75			-1.40	-1.40	2.36
S-120SRTF	AOI 9	Shallow/Intermediate				18.50	NP	9.47			2.60	2.60	12.07
S-120DSRTF	AOI 9	Deep				36.00	NP	21.8			-9.43	-9.43	12.37
S-121SRTF	AOI 9	Shallow/Intermediate				14.50	NP	9.64			-8.63	-8.63	1.01
S-122SRTF	AOI 9	Shallow/Intermediate/Deep				15.50	NP	9.6			-7.18	-7.18	2.42
S-123SRTF	AOI 9	Shallow/Intermediate/Deep				15.50	NP	NM			NM	NM	2.42
S-124SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	7.87			0.01	0.01	7.88
S-125SRTF	AOI 9	Shallow/Intermediate/Deep				14.00	NP	6.12			1.06	1.06	7.18
S-126SRTF	AOI 9	Shallow/Intermediate/Deep				18.00	NP	NM			NM	NM	11.83
S-127SRTF	AOI 9	Shallow/Intermediate/Deep				18.00	NP	5.96			6.17	6.17	12.13
S-128SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	11.06			2.25	2.25	13.31
S-129SRTF	AOI 9	Shallow/Intermediate/Deep				19.00	NP	NM			NM	NM	11.35
S-130SRTF	AOI 9	Shallow/Intermediate/Deep				16.90	NP	9.2			2.21	2.21	11.41
S-131SRTF	AOI 9	Shallow/Intermediate/Deep				18.10	NP	NM			NM	NM	8.81
S-132SRTF	AOI 9	Shallow/Intermediate/Deep				15.30	NP	7.25			1.45	1.45	8.70
S-133SRTF	AOI 9	Shallow/Intermediate/Deep				8.20	NP	3.57			1.11	1.11	4.68
S-134SRTF	AOI 9	Shallow/Intermediate/Deep				17.50	NP	9.63			0.71	0.71	10.34
S-135SRTF	AOI 9	Shallow/Intermediate				22.58	NP	11.52			-9.34	-9.34	2.18
S-136SRTF	AOI 9	Shallow/Intermediate				17.60	NP	5.73			-0.78	-0.78	4.95

Notes:
1. Specific Gravity (S.G.) values were determined from LNAPL samples taken by Aquaterra in 2008 or from samples collected by SECOR in 1999-2000.
2. Depth to water and depth to LNAPL provided by Aquaterra August 2009.
3. Well was regauged on September 23, 2009 to confirm product thickness.

AOI = Area of Interest
g/cc = grams per cubic centimeter
LNAPL = Light Non-Aqueous Phase Liquid
ft amsl = Feet Above Mean Sea Level
GW = Groundwater
NM = Not Measured
NP = No Product
ft btic = Feet Below Top of Inner Casing

Table 4a
Summary of PADEP Inspection Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-Residential Soil MSCs	Location ID	BHSRTF-09-10a			BHSRTF-09-10b			BHSRTF-09-10c			BHSRTF-09-11a			BHSRTF-09-11b			BHSRTF-09-11c			BHSRTF-09-11d		
			Sample Name	BHSRTF-09-10a			BHSRTF-09-10b			BHSRTF-09-10c			BHSRTF-09-11a			BHSRTF-09-11b			BHSRTF-09-11c			BHSRTF-09-11d		
			Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil		
			Sample Interval	0-2			0-2			0-2			0-2			0-2			0-2			0-2		
			Sample Date	7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009		
Volatile Organic Compounds			Unit	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Benzene	71-43-2	500	ug/kg	ND	U	240	ND	U	310	ND	U	290	ND	U	240	ND	U	230	ND	U	270	ND	U	310
Semi Volatile Organic Compounds																								
Anthracene	120-12-7	350000	ug/kg	330		200	4000		2100	5500		2100	ND	U	1900	ND	U	200	ND	U	210	ND	U	240
Benzo(A)Anthracene	56-55-3	110000	ug/kg	1500		200	2300		2100	ND	U	2100	ND	U	1900	270		200	ND	U	210	ND	U	240
Benzo(A)Pyrene	50-32-8	11000	ug/kg	1600		200	ND	U	2100	2400		2100	ND	U	1900	320		200	ND	U	210	ND	U	240
Benzo(B)Fluoranthene	205-99-2	110000	ug/kg	2000		200	2300		2100	2400		2100	ND	U	1900	370		200	ND	U	210	ND	U	240
Benzo(G,H,I)Perylene	191-24-2	180000	ug/kg	1200		200	ND	U	2100	ND	U	2100	ND	U	1900	260		200	280		210	ND	U	240
Chrysene	218-01-9	230000	ug/kg	1500		200	3800		2100	4800		2100	ND	U	1900	270		200	ND	U	210	ND	U	240
Fluorene	86-73-7	3800000	ug/kg	ND	U	200	4300		2100	5500		2100	ND	U	1900	ND	U	200	ND	U	210	ND	U	240
Naphthalene	91-20-3	25000	ug/kg	ND	U	240	920		310	9900		290	ND	U	240	ND	U	230	ND	U	270	ND	U	310
Phenanthrene	85-01-8	10000000	ug/kg	1200		200	15000		2100	22000		2100	ND	U	1900	200		200	ND	U	210	350		240
Pyrene	129-00-0	2200000	ug/kg	1800		200	6500		2100	6500		2100	ND	U	1900	380		200	ND	U	210	ND	U	240
General Chemistry																								
Moisture	MOIST	NC	%	18.2		0.5	21.9		0.5	21.6		0.5	12.6		0.5	14.6		0.5	19.6		0.5	30.3		0.5

Notes:
PADEP - Pennsylvania Department of Environmental Protection
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
MSC - PADEP's Medium Specific Concentration for Soil
RL - Reporting Limit
ND - Not Detected
NA - Not Analyzed
TDS - Total Dissolved Solids
NC - No Criteria
(1) All soil samples collected and analyzed were unsaturated.

Qualifiers:
Q - Qualifier
U - The analyte was analyzed but not detected

Exceedance Summary:
10 - Result exceeds the PADEP Non-Residential Soil MSC
10 - RL exceeds the PADEP Non-Residential Soil MSC

Table 4a
Summary of PADEP Inspection Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-Residential Soil MSCs	Location ID	BHSRTF-09-12a			BHSRTF-09-12b			BHSRTF-09-12c			BHSRTF-09-12d			BHSRTF-09-12e			BHSRTF-09-13a			BHSRTF-09-13b		
			Sample Name	BHSRTF-09-12a			BHSRTF-09-12b			BHSRTF-09-12c			BHSRTF-09-12d			BHSRTF-09-12e			BHSRTF-09-13a			BHSRTF-09-13b		
			Sample Matrix	Soil			Soil			Soil			Soil			Soil			Soil			Soil		
			Sample Interval	0-2			0-2			0-2			0-2			0-2			0-2			0-2		
			Sample Date	7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009			7/20/2009		
Volatile Organic Compounds			Unit	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Benzene	71-43-2	500	ug/kg	ND	U	270	ND	U	360	ND	U	260	ND	U	230	ND	U	220	ND	U	280	ND	U	270
Semi Volatile Organic Compounds																								
Anthracene	120-12-7	350000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Benzo(A)Anthracene	56-55-3	110000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Benzo(A)Pyrene	50-32-8	11000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Benzo(B)Fluoranthene	205-99-2	110000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Benzo(G,H,I)Perylene	191-24-2	180000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	250		190	ND	U	190	ND	U	180
Chrysene	218-01-9	230000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	2200		2000	ND	U	190	ND	U	190	ND	U	180
Fluorene	86-73-7	3800000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Naphthalene	91-20-3	25000	ug/kg	ND	U	270	ND	U	360	ND	U	260	ND	U	230	ND	U	220	ND	U	280	ND	U	270
Phenanthrene	85-01-8	10000000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	ND	U	2000	ND	U	190	ND	U	190	ND	U	180
Pyrene	129-00-0	2200000	ug/kg	ND	U	1900	ND	U	2400	ND	U	2000	3200		2000	ND	U	190	ND	U	190	ND	U	180
General Chemistry																								
Moisture	MOIST	NC	%	12.4		0.5	30.1		0.5	17.9		0.5	16.6		0.5	12		0.5	12		0.5	6.6		0.5

Notes:
PADEP - Pennsylvania Department of Environmental Protection
ug/kg - microgram per kilogram
mg/kg - milligram per kilogram
MSC - PADEP's Medium Specific Concentration for Soil
RL - Reporting Limit
ND - Not Detected
NA - Not Analyzed
TDS - Total Dissolved Solids
NC - No Criteria
(1) All soil samples collected and analyzed were unsaturated.

Qualifiers:
Q - Qualifier
U - The analyte was analyzed but not detected

Exceedance Summary:
10 - Result exceeds the PADEP Non-Residential Soil MSC
10 - RL exceeds the PADEP Non-Residential Soil MSC

Table 4b
Summary of PADEP Inspection Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-Residential Used Aquifer TDS <2,500 mg/L Groundwater MSCs	Location ID	S-121 SRTF			S-122 SRTF			S-123 SRTF			S-128 SRTF			S-78 SRTF			S-79 SRTF			S-80 SRTF		
			Sample ID	S-121 SRTF			S-122 SRTF			S-123 SRTF			S-128 SRTF			S-78 SRTF			S-79 SRTF			S-80 SRTF		
			Sample Date	8/12/2009			8/13/2009			8/13/2009			8/13/2009			8/12/2009			8/12/2009			8/12/2009		
			Sample Matrix	GW			GW			GW			GW			GW			GW			GW		
Volatile Organic Compounds			**Unit**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
1,2,4-Trimethylbenzene	95-63-6	35	ug/l	ND	U	2	19		10	**430**		**50**	ND	U	2	4		2	ND	U	2	ND	U	2
1,3,5-Trimethylbenzene	108-67-8	35	ug/l	ND	U	2	**290**		10	**880**		**50**	ND	U	2	4		2	ND	U	2	ND	U	2
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	ND	U	5	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Benzene	71-43-2	5	ug/l	ND	U	1	**1800**		**50**	**390**		**25**	ND	U	1	**22**		1	ND	U	1	ND	U	1
Cumene	98-82-8	2300	ug/l	8		2	240		10	180		2	ND	U	2	21		2	ND	U	2	ND	U	2
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	56		5	320		25	ND	U	1	1		1	ND	U	1	ND	U	1
Ethylene Dibromide (Edb)	106-93-4	0.05	ug/l	ND	U	0.029	ND	U	0.029	ND	U	0.029	ND	U	0.029	ND	U	0.029	ND	U	0.029	ND	U	0.029
Methyl Tertiary Butyl Ether	1634-04-4	20	ug/l	5		1	**140**		5	ND	U	1	2		1	**58**		1	ND	U	1	ND	U	1
Toluene	108-88-3	1000	ug/l	ND	U	1	51		5	32		1	ND	U	1	2		1	ND	U	1	ND	U	1
Xylene (Total)	1330-20-7	10000	ug/l	1		1	49		5	710		25	ND	U	1	14		1	2		1	ND	U	1
Semivolatile Organic Compounds																								
Chrysene	218-01-9	1.9	ug/l	ND	U	**50**	ND	U	**5**	ND	U	**50**	ND	U	**50**	ND	U	**25**	ND	U	**50**	ND	U	**25**
Fluorene	86-73-7	1900	ug/l	ND	U	50	21		5	64		50	ND	U	50	ND	U	25	ND	U	50	ND	U	25
Naphthalene	91-20-3	100	ug/l	ND	U	50	**310**		25	**1400**		100	ND	U	50	ND	U	25	ND	U	50	ND	U	25
Phenanthrene	85-01-8	1100	ug/l	ND	U	50	47		5	280		50	ND	U	50	ND	U	25	ND	U	50	ND	U	25
Pyrene	129-00-0	130	ug/l	ND	U	50	14		5	ND	U	50	ND	U	50	ND	U	25	ND	U	50	ND	U	25
Metals																								
Lead (Total)	7439-92-1	0.005	mg/l	ND	U	0.001	**0.0085**		0.001	**0.0542**		0.001	ND	U	0.001	0.0013		0.001	ND	U	0.001	ND	U	0.001

Notes:
PADEP - Pennsylvania Department of Environmental Protection
ug/l - microgram per liter
mg/l - milligram per liter
MSC - PADEP's Medium Specific Concentration for Groundwater
RL - Reporting Limit
ND - Not Detected
NA - Not Analyzed
TDS - Total Dissolved Solids

Qualifiers:
Q - Lab Qualifier
U - The analyte was analyzed but not detected
E - The analyte exceeded the calibration range of the instrument

Exceedance Summary:
10 - Result exceeds the PADEP Non-Residential Groundwater MSC
10 - RL exceeds the PADEP Non-Residential Groundwater MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-1					AOI9-BH-15-2					AOI9-BH-15-3					AOI9-BH-15-4					AOI9-BH-15-5				
				Sample Date	6/19/2015					6/18/2015					6/18/2015					6/19/2015					7/1/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	587		0.35	0.36	1	24		0.4	0.41	1	1,030		0.49	0.51	1	270		0.45	0.47	1	1,610		0.52	0.54	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-6					AOI9-BH-15-7					AOI9-BH-15-8					AOI9-BH-15-9					AOI9-BH-15-10				
				Sample Date	7/1/2015					7/1/2015					7/2/2015					6/25/2015					6/25/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					1.3		0.016	0.17	20	2.1		0.008	0.083	10
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	2,390		0.5	0.52	1	2,040		0.41	0.43	1	348		0.52	0.54	1	NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-11					AOI9-BH-15-12					AOI9-BH-15-13					AOI9-BH-15-14					AOI9-BH-15-15				
				Sample Date	6/25/2015					8/3/2015					8/3/2015					8/3/2015					8/3/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	1.3		0.015	0.16	20	NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	NA					1000		0.5	0.51	1	1,030		0.65	0.68	1	711		0.51	0.52	1	526		0.53	0.54	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-16					AOI9-BH-15-17					AOI9-BH-15-18					AOI9-BH-15-19					AOI9-BH-15-20				
				Sample Date	7/9/2015					7/9/2015					7/9/2015					7/9/2015					6/16/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	2,180		0.4	0.41	1	1,910		0.43	0.45	1	397		0.42	0.43	1	1,360		0.43	0.44	1	1,320		0.47	0.49	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-21					AOI9-BH-15-22					AOI9-BH-15-23					AOI9-BH-15-24					AOI9-BH-15-25				
				Sample Date	6/16/2015					6/16/2015					6/16/2015					6/15/2015					6/15/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	1,720		0.48	0.49	1	1,900		0.45	0.46	1	1,230		0.44	0.46	1	2,190		0.53	0.55	1	1,580		0.4	0.41	1

Note:
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ND - Not detected
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Qualifiers:
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Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-26					AOI9-BH-15-27					AOI9-BH-15-28					AOI9-BH-15-29					AOI9-BH-15-30				
				Sample Date	6/15/2015					6/15/2015					6/24/2015					6/23/2015					6/24/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	1,660		0.63	0.65	1	1,510		0.49	0.5	1	1,160		0.5	0.52	1	1,440		0.69	0.71	1	1,020		0.45	0.47	1

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10 - Result exceeds PADEP Non-residential Surface Soil MSC
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-31					AOI9-BH-15-33					AOI9-BH-15-45					AOI9-BH-15-49					AOI9-BH-15-55				
				Sample Date	6/24/2015					7/20/2015					6/9/2015					6/23/2015					7/13/2015				
				Sample depth (ft bgs)	0-2					0.5-1					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					ND	U	0.0025	0.0087	1	NA					ND	U	0.0021	0.0072	1	ND	U	0.002	0.007	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					ND	U	0.0022	0.0052	1	NA					ND	U	0.0018	0.0043	1	ND	U	0.0018	0.0042	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					ND	U	0.0018	0.0087	1	NA					ND	U	0.0015	0.0072	1	ND	U	0.0015	0.007	1
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					ND	U	0.0029	0.0087	1	NA					ND	U	0.0024	0.0072	1	ND	U	0.0024	0.007	1
Benzene	71-43-2	0.5	290	mg/kg	NA					0.011		0.0024	0.0087	1	NA					0.007	J	0.002	0.0072	1	0.0085		0.0019	0.007	1
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					ND	U	0.0018	0.0087	1	NA					ND	U	0.0015	0.0072	1	ND	U	0.0014	0.007	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					ND	U	0.003	0.0087	1	NA					ND	U	0.0025	0.0072	1	ND	U	0.0024	0.007	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					ND	U	0.0042	0.0087	1	NA					ND	U	0.0035	0.0072	1	ND	U	0.0034	0.007	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					0.0055	J	0.0027	0.0087	1	NA					0.0095		0.0023	0.0072	1	0.0044	J	0.0022	0.007	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					ND	U	0.0049	0.026	1	NA					ND	U	0.0041	0.022	1	ND	U	0.004	0.021	1
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					0.031	J	0.009	0.093	10	NA					0.076	J	0.0096	0.099	10	0.072	J	0.039	0.4	50
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					0.15		0.024	0.093	10	NA					0.38		0.025	0.099	10	0.27	J	0.1	0.4	50
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					0.13		0.0089	0.093	10	NA					0.43		0.0094	0.099	10	0.32	J	0.038	0.4	50
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					0.32		0.0082	0.093	10	NA					1.1		0.0087	0.099	10	0.61		0.035	0.4	50
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					0.042	J	0.014	0.093	10	NA					0.3		0.015	0.099	10	0.22	J	0.061	0.4	50
Chrysene	218-01-9	230	11000	mg/kg	NA					0.15		0.0061	0.093	10	NA					0.42		0.0065	0.099	10	0.26	J	0.026	0.4	50
Fluorene	86-73-7	3800	110000	mg/kg	NA					0.01	J	0.0081	0.093	10	NA					0.029	J	0.0085	0.099	10	ND	U	0.035	0.4	50
Naphthalene	91-20-3	25	56000	mg/kg	NA					0.082	J	0.013	0.093	10	NA					0.32		0.014	0.099	10	0.49		0.056	0.4	50
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					0.13		0.0093	0.093	10	NA					0.36		0.0099	0.099	10	0.2	J	0.04	0.4	50
Pyrene	129-00-0	2200	84000	mg/kg	NA					0.22		0.0075	0.093	10	NA					0.47		0.008	0.099	10	0.34	J	0.032	0.4	50
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	767		0.41	0.42	1	710		0.5	0.52	1	724		0.35	0.36	1	803		0.51	0.53	1	2,210		0.49	0.51	1

Note:
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ND - Not detected
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J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
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Table 5
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-56					AOI9-BH-15-57					AOI9-BH-15-58					AOI9-BH-15-59					AOI9-BH-15-60				
				Sample Date	7/13/2015					7/13/2015					7/13/2015					6/30/2015					6/30/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.0015	0.0053	1	ND	U	0.0021	0.0074	1	ND	U	0.0021	0.0073	1	9.7		0.096	0.33	50	1.1		0.12	0.4	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0014	0.0032	1	ND	U	0.0019	0.0044	1	ND	U	0.0018	0.0044	1	ND	U	0.0016	0.0038	1	ND	U	***0.1***	0.24	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0011	0.0053	1	ND	U	0.0016	0.0074	1	ND	U	0.0015	0.0073	1	ND	U	0.0014	0.0064	1	ND	U	0.086	0.4	50
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.0018	0.0053	1	ND	U	0.0025	0.0074	1	ND	U	0.0024	0.0073	1	0.28		0.0021	0.0064	1	0.37	J	0.14	0.4	50
Benzene	71-43-2	0.5	290	mg/kg	0.0062		0.0015	0.0053	1	0.11		0.002	0.0074	1	ND	U	0.002	0.0073	1	0.018		0.0017	0.0064	1	ND	U	0.11	0.4	50
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0011	0.0053	1	ND	U	0.0015	0.0074	1	ND	U	0.0015	0.0073	1	0.2		0.0013	0.0064	1	0.57		0.082	0.4	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0018	0.0053	1	ND	U	0.0025	0.0074	1	ND	U	0.0025	0.0073	1	0.096		0.0022	0.0064	1	3		0.14	0.4	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0026	0.0053	1	ND	U	0.0036	0.0074	1	ND	U	0.0035	0.0073	1	ND	U	0.0031	0.0064	1	ND	U	0.2	0.4	50
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0017	0.0053	1	0.046		0.0023	0.0074	1	ND	U	0.0023	0.0073	1	0.043		0.002	0.0064	1	0.43		0.13	0.4	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.003	0.016	1	0.021	J	0.0042	0.022	1	ND	U	0.0041	0.022	1	0.89		0.0036	0.019	1	2.3		0.23	1.2	50
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	0.13	J	0.041	0.42	50	0.03	J	0.0087	0.089	10	0.02	J	0.016	0.17	20	0.075		0.0017	0.017	2	0.029		0.002	0.021	2
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.5		0.11	0.42	50	0.22		0.023	0.089	10	0.15	J	0.043	0.17	20	0.3		0.0044	0.017	2	0.15		0.0053	0.021	2
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.48		0.04	0.42	50	0.22		0.0085	0.089	10	0.17		0.016	0.17	20	0.26		0.0016	0.017	2	0.2		0.002	0.021	2
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	1.3		0.037	0.42	50	0.55		0.0079	0.089	10	0.31		0.015	0.17	20	0.47		0.0015	0.017	2	0.32		0.0018	0.021	2
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.35	J	0.064	0.42	50	0.088	J	0.014	0.089	10	0.12	J	0.026	0.17	20	0.17		0.0026	0.017	2	0.2		0.0032	0.021	2
Chrysene	218-01-9	230	11000	mg/kg	0.53		0.027	0.42	50	0.24		0.0059	0.089	10	0.16	J	0.011	0.17	20	0.28		0.0011	0.017	2	0.16		0.0014	0.021	2
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.036	0.42	50	0.0079	J	0.0077	0.089	10	ND	U	0.015	0.17	20	0.059		0.0015	0.017	2	0.089		0.0018	0.021	2
Naphthalene	91-20-3	25	56000	mg/kg	0.065	J	0.059	0.42	50	0.18		0.013	0.089	10	0.1	J	0.024	0.17	20	1.3		0.0024	0.017	2	2.5		0.0029	0.021	2
Phenanthrene	85-01-8	10000	190000	mg/kg	0.34	J	0.042	0.42	50	0.13		0.0089	0.089	10	0.13	J	0.017	0.17	20	0.27		0.0017	0.017	2	0.15		0.0021	0.021	2
Pyrene	129-00-0	2200	84000	mg/kg	0.71		0.034	0.42	50	0.25		0.0072	0.089	10	0.19		0.014	0.17	20	0.4		0.0014	0.017	2	0.22		0.0017	0.021	2
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	446		0.39	0.4	1	1,480		0.46	0.48	1	3,540		0.36	0.37	1	1,160		0.45	0.47	1	1,870		0.59	0.61	1

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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-60A					AOI9-BH-15-61					AOI9-BH-15-62					AOI9-BH-15-63				
				Sample Date	6/30/2015					7/21/2015					6/17/2015					6/17/2015				
				Sample depth (ft bgs)	0-2					1.5					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	0.018		0.0021	0.0072	1	255		10	34.9	5,000	0.54		0.068	0.24	50	77.2		0.77	2.7	500
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0018	0.0043	1	ND	U	***0.089***	0.21	50	ND	U	***0.061***	0.14	50	ND	U	***0.068***	0.16	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0015	0.0072	1	ND	U	0.074	0.35	50	ND	U	0.051	0.24	50	ND	U	0.057	0.27	50
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	0.007	J	0.0024	0.0072	1	125		1.2	3.5	500	0.26		0.08	0.24	50	30.5		0.9	2.7	500
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.002	0.0072	1	1.4		0.095	0.35	50	0.67		0.065	0.24	50	7.8		0.073	0.27	50
Ethylbenzene	100-41-4	70	10000	mg/kg	0.0051	J	0.0015	0.0072	1	45.3		0.7	3.5	500	0.22	J	0.048	0.24	50	41.9		0.54	2.7	500
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.008		0.0025	0.0072	1	12.8		0.12	0.35	50	3.2		0.083	0.24	50	10.9		0.093	0.27	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0035	0.0072	1	ND	U	0.17	0.35	50	ND	U	0.12	0.24	50	5.6		0.13	0.27	50
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	0.0043	J	0.0023	0.0072	1	2.2		0.11	0.35	50	0.55		0.075	0.24	50	2.3	J	0.84	2.7	500
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	0.032		0.0041	0.022	1	362		2	10.5	500	1.3		0.14	0.72	50	36.6		1.5	8.1	500
SEMI-VOLATILE ORGANIC COMPOUNDS																								
Anthracene	120-12-7	350	190000	mg/kg	0.0029	J	0.00079	0.0082	1	0.11		0.0085	0.087	10	0.31		0.004	0.041	5	0.14		0.0036	0.037	5
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.014		0.0021	0.0082	1	0.053	J	0.022	0.087	10	0.34		0.011	0.041	5	0.29		0.0095	0.037	5
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.015		0.00078	0.0082	1	0.028	J	0.0083	0.087	10	0.3		0.0039	0.041	5	0.26		0.0036	0.037	5
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.032		0.00072	0.0082	1	0.077	J	0.0077	0.087	10	0.73		0.0036	0.041	5	0.5		0.0033	0.037	5
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.01		0.0013	0.0082	1	0.016	J	0.013	0.087	10	0.11		0.0063	0.041	5	0.08		0.0057	0.037	5
Chrysene	218-01-9	230	11000	mg/kg	0.016		0.00054	0.0082	1	0.041	J	0.0057	0.087	10	0.34		0.0027	0.041	5	0.29		0.0025	0.037	5
Fluorene	86-73-7	3800	110000	mg/kg	0.001	J	0.00071	0.0082	1	0.28		0.0075	0.087	10	0.4		0.0036	0.041	5	0.22		0.0032	0.037	5
Naphthalene	91-20-3	25	56000	mg/kg	0.035		0.0011	0.0082	1	36.4		0.12	0.87	100	0.66		0.0058	0.041	5	7		0.01	0.075	10
Phenanthrene	85-01-8	10000	190000	mg/kg	0.0096		0.00082	0.0082	1	0.27		0.0087	0.087	10	0.83		0.0041	0.041	5	0.59		0.0037	0.037	5
Pyrene	129-00-0	2200	84000	mg/kg	0.022		0.00066	0.0082	1	0.11		0.007	0.087	10	0.69		0.0033	0.041	5	0.5		0.003	0.037	5
METALS																								
Lead	7439-92-1	2240	2240	mg/kg	149		0.47	0.49	1	264		0.47	0.49	1	527		0.31	0.32	1	1,010		0.33	0.34	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-64					AOI9-BH-15-65					AOI9-BH-15-66					AOI9-BH-15-67					AOI9-BH-15-68				
				Sample Date	6/17/2015					6/17/2015					6/10/2015					6/10/2015					6/10/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	383		8.8	30.8	5,000	0.012		0.0013	0.0047	1	0.0055	J	0.0019	0.0068	1	0.13		0.0031	0.011	1	24.2		0.095	0.33	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	***0.78***	1.8	500	ND	U	0.0012	0.0028	1	ND	U	0.0017	0.0041	1	ND	U	0.0028	0.0066	1	ND	U	***0.084***	0.2	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.65	3.1	500	ND	U	0.00099	0.0047	1	ND	U	0.0014	0.0068	1	ND	U	0.0023	0.011	1	ND	U	0.07	0.33	50
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	130		***10.3***	30.8	5,000	0.015		0.0016	0.0047	1	0.0043	J	0.0023	0.0068	1	0.054		0.0037	0.011	1	8.8		0.11	0.33	50
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.84	3.1	500	0.013		0.0013	0.0047	1	0.097		0.0019	0.0068	1	0.077		0.003	0.011	1	ND	U	0.09	0.33	50
Ethylbenzene	100-41-4	70	10000	mg/kg	178		0.62	3.1	500	ND	U	0.00094	0.0047	1	ND	U	0.0014	0.0068	1	0.028		0.0022	0.011	1	0.94		0.067	0.33	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	41.5		1.1	3.1	500	0.015		0.0016	0.0047	1	0.0042	J	0.0024	0.0068	1	0.28		0.0038	0.011	1	1.5		0.11	0.33	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	1.5	3.1	500	0.11		0.0023	0.0047	1	0.39		0.0033	0.0068	1	0.022		0.0053	0.011	1	ND	U	0.16	0.33	50
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	3.6		0.96	3.1	500	0.0033	J	0.0015	0.0047	1	0.018		0.0021	0.0068	1	0.064		0.0034	0.011	1	ND	U	0.1	0.33	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	225		17.5	92.3	5,000	0.045		0.0026	0.014	1	0.031		0.0039	0.02	1	0.23		0.0062	0.033	1	1.2		0.19	0.99	50
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.16		0.0043	0.044	5	0.65		0.0039	0.04	5	0.15		0.0037	0.039	5	0.59		0.012	0.13	10	0.21		0.0038	0.039	5
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.15		0.011	0.044	5	0.61		0.01	0.04	5	0.56		0.0098	0.039	5	6.7		0.032	0.13	10	0.57		0.01	0.039	5
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.17		0.0042	0.044	5	0.45		0.0039	0.04	5	0.67		0.0037	0.039	5	7.1		0.012	0.13	10	0.62		0.0038	0.039	5
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.39		0.0039	0.044	5	0.81		0.0036	0.04	5	1.2		0.0034	0.039	5	10.6		0.011	0.13	10	1.1		0.0035	0.039	5
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.065		0.0068	0.044	5	0.16		0.0062	0.04	5	0.45		0.0059	0.039	5	4.2		0.019	0.13	10	0.41		0.006	0.039	5
Chrysene	218-01-9	230	11000	mg/kg	0.15		0.0029	0.044	5	0.58		0.0027	0.04	5	0.58		0.0025	0.039	5	6.7		0.0083	0.13	10	0.61		0.0026	0.039	5
Fluorene	86-73-7	3800	110000	mg/kg	0.28		0.0038	0.044	5	0.25		0.0035	0.04	5	0.054		0.0033	0.039	5	0.19		0.011	0.13	10	0.46		0.0034	0.039	5
Naphthalene	91-20-3	25	56000	mg/kg	22.9		0.062	0.44	50	0.19		0.0057	0.04	5	0.12		0.0054	0.039	5	2		0.018	0.13	10	12.1		0.022	0.16	20
Phenanthrene	85-01-8	10000	190000	mg/kg	0.47		0.0044	0.044	5	0.42		0.004	0.04	5	0.53		0.0039	0.039	5	1.8		0.013	0.13	10	1.2		0.0039	0.039	5
Pyrene	129-00-0	2200	84000	mg/kg	0.39		0.0036	0.044	5	1.5		0.0033	0.04	5	0.83		0.0031	0.039	5	9.3		0.01	0.13	10	1.1		0.0032	0.039	5
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	785		0.42	0.43	1	508		0.34	0.36	1	1,060		0.44	0.46	1	1,700		0.64	0.66	1	711		0.36	0.37	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
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J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-69					AOI9-BH-15-70					AOI9-BH-15-76					AOI9-BH-15-78					AOI9-BH-15-82				
				Sample Date	6/10/2015					6/10/2015					6/16/2015					6/16/2015					6/12/2015				
				Sample depth (ft bgs)	0-2					0-2					1-2					1.5					1.25				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	0.19		0.0019	0.0066	1	ND	U	0.0017	0.0058	1	440		8.3	29.1	5,000	22.5		0.086	0.3	50	0.86		0.098	0.34	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0017	0.004	1	ND	U	0.0015	0.0035	1	ND	U	***0.074***	0.17	50	ND	U	***0.077***	0.18	50	ND	U	***0.087***	0.21	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0014	0.0066	1	ND	U	0.0012	0.0058	1	ND	U	0.062	0.29	50	ND	U	0.064	0.3	50	ND	U	0.073	0.34	50
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	0.12		0.0022	0.0066	1	ND	U	0.002	0.0058	1	198		0.98	2.9	500	6.7		0.1	0.3	50	0.65		0.12	0.34	50
Benzene	71-43-2	0.5	290	mg/kg	0.22		0.0018	0.0066	1	0.016		0.0016	0.0058	1	1.3		0.079	0.29	50	0.36		0.082	0.3	50	1.8		0.093	0.34	50
Ethylbenzene	100-41-4	70	10000	mg/kg	0.21		0.0013	0.0066	1	ND	U	0.0012	0.0058	1	76.2		0.59	2.9	500	3.6		0.061	0.3	50	0.46		0.069	0.34	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.031		0.0023	0.0066	1	ND	U	0.002	0.0058	1	29.7		1	2.9	500	1.3		0.1	0.3	50	0.55		0.12	0.34	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	0.0049	J	0.0032	0.0066	1	ND	U	0.0028	0.0058	1	ND	U	0.14	0.29	50	ND	U	0.15	0.3	50	ND	U	0.17	0.34	50
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	0.14		0.0021	0.0066	1	0.0063		0.0018	0.0058	1	2.4		0.091	0.29	50	ND	U	0.094	0.3	50	0.57		0.11	0.34	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	0.78		0.0038	0.02	1	ND	U	0.0033	0.017	1	533		1.7	8.7	500	7.9		0.17	0.91	50	3.2		0.19	1	50
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.21		0.0074	0.076	10	0.37		0.0086	0.088	10	0.051		0.00091	0.0094	1	0.001	J	0.00091	0.0094	1	0.5		0.0041	0.042	5
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.87		0.019	0.076	10	0.82		0.023	0.088	10	0.032		0.0024	0.0094	1	ND	U	0.0024	0.0094	1	1.8		0.011	0.042	5
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.88		0.0073	0.076	10	1.9		0.0084	0.088	10	0.015		0.0009	0.0094	1	ND	U	0.0009	0.0094	1	1.8		0.004	0.042	5
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	1.3		0.0067	0.076	10	1.9		0.0078	0.088	10	0.039		0.00083	0.0094	1	0.0051	J	0.00083	0.0094	1	3		0.0037	0.042	5
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.41		0.012	0.076	10	1.1		0.014	0.088	10	0.0082	J	0.0014	0.0094	1	ND	U	0.0014	0.0094	1	0.74		0.0065	0.042	5
Chrysene	218-01-9	230	11000	mg/kg	0.89		0.005	0.076	10	1.1		0.0058	0.088	10	0.04		0.00062	0.0094	1	0.0029	J	0.00062	0.0094	1	1.6		0.0028	0.042	5
Fluorene	86-73-7	3800	110000	mg/kg	0.055	J	0.0066	0.076	10	0.088	J	0.0076	0.088	10	0.13		0.00082	0.0094	1	0.0035	J	0.00081	0.0094	1	0.26		0.0037	0.042	5
Naphthalene	91-20-3	25	56000	mg/kg	0.33		0.011	0.076	10	0.15		0.012	0.088	10	31.4		0.13	0.94	100	1.6		0.0013	0.0094	1	0.27		0.0059	0.042	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.79		0.0076	0.076	10	0.47		0.0088	0.088	10	0.14		0.00094	0.0094	1	0.0079	J	0.00094	0.0094	1	1.8		0.0042	0.042	5
Pyrene	129-00-0	2200	84000	mg/kg	1.4		0.0061	0.076	10	1.2		0.0071	0.088	10	0.078		0.00076	0.0094	1	0.0043	J	0.00076	0.0094	1	2.5		0.0034	0.042	5
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	1,140		0.42	0.44	1	936		0.44	0.45	1	34.8		0.49	0.51	1	14.5		0.53	0.55	1	3,520		0.48	0.49	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-83					AOI9-BH-15-84					AOI9-BH-15-87					AOI9-BH-15-88					AOI9-BH-15-89				
				Sample Date	6/12/2015					6/15/2015					6/17/2015					6/17/2015					6/8/2015				
				Sample depth (ft bgs)	1-2					1.5					1.5					1.5					1.5				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	136		0.86	3	500	4.5		0.079	0.27	50	274		8.6	30	5,000	59.1		0.8	2.8	500	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	***0.077***	0.18	50	ND	U	***0.07***	0.16	50	ND	U	***0.076***	0.18	50	ND	U	***0.071***	0.17	50	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.064	0.3	50	ND	U	0.058	0.27	50	ND	U	0.064	0.3	50	ND	U	0.059	0.28	50	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	51.2		1	3	500	4.6		0.092	0.27	50	117		1	3	500	11.5		0.094	0.28	50	NA				
Benzene	71-43-2	0.5	290	mg/kg	0.88		0.082	0.3	50	ND	U	0.075	0.27	50	5.9		0.082	0.3	50	2		0.076	0.28	50	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	18.7		0.061	0.3	50	0.24	J	0.056	0.27	50	61.6		0.61	3	500	7.9		0.056	0.28	50	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	5		0.1	0.3	50	ND	U	0.095	0.27	50	15.6		0.1	0.3	50	2.6		0.097	0.28	50	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.15	0.3	50	ND	U	0.13	0.27	50	ND	U	0.15	0.3	50	ND	U	0.14	0.28	50	NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	0.85		0.094	0.3	50	0.37		0.086	0.27	50	111		0.94	3	500	0.77		0.087	0.28	50	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	93.9		1.7	9.1	500	2.2		0.16	0.82	50	461		1.7	9	500	25.6		0.16	0.84	50	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.034		0.0018	0.019	2	0.0091	J	0.0019	0.02	2	0.026		0.00094	0.0096	1	0.0053	J	0.00092	0.0095	1	NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.025		0.0048	0.019	2	0.02		0.005	0.02	2	0.0059	J	0.0025	0.0096	1	0.0028	J	0.0024	0.0095	1	NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.0018	0.019	2	0.0047	J	0.0019	0.02	2	0.0013	J	0.00092	0.0096	1	ND	U	0.00091	0.0095	1	NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.055		0.0017	0.019	2	0.038		0.0017	0.02	2	0.0033	J	0.00085	0.0096	1	0.003	J	0.00084	0.0095	1	NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.0029	0.019	2	0.0076	J	0.003	0.02	2	0.0018	J	0.0015	0.0096	1	ND	U	0.0015	0.0095	1	NA				
Chrysene	218-01-9	230	11000	mg/kg	0.045		0.0012	0.019	2	0.031		0.0013	0.02	2	0.0045	J	0.00063	0.0096	1	0.0019	J	0.00062	0.0095	1	NA				
Fluorene	86-73-7	3800	110000	mg/kg	0.18		0.0016	0.019	2	0.018	J	0.0017	0.02	2	0.088		0.00083	0.0096	1	0.013		0.00082	0.0095	1	NA				
Naphthalene	91-20-3	25	56000	mg/kg	2.2		0.0026	0.019	2	0.19		0.0028	0.02	2	17.3		0.027	0.19	20	3.7		0.0067	0.048	5	NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.21		0.0019	0.019	2	0.029		0.002	0.02	2	0.085		0.00096	0.0096	1	0.014		0.00095	0.0095	1	NA				
Pyrene	129-00-0	2200	84000	mg/kg	0.077		0.0015	0.019	2	0.041		0.0016	0.02	2	0.023		0.00078	0.0096	1	0.0042	J	0.00077	0.0095	1	NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	90.6		0.52	0.54	1	136		0.53	0.55	1	25.4		0.54	0.56	1	11.6		0.57	0.59	1	62.3		0.46	0.47	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-90					AOI9-BH-15-91					AOI9-BH-15-92					AOI9-BH-15-93					AOI9-BH-15-94				
				Sample Date	6/11/2015					6/17/2015					8/7/2015					8/7/2015					8/7/2015				
				Sample depth (ft bgs)	1-2					1.5					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.0016	0.0056	1	133		7.1	24.9	5,000	0.24		0.0014	0.0048	1	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0014	0.0033	1	ND	U	***0.063***	0.15	50	ND	U	0.0012	0.0029	1	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0012	0.0056	1	ND	U	0.053	0.25	50	ND	U	0.001	0.0048	1	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.0019	0.0056	1	116		0.83	2.5	500	0.12		0.0016	0.0048	1	NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0015	0.0056	1	2		0.068	0.25	50	ND	U	0.0013	0.0048	1	NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0011	0.0056	1	34.3		0.5	2.5	500	0.0082		0.00097	0.0048	1	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0019	0.0056	1	8		0.086	0.25	50	0.012		0.0017	0.0048	1	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0027	0.0056	1	ND	U	0.12	0.25	50	ND	U	0.0023	0.0048	1	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0017	0.0056	1	2.8		0.078	0.25	50	0.0052		0.0015	0.0048	1	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.0032	0.017	1	261		1.4	7.4	500	0.03		0.0027	0.014	1	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.021	J	0.0037	0.038	5	0.011	J	0.0045	0.047	5	ND	U	0.0074	0.076	10	NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.049		0.0098	0.038	5	ND	U	0.012	0.047	5	ND	U	0.019	0.076	10	NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.068		0.0037	0.038	5	ND	U	0.0044	0.047	5	ND	U	0.0073	0.076	10	NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.086		0.0034	0.038	5	ND	U	0.0041	0.047	5	ND	U	0.0067	0.076	10	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.061		0.0059	0.038	5	ND	U	0.0072	0.047	5	ND	U	0.012	0.076	10	NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	0.051		0.0025	0.038	5	0.005	J	0.0031	0.047	5	ND	U	0.005	0.076	10	NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.0033	0.038	5	0.029	J	0.004	0.047	5	ND	U	0.0066	0.076	10	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.0054	0.038	5	8.9		0.0065	0.047	5	0.041	J	0.011	0.076	10	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.058		0.0038	0.038	5	0.031	J	0.0047	0.047	5	ND	U	0.0076	0.076	10	NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	0.075		0.0031	0.038	5	0.01	J	0.0038	0.047	5	ND	U	0.0061	0.076	10	NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	112		0.39	0.4	1	10.8		0.46	0.48	1	50		0.5	0.52	1	34.7		0.32	0.33	1	23.9		0.48	0.5	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
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MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-95					AOI9-BH-15-96					AOI9-BH-15-97					AOI9-BH-15-98					AOI9-BH-15-99				
				Sample Date	8/4/2015					8/4/2015					8/7/2015					8/5/2015					8/5/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	1,970		0.48	0.49	1	227		0.43	0.45	1	37.8		0.5	0.52	1	41.1		0.48	0.49	1	22.2		0.52	0.54	1

Note:
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Qualifiers:
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J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-102					AOI9-BH-15-103					AOI9-BH-15-106					AOI9-BH-15-106					AOI9-BH-15-107				
				Sample Date	8/5/2015					8/5/2015					6/9/2015					6/9/2015					7/31/2015				
				Sample depth (ft bgs)	0-2					0-2					0.5-1					1-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					50.6		0.9	3.1	500	NA					ND	U	0.0015	0.0052	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					ND	U	***0.08***	0.19	50	NA					ND	U	0.0013	0.0031	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					ND	U	0.067	0.31	50	NA					ND	U	0.0011	0.0052	1
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					26.8		1.1	3.1	500	NA					ND	U	0.0017	0.0052	1
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					0.66		0.085	0.31	50	NA					ND	U	0.0014	0.0052	1
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					1.7		0.063	0.31	50	NA					ND	U	0.001	0.0052	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					1.7		0.11	0.31	50	NA					ND	U	0.0018	0.0052	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					ND	U	0.15	0.31	50	NA					ND	U	0.0025	0.0052	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					2.3		0.098	0.31	50	NA					0.0039	J	0.0016	0.0052	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					10.8		0.18	0.94	50	NA					0.0044	J	0.0029	0.015	1
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					0.32		0.0041	0.042	5	NA					0.006	J	0.00085	0.0088	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					1		0.011	0.042	5	NA					0.0056	J	0.0022	0.0088	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					0.91		0.004	0.042	5	NA					0.0011	J	0.00084	0.0088	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					1.7		0.0037	0.042	5	NA					0.0028	J	0.00077	0.0088	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					0.53		0.0064	0.042	5	NA					0.0014	J	0.0013	0.0088	1
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					1.1		0.0027	0.042	5	NA					0.0034	J	0.00058	0.0088	1
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					0.31		0.0036	0.042	5	NA					0.0086	J	0.00076	0.0088	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					8.3		0.012	0.084	10	NA					0.26		0.0012	0.0088	1
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					2.4		0.0042	0.042	5	NA					0.01		0.00088	0.0088	1
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					1.9		0.0034	0.042	5	NA					0.011		0.00071	0.0088	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	300		0.39	0.4	1	18.1		0.55	0.57	1	489		0.4	0.41	1	147		0.47	0.49	1	16.8		0.6	0.63	1

Note:
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PADEP - Pennsylvania Department of Environmental Protection
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ND - Not detected
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Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-108					AOI9-BH-15-108					AOI9-BH-15-111					AOI9-BH-15-112					AOI9-BH-15-113				
				Sample Date	7/31/2015					8/5/2015					7/30/2015					7/31/2015					7/30/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					ND	U	0.0014	0.0049	1	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					ND	U	0.0012	0.0029	1	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					ND	U	0.001	0.0049	1	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					ND	U	0.0016	0.0049	1	NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					ND	U	0.0013	0.0049	1	NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					ND	U	0.00099	0.0049	1	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					ND	U	0.0017	0.0049	1	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					ND	U	0.0024	0.0049	1	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					ND	U	0.0015	0.0049	1	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					ND	U	0.0028	0.015	1	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					ND	U	0.00075	0.0077	1	NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					ND	U	0.002	0.0077	1	NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					0.00099	J	0.00074	0.0077	1	NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					ND	U	0.00068	0.0077	1	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					ND	U	0.0012	0.0077	1	NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					ND	U	0.00051	0.0077	1	NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					ND	U	0.00067	0.0077	1	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					0.0012	J	0.0011	0.0077	1	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					ND	U	0.00077	0.0077	1	NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					ND	U	0.00062	0.0077	1	NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	6.9		0.5	0.52	1	411		0.55	0.57	1	13.9		0.53	0.55	1	63.5		3.8	3.9	10	478		0.31	0.33	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-114					AOI9-BH-15-115					AOI9-BH-15-116					AOI9-BH-15-117					AOI9-BH-15-118				
				Sample Date	7/22/2015					7/30/2015					7/29/2015					7/29/2015					7/29/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	177		8	28	5,000	NA					NA					NA					ND	U	0.0011	0.004	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	***0.071***	0.17	50	NA					NA					NA					ND	U	0.001	0.0024	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.059	0.28	50	NA					NA					NA					ND	U	0.00085	0.004	1
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	98.5		0.94	2.8	500	NA					NA					NA					ND	U	0.0013	0.004	1
Benzene	71-43-2	0.5	290	mg/kg	0.67		0.076	0.28	50	NA					NA					NA					ND	U	0.0011	0.004	1
Ethylbenzene	100-41-4	70	10000	mg/kg	15		0.057	0.28	50	NA					NA					NA					ND	U	0.00081	0.004	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	4.8		0.097	0.28	50	NA					NA					NA					ND	U	0.0014	0.004	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.14	0.28	50	NA					NA					NA					ND	U	0.0019	0.004	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	2		0.087	0.28	50	NA					NA					NA					ND	U	0.0013	0.004	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	27.7		0.16	0.84	50	NA					NA					NA					ND	U	0.0023	0.012	1
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.031	J	0.0078	0.081	10	NA					NA					NA					0.0064	J	0.0036	0.037	5
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.057	J	0.021	0.081	10	NA					NA					NA					0.03	J	0.0094	0.037	5
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.044	J	0.0077	0.081	10	NA					NA					NA					0.025	J	0.0035	0.037	5
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.13		0.0071	0.081	10	NA					NA					NA					0.055		0.0032	0.037	5
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.047	J	0.012	0.081	10	NA					NA					NA					0.015	J	0.0057	0.037	5
Chrysene	218-01-9	230	11000	mg/kg	0.054	J	0.0053	0.081	10	NA					NA					NA					0.029	J	0.0024	0.037	5
Fluorene	86-73-7	3800	110000	mg/kg	0.066	J	0.007	0.081	10	NA					NA					NA					ND	U	0.0032	0.037	5
Naphthalene	91-20-3	25	56000	mg/kg	7.7		0.011	0.081	10	NA					NA					NA					0.008	J	0.0052	0.037	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.13		0.0081	0.081	10	NA					NA					NA					0.027	J	0.0037	0.037	5
Pyrene	129-00-0	2200	84000	mg/kg	0.091		0.0065	0.081	10	NA					NA					NA					0.046		0.003	0.037	5
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	210		0.32	0.34	1	1,690		0.58	0.6	1	227		0.53	0.55	1	458		0.4	0.41	1	116		0.46	0.48	1

Note:
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PADEP - Pennsylvania Department of Environmental Protection
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ND - Not detected
NS - No standard
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Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-119					AOI9-BH-15-120					AOI9-BH-15-121					AOI9-BH-15-122					AOI9-BH-15-122				
				Sample Date	7/24/2015					7/28/2015					7/29/2015					7/22/2015					7/28/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					ND	U	0.0017	0.006	1	NA					ND	U	0.0016	0.0055	1	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					ND	U	0.0015	0.0036	1	NA					ND	U	0.0014	0.0033	1	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					ND	U	0.0013	0.006	1	NA					ND	U	0.0012	0.0055	1	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					ND	U	0.002	0.006	1	NA					ND	U	0.0018	0.0055	1	NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					0.093		0.0016	0.006	1	NA					0.0091		0.0015	0.0055	1	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					ND	U	0.0012	0.006	1	NA					ND	U	0.0011	0.0055	1	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					ND	U	0.0021	0.006	1	NA					ND	U	0.0019	0.0055	1	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					ND	U	0.0029	0.006	1	NA					ND	U	0.0027	0.0055	1	NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					0.029		0.0019	0.006	1	NA					0.0071		0.0017	0.0055	1	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					0.011	J	0.0034	0.018	1	NA					ND	U	0.0031	0.016	1	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					0.019	J	0.0042	0.044	5	NA					NA					0.22		0.0088	0.091	10
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					0.12		0.011	0.044	5	NA					NA					0.23		0.023	0.091	10
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					0.13		0.0042	0.044	5	NA					NA					0.19		0.0087	0.091	10
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					0.28		0.0039	0.044	5	NA					NA					0.36		0.008	0.091	10
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					0.081		0.0067	0.044	5	NA					NA					0.12		0.014	0.091	10
Chrysene	218-01-9	230	11000	mg/kg	NA					0.14		0.0029	0.044	5	NA					NA					0.31		0.006	0.091	10
Fluorene	86-73-7	3800	110000	mg/kg	NA					ND	U	0.0038	0.044	5	NA					NA					0.075	J	0.0079	0.091	10
Naphthalene	91-20-3	25	56000	mg/kg	NA					0.019	J	0.0061	0.044	5	NA					NA					0.63		0.013	0.091	10
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					0.066		0.0044	0.044	5	NA					NA					0.58		0.0091	0.091	10
Pyrene	129-00-0	2200	84000	mg/kg	NA					0.17		0.0035	0.044	5	NA					NA					0.49		0.0073	0.091	10
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	835		4.7	4.9	10	544		0.58	0.6	1	1,070		0.33	0.35	1	NA					286		0.4	0.41	1

Note:
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PADEP - Pennsylvania Department of Environmental Protection
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J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
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Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-123					AOI9-BH-15-124					AOI9-BH-15-125					AOI9-BH-15-126					AOI9-BH-15-126				
				Sample Date	7/23/2015					7/28/2015					7/28/2015					7/28/2015					7/28/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0.5-1					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					0.0087		0.0022	0.0077	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					ND	U	0.0019	0.0046	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					ND	U	0.0016	0.0077	1
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					ND	U	0.0026	0.0077	1
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					0.094		0.0021	0.0077	1
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					ND	U	0.0016	0.0077	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					ND	U	0.0027	0.0077	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					ND	U	0.0037	0.0077	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					0.051		0.0024	0.0077	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					0.027		0.0044	0.023	1
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					0.094	J	0.01	0.11	10
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					0.25		0.028	0.11	10
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					0.24		0.01	0.11	10
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					0.53		0.0095	0.11	10
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					0.17		0.017	0.11	10
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					0.28		0.0071	0.11	10
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					0.029	J	0.0093	0.11	10
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					0.24		0.015	0.11	10
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					0.29		0.011	0.11	10
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					0.41		0.0087	0.11	10
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	1,840		0.41	0.43	1	880		0.48	0.5	1	289		0.45	0.46	1	210		0.37	0.38	1	506		0.51	0.53	1

Note:
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ND - Not detected
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Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
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Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-127					AOI9-BH-15-128					AOI9-BH-15-129					AOI9-BH-15-130					AOI9-BH-15-131				
				Sample Date	6/23/2015					6/22/2015					6/22/2015					6/8/2015					6/8/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					1.5-2					1.5-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.085	0.3	50	0.0033	J	0.0015	0.0052	1	0.0049	J	0.0019	0.0067	1	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	***0.076***	0.18	50	ND	U	0.0013	0.0031	1	ND	U	0.0017	0.004	1	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.063	0.3	50	ND	U	0.0011	0.0052	1	ND	U	0.0014	0.0067	1	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.1	0.3	50	ND	U	0.0017	0.0052	1	ND	U	0.0022	0.0067	1	NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.081	0.3	50	0.0073		0.0014	0.0052	1	0.0057	J	0.0018	0.0067	1	NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.06	0.3	50	ND	U	0.001	0.0052	1	ND	U	0.0014	0.0067	1	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.35		0.1	0.3	50	ND	U	0.0018	0.0052	1	ND	U	0.0023	0.0067	1	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.14	0.3	50	ND	U	0.0025	0.0052	1	ND	U	0.0032	0.0067	1	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.093	0.3	50	0.0048	J	0.0016	0.0052	1	0.012		0.0021	0.0067	1	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.17	0.89	50	0.0056	J	0.0029	0.016	1	ND	U	0.0038	0.02	1	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.97		0.008	0.082	10	0.029	J	0.015	0.16	20	0.56		0.044	0.45	50	NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.048	J	0.021	0.082	10	0.099	J	0.041	0.16	20	1.5		0.12	0.45	50	NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.05	J	0.0079	0.082	10	0.12	J	0.015	0.16	20	1.5		0.043	0.45	50	NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.11		0.0073	0.082	10	0.23		0.014	0.16	20	2.5		0.04	0.45	50	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.048	J	0.013	0.082	10	0.093	J	0.024	0.16	20	0.92		0.069	0.45	50	NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	0.076	J	0.0054	0.082	10	0.086	J	0.01	0.16	20	1.3		0.03	0.45	50	NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	4.4		0.0071	0.082	10	0.016	J	0.014	0.16	20	0.078	J	0.039	0.45	50	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	2.7		0.012	0.082	10	0.041	J	0.022	0.16	20	0.85		0.063	0.45	50	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	12.5		0.0082	0.082	10	0.067	J	0.016	0.16	20	1.1		0.045	0.45	50	NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	0.84		0.0066	0.082	10	0.11	J	0.013	0.16	20	2.4		0.036	0.45	50	NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	44.8		0.5	0.51	1	364		0.33	0.34	1	1,340		0.44	0.46	1	94.6		0.42	0.43	1	18.1		0.5	0.52	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-132					AOI9-BH-15-132					AOI9-BH-15-133					AOI9-BH-15-134					AOI9-BH-15-135				
				Sample Date	6/8/2015					6/8/2015					6/8/2015					6/11/2015					6/11/2015				
				Sample depth (ft bgs)	1.5-2					0.25-2.75					1.5-2					0.5-1					1.5-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	71.7		0.41	0.42	1	14		0.45	0.46	1	48.3		0.42	0.43	1	59.1		0.37	0.38	1	17.3		0.42	0.43	1

Note:
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RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

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Summary of Surface Soil Analytical Results
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-136					AOI9-BH-15-137					AOI9-BH-15-138					AOI9-BH-15-139					AOI9-BH-15-140				
				Sample Date	6/11/2015					6/11/2015					11/5/2015					11/5/2015					11/5/2015				
				Sample depth (ft bgs)	1.5-2					1.5-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					0.46		0.0016	0.0057	1	NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					ND	U	0.0014	0.0034	1	NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					ND	U	0.0012	0.0057	1	NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					0.24		0.0019	0.0057	1	NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					ND	U	0.0016	0.0057	1	NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					0.12		0.0012	0.0057	1	NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					0.037		0.002	0.0057	1	NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					ND	U	0.0028	0.0057	1	NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					ND	U	0.0018	0.0057	1	NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					0.21		0.0032	0.017	1	NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					ND	U	0.00078	0.0081	1	NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					ND	U	0.0021	0.0081	1	NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					ND	U	0.00077	0.0081	1	NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					ND	U	0.00071	0.0081	1	NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					ND	U	0.0012	0.0081	1	NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					ND	U	0.00053	0.0081	1	NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					0.0076	J	0.0007	0.0081	1	NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					0.45		0.0011	0.0081	1	NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					0.0054	J	0.00081	0.0081	1	NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					0.0012	J	0.00065	0.0081	1	NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	16.1		0.42	0.43	1	12.4		0.48	0.49	1	1020		0.31	2.6	1	354		0.27	2.2	1	840		0.33	2.8	1

Note:
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MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

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Summary of Surface Soil Analytical Results
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Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-141					AOI9-BH-15-142					AOI9-BH-15-143					AOI9-BH-15-144					AOI9-BH-15-145				
				Sample Date	11/5/2015					11/4/2015					11/4/2015					11/4/2015					11/4/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					0.336		0.0089	0.042	1	0.426		0.0078	0.037	1	0.143		0.0082	0.039	1	0.109		0.0083	0.039	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	945		0.28	2.4	1	NA					NA					NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

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Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-146					AOI9-BH-15-147					AOI9-BH-15-148					AOI9-BH-15-149					AOI9-BH-15-150				
				Sample Date	11/4/2015					11/4/2015					11/4/2015					11/5/2015					11/5/2015				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	3350		1.2	10	1	589		0.55	4.6	1	623		0.53	4.4	1	48.5		0.55	4.6	1	1290		0.95	8	1

Note:
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PADEP - Pennsylvania Department of Environmental Protection
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ND - Not detected
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Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-151					AOI9-BH-15-152					AOI9-BH-15-153					AOI9-BH-15-154					BHSRTF-09-01				
				Sample Date	11/5/2015					11/5/2015					11/25/2015					11/25/2015					6/1/2009				
				Sample depth (ft bgs)	0-2					0-2					0-2					0-2					1-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					3.2		0.001	0.29	43.03
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					ND	U	0.001	0.29	43.03
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					ND	U	0.001	0.29	43.03
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					0.88		0.001	0.29	43.03
Benzene	71-43-2	0.5	290	mg/kg	NA					NA					NA					NA					ND	U	0.0005	0.29	43.03
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					0.52		0.001	0.29	43.03
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					0.6		0.001	0.29	43.03
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					ND	U	0.0005	0.29	43.03
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					ND	U	0.001	0.29	43.03
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					1.7		0.001	0.29	43.03
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Chrysene	218-01-9	230	11000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Fluorene	86-73-7	3800	110000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
Pyrene	129-00-0	2200	84000	mg/kg	NA					NA					NA					NA					ND	U	0.033	0.22	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	1170		0.31	2.6	1	620		0.27	2.3	1	1320		0.59	4.9	1	1720		0.62	5.2	1	18.9		0.02	1.32	10

Note:
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ND - Not detected
NS - No standard
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Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	BHSRTF-09-02					BHSRTF-09-03					BHSRTF-09-04					BHSRTF-09-05					BHSRTF-09-06				
				Sample Date	6/1/2009					6/1/2009					6/1/2009					5/27/2009					5/27/2009				
				Sample depth (ft bgs)	1-2					1-2					1-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.3	43.25	10		0.001	0.28	40.19	72		0.001	3.4	524.11	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.3	43.25	ND	U	0.001	0.28	40.19	ND	U	0.001	0.34	52.41	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.3	43.25	ND	U	0.001	0.28	40.19	ND	U	0.001	0.34	52.41	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.3	43.25	3.2		0.001	0.28	40.19	46		0.001	3.4	524.11	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.3	43.25	1.5		0.0005	0.28	40.19	1		0.0005	0.34	52.41	ND	U	0.0005	0.008	0.9	0.014		0.0005	0.008	1.24
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.3	43.25	2.9		0.001	0.28	40.19	1.9		0.001	0.34	52.41	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.3	43.25	0.36		0.001	0.28	40.19	0.89		0.001	0.34	52.41	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.3	43.25	ND	U	0.0005	0.28	40.19	ND	U	0.0005	0.34	52.41	ND	U	0.0005	0.008	0.9	ND	U	0.0005	0.008	1.24
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.3	43.25	2		0.001	0.28	40.19	1.4		0.001	0.34	52.41	ND	U	0.001	0.008	0.9	0.009		0.001	0.008	1.24
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.3	43.25	19		0.001	0.28	40.19	8		0.001	0.34	52.41	ND	U	0.001	0.008	0.9	ND	U	0.001	0.008	1.24
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	ND	U	0.033	0.22	1	0.57		0.033	0.29	1	ND	U	0.033	0.22	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	ND	U	0.033	0.22	1	2.2		0.033	0.29	1	0.27		0.033	0.22	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	0.24		0.033	0.22	1	2.2		0.033	0.29	1	0.34		0.033	0.22	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	0.35		0.033	0.22	1	3.3		0.033	0.29	1	0.53		0.033	0.22	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	ND	U	0.033	0.22	1	1.5		0.033	0.29	1	0.28		0.033	0.22	1
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	0.28		0.033	0.22	1	2.3		0.033	0.29	1	0.33		0.033	0.22	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	ND	U	0.033	0.22	1	ND	U	0.033	0.29	1	ND	U	0.033	0.22	1
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	0.23	1	0.92		0.033	0.23	1	28		0.033	2.2	10	ND	U	0.033	0.29	1	0.29		0.033	0.22	1
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	0.56		0.033	0.22	1	2.8		0.033	0.29	1	0.44		0.033	0.22	1
Pyrene	129-00-0	2200	84000	mg/kg	ND	U	0.033	0.23	1	ND	U	0.033	0.23	1	0.54		0.033	0.22	1	4.2		0.033	0.29	1	0.57		0.033	0.22	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	23.6		0.02	1.36	10	19.8		0.02	1.32	10	1180		0.02	6.51	50	2590		0.02	33.6	200	885		0.02	13.2	100

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	BHSRTF-09-07					BHSRTF-09-08					BHSRTF-09-09					BHSRTF-09-10A					BHSRTF-09-10B				
				Sample Date	5/27/2009					5/27/2009					6/3/2009					7/20/2009					7/20/2009				
				Sample depth (ft bgs)	0-2					0-2					1-2					0.5-1					0.5-1				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.005	0.83	0.028		0.0005	0.006	0.99	0.087		0.0005	0.007	1.08	ND	U	0.0005	0.24	39.68	ND	U	0.0005	0.31	49.02
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.005	0.83	ND	U	0.001	0.006	0.99	ND	U	0.001	0.007	1.08	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.005	0.83	ND	U	0.0005	0.006	0.99	ND	U	0.0005	0.007	1.08	NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					ND	U	0.001	0.24	39.68	0.92		0.001	0.31	49.02
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.005	0.83	0.042		0.001	0.006	0.99	0.018		0.001	0.007	1.08	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.005	0.83	0.034		0.001	0.006	0.99	0.013		0.001	0.007	1.08	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	0.27		0.033	0.2	1	0.33		0.033	0.2	1	4		0.033	2.1	10
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	1.2		0.033	0.2	1	1.5		0.033	0.2	1	2.3		0.033	2.1	10
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	1.2		0.033	0.2	1	1.6		0.033	0.2	1	ND	U	0.033	2.1	10
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	1.7		0.033	0.2	1	2		0.033	0.2	1	2.3		0.033	2.1	10
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	0.96		0.033	0.2	1	1.2		0.033	0.2	1	ND	U	0.033	2.1	10
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	1.2		0.033	0.2	1	1.5		0.033	0.2	1	3.8		0.033	2.1	10
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	4.3		0.033	2.1	10
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	0.88		0.033	0.2	1	1.2		0.033	0.2	1	15		0.033	2.1	10
Pyrene	129-00-0	2200	84000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.2	1	1.8		0.033	0.2	1	1.8		0.033	0.2	1	6.5		0.033	2.1	10
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	38.2		0.02	1.13	10	1120		0.02	12.2	100	1760		0.02	5.88	50	NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	BHSRTF-09-10C					BHSRTF-09-11A					BHSRTF-09-11B					BHSRTF-09-11C					BHSRTF-09-11D				
				Sample Date	7/20/2009					7/20/2009					7/20/2009					7/20/2009					7/20/2009				
				Sample depth (ft bgs)	0.5-1					0.5-1					0.5-1					0.5-1					0.5-1				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.29	45.79	ND	U	0.0005	0.24	41.74	ND	U	0.0005	0.23	38.82	ND	U	0.0005	0.27	42.66	ND	U	0.0005	0.31	43.71
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	9.9		0.001	0.29	45.79	ND	U	0.001	0.24	41.74	ND	U	0.001	0.23	38.82	ND	U	0.001	0.27	42.66	ND	U	0.001	0.31	43.71
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	5.5		0.033	2.1	10	ND	U	0.033	1.9	10	ND	U	0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	2.1	10	ND	U	0.033	1.9	10	0.27		0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	2.4		0.033	2.1	10	ND	U	0.033	1.9	10	0.32		0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	2.4		0.033	2.1	10	ND	U	0.033	1.9	10	0.37		0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	2.1	10	ND	U	0.033	1.9	10	0.26		0.033	0.2	1	0.28		0.033	0.21	1	ND	U	0.033	0.24	1
Chrysene	218-01-9	230	11000	mg/kg	4.8		0.033	2.1	10	ND	U	0.033	1.9	10	0.27		0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Fluorene	86-73-7	3800	110000	mg/kg	5.5		0.033	2.1	10	ND	U	0.033	1.9	10	ND	U	0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	22		0.033	2.1	10	ND	U	0.033	1.9	10	0.2		0.033	0.2	1	ND	U	0.033	0.21	1	0.35		0.033	0.24	1
Pyrene	129-00-0	2200	84000	mg/kg	6.5		0.033	2.1	10	ND	U	0.033	1.9	10	0.38		0.033	0.2	1	ND	U	0.033	0.21	1	ND	U	0.033	0.24	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	NA					NA					NA					NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	BHSRTF-09-12A					BHSRTF-09-12B					BHSRTF-09-12C					BHSRTF-09-12D					BHSRTF-09-12E				
				Sample Date	7/20/2009					7/20/2009					7/20/2009					7/20/2009					7/20/2009				
				Sample depth (ft bgs)	0.5-1					0-2					0-2					0-2					0.5-1				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.27	47.17	ND	U	0.0005	0.36	51.02	ND	U	0.0005	0.26	43.48	ND	U	0.0005	0.23	37.71	ND	U	0.0005	0.22	38.94
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.001	0.27	47.17	ND	U	0.001	0.36	51.02	ND	U	0.001	0.26	43.48	ND	U	0.001	0.23	37.71	ND	U	0.001	0.22	38.94
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	0.25		0.033	0.19	1
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	2.2		0.033	2	10	ND	U	0.033	0.19	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	ND	U	0.033	2	10	ND	U	0.033	0.19	1
Pyrene	129-00-0	2200	84000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	2.4	10	ND	U	0.033	2	10	3.2		0.033	2	10	ND	U	0.033	0.19	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	NA					NA					NA					NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	BHSRTF-09-13A					BHSRTF-09-13B					BHSRTF-09-14					S-108SRTF					S-109SRTF				
				Sample Date	7/20/2009					7/20/2009					6/2/2009					6/2/2009					8/18/2009				
				Sample depth (ft bgs)	0.5-1					0.5-1					1-2					1-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.28	48.73	ND	U	0.0005	0.27	49.9	ND	U	0.0005	0.01	1.42	ND	U	0.0005	0.006	0.92	ND	U	0.0005	0.34	45.45
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					ND	U	0.0005	0.01	1.42	ND	U	0.0005	0.006	0.92	ND	U	0.0005	0.34	45.45
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.001	0.28	48.73	ND	U	0.001	0.27	49.9	NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					ND	U	0.001	0.01	1.42	ND	U	0.001	0.006	0.92	ND	U	0.001	0.34	45.45
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	ND	U	0.033	0.23	1	ND	U	0.033	0.24	1	ND	U	0.033	0.25	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.43		0.033	0.23	1	ND	U	0.033	0.24	1	0.61		0.033	0.25	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.41		0.033	0.23	1	ND	U	0.033	0.24	1	0.53		0.033	0.25	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.54		0.033	0.23	1	0.28		0.033	0.24	1	0.69		0.033	0.25	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.27		0.033	0.23	1	ND	U	0.033	0.24	1	0.34		0.033	0.25	1
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.48		0.033	0.23	1	ND	U	0.033	0.24	1	0.52		0.033	0.25	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	ND	U	0.033	0.23	1	ND	U	0.033	0.24	1	ND	U	0.033	0.25	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					ND	U	0.033	0.23	1	ND	U	0.033	0.24	1	ND	U	0.033	0.25	1
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.58		0.033	0.23	1	ND	U	0.033	0.24	1	0.46		0.033	0.25	1
Pyrene	129-00-0	2200	84000	mg/kg	ND	U	0.033	0.19	1	ND	U	0.033	0.18	1	0.85		0.033	0.23	1	0.32		0.033	0.24	1	0.99		0.033	0.25	1
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	NA					NA					534		0.02	1.37	10	690		0.02	2.77	20	775		0.02	3.03	20

Note:
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mg/kg - Milligrams per kilogram
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MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
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Qualifiers:
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Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-110DSRTF					S-110SRTF					S-112SRTF					S-113SRTF					S-114SRTF				
				Sample Date	5/28/2015					6/1/2009					6/1/2009					6/1/2009					6/1/2009				
				Sample depth (ft bgs)	0-2					1-2					1-2					1-2					1-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.0017	0.0059	1	ND	U	0.001	0.005	0.79	24		0.001	2.8	421.59	ND	U	0.001	0.005	0.79	5.5		0.001	0.29	44.17
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0015	0.0035	1	ND	U	0.001	0.005	0.79	ND	U	0.001	0.28	42.16	ND	U	0.001	0.005	0.79	ND	U	0.001	0.29	44.17
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0012	0.0059	1	ND	U	0.001	0.005	0.79	ND	U	0.001	0.28	42.16	ND	U	0.001	0.005	0.79	ND	U	0.001	0.29	44.17
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.002	0.0059	1	ND	U	0.001	0.005	0.79	10		0.001	0.28	42.16	ND	U	0.001	0.005	0.79	1.7		0.001	0.29	44.17
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0016	0.0059	1	ND	U	0.0005	0.005	0.79	0.48		0.0005	0.28	42.16	ND	U	0.0005	0.005	0.79	0.92		0.0005	0.29	44.17
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0012	0.0059	1	ND	U	0.001	0.005	0.79	1.2		0.001	0.28	42.16	ND	U	0.001	0.005	0.79	3.1		0.001	0.29	44.17
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.002	0.0059	1	ND	U	0.001	0.005	0.79	0.85		0.001	0.28	42.16	ND	U	0.001	0.005	0.79	ND	U	0.001	0.29	44.17
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0029	0.0059	1	ND	U	0.0005	0.005	0.79	ND	U	0.0005	0.28	42.16	ND	U	0.0005	0.005	0.79	ND	U	0.0005	0.29	44.17
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0018	0.0059	1	ND	U	0.001	0.005	0.79	0.58		0.001	0.28	42.16	ND	U	0.001	0.005	0.79	0.7		0.001	0.29	44.17
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.0033	0.018	1	ND	U	0.001	0.005	0.79	11		0.001	0.28	42.16	ND	U	0.001	0.005	0.79	18		0.001	0.29	44.17
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	0.0032	J	0.00073	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.015		0.0019	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.019		0.00072	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.041		0.00066	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.0069	J	0.0012	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Chrysene	218-01-9	230	11000	mg/kg	0.018		0.00049	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Fluorene	86-73-7	3800	110000	mg/kg	0.0012	J	0.00065	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Naphthalene	91-20-3	25	56000	mg/kg	0.0026	J	0.0011	0.0075	1	ND	U	0.033	0.19	1	2.6		0.033	0.22	1	ND	U	0.033	0.21	1	0.32		0.033	0.22	1
Phenanthrene	85-01-8	10000	190000	mg/kg	0.012		0.00075	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
Pyrene	129-00-0	2200	84000	mg/kg	0.021		0.00061	0.0075	1	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.21	1	ND	U	0.033	0.22	1
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	NA					70		0.02	1.13	10	20.2		0.02	1.28	10	12.1		0.02	1.26	10	23.3		0.02	1.33	10

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-115DSRTF					S-115SRTF					S-116SRTF					S-117SRTF					S-118DSRTF				
				Sample Date	5/28/2015					6/1/2009					6/1/2009					6/1/2009					6/11/2015				
				Sample depth (ft bgs)	0-2					1-2					1-2					1-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.0016	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.0014	0.0033	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.0011	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.0018	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
Benzene	71-43-2	0.5	290	mg/kg	0.0058		0.0015	0.0054	1	ND	U	0.0005	0.005	0.78	ND	U	0.0005	0.005	0.86	0.01		0.0005	0.007	1.02	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0011	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0019	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0026	0.0054	1	ND	U	0.0005	0.005	0.78	ND	U	0.0005	0.005	0.86	ND	U	0.0005	0.007	1.02	NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0017	0.0054	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	0.008		0.001	0.007	1.02	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.0031	0.016	1	ND	U	0.001	0.005	0.78	ND	U	0.001	0.005	0.86	ND	U	0.001	0.007	1.02	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	0.1		0.00073	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	0.84		0.033	0.22	1	NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.83		0.0019	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	3.7		0.033	0.22	1	NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.74		0.00072	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	3.6		0.033	0.22	1	3		0.016	0.17	20
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	1.3		0.00066	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	4.8		0.033	0.22	1	NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.16		0.0012	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	2.5		0.033	0.22	1	NA				
Chrysene	218-01-9	230	11000	mg/kg	0.67		0.00049	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	3.6		0.033	0.22	1	NA				
Fluorene	86-73-7	3800	110000	mg/kg	0.012		0.00065	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	0.26		0.033	0.22	1	NA				
Naphthalene	91-20-3	25	56000	mg/kg	0.019		0.0011	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	0.25		0.033	0.22	1	NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.39		0.00075	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	3.7		0.033	0.22	1	NA				
Pyrene	129-00-0	2200	84000	mg/kg	1.1		0.00061	0.0075	1	ND	U	0.033	0.2	1	ND	U	0.033	0.2	1	6.4		0.033	0.44	2	NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	NA					41.8		0.02	1.18	10	33.1		0.02	1.17	10	5470		0.02	13.3	100	NA				

Note:
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10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-118SRTF					S-119SRTF					S-120SRTF					S-124SRTF					S-125SRTF				
				Sample Date	6/1/2009					6/1/2009					6/2/2009					6/2/2009					6/2/2009				
				Sample depth (ft bgs)	1-2					1-2					1-2					1-2					1-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.006	0.96	ND	U	0.0005	0.004	0.75	ND	U	0.0005	0.007	1.11	ND	U	0.0005	0.005	0.97	0.01		0.0005	0.01	1.17
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	0.006		0.001	0.005	0.97	ND	U	0.001	0.01	1.17
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.006	0.96	ND	U	0.0005	0.004	0.75	ND	U	0.0005	0.007	1.11	ND	U	0.0005	0.005	0.97	ND	U	0.0005	0.01	1.17
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.006	0.96	ND	U	0.001	0.004	0.75	ND	U	0.001	0.007	1.11	ND	U	0.001	0.005	0.97	ND	U	0.001	0.01	1.17
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	36		0.033	1.9	10	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.19	1	ND	U	0.033	0.27	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	94		0.033	9.7	50	0.2		0.033	0.19	1	0.37		0.033	0.22	1	0.24		0.033	0.19	1	0.67		0.033	0.27	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	73		0.033	9.7	50	0.27		0.033	0.19	1	0.48		0.033	0.22	1	0.32		0.033	0.19	1	0.95		0.033	0.27	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	100		0.033	9.7	50	0.26		0.033	0.19	1	0.48		0.033	0.22	1	0.4		0.033	0.19	1	1.2		0.033	0.27	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	45		0.033	9.7	50	0.2		0.033	0.19	1	0.45		0.033	0.22	1	0.26		0.033	0.19	1	0.77		0.033	0.27	1
Chrysene	218-01-9	230	11000	mg/kg	95		0.033	9.7	50	0.24		0.033	0.19	1	0.53		0.033	0.22	1	0.31		0.033	0.19	1	0.74		0.033	0.27	1
Fluorene	86-73-7	3800	110000	mg/kg	17		0.033	1.9	10	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.19	1	ND	U	0.033	0.27	1
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	1.9	10	ND	U	0.033	0.19	1	ND	U	0.033	0.22	1	ND	U	0.033	0.19	1	ND	U	0.033	0.27	1
Phenanthrene	85-01-8	10000	190000	mg/kg	160		0.033	9.7	50	ND	U	0.033	0.19	1	0.51		0.033	0.22	1	ND	U	0.033	0.19	1	ND	U	0.033	0.27	1
Pyrene	129-00-0	2200	84000	mg/kg	180		0.033	9.7	50	0.42		0.033	0.19	1	0.69		0.033	0.22	1	0.38		0.033	0.19	1	0.5		0.033	0.27	1
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	1440		0.02	5.6	50	39.3		0.02	1.16	10	1300		0.02	6.36	50	605		0.02	2.21	20	5390		0.02	16.2	100

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-126SRTF					S-127SRTF					S-128SRTF					S-129SRTF					S-131SRTF				
				Sample Date	6/2/2009					6/2/2009					6/2/2009					6/24/2009					7/20/2009				
				Sample depth (ft bgs)	1-2					1-2					1-2					1-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.004	0.83	0.011		0.0005	0.009	1.08	0.03		0.0005	0.007	1.15	0.014		0.0005	0.006	0.95	ND	U	0.0005	0.37	56.95
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.004	0.83	ND	U	0.0005	0.009	1.08	ND	U	0.0005	0.007	1.15	ND	U	0.0005	0.006	0.95	ND	U	0.0005	0.37	56.95
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	0.014		0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.004	0.83	ND	U	0.001	0.009	1.08	ND	U	0.001	0.007	1.15	ND	U	0.001	0.006	0.95	ND	U	0.001	0.37	56.95
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	1.7		0.033	0.22	1	0.26		0.033	0.21	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	7		0.033	1.1	5	1.1		0.033	0.21	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	7.5		0.033	1.1	5	1.3		0.033	0.21	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	9.2		0.033	1.1	5	1.7		0.033	0.21	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	4.1		0.033	0.22	1	ND	U	0.033	0.21	1
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	6.4		0.033	1.1	5	1.1		0.033	0.21	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	0.3		0.033	0.22	1	ND	U	0.033	0.21	1
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	1.1		0.033	0.22	1	ND	U	0.033	0.21	1
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	1.3		0.033	0.22	1	0.75		0.033	0.21	1
Pyrene	129-00-0	2200	84000	mg/kg	ND	U	0.033	0.18	1	ND	U	0.033	0.53	1	ND	U	0.033	0.2	1	8.3		0.033	1.1	5	1.4		0.033	0.21	1
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	8.85		0.02	1.06	10	1590		0.02	7.62	50	4600		0.02	12.1	100	1100		0.02	6.3	50	2440		0.02	12.9	100

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-132SRTF					S-133SRTF					S-134SRTF					S-135SRTF					S-136SRTF				
				Sample Date	6/2/2009					6/24/2009					6/2/2009					5/29/2015					7/23/2015				
				Sample depth (ft bgs)	1-2					1-2					1-2					0-2					0-2				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0017	0.0061	1	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0015	0.0036	1	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0013	0.0061	1	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.002	0.0061	1	NA				
Benzene	71-43-2	0.5	290	mg/kg	0.009		0.0005	0.008	1.22	0.009		0.0005	0.006	1	0.025		0.0005	0.006	1.08	0.009		0.0017	0.0061	1	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0012	0.0061	1	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0021	0.0061	1	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.008	1.22	ND	U	0.0005	0.006	1	ND	U	0.0005	0.006	1.08	ND	U	0.003	0.0061	1	NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	0.007		0.001	0.006	1.08	ND	U	0.0019	0.0061	1	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.008	1.22	ND	U	0.001	0.006	1	ND	U	0.001	0.006	1.08	ND	U	0.0034	0.018	1	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	1.1	5	2.8		0.033	2.1	10	ND	U	0.033	0.2	1	0.035		0.00072	0.0074	1	NA				
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	ND	U	0.033	1.1	5	17		0.033	2.1	10	0.53		0.033	0.2	1	0.22		0.0019	0.0074	1	NA				
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	ND	U	0.033	1.1	5	18		0.033	2.1	10	0.58		0.033	0.2	1	0.27		0.00071	0.0074	1	NA				
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	1.2		0.033	1.1	5	21		0.033	2.1	10	0.78		0.033	0.2	1	0.55		0.00066	0.0074	1	NA				
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U	0.033	1.1	5	8.4		0.033	2.1	10	0.42		0.033	0.2	1	0.079		0.0011	0.0074	1	NA				
Chrysene	218-01-9	230	11000	mg/kg	ND	U	0.033	1.1	5	14		0.033	2.1	10	0.58		0.033	0.2	1	0.22		0.00049	0.0074	1	NA				
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	1.1	5	ND	U	0.033	2.1	10	ND	U	0.033	0.2	1	0.0068	J	0.00064	0.0074	1	NA				
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	1.1	5	2.3		0.033	2.1	10	ND	U	0.033	0.2	1	0.014		0.001	0.0074	1	NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	1.1		0.033	1.1	5	2.5		0.033	2.1	10	0.38		0.033	0.2	1	0.12		0.00074	0.0074	1	NA				
Pyrene	129-00-0	2200	84000	mg/kg	1.5		0.033	1.1	5	21		0.033	2.1	10	0.82		0.033	0.2	1	0.32		0.0006	0.0074	1	NA				
METALS																												
Lead	7439-92-1	2240	2240	mg/kg	2330		0.02	12.9	100	630		0.02	4.92	40	1580		0.02	5.84	50	NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
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MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-74DSRTF					S-77DSRTF					TK34-1					TK34-2					TK34-3				
				Sample Date	7/20/2009					6/2/2009					12/23/2003					12/23/2003					12/23/2003				
				Sample depth (ft bgs)	0-2					1-2					1-2					0.5-1					0.5-1				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																													
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U	0.0005	0.31	51.33	0.008		0.0005	0.006	1.01	ND	U		0.38	1	ND	U		0.32	1	ND	U		0.31	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	ND	U	0.0005	0.31	51.33	ND	U	0.0005	0.006	1.01	NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					ND	U		0.38	1	ND	U		0.32	1	ND	U		0.31	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	ND	U	0.001	0.31	51.33	ND	U	0.001	0.006	1.01	NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																													
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.44		0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.5		0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.69		0.033	0.2	1	0.28		0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	0.4		0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Chrysene	218-01-9	230	11000	mg/kg	0.46		0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U	0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Naphthalene	91-20-3	25	56000	mg/kg	ND	U	0.033	0.2	1	ND	U	0.033	0.19	1	NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.43		0.033	0.2	1	ND	U	0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
Pyrene	129-00-0	2200	84000	mg/kg	0.68		0.033	0.2	1	0.24		0.033	0.19	1	ND	U		0.52	1	ND	U		0.42	1	ND	U		4.4	1
METALS																													
Lead	7439-92-1	2240	2240	mg/kg	675		0.02	2.4	20	3110		0.02	11.6	100	NA					NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 5
Summary of Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Surface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	TK34-4					TK34-5					TK34-6					TK34-7				
				Sample Date	12/23/2003					12/23/2003					12/23/2003					12/23/2003				
				Sample depth (ft bgs)	0.5-1					0.5-1					1-2					0.5-1				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	560	mg/kg	NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	3.7	mg/kg	NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	86	mg/kg	NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	480	mg/kg	NA					NA					NA					NA				
Benzene	71-43-2	0.5	290	mg/kg	ND	U		0.43	1	ND	U		0.3	1	ND	U		0.27	1	ND	U		0.29	1
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3200	mg/kg	NA					NA					NA					NA				
Naphthalene	91-20-3	25	56000	mg/kg	ND	U		0.43	1	ND	U		0.3	1	ND	U		0.27	1	ND	U		0.29	1
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	8000	mg/kg	NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
Anthracene	120-12-7	350	190000	mg/kg	ND	U		0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Benzo(A)Anthracene	56-55-3	110	110	mg/kg	0.56			0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Benzo(A)Pyrene	50-32-8	11	11	mg/kg	0.62			0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Benzo(B)Fluoranthene	205-99-2	110	110	mg/kg	0.73			0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Benzo(G,H,I)Perylene	191-24-2	180	170000	mg/kg	ND	U		0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Chrysene	218-01-9	230	11000	mg/kg	0.68			0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Fluorene	86-73-7	3800	110000	mg/kg	ND	U		0.44	1	ND	U		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Naphthalene	91-20-3	25	56000	mg/kg	NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.59			0.44	1	0.26	J		0.45	1	ND	U		3.6	1	ND	U		4.4	1
Pyrene	129-00-0	2200	84000	mg/kg	0.81			0.44	1	0.27	J		0.45	1	ND	U		3.6	1	ND	U		4.4	1
METALS																								
Lead	7439-92-1	2240	2240	mg/kg	NA					NA					NA					NA				

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
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DF - Dilution factor
ND - Not detected
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Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate

Exceedances:
10 - Result exceeds PADEP Non-residential Surface Soil MSC
10 - Result exceeds PADEP Non-residential Soil Direct Contact MSC
15 - MDL exceeds either PADEP Non-residential Surface Soil MSC or PADEP Non-residential Soil Direct Contact MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-1					AOI9-BH-15-1D[1]					AOI9-BH-15-2					AOI9-BH-15-3				
				Sample Date	6/19/2015					6/19/2015					6/18/2015					6/19/2015				
				Sample depth (ft bgs)	6-8					6-8					4-6					6-8				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0013	0.0047	1	ND	U	0.0012	0.0041	1	ND	U	0.0013	0.0045	1	ND	U	0.0015	0.0052	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0012	0.0028	1	ND	U	0.001	0.0024	1	ND	U	0.0011	0.0027	1	ND	U	0.0013	0.0031	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.001	0.0047	1	ND	U	0.00086	0.0041	1	ND	U	0.00095	0.0045	1	ND	U	0.0011	0.0052	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0016	0.0047	1	ND	U	0.0014	0.0041	1	ND	U	0.0015	0.0045	1	ND	U	0.0017	0.0052	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.024				1	0.021				1	0.023				1	0.026				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0013	0.0047	1	ND	U	0.0011	0.0041	1	ND	U	0.0012	0.0045	1	ND	U	0.0014	0.0052	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.00095	0.0047	1	ND	U	0.00082	0.0041	1	ND	U	0.00091	0.0045	1	ND	U	0.001	0.0052	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0016	0.0047	1	ND	U	0.0014	0.0041	1	ND	U	0.0016	0.0045	1	ND	U	0.0018	0.0052	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0023	0.0047	1	ND	U	0.002	0.0041	1	ND	U	0.0022	0.0045	1	ND	U	0.0025	0.0052	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0015	0.0047	1	ND	U	0.0013	0.0041	1	ND	U	0.0014	0.0045	1	ND	U	0.0016	0.0052	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0027	0.014	1	ND	U	0.0023	0.012	1	ND	U	0.0026	0.014	1	ND	U	0.0029	0.016	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.23				1	0.23				1	0.17				1	0.25				1
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.00075	0.0077	1	ND	U	0.00078	0.0081	1	0.0049	J	0.00078	0.0081	1	ND	U	0.00077	0.0079	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.002	0.0077	1	0.0033	J	0.0021	0.0081	1	0.0045	J	0.0021	0.0081	1	ND	U	0.002	0.0079	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.0012	J	0.00074	0.0077	1	0.0028	J	0.00077	0.0081	1	0.0029	J	0.00077	0.0081	1	ND	U	0.00075	0.0079	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.0022	J	0.00068	0.0077	1	0.0058	J	0.00071	0.0081	1	0.0053	J	0.00071	0.0081	1	ND	U	0.0007	0.0079	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0012	0.0077	1	0.002	J	0.0012	0.0081	1	0.0018	J	0.0012	0.0081	1	ND	U	0.0012	0.0079	1
Chrysene	218-01-9	230	190000	mg/kg	0.001	J	0.00051	0.0077	1	0.0025	J	0.00053	0.0081	1	0.0037	J	0.00053	0.0081	1	ND	U	0.00052	0.0079	1
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.00067	0.0077	1	ND	U	0.0007	0.0081	1	0.0023	J	0.0007	0.0081	1	ND	U	0.00068	0.0079	1
Naphthalene	91-20-3	25	190000	mg/kg	ND	U	0.0011	0.0077	1	ND	U	0.0011	0.0081	1	0.0042	J	0.0011	0.0081	1	ND	U	0.0011	0.0079	1
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.00077	0.0077	1	0.0025	J	0.00081	0.0081	1	0.016		0.00081	0.0081	1	ND	U	0.00079	0.0079	1
Pyrene	129-00-0	2200	190000	mg/kg	0.0016	J	0.00062	0.0077	1	0.0041	J	0.00065	0.0081	1	0.012		0.00065	0.0081	1	ND	U	0.00064	0.0079	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	14.2		0.39	0.4	1	19.4		0.48	0.49	1	10.7		0.44	0.46	1	11		0.46	0.47	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-4					AOI9-BH-15-5					AOI9-BH-15-6					AOI9-BH-15-7				
				Sample Date	6/19/2015					7/1/2015					7/1/2015					7/2/2015				
				Sample depth (ft bgs)	4-6					4-6					2-4					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0014	0.0049	1	ND	U	0.0016	0.0056	1	ND	U	0.0024	0.0084	1	ND	U	0.0016	0.0057	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0012	0.0029	1	ND	U	0.0014	0.0034	1	ND	U	0.0021	0.005	1	ND	U	0.0015	0.0034	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.001	0.0049	1	ND	U	0.0012	0.0056	1	ND	U	0.0018	0.0084	1	ND	U	0.0012	0.0057	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0016	0.0049	1	ND	U	0.0019	0.0056	1	ND	U	0.0028	0.0084	1	ND	U	0.0019	0.0057	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.025				1	0.024				1	0.037				1	0.025				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0013	0.0049	1	ND	U	0.0015	0.0056	1	0.0067	J	0.0023	0.0084	1	ND	U	0.0016	0.0057	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.00098	0.0049	1	ND	U	0.0011	0.0056	1	ND	U	0.0017	0.0084	1	ND	U	0.0012	0.0057	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0017	0.0049	1	ND	U	0.0019	0.0056	1	ND	U	0.0029	0.0084	1	ND	U	0.002	0.0057	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0024	0.0049	1	ND	U	0.0027	0.0056	1	ND	U	0.0041	0.0084	1	ND	U	0.0028	0.0057	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0015	0.0049	1	ND	U	0.0018	0.0056	1	ND	U	0.0026	0.0084	1	ND	U	0.0018	0.0057	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0028	0.015	1	ND	U	0.0032	0.017	1	ND	U	0.0048	0.025	1	ND	U	0.0033	0.017	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.24				1	0.24				1	0.22				1	0.24				1
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.00077	0.008	1	0.45		0.0009	0.0093	1	0.093		0.00089	0.0092	1	0.0029	J	0.00088	0.0091	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.002	0.008	1	0.63		0.0024	0.0093	1	0.39		0.0023	0.0092	1	0.023		0.0023	0.0091	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.00076	0.008	1	0.43		0.00088	0.0093	1	0.29		0.00087	0.0092	1	0.019		0.00087	0.0091	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.0007	0.008	1	0.63		0.00082	0.0093	1	0.48		0.00081	0.0092	1	0.032		0.0008	0.0091	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0012	0.008	1	0.21		0.0014	0.0093	1	0.14		0.0014	0.0092	1	0.0094		0.0014	0.0091	1
Chrysene	218-01-9	230	190000	mg/kg	ND	U	0.00052	0.008	1	0.45		0.00061	0.0093	1	0.33		0.0006	0.0092	1	0.021		0.00059	0.0091	1
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.00069	0.008	1	0.28		0.0008	0.0093	1	0.047		0.00079	0.0092	1	0.0016	J	0.00078	0.0091	1
Naphthalene	91-20-3	25	190000	mg/kg	ND	U	0.0011	0.008	1	0.31		0.0013	0.0093	1	0.11		0.0013	0.0092	1	0.0072	J	0.0013	0.0091	1
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.0008	0.008	1	1.5		0.00093	0.0093	1	0.36		0.00092	0.0092	1	0.015		0.00091	0.0091	1
Pyrene	129-00-0	2200	190000	mg/kg	ND	U	0.00064	0.008	1	1.2		0.00075	0.0093	1	0.54		0.00074	0.0092	1	0.031		0.00073	0.0091	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	12.9		0.33	0.34	1	41.9		0.46	0.48	1	536		0.48	0.5	1	36.1		0.48	0.5	1

Note:
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-8					AOI9-BH-15-8D[1]					AOI9-BH-15-9					AOI9-BH-15-10				
				Sample Date	7/2/2015					7/2/2015					6/25/2015					6/25/2015				
				Sample depth (ft bgs)	4-6					4-6					6-8					6-8				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0016	0.0055	1	ND	U	0.0016	0.0058	1	ND	U	0.002	0.0069	1	ND	U	0.0021	0.0072	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0014	0.0033	1	ND	U	0.0015	0.0035	1	ND	U	0.0018	0.0042	1	ND	U	0.0018	0.0043	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0012	0.0055	1	ND	U	0.0012	0.0058	1	ND	U	0.0015	0.0069	1	ND	U	0.0015	0.0072	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0019	0.0055	1	ND	U	0.0019	0.0058	1	ND	U	0.0023	0.0069	1	ND	U	0.0024	0.0072	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.024				1	0.025				1	0.03				1	0.032				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0015	0.0055	1	ND	U	0.0016	0.0058	1	ND	U	0.0019	0.0069	1	ND	U	0.002	0.0072	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0011	0.0055	1	ND	U	0.0012	0.0058	1	ND	U	0.0014	0.0069	1	ND	U	0.0015	0.0072	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0019	0.0055	1	ND	U	0.002	0.0058	1	ND	U	0.0024	0.0069	1	ND	U	0.0025	0.0072	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0027	0.0055	1	ND	U	0.0028	0.0058	1	ND	U	0.0034	0.0069	1	ND	U	0.0035	0.0072	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0017	0.0055	1	ND	U	0.0018	0.0058	1	ND	U	0.0022	0.0069	1	ND	U	0.0023	0.0072	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0031	0.017	1	ND	U	0.0033	0.017	1	ND	U	0.0039	0.021	1	ND	U	0.0041	0.022	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.27				1	0.31				1	0.26				1	0.22				1
Anthracene	120-12-7	350	190000	mg/kg	0.037		0.00089	0.0092	1	0.0083	J	0.0009	0.0093	1	ND	U	0.00094	0.0097	1	ND	U	0.001	0.01	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.087		0.0023	0.0092	1	0.04		0.0024	0.0093	1	ND	U	0.0025	0.0097	1	ND	U	0.0027	0.01	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.068		0.00088	0.0092	1	0.037		0.00089	0.0093	1	0.066		0.00093	0.0097	1	0.066		0.001	0.01	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.11		0.00081	0.0092	1	0.066		0.00082	0.0093	1	0.0068	J	0.00085	0.0097	1	0.0073	J	0.00092	0.01	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.039		0.0014	0.0092	1	0.019		0.0014	0.0093	1	ND	U	0.0015	0.0097	1	ND	U	0.0016	0.01	1
Chrysene	218-01-9	230	190000	mg/kg	0.072		0.0006	0.0092	1	0.045		0.00061	0.0093	1	0.00096	J	0.00064	0.0097	1	0.00089	J	0.00069	0.01	1
Fluorene	86-73-7	3800	190000	mg/kg	0.023		0.0008	0.0092	1	0.0037	J	0.0008	0.0093	1	0.0011	J	0.00084	0.0097	1	0.0011	J	0.0009	0.01	1
Naphthalene	91-20-3	25	190000	mg/kg	0.021		0.0013	0.0092	1	0.004	J	0.0013	0.0093	1	0.0021	J	0.0014	0.0097	1	0.0042	J	0.0015	0.01	1
Phenanthrene	85-01-8	10000	190000	mg/kg	0.14		0.00092	0.0092	1	0.059		0.00093	0.0093	1	0.0039	J	0.00097	0.0097	1	0.0046	J	0.001	0.01	1
Pyrene	129-00-0	2200	190000	mg/kg	0.14		0.00074	0.0092	1	0.077		0.00075	0.0093	1	0.00097	J	0.00078	0.0097	1	0.0014	J	0.00084	0.01	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	20.6		0.45	0.46	1	28.1		0.39	0.41	1	11		0.53	0.55	1	10.5		0.5	0.52	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-11					AOI9-BH-15-12					AOI9-BH-15-13					AOI9-BH-15-14				
				Sample Date	6/25/2015					8/3/2015					8/3/2015					8/3/2015				
				Sample depth (ft bgs)	8-10					4-6					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0022	0.0077	1	ND	U	0.11	0.37	50	ND	U	0.14	0.48	50	ND	U	0.11	0.38	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.002	0.0046	1	ND	U	***0.094***	0.22	50	ND	U	***0.12***	0.29	50	ND	U	***0.095***	0.23	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0016	0.0077	1	ND	U	0.079	0.37	50	ND	U	0.1	0.48	50	ND	U	0.08	0.38	50
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0026	0.0077	1	ND	U	0.12	0.37	50	ND	U	0.16	0.48	50	ND	U	0.13	0.38	50
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.032				1	1.7				50	1.7				50	1.9				50
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0021	0.0077	1	ND	U	0.1	0.37	50	ND	U	0.13	0.48	50	ND	U	0.1	0.38	50
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0016	0.0077	1	ND	U	0.075	0.37	50	ND	U	0.096	0.48	50	ND	U	0.076	0.38	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0027	0.0077	1	ND	U	0.13	0.37	50	ND	U	0.16	0.48	50	ND	U	0.13	0.38	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0038	0.0077	1	ND	U	0.18	0.37	50	ND	U	0.23	0.48	50	ND	U	0.18	0.38	50
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0024	0.0077	1	ND	U	0.12	0.37	50	ND	U	0.15	0.48	50	ND	U	0.12	0.38	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0044	0.023	1	ND	U	0.21	1.1	50	ND	U	0.27	1.4	50	ND	U	0.21	1.1	50
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.22				1	0.18				10	0.14				10	0.22				10
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.001	0.011	1	0.19		0.0082	0.084	10	0.019	J	0.011	0.11	10	0.28		0.008	0.082	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.0027	0.011	1	0.76		0.021	0.084	10	0.13		0.028	0.11	10	1.2		0.021	0.082	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.079		0.001	0.011	1	0.7		0.008	0.084	10	0.13		0.01	0.11	10	1.1		0.0078	0.082	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.0072	J	0.00093	0.011	1	1.4		0.0074	0.084	10	0.25		0.0096	0.11	10	2.1		0.0072	0.082	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0016	0.011	1	0.32		0.013	0.084	10	0.073	J	0.017	0.11	10	0.59		0.013	0.082	10
Chrysene	218-01-9	230	190000	mg/kg	0.0008	J	0.00069	0.011	1	0.84		0.0055	0.084	10	0.13		0.0071	0.11	10	1.3		0.0054	0.082	10
Fluorene	86-73-7	3800	190000	mg/kg	0.003	J	0.00092	0.011	1	0.049	J	0.0073	0.084	10	ND	U	0.0094	0.11	10	0.056	J	0.0071	0.082	10
Naphthalene	91-20-3	25	190000	mg/kg	0.0041	J	0.0015	0.011	1	0.3		0.012	0.084	10	0.044	J	0.015	0.11	10	0.12		0.012	0.082	10
Phenanthrene	85-01-8	10000	190000	mg/kg	0.0061	J	0.0011	0.011	1	0.76		0.0084	0.084	10	0.096	J	0.011	0.11	10	1.1		0.0082	0.082	10
Pyrene	129-00-0	2200	190000	mg/kg	0.0014	J	0.00085	0.011	1	1.3		0.0068	0.084	10	0.18		0.0088	0.11	10	2.2		0.0066	0.082	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	9.7		0.64	0.66	1	857		0.6	0.62	1	752		0.58	0.6	1	744		0.53	0.55	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
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NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
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Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-15					AOI9-BH-15-16					AOI9-BH-15-17					AOI9-BH-15-18				
				Sample Date	8/3/2015					7/10/2015					7/10/2015					7/10/2015				
				Sample depth (ft bgs)	2-4					4-6					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.1	0.36	50	ND	U	0.0018	0.0064	1	ND	U	0.0027	0.0096	1	ND	U	0.002	0.007	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.092***	0.22	50	ND	U	0.0016	0.0039	1	ND	U	0.0024	0.0057	1	ND	U	0.0018	0.0042	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.077	0.36	50	ND	U	0.0014	0.0064	1	ND	U	0.002	0.0096	1	ND	U	0.0015	0.007	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.12	0.36	50	ND	U	0.0022	0.0064	1	ND	U	0.0032	0.0096	1	ND	U	0.0023	0.007	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.5				50	0.024				1	0.032				1	0.032				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.098	0.36	50	ND	U	0.0017	0.0064	1	ND	U	0.0026	0.0096	1	ND	U	0.0019	0.007	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.073	0.36	50	ND	U	0.0013	0.0064	1	ND	U	0.0019	0.0096	1	ND	U	0.0014	0.007	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.13	0.36	50	ND	U	0.0022	0.0064	1	ND	U	0.0033	0.0096	1	ND	U	0.0024	0.007	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.18	0.36	50	ND	U	0.0031	0.0064	1	ND	U	0.0046	0.0096	1	ND	U	0.0034	0.007	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.11	0.36	50	ND	U	0.002	0.0064	1	ND	U	0.003	0.0096	1	ND	U	0.0022	0.007	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.21	1.1	50	ND	U	0.0037	0.019	1	ND	U	0.0054	0.029	1	ND	U	0.004	0.021	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.21				10	0.19				10	0.2				10	0.2				20
Anthracene	120-12-7	350	190000	mg/kg	0.079	J	0.0095	0.098	10	0.068	J	0.01	0.1	10	0.051	J	0.012	0.12	10	0.13	J	0.016	0.17	20
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.35		0.025	0.098	10	0.89		0.026	0.1	10	0.28		0.031	0.12	10	1.2		0.043	0.17	20
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.35		0.0093	0.098	10	0.94		0.0099	0.1	10	0.35		0.012	0.12	10	1.4		0.016	0.17	20
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.71		0.0086	0.098	10	2.2		0.0091	0.1	10	0.82		0.011	0.12	10	3.4		0.015	0.17	20
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.19		0.015	0.098	10	0.52		0.016	0.1	10	0.23		0.019	0.12	10	0.69		0.026	0.17	20
Chrysene	218-01-9	230	190000	mg/kg	0.42		0.0064	0.098	10	0.92		0.0068	0.1	10	0.34		0.0081	0.12	10	1.3		0.011	0.17	20
Fluorene	86-73-7	3800	190000	mg/kg	0.022	J	0.0084	0.098	10	0.015	J	0.0089	0.1	10	0.017	J	0.011	0.12	10	0.028	J	0.014	0.17	20
Naphthalene	91-20-3	25	190000	mg/kg	0.11		0.014	0.098	10	0.19		0.014	0.1	10	0.093	J	0.017	0.12	10	0.34		0.023	0.17	20
Phenanthrene	85-01-8	10000	190000	mg/kg	0.36		0.0098	0.098	10	0.36		0.01	0.1	10	0.37		0.012	0.12	10	0.71		0.017	0.17	20
Pyrene	129-00-0	2200	190000	mg/kg	0.63		0.0079	0.098	10	0.72		0.0083	0.1	10	0.4		0.0099	0.12	10	1.2		0.013	0.17	20
METALS																								
Lead	7439-92-1	450	190000	mg/kg	2,170		0.67	0.69	1	5,280		0.42	0.43	1	3,180		0.56	0.58	1	3,760		0.44	0.46	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-18D[1]					AOI9-BH-15-19					AOI9-BH-15-20					AOI9-BH-15-21				
				Sample Date	7/10/2015					7/10/2015					6/16/2015					6/16/2015				
				Sample depth (ft bgs)	4-6					4-6					6-7					6-7				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0026	0.0091	1	ND	U	0.0018	0.0063	1	ND	U	0.0024	0.0085	1	ND	U	0.0019	0.0066	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0023	0.0055	1	ND	U	0.0016	0.0038	1	ND	U	0.0022	0.0051	1	ND	U	0.0017	0.004	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0019	0.0091	1	ND	U	0.0013	0.0063	1	ND	U	0.0018	0.0085	1	ND	U	0.0014	0.0066	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0031	0.0091	1	ND	U	0.0021	0.0063	1	ND	U	0.0029	0.0085	1	ND	U	0.0022	0.0066	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.036				1	0.033				1	0.031				1	0.03				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0025	0.0091	1	ND	U	0.0017	0.0063	1	0.01		0.0023	0.0085	1	0.013		0.0018	0.0066	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0018	0.0091	1	ND	U	0.0013	0.0063	1	ND	U	0.0017	0.0085	1	ND	U	0.0013	0.0066	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0032	0.0091	1	ND	U	0.0022	0.0063	1	ND	U	0.003	0.0085	1	ND	U	0.0023	0.0066	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0044	0.0091	1	ND	U	0.0031	0.0063	1	ND	U	0.0042	0.0085	1	ND	U	0.0032	0.0066	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0028	0.0091	1	ND	U	0.002	0.0063	1	ND	U	0.0027	0.0085	1	ND	U	0.0021	0.0066	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0052	0.027	1	ND	U	0.0036	0.019	1	ND	U	0.0049	0.026	1	ND	U	0.0038	0.02	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.22				20	0.22				20	0.23				5	0.2				5
Anthracene	120-12-7	350	190000	mg/kg	0.074	J	0.019	0.2	20	0.86		0.016	0.17	20	0.03	J	0.0052	0.054	5	3.6		0.0049	0.05	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.58		0.051	0.2	20	5		0.042	0.17	20	0.16		0.014	0.054	5	9.9		0.013	0.05	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.7		0.019	0.2	20	3.7		0.016	0.17	20	0.15		0.0052	0.054	5	9.5		0.019	0.2	20
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	1.7		0.018	0.2	20	7.1		0.015	0.17	20	0.3		0.0048	0.054	5	14.7		0.018	0.2	20
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.38		0.031	0.2	20	1.3		0.026	0.17	20	0.093		0.0083	0.054	5	3.7		0.0077	0.05	5
Chrysene	218-01-9	230	190000	mg/kg	0.66		0.013	0.2	20	4.3		0.011	0.17	20	0.17		0.0036	0.054	5	8.4		0.0033	0.05	5
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.017	0.2	20	0.069	J	0.014	0.17	20	0.0065	J	0.0047	0.054	5	1.7		0.0043	0.05	5
Naphthalene	91-20-3	25	190000	mg/kg	0.22		0.028	0.2	20	0.26		0.023	0.17	20	0.072		0.0076	0.054	5	1.7		0.007	0.05	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.41		0.02	0.2	20	3		0.017	0.17	20	0.15		0.0054	0.054	5	10.3		0.02	0.2	20
Pyrene	129-00-0	2200	190000	mg/kg	0.61		0.016	0.2	20	6.5		0.013	0.17	20	0.2		0.0044	0.054	5	13.3		0.016	0.2	20
METALS																								
Lead	7439-92-1	450	190000	mg/kg	3,750		0.46	0.47	1	7,290		0.55	0.57	1	4,790		0.54	0.56	1	473		0.57	0.59	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-22					AOI9-BH-15-23					AOI9-BH-15-24					AOI9-BH-15-25				
				Sample Date	6/16/2015					6/16/2015					6/15/2015					6/15/2015				
				Sample depth (ft bgs)	6-7					6-7					3-4					3-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0036	0.013	1	ND	U	0.0018	0.0064	1	ND	U	0.0019	0.0067	1	ND	U	0.0023	0.008	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0032	0.0075	1	ND	U	0.0016	0.0038	1	ND	U	0.0017	0.004	1	ND	U	0.002	0.0048	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0027	0.013	1	ND	U	0.0014	0.0064	1	ND	U	0.0014	0.0067	1	ND	U	0.0017	0.008	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0042	0.013	1	ND	U	0.0021	0.0064	1	ND	U	0.0022	0.0067	1	ND	U	0.0027	0.008	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.055				1	0.027				1	0.025				1	0.029				1
Benzene	71-43-2	0.5	330	mg/kg	0.017		0.0034	0.013	1	ND	U	0.0017	0.0064	1	ND	U	0.0018	0.0067	1	ND	U	0.0022	0.008	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0025	0.013	1	ND	U	0.0013	0.0064	1	ND	U	0.0013	0.0067	1	ND	U	0.0016	0.008	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0043	0.013	1	ND	U	0.0022	0.0064	1	ND	U	0.0023	0.0067	1	ND	U	0.0028	0.008	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0061	0.013	1	ND	U	0.0031	0.0064	1	ND	U	0.0032	0.0067	1	ND	U	0.0039	0.008	1
Toluene	108-88-3	100	10000	mg/kg	0.01	J	0.0039	0.013	1	ND	U	0.002	0.0064	1	ND	U	0.0021	0.0067	1	ND	U	0.0025	0.008	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0071	0.038	1	ND	U	0.0036	0.019	1	ND	U	0.0038	0.02	1	ND	U	0.0045	0.024	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.27				5	0.24				5	0.2				5	0.2				5
Anthracene	120-12-7	350	190000	mg/kg	0.46		0.0048	0.049	5	0.45		0.0047	0.048	5	1.3		0.0049	0.05	5	0.59		0.0056	0.057	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	7.5		0.013	0.049	5	1.4		0.012	0.048	5	1.7		0.013	0.05	5	1.1		0.015	0.057	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	8.4		0.0047	0.049	5	1.4		0.0046	0.048	5	1.2		0.0048	0.05	5	1.2		0.0055	0.057	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	11.3		0.0087	0.098	10	2.5		0.0043	0.048	5	1.7		0.0044	0.05	5	1.8		0.0051	0.057	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	2.6		0.0076	0.049	5	0.7		0.0074	0.048	5	0.5		0.0077	0.05	5	0.59		0.0088	0.057	5
Chrysene	218-01-9	230	190000	mg/kg	6.4		0.0032	0.049	5	1.5		0.0032	0.048	5	1.5		0.0033	0.05	5	1.1		0.0038	0.057	5
Fluorene	86-73-7	3800	190000	mg/kg	0.056		0.0043	0.049	5	0.047	J	0.0042	0.048	5	1.1		0.0043	0.05	5	0.24		0.005	0.057	5
Naphthalene	91-20-3	25	190000	mg/kg	0.18		0.0069	0.049	5	0.5		0.0068	0.048	5	5.6		0.007	0.05	5	4.1		0.0081	0.057	5
Phenanthrene	85-01-8	10000	190000	mg/kg	1.5		0.0049	0.049	5	7.2		0.0048	0.048	5	2.6		0.005	0.05	5	1.7		0.0057	0.057	5
Pyrene	129-00-0	2200	190000	mg/kg	5.5		0.004	0.049	5	3		0.0039	0.048	5	3.9		0.004	0.05	5	1.3		0.0046	0.057	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	1,380		0.52	0.54	1	1,260		0.58	0.6	1	194		0.45	0.47	1	324		0.47	0.49	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-26					AOI9-BH-15-27					AOI9-BH-15-28					AOI9-BH-15-29				
				Sample Date	6/15/2015					6/15/2015					6/24/2015					6/23/2015				
				Sample depth (ft bgs)	3-4					3-4					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0021	0.0072	1	ND	U	0.0023	0.0081	1	ND	U	0.0022	0.0076	1	ND	U	0.0019	0.0065	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0018	0.0043	1	ND	U	0.0021	0.0049	1	ND	U	0.0019	0.0045	1	ND	U	0.0016	0.0039	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0015	0.0072	1	ND	U	0.0017	0.0081	1	ND	U	0.0016	0.0076	1	ND	U	0.0014	0.0065	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0024	0.0072	1	ND	U	0.0027	0.0081	1	ND	U	0.0025	0.0076	1	ND	U	0.0022	0.0065	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.033				1	0.032				1	0.037				1	0.028				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.002	0.0072	1	ND	U	0.0022	0.0081	1	0.014		0.0021	0.0076	1	ND	U	0.0018	0.0065	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0015	0.0072	1	ND	U	0.0016	0.0081	1	ND	U	0.0015	0.0076	1	ND	U	0.0013	0.0065	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0025	0.0072	1	ND	U	0.0028	0.0081	1	ND	U	0.0026	0.0076	1	ND	U	0.0022	0.0065	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0035	0.0072	1	ND	U	0.004	0.0081	1	ND	U	0.0037	0.0076	1	ND	U	0.0031	0.0065	1
Toluene	108-88-3	100	10000	mg/kg	0.0055	J	0.0023	0.0072	1	ND	U	0.0025	0.0081	1	0.0047	J	0.0024	0.0076	1	ND	U	0.002	0.0065	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0041	0.022	1	ND	U	0.0046	0.024	1	ND	U	0.0043	0.023	1	ND	U	0.0037	0.019	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.19				5	0.21				5	0.24				20	0.23				20
Anthracene	120-12-7	350	190000	mg/kg	1.4		0.0053	0.054	5	0.27		0.0051	0.052	5	0.72		0.02	0.21	20	5.1		0.018	0.19	20
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	3.2		0.014	0.054	5	0.57		0.013	0.052	5	2.4		0.053	0.21	20	13.3		0.048	0.19	20
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	2.7		0.0052	0.054	5	0.67		0.005	0.052	5	1.9		0.02	0.21	20	10		0.018	0.19	20
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	4		0.0048	0.054	5	0.99		0.0046	0.052	5	4.1		0.018	0.21	20	15.9		0.017	0.19	20
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	1.2		0.0084	0.054	5	0.37		0.008	0.052	5	1		0.032	0.21	20	5.1		0.029	0.19	20
Chrysene	218-01-9	230	190000	mg/kg	2.9		0.0036	0.054	5	0.58		0.0034	0.052	5	2.1		0.014	0.21	20	11.7		0.012	0.19	20
Fluorene	86-73-7	3800	190000	mg/kg	0.76		0.0047	0.054	5	0.16		0.0045	0.052	5	0.15	J	0.018	0.21	20	1		0.016	0.19	20
Naphthalene	91-20-3	25	190000	mg/kg	3.8		0.0076	0.054	5	2.1		0.0073	0.052	5	2.5		0.029	0.21	20	0.71		0.026	0.19	20
Phenanthrene	85-01-8	10000	190000	mg/kg	6		0.0054	0.054	5	0.79		0.0052	0.052	5	2.4		0.021	0.21	20	22.5		0.019	0.19	20
Pyrene	129-00-0	2200	190000	mg/kg	5.2		0.0044	0.054	5	0.86		0.0042	0.052	5	3.5		0.017	0.21	20	22.9		0.015	0.19	20
METALS																								
Lead	7439-92-1	450	190000	mg/kg	303		0.46	0.48	1	369		0.52	0.54	1	3,810		0.42	0.44	1	4,010		0.49	0.51	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
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Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
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15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-30					AOI9-BH-15-31					AOI9-BH-15-32					AOI9-BH-15-34				
				Sample Date	6/24/2015					6/24/2015					7/30/2015					6/22/2015				
				Sample depth (ft bgs)	2-4					4-6					3-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0018	0.0064	1	ND	U	0.0022	0.0077	1	0.015		0.0025	0.0089	1	0.0066		0.0019	0.0066	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0016	0.0038	1	ND	U	0.002	0.0046	1	ND	U	0.0023	0.0053	1	ND	U	0.0017	0.004	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0014	0.0064	1	ND	U	0.0016	0.0077	1	ND	U	0.0019	0.0089	1	ND	U	0.0014	0.0066	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0022	0.0064	1	ND	U	0.0026	0.0077	1	ND	U	0.003	0.0089	1	ND	U	0.0022	0.0066	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.032				1	0.038				1	0.047				1	0.032				1
Benzene	71-43-2	0.5	330	mg/kg	0.0091		0.0017	0.0064	1	0.0039	J	0.0021	0.0077	1	0.027		0.0024	0.0089	1	ND	U	0.0018	0.0066	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0013	0.0064	1	ND	U	0.0016	0.0077	1	ND	U	0.0018	0.0089	1	ND	U	0.0013	0.0066	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0022	0.0064	1	ND	U	0.0027	0.0077	1	ND	U	0.0031	0.0089	1	ND	U	0.0023	0.0066	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0031	0.0064	1	ND	U	0.0037	0.0077	1	ND	U	0.0043	0.0089	1	ND	U	0.0032	0.0066	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.002	0.0064	1	ND	U	0.0024	0.0077	1	0.051		0.0028	0.0089	1	ND	U	0.0021	0.0066	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0036	0.019	1	ND	U	0.0044	0.023	1	0.039		0.0051	0.027	1	0.0061	J	0.0037	0.02	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.28				10	0.16				10	0.27				10	0.24				5
Anthracene	120-12-7	350	190000	mg/kg	0.03	J	0.0083	0.086	10	0.69		0.0096	0.099	10	0.46		0.0082	0.084	10	0.018	J	0.0045	0.046	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.17		0.022	0.086	10	1.8		0.025	0.099	10	1.7		0.021	0.084	10	0.081		0.012	0.046	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.19		0.0082	0.086	10	1.5		0.0095	0.099	10	1.6		0.008	0.084	10	0.094		0.0044	0.046	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.41		0.0076	0.086	10	3.1		0.0088	0.099	10	2.3		0.0074	0.084	10	0.13		0.004	0.046	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.13		0.013	0.086	10	0.94		0.015	0.099	10	0.77		0.013	0.084	10	0.092		0.0071	0.046	5
Chrysene	218-01-9	230	190000	mg/kg	0.17		0.0056	0.086	10	1.5		0.0065	0.099	10	1.9		0.0055	0.084	10	0.08		0.003	0.046	5
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.0074	0.086	10	0.29		0.0086	0.099	10	0.12		0.0073	0.084	10	0.0055	J	0.004	0.046	5
Naphthalene	91-20-3	25	190000	mg/kg	0.094		0.012	0.086	10	0.4		0.014	0.099	10	0.096		0.012	0.084	10	0.0069	J	0.0064	0.046	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.1		0.0086	0.086	10	2.3		0.0099	0.099	10	1.8		0.0084	0.084	10	0.048		0.0046	0.046	5
Pyrene	129-00-0	2200	190000	mg/kg	0.19		0.0069	0.086	10	2.7		0.008	0.099	10	2.9		0.0068	0.084	10	0.14		0.0037	0.046	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	562		0.34	0.35	1	715		0.4	0.42	1	944		0.6	0.62	1	103		0.45	0.47	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-35					AOI9-BH-15-36					AOI9-BH-15-36					AOI9-BH-15-37				
				Sample Date	6/16/2015					6/29/2015					6/29/2015					8/4/2015				
				Sample depth (ft bgs)	7-8					2-4					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0025	0.0086	1	ND	U	0.0017	0.006	1	0.11		0.0014	0.0049	1	7.9		0.071	0.25	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0022	0.0052	1	ND	U	0.0015	0.0036	1	ND	U	0.0013	0.003	1	ND	U	***0.063***	0.15	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0018	0.0086	1	ND	U	0.0013	0.006	1	ND	U	0.001	0.0049	1	ND	U	0.053	0.25	50
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0029	0.0086	1	ND	U	0.002	0.006	1	0.017		0.0017	0.0049	1	2.9		0.083	0.25	50
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.033				1	0.028				1	0.027				1	1.2				50
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0023	0.0086	1	ND	U	0.0016	0.006	1	ND	U	0.0013	0.0049	1	0.38		0.067	0.25	50
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0017	0.0086	1	ND	U	0.0012	0.006	1	0.011		0.001	0.0049	1	0.74		0.05	0.25	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.003	0.0086	1	ND	U	0.0021	0.006	1	0.0079		0.0017	0.0049	1	0.32		0.086	0.25	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0042	0.0086	1	ND	U	0.0029	0.006	1	ND	U	0.0024	0.0049	1	ND	U	0.12	0.25	50
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0027	0.0086	1	ND	U	0.0019	0.006	1	0.0027	J	0.0015	0.0049	1	0.14	J	0.077	0.25	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0049	0.026	1	ND	U	0.0034	0.018	1	0.017		0.0028	0.015	1	4.5		0.14	0.74	50
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.14				5	0.2				5	0.23				10	0.21				10
Anthracene	120-12-7	350	190000	mg/kg	0.84		0.0051	0.053	5	0.0044	J	0.0044	0.045	5	ND	U	0.0076	0.078	10	ND	U	0.0083	0.086	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	4.4		0.013	0.053	5	0.014	J	0.012	0.045	5	ND	U	0.02	0.078	10	ND	U	0.022	0.086	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	5.8		0.005	0.053	5	0.025	J	0.0043	0.045	5	ND	U	0.0075	0.078	10	ND	U	0.0082	0.086	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	8.6		0.0046	0.053	5	0.055		0.004	0.045	5	ND	U	0.0069	0.078	10	ND	U	0.0076	0.086	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	1.6		0.0081	0.053	5	ND	U	0.007	0.045	5	ND	U	0.012	0.078	10	ND	U	0.013	0.086	10
Chrysene	218-01-9	230	190000	mg/kg	4.1		0.0034	0.053	5	0.017	J	0.003	0.045	5	ND	U	0.0051	0.078	10	ND	U	0.0056	0.086	10
Fluorene	86-73-7	3800	190000	mg/kg	0.27		0.0045	0.053	5	0.0053	J	0.0039	0.045	5	ND	U	0.0068	0.078	10	ND	U	0.0074	0.086	10
Naphthalene	91-20-3	25	190000	mg/kg	0.38		0.0074	0.053	5	0.011	J	0.0063	0.045	5	ND	U	0.011	0.078	10	1.4		0.012	0.086	10
Phenanthrene	85-01-8	10000	190000	mg/kg	2.6		0.0053	0.053	5	0.023	J	0.0045	0.045	5	ND	U	0.0078	0.078	10	ND	U	0.0086	0.086	10
Pyrene	129-00-0	2200	190000	mg/kg	5		0.0042	0.053	5	0.024	J	0.0036	0.045	5	ND	U	0.0063	0.078	10	ND	U	0.0069	0.086	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	1,420		0.61	0.63	1	136		0.43	0.44	1	11.4		0.39	0.41	1	12.2		0.41	0.42	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-38					AOI9-BH-15-39					AOI9-BH-15-40					AOI9-BH-15-41				
				Sample Date	6/8/2015					8/4/2015					7/24/2015					6/12/2015				
				Sample depth (ft bgs)	6-8					4-6					6-8					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0013	0.0045	1	5.4		0.075	0.26	50	ND	U	0.002	0.0068	1	ND	U	0.0019	0.0067	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0011	0.0027	1	ND	U	***0.067***	0.16	50	ND	U	0.0017	0.0041	1	ND	U	0.0017	0.004	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.00096	0.0045	1	ND	U	0.056	0.26	50	ND	U	0.0014	0.0068	1	ND	U	0.0014	0.0067	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0015	0.0045	1	4.1		0.088	0.26	50	ND	U	0.0023	0.0068	1	ND	U	0.0023	0.0067	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.026				1	1.4				50	0.029				1	0.029				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0012	0.0045	1	ND	U	0.072	0.26	50	0.21		0.0019	0.0068	1	0.0057	J	0.0018	0.0067	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.00091	0.0045	1	ND	U	0.053	0.26	50	ND	U	0.0014	0.0068	1	ND	U	0.0014	0.0067	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0016	0.0045	1	0.31		0.091	0.26	50	ND	U	0.0024	0.0068	1	ND	U	0.0023	0.0067	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0022	0.0045	1	ND	U	0.13	0.26	50	ND	U	0.0033	0.0068	1	ND	U	0.0033	0.0067	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0014	0.0045	1	ND	U	0.082	0.26	50	0.028		0.0021	0.0068	1	ND	U	0.0021	0.0067	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0026	0.014	1	0.29	J	0.15	0.79	50	ND	U	0.0039	0.02	1	ND	U	0.0038	0.02	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.2				1	0.22				10	0.2				20	0.28				10
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.00069	0.0071	1	ND	U	0.0076	0.078	10	ND	U	0.018	0.19	20	0.42		0.0092	0.094	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.0018	0.0071	1	ND	U	0.02	0.078	10	0.062	J	0.048	0.19	20	1.6		0.024	0.094	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.00068	0.0071	1	ND	U	0.0075	0.078	10	0.042	J	0.018	0.19	20	1.7		0.009	0.094	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.00063	0.0071	1	ND	U	0.0069	0.078	10	0.098	J	0.017	0.19	20	2.8		0.0083	0.094	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.0024	J	0.0011	0.0071	1	ND	U	0.012	0.078	10	0.032	J	0.029	0.19	20	1.2		0.015	0.094	10
Chrysene	218-01-9	230	190000	mg/kg	0.0016	J	0.00047	0.0071	1	ND	U	0.0051	0.078	10	0.057	J	0.012	0.19	20	1.7		0.0062	0.094	10
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.00062	0.0071	1	ND	U	0.0068	0.078	10	ND	U	0.016	0.19	20	0.068	J	0.0082	0.094	10
Naphthalene	91-20-3	25	190000	mg/kg	ND	U	0.001	0.0071	1	0.072	J	0.011	0.078	10	ND	U	0.026	0.19	20	0.66		0.013	0.094	10
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.00071	0.0071	1	ND	U	0.0078	0.078	10	0.055	J	0.019	0.19	20	1.5		0.0094	0.094	10
Pyrene	129-00-0	2200	190000	mg/kg	0.0027	J	0.00058	0.0071	1	ND	U	0.0063	0.078	10	0.079	J	0.015	0.19	20	2.3		0.0076	0.094	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	11.4		0.3	0.31	1	12.7		0.41	0.42	1	2,270		0.48	0.5	1	2,620		0.54	0.56	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-42					AOI9-BH-15-43					AOI9-BH-15-44					AOI9-BH-15-45				
				Sample Date	7/7/2015					7/8/2015					7/8/2015					6/9/2015				
				Sample depth (ft bgs)	6-8					4-6					6-8					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	71		0.75	2.6	500	ND	U	0.002	0.007	1	7.2		0.1	0.36	50	ND	U	0.0017	0.0059	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.067***	0.16	50	ND	U	0.0018	0.0042	1	ND	U	***0.091***	0.21	50	ND	U	0.0015	0.0035	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.056	0.26	50	ND	U	0.0015	0.007	1	ND	U	0.076	0.36	50	ND	U	0.0012	0.0059	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	23.9		0.88	2.6	500	ND	U	0.0024	0.007	1	1.6		0.12	0.36	50	ND	U	0.002	0.0059	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.2				50	0.028				1	1.4				50	0.03				1
Benzene	71-43-2	0.5	330	mg/kg	1.6		0.071	0.26	50	0.024		0.0019	0.007	1	6.7		0.097	0.36	50	ND	U	0.0016	0.0059	1
Ethylbenzene	100-41-4	70	10000	mg/kg	13.7		0.053	0.26	50	0.0055	J	0.0014	0.007	1	6		0.072	0.36	50	ND	U	0.0012	0.0059	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	4		0.091	0.26	50	0.011		0.0024	0.007	1	2.8		0.12	0.36	50	ND	U	0.002	0.0059	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.13	0.26	50	ND	U	0.0034	0.007	1	ND	U	0.17	0.36	50	ND	U	0.0028	0.0059	1
Toluene	108-88-3	100	10000	mg/kg	30.2		0.82	2.6	500	ND	U	0.0022	0.007	1	0.71		0.11	0.36	50	ND	U	0.0018	0.0059	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	161		1.5	7.9	500	0.012	J	0.004	0.021	1	6.6		0.2	1.1	50	ND	U	0.0033	0.018	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.22				1	0.25				1	0.16				1	0.21				5
Anthracene	120-12-7	350	190000	mg/kg	0.0017	J	0.0008	0.0083	1	ND	U	0.00099	0.01	1	0.05		0.00097	0.01	1	0.14		0.0042	0.043	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.0021	J	0.0021	0.0083	1	ND	U	0.0026	0.01	1	0.1		0.0026	0.01	1	0.24		0.011	0.043	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.00079	0.0083	1	ND	U	0.00097	0.01	1	0.068		0.00096	0.01	1	0.28		0.0041	0.043	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.0066	J	0.00073	0.0083	1	0.007	J	0.0009	0.01	1	0.15		0.00088	0.01	1	0.52		0.0038	0.043	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0013	0.0083	1	ND	U	0.0016	0.01	1	0.035		0.0015	0.01	1	0.18		0.0067	0.043	5
Chrysene	218-01-9	230	190000	mg/kg	0.0029	J	0.00054	0.0083	1	0.00075	J	0.00067	0.01	1	0.11		0.00066	0.01	1	0.28		0.0029	0.043	5
Fluorene	86-73-7	3800	190000	mg/kg	0.012		0.00072	0.0083	1	0.0011	J	0.00088	0.01	1	0.079		0.00087	0.01	1	0.16		0.0038	0.043	5
Naphthalene	91-20-3	25	190000	mg/kg	5.4		0.012	0.083	10	0.0034	J	0.0014	0.01	1	10		0.014	0.1	10	1		0.0061	0.043	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.089		0.00083	0.0083	1	0.0015	J	0.001	0.01	1	0.28		0.001	0.01	1	0.7		0.0043	0.043	5
Pyrene	129-00-0	2200	190000	mg/kg	0.012		0.00067	0.0083	1	ND	U	0.00082	0.01	1	0.28		0.00081	0.01	1	0.63		0.0035	0.043	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	10.1		0.45	0.47	1	11.9		0.55	0.57	1	144		0.57	0.59	1	1,340		0.49	0.51	1

Note:
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MDL - Method detection limit
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Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-46					AOI9-BH-15-47					AOI9-BH-15-48					AOI9-BH-15-50				
				Sample Date	6/8/2015					6/17/2015					6/15/2015					7/9/2015				
				Sample depth (ft bgs)	4-6					6-7					3-3.5					6-8				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0021	0.0075	1	ND	U	0.0021	0.0073	1	ND	U	0.19	0.67	50	ND	U	0.0015	0.0053	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0019	0.0045	1	ND	U	0.0019	0.0044	1	ND	U	***0.17***	0.4	50	ND	U	0.0013	0.0032	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0016	0.0075	1	ND	U	0.0015	0.0073	1	ND	U	0.14	0.67	50	ND	U	0.0011	0.0053	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0025	0.0075	1	ND	U	0.0024	0.0073	1	ND	U	0.23	0.67	50	ND	U	0.0018	0.0053	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.032				1	0.031				1	2.1				50	0.023				1
Benzene	71-43-2	0.5	330	mg/kg	0.0042	J	0.002	0.0075	1	ND	U	0.002	0.0073	1	ND	U	0.18	0.67	50	ND	U	0.0014	0.0053	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0015	0.0075	1	ND	U	0.0015	0.0073	1	ND	U	0.14	0.67	50	ND	U	0.0011	0.0053	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0026	0.0075	1	0.1		0.0025	0.0073	1	ND	U	0.23	0.67	50	ND	U	0.0018	0.0053	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0036	0.0075	1	ND	U	0.0035	0.0073	1	ND	U	0.33	0.67	50	ND	U	0.0026	0.0053	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0023	0.0075	1	ND	U	0.0023	0.0073	1	ND	U	0.21	0.67	50	ND	U	0.0016	0.0053	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0042	0.022	1	ND	U	0.0041	0.022	1	ND	U	0.38	2	50	ND	U	0.003	0.016	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.25				5	0.26				5	0.17				10	0.2				1
Anthracene	120-12-7	350	190000	mg/kg	0.065		0.0047	0.049	5	0.98		0.0039	0.04	5	0.14		0.013	0.14	10	0.0031	J	0.00083	0.0085	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.22		0.012	0.049	5	2.6		0.01	0.04	5	0.4		0.035	0.14	10	0.016		0.0022	0.0085	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.21		0.0046	0.049	5	2.1		0.0038	0.04	5	0.36		0.013	0.14	10	0.011		0.00082	0.0085	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.38		0.0043	0.049	5	4.8		0.0035	0.04	5	0.63		0.012	0.14	10	0.023		0.00075	0.0085	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.14		0.0075	0.049	5	0.45		0.0062	0.04	5	0.091	J	0.021	0.14	10	0.005	J	0.0013	0.0085	1
Chrysene	218-01-9	230	190000	mg/kg	0.23		0.0032	0.049	5	2.3		0.0026	0.04	5	0.39		0.009	0.14	10	0.014		0.00056	0.0085	1
Fluorene	86-73-7	3800	190000	mg/kg	0.036	J	0.0042	0.049	5	0.74		0.0035	0.04	5	0.094	J	0.012	0.14	10	0.00084	J	0.00074	0.0085	1
Naphthalene	91-20-3	25	190000	mg/kg	0.48		0.0068	0.049	5	0.75		0.0056	0.04	5	0.64		0.019	0.14	10	0.0013	J	0.0012	0.0085	1
Phenanthrene	85-01-8	10000	190000	mg/kg	0.33		0.0049	0.049	5	4.3		0.004	0.04	5	0.51		0.014	0.14	10	0.0066	J	0.00085	0.0085	1
Pyrene	129-00-0	2200	190000	mg/kg	0.35		0.0039	0.049	5	3.9		0.0032	0.04	5	0.62		0.011	0.14	10	0.031		0.00069	0.0085	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	628		0.5	0.52	1	837		0.41	0.42	1	943		0.76	0.79	1	11.2		0.43	0.44	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-51					AOI9-BH-15-52					AOI9-BH-15-53					AOI9-BH-15-54				
				Sample Date	6/26/2015					6/11/2015					6/11/2015					7/13/2015				
				Sample depth (ft bgs)	6-8					4-6					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0013	0.0046	1	ND	U	0.0028	0.01	1	ND	U	0.0026	0.0091	1	0.041		0.0021	0.0074	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0012	0.0028	1	ND	U	0.0025	0.006	1	ND	U	0.0023	0.0055	1	ND	U	0.0019	0.0044	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.00097	0.0046	1	ND	U	0.0021	0.01	1	ND	U	0.0019	0.0091	1	ND	U	0.0016	0.0074	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0015	0.0046	1	ND	U	0.0033	0.01	1	ND	U	0.0031	0.0091	1	0.023		0.0025	0.0074	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.025				1	0.048				1	0.038				1	0.044				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0012	0.0046	1	ND	U	0.0027	0.01	1	0.024		0.0025	0.0091	1	0.017		0.002	0.0074	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.00093	0.0046	1	ND	U	0.002	0.01	1	ND	U	0.0018	0.0091	1	0.0061	J	0.0015	0.0074	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0016	0.0046	1	ND	U	0.0034	0.01	1	ND	U	0.0032	0.0091	1	0.0052	J	0.0026	0.0074	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0022	0.0046	1	ND	U	0.0048	0.01	1	ND	U	0.0044	0.0091	1	ND	U	0.0036	0.0074	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0014	0.0046	1	ND	U	0.0031	0.01	1	0.0096		0.0028	0.0091	1	0.057		0.0023	0.0074	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0026	0.014	1	ND	U	0.0057	0.03	1	ND	U	0.0052	0.027	1	0.086		0.0042	0.022	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.22				10	0.29				10	0.29				50	0.16				5
Anthracene	120-12-7	350	190000	mg/kg	0.082		0.0073	0.075	10	0.16		0.0096	0.099	10	ND	U	0.055	0.57	50	0.035	J	0.0042	0.043	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.29		0.019	0.075	10	0.31		0.025	0.099	10	ND	U	0.15	0.57	50	0.074		0.011	0.043	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.23		0.0072	0.075	10	0.33		0.0094	0.099	10	ND	U	0.055	0.57	50	0.054		0.0041	0.043	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.47		0.0066	0.075	10	0.56		0.0087	0.099	10	ND	U	0.05	0.57	50	0.15		0.0038	0.043	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.099		0.012	0.075	10	0.23		0.015	0.099	10	ND	U	0.088	0.57	50	0.02	J	0.0066	0.043	5
Chrysene	218-01-9	230	190000	mg/kg	0.23		0.0049	0.075	10	0.34		0.0065	0.099	10	ND	U	0.037	0.57	50	0.081		0.0028	0.043	5
Fluorene	86-73-7	3800	190000	mg/kg	0.023	J	0.0065	0.075	10	0.15		0.0085	0.099	10	ND	U	0.049	0.57	50	0.036	J	0.0037	0.043	5
Naphthalene	91-20-3	25	190000	mg/kg	0.018	J	0.011	0.075	10	1.5		0.014	0.099	10	ND	U	0.08	0.57	50	0.27		0.006	0.043	5
Phenanthrene	85-01-8	10000	190000	mg/kg	0.34		0.0075	0.075	10	0.6		0.0099	0.099	10	ND	U	0.057	0.57	50	0.15		0.0043	0.043	5
Pyrene	129-00-0	2200	190000	mg/kg	0.43		0.006	0.075	10	0.53		0.0079	0.099	10	ND	U	0.046	0.57	50	0.14		0.0035	0.043	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	77.6		0.35	0.36	1	1,060		0.59	0.61	1	7,900		0.7	0.72	1	636		0.53	0.55	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-55					AOI9-BH-15-56					AOI9-BH-15-57					AOI9-BH-15-58				
				Sample Date	7/22/2015					7/27/2015					7/27/2015					7/22/2015				
				Sample depth (ft bgs)	6-8					4-6					4-6					6-8				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0017	0.0058	1	0.0096	J	0.0037	0.013	1	ND	U	0.0021	0.0074	1	ND	U	0.002	0.0071	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0015	0.0035	1	ND	U	0.0032	0.0077	1	ND	U	0.0019	0.0045	1	ND	U	0.0018	0.0043	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0012	0.0058	1	ND	U	0.0027	0.013	1	ND	U	0.0016	0.0074	1	ND	U	0.0015	0.0071	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0019	0.0058	1	ND	U	0.0043	0.013	1	ND	U	0.0025	0.0074	1	ND	U	0.0024	0.0071	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.026				1	0.05				1	0.039				1	0.032				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0016	0.0058	1	0.024		0.0035	0.013	1	0.0054	J	0.002	0.0074	1	ND	U	0.0019	0.0071	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0012	0.0058	1	ND	U	0.0026	0.013	1	ND	U	0.0015	0.0074	1	ND	U	0.0014	0.0071	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.002	0.0058	1	ND	U	0.0044	0.013	1	ND	U	0.0026	0.0074	1	ND	U	0.0025	0.0071	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0028	0.0058	1	ND	U	0.0062	0.013	1	ND	U	0.0036	0.0074	1	ND	U	0.0035	0.0071	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0018	0.0058	1	0.016		0.004	0.013	1	ND	U	0.0023	0.0074	1	ND	U	0.0022	0.0071	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0033	0.017	1	ND	U	0.0073	0.038	1	ND	U	0.0042	0.022	1	ND	U	0.004	0.021	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.24				10	0.2				20	0.21				10	0.21				5
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.009	0.093	10	0.96		0.025	0.26	20	0.057	J	0.0093	0.096	10	ND	U	0.0048	0.049	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.024	0.093	10	2.1		0.067	0.26	20	0.18		0.024	0.096	10	0.019	J	0.013	0.049	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.0089	0.093	10	1.9		0.025	0.26	20	0.19		0.0092	0.096	10	0.013	J	0.0047	0.049	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.0082	0.093	10	3.2		0.023	0.26	20	0.44		0.0084	0.096	10	0.034	J	0.0044	0.049	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.014	0.093	10	0.87		0.04	0.26	20	0.14		0.015	0.096	10	ND	U	0.0076	0.049	5
Chrysene	218-01-9	230	190000	mg/kg	ND	U	0.0061	0.093	10	1.9		0.017	0.26	20	0.23		0.0063	0.096	10	0.015	J	0.0032	0.049	5
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.008	0.093	10	0.28		0.023	0.26	20	0.027	J	0.0083	0.096	10	ND	U	0.0043	0.049	5
Naphthalene	91-20-3	25	190000	mg/kg	ND	U	0.013	0.093	10	0.33		0.037	0.26	20	0.16		0.013	0.096	10	0.018	J	0.0069	0.049	5
Phenanthrene	85-01-8	10000	190000	mg/kg	ND	U	0.0093	0.093	10	2.7		0.026	0.26	20	0.16		0.0096	0.096	10	0.015	J	0.0049	0.049	5
Pyrene	129-00-0	2200	190000	mg/kg	ND	U	0.0075	0.093	10	3.7		0.021	0.26	20	0.33		0.0077	0.096	10	0.021	J	0.004	0.049	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	13.1		0.53	0.55	1	1,530		0.63	0.66	1	1,730		0.57	0.59	1	14.3		0.45	0.46	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-59					AOI9-BH-15-60					AOI9-BH-15-60A					AOI9-BH-15-62				
				Sample Date	6/30/2015					6/30/2015					6/30/2015					6/17/2015				
				Sample depth (ft bgs)	2-4					2-4					2-4					3-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	94.2		0.96	3.4	500	ND	U	1.2	4.3	500	8.6		1	3.7	500	0.66		0.076	0.27	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.086***	0.2	50	ND	U	***1.1***	2.6	500	ND	U	***0.93***	2.2	500	ND	U	***0.068***	0.16	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.072	0.34	50	ND	U	***0.91***	4.3	500	ND	U	***0.78***	3.7	500	ND	U	0.056	0.27	50
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	34.6		1.1	3.4	500	ND	U	1.4	4.3	500	ND	U	1.2	3.7	500	0.39		0.089	0.27	50
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.6				50	17.5				500	17.5				500	1.2				50
Benzene	71-43-2	0.5	330	mg/kg	0.18	J	0.092	0.34	50	ND	U	***1.2***	4.3	500	ND	U	1	3.7	500	0.73		0.072	0.27	50
Ethylbenzene	100-41-4	70	10000	mg/kg	26.5		0.068	0.34	50	ND	U	0.87	4.3	500	2.5	J	0.74	3.7	500	0.32		0.054	0.27	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	13.3		0.12	0.34	50	3.8	J	1.5	4.3	500	60.1		1.3	3.7	500	6		0.092	0.27	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.16	0.34	50	ND	U	***2.1***	4.3	500	ND	U	1.8	3.7	500	ND	U	0.13	0.27	50
Toluene	108-88-3	100	10000	mg/kg	9.8		0.11	0.34	50	ND	U	1.3	4.3	500	ND	U	1.1	3.7	500	0.51		0.083	0.27	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	153		1.9	10.1	500	ND	U	2.4	12.9	500	5.7	J	2.1	11	500	1.1		0.15	0.8	50
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.19				2	0.24				10	0.22				10	0.25				5
Anthracene	120-12-7	350	190000	mg/kg	0.3		0.0016	0.017	2	0.018	J	0.0086	0.089	10	0.14		0.0077	0.079	10	0.18		0.0043	0.045	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.63		0.0043	0.017	2	ND	U	0.023	0.089	10	0.027	J	0.02	0.079	10	0.22		0.011	0.045	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.46		0.0016	0.017	2	0.041	J	0.0085	0.089	10	0.037	J	0.0076	0.079	10	0.23		0.0043	0.045	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.78		0.0015	0.017	2	0.071	J	0.0078	0.089	10	0.066	J	0.007	0.079	10	0.5		0.0039	0.045	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.24		0.0026	0.017	2	0.015	J	0.014	0.089	10	0.015	J	0.012	0.079	10	0.062		0.0069	0.045	5
Chrysene	218-01-9	230	190000	mg/kg	0.5		0.0011	0.017	2	0.037	J	0.0058	0.089	10	0.037	J	0.0052	0.079	10	0.2		0.0029	0.045	5
Fluorene	86-73-7	3800	190000	mg/kg	0.32		0.0014	0.017	2	0.039	J	0.0077	0.089	10	0.32		0.0069	0.079	10	0.27		0.0039	0.045	5
Naphthalene	91-20-3	25	190000	mg/kg	5.2		0.0059	0.042	5	3		0.012	0.089	10	3.2		0.011	0.079	10	0.92		0.0063	0.045	5
Phenanthrene	85-01-8	10000	190000	mg/kg	1.2		0.0017	0.017	2	0.09		0.0089	0.089	10	0.4		0.0079	0.079	10	0.6		0.0045	0.045	5
Pyrene	129-00-0	2200	190000	mg/kg	1		0.0013	0.017	2	0.048	J	0.0072	0.089	10	0.092		0.0064	0.079	10	0.43		0.0036	0.045	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	1,430		0.45	0.47	1	287		0.49	0.5	1	3,140		0.35	0.36	1	1,260		0.54	0.56	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-63					AOI9-BH-15-64					AOI9-BH-15-65					AOI9-BH-15-66				
				Sample Date	6/17/2015					6/17/2015					6/17/2015					6/10/2015				
				Sample depth (ft bgs)	3-4					3-4					3-3.5					3-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	207		9.7	34	5,000	114		1.2	4.2	500	0.0058	J	0.0019	0.0065	1	681		12.1	42.2	5,000
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.86***	2	500	ND	U	***0.11***	0.25	50	ND	U	0.0017	0.0039	1	ND	U	***1.1***	2.5	500
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.72	3.4	500	ND	U	0.088	0.42	50	ND	U	0.0014	0.0065	1	ND	U	0.9	4.2	500
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	106		1.1	3.4	500	44.8		1.4	4.2	500	0.0037	J	0.0022	0.0065	1	272		1.4	4.2	500
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	14.4				500	1.7				50	0.03				1	16.4				500
Benzene	71-43-2	0.5	330	mg/kg	51		0.93	3.4	500	12		0.11	0.42	50	0.37		0.0018	0.0065	1	4.9		1.1	4.2	500
Ethylbenzene	100-41-4	70	10000	mg/kg	250		0.69	3.4	500	62.1		0.84	4.2	500	0.0038	J	0.0013	0.0065	1	279		8.5	42.2	5,000
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	43.3		1.2	3.4	500	27.2		1.4	4.2	500	0.028		0.0023	0.0065	1	38.6		1.5	4.2	500
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	1.7	3.4	500	ND	U	0.2	0.42	50	0.11		0.0032	0.0065	1	ND	U	2.1	4.2	500
Toluene	108-88-3	100	10000	mg/kg	25		1.1	3.4	500	4.2		0.13	0.42	50	0.0095		0.002	0.0065	1	30.6		1.3	4.2	500
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	468		1.9	10.2	500	64.1		0.24	1.2	50	0.021		0.0037	0.02	1	1,740		24	127	5,000
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.2				1	0.23				5	0.26				5	0.24				10
Anthracene	120-12-7	350	190000	mg/kg	0.11		0.00094	0.0097	1	0.15		0.0048	0.049	5	0.2		0.0048	0.049	5	0.3		0.01	0.1	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.069		0.0025	0.0097	1	0.64		0.013	0.049	5	0.62		0.013	0.049	5	0.52		0.026	0.1	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.044		0.00093	0.0097	1	0.55		0.0047	0.049	5	0.55		0.0047	0.049	5	0.6		0.0099	0.1	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.085		0.00086	0.0097	1	1.2		0.0043	0.049	5	0.97		0.0043	0.049	5	1		0.0091	0.1	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.014		0.0015	0.0097	1	0.12		0.0075	0.049	5	0.16		0.0076	0.049	5	0.37		0.016	0.1	10
Chrysene	218-01-9	230	190000	mg/kg	0.061		0.00064	0.0097	1	0.58		0.0032	0.049	5	0.64		0.0032	0.049	5	0.6		0.0068	0.1	10
Fluorene	86-73-7	3800	190000	mg/kg	0.3		0.00084	0.0097	1	0.22		0.0042	0.049	5	0.11		0.0043	0.049	5	1.6		0.009	0.1	10
Naphthalene	91-20-3	25	190000	mg/kg	14.4		0.027	0.19	20	11.6		0.014	0.098	10	0.74		0.0069	0.049	5	113		0.15	1	100
Phenanthrene	85-01-8	10000	190000	mg/kg	0.57		0.00097	0.0097	1	0.52		0.0049	0.049	5	0.78		0.0049	0.049	5	2.5		0.01	0.1	10
Pyrene	129-00-0	2200	190000	mg/kg	0.23		0.00078	0.0097	1	0.89		0.004	0.049	5	1.1		0.004	0.049	5	1.2		0.0084	0.1	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	566		0.51	0.53	1	2,160		0.4	0.42	1	1,840		0.54	0.56	1	999		0.55	0.57	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-67					AOI9-BH-15-68					AOI9-BH-15-69					AOI9-BH-15-70				
				Sample Date	6/10/2015					6/10/2015					6/10/2015					6/10/2015				
				Sample depth (ft bgs)	3-4					3-4					3-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	0.52		0.15	0.51	50	79.9		0.86	3	500	660		13.5	47.3	5,000	0.13		0.0041	0.014	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.13***	0.31	50	ND	U	***0.076***	0.18	50	ND	U	***1.2***	2.8	500	ND	U	0.0037	0.0086	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.11	0.51	50	ND	U	0.064	0.3	50	ND	U	1	4.7	500	ND	U	0.003	0.014	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	0.39	J	0.17	0.51	50	23.7		0.1	0.3	50	246		1.6	4.7	500	0.054		0.0048	0.014	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.7				50	1.4				50	19.8				500	0.063				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.14	0.51	50	0.33		0.082	0.3	50	30.5		1.3	4.7	500	0.16		0.0039	0.014	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.1	0.51	50	51.8		0.61	3	500	263		0.96	4.7	500	0.024		0.0029	0.014	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	1.3		0.18	0.51	50	4.6		0.1	0.3	50	29.5		1.6	4.7	500	1.7		0.14	0.42	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.25	0.51	50	ND	U	0.15	0.3	50	ND	U	2.3	4.7	500	0.025		0.007	0.014	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.16	0.51	50	2.3		0.094	0.3	50	455		14.8	47.3	5,000	0.033		0.0045	0.014	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	0.42	J	0.29	1.5	50	51.9		0.17	0.9	50	1,600		26.9	142	5,000	0.18		0.0082	0.043	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.24				10	0.23				5	0.26				5	0.24				5
Anthracene	120-12-7	350	190000	mg/kg	0.23		0.012	0.12	10	0.084		0.0041	0.042	5	0.21		0.0046	0.047	5	0.11		0.005	0.052	5
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.22		0.031	0.12	10	0.18		0.011	0.042	5	0.33		0.012	0.047	5	0.27		0.013	0.052	5
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.17		0.012	0.12	10	0.2		0.004	0.042	5	0.31		0.0045	0.047	5	0.24		0.0049	0.052	5
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.26		0.011	0.12	10	0.35		0.0037	0.042	5	0.57		0.0041	0.047	5	0.49		0.0046	0.052	5
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.15		0.019	0.12	10	0.17		0.0065	0.042	5	0.23		0.0072	0.047	5	0.17		0.008	0.052	5
Chrysene	218-01-9	230	190000	mg/kg	0.19		0.008	0.12	10	0.21		0.0028	0.042	5	0.37		0.0031	0.047	5	0.3		0.0034	0.052	5
Fluorene	86-73-7	3800	190000	mg/kg	0.24		0.011	0.12	10	0.24		0.0036	0.042	5	0.68		0.0041	0.047	5	0.087		0.0045	0.052	5
Naphthalene	91-20-3	25	190000	mg/kg	3.1		0.017	0.12	10	14.8		0.024	0.17	20	43.7		0.066	0.47	50	1.1		0.0073	0.052	5
Phenanthrene	85-01-8	10000	190000	mg/kg	1.1		0.012	0.12	10	0.47		0.0042	0.042	5	1.4		0.0047	0.047	5	0.52		0.0052	0.052	5
Pyrene	129-00-0	2200	190000	mg/kg	0.6		0.0098	0.12	10	0.38		0.0034	0.042	5	0.75		0.0038	0.047	5	0.52		0.0042	0.052	5
METALS																								
Lead	7439-92-1	450	190000	mg/kg	1,500		0.68	0.7	1	1,950		0.43	0.45	1	1,140		0.54	0.56	1	1,590		0.54	0.56	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
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Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-74					AOI9-BH-15-76					AOI9-BH-15-78					AOI9-BH-15-80				
				Sample Date	6/15/2015					6/16/2015					6/16/2015					6/17/2015				
				Sample depth (ft bgs)	3.5-4					2.5-3					4.5					5-5.5				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	217		0.89	3.1	500	186		0.72	2.5	500	209		0.98	3.4	500	153		5.5	19.3	5,000
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.079***	0.19	50	ND	U	***0.064***	0.15	50	ND	U	***0.087***	0.21	50	ND	U	***0.49***	1.2	500
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.066	0.31	50	ND	U	0.053	0.25	50	ND	U	0.073	0.34	50	ND	U	0.41	1.9	500
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	73.5		1	3.1	500	64		0.84	2.5	500	45.1		1.2	3.4	500	84.7		0.65	1.9	500
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.3				50	1.1				50	1.3				50	9.9				500
Benzene	71-43-2	0.5	330	mg/kg	5.2		0.084	0.31	50	0.98		0.068	0.25	50	4.8		0.094	0.34	50	4.8		0.52	1.9	500
Ethylbenzene	100-41-4	70	10000	mg/kg	74.8		0.63	3.1	500	34.4		0.51	2.5	500	47.5		0.69	3.4	500	62.9		0.39	1.9	500
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	9.8		0.11	0.31	50	11.8		0.087	0.25	50	11.5		0.12	0.34	50	16.8		0.67	1.9	500
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.15	0.31	50	ND	U	0.12	0.25	50	ND	U	0.17	0.34	50	ND	U	0.94	1.9	500
Toluene	108-88-3	100	10000	mg/kg	0.6		0.097	0.31	50	0.43		0.078	0.25	50	0.99		0.11	0.34	50	6.6		0.6	1.9	500
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	340		1.8	9.3	500	176		1.4	7.5	500	22.4		0.2	1	50	384		1.1	5.8	500
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.18				1	0.23				1	0.17				5	0.22				1
Anthracene	120-12-7	350	190000	mg/kg	0.05		0.00095	0.0098	1	0.015		0.0009	0.0092	1	0.039	J	0.0052	0.053	5	0.017		0.00077	0.008	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.0071	J	0.0025	0.0098	1	0.012		0.0024	0.0092	1	0.027	J	0.014	0.053	5	0.0071	J	0.002	0.008	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.0032	J	0.00094	0.0098	1	0.0052	J	0.00088	0.0092	1	0.22		0.0051	0.053	5	0.002	J	0.00076	0.008	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.012		0.00086	0.0098	1	0.012		0.00081	0.0092	1	0.025	J	0.0047	0.053	5	0.0055	J	0.0007	0.008	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.0068	J	0.0015	0.0098	1	0.0025	J	0.0014	0.0092	1	ND	U	0.0082	0.053	5	0.0018	J	0.0012	0.008	1
Chrysene	218-01-9	230	190000	mg/kg	0.011		0.00064	0.0098	1	0.014		0.00061	0.0092	1	0.018	J	0.0035	0.053	5	0.0058	J	0.00052	0.008	1
Fluorene	86-73-7	3800	190000	mg/kg	0.16		0.00085	0.0098	1	0.04		0.0008	0.0092	1	0.11		0.0046	0.053	5	0.042		0.00069	0.008	1
Naphthalene	91-20-3	25	190000	mg/kg	10.9		0.014	0.098	10	10.7		0.026	0.18	20	46.2		0.075	0.53	50	13.4		0.022	0.16	20
Phenanthrene	85-01-8	10000	190000	mg/kg	0.24		0.00098	0.0098	1	0.045		0.00092	0.0092	1	0.14		0.0053	0.053	5	0.051		0.0008	0.008	1
Pyrene	129-00-0	2200	190000	mg/kg	0.087		0.00079	0.0098	1	0.026		0.00074	0.0092	1	0.073		0.0043	0.053	5	0.019		0.00064	0.008	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	21.9		0.5	0.51	1	37.3		0.45	0.47	1	12.9		0.61	0.63	1	11.6		0.35	0.36	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
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J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-82					AOI9-BH-15-83					AOI9-BH-15-84					AOI9-BH-15-85				
				Sample Date	6/12/2015					6/12/2015					6/15/2015					6/15/2015				
				Sample depth (ft bgs)	3-3.5					4-6					3-3.5					3.5-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.098	0.34	50	163		0.96	3.4	500	259		5.6	19.6	5,000	166		5.1	17.9	5,000
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.087***	0.21	50	ND	U	***0.085***	0.2	50	ND	U	***0.5***	1.2	500	ND	U	***0.45***	1.1	500
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.073	0.34	50	ND	U	0.071	0.34	50	ND	U	0.41	2	500	ND	U	0.38	1.8	500
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	0.53		0.11	0.34	50	51.5		1.1	3.4	500	128		0.66	2	500	122		0.6	1.8	500
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.3				50	1.4				50	10.4				500	9.4				500
Benzene	71-43-2	0.5	330	mg/kg	1.9		0.093	0.34	50	1.9		0.091	0.34	50	ND	U	0.53	2	500	6.5		0.49	1.8	500
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.069	0.34	50	58.7		0.68	3.4	500	50.4		0.4	2	500	75.9		0.36	1.8	500
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.89		0.12	0.34	50	8.1		0.12	0.34	50	18.7		0.68	2	500	24.9		0.62	1.8	500
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.17	0.34	50	ND	U	0.16	0.34	50	ND	U	0.95	2	500	ND	U	0.87	1.8	500
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.11	0.34	50	0.97		0.1	0.34	50	30.5		0.61	2	500	72.5		0.56	1.8	500
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	1.9		0.19	1	50	166		1.9	10.1	500	363		1.1	5.9	500	245		10.2	53.7	5,000
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.21				2	0.18				2	0.21				1	0.25				1
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.002	0.02	2	0.03		0.002	0.02	2	0.011		0.00072	0.0074	1	0.015		0.00075	0.0078	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.042		0.0052	0.02	2	ND	U	0.0051	0.02	2	0.0068	J	0.0019	0.0074	1	0.0083		0.002	0.0078	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.041		0.0019	0.02	2	ND	U	0.0019	0.02	2	0.0027	J	0.00071	0.0074	1	0.0026	J	0.00074	0.0078	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.064		0.0018	0.02	2	ND	U	0.0018	0.02	2	0.0059	J	0.00065	0.0074	1	0.0044	J	0.00068	0.0078	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.021		0.0031	0.02	2	ND	U	0.0031	0.02	2	0.0017	J	0.0011	0.0074	1	0.0014	J	0.0012	0.0078	1
Chrysene	218-01-9	230	190000	mg/kg	0.042		0.0013	0.02	2	ND	U	0.0013	0.02	2	0.0067	J	0.00049	0.0074	1	0.0063	J	0.00051	0.0078	1
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.0018	0.02	2	0.15		0.0017	0.02	2	0.027		0.00064	0.0074	1	0.04		0.00067	0.0078	1
Naphthalene	91-20-3	25	190000	mg/kg	0.032		0.0029	0.02	2	6		0.014	0.1	10	6.7		0.021	0.15	20	12.8		0.022	0.16	20
Phenanthrene	85-01-8	10000	190000	mg/kg	0.035		0.002	0.02	2	0.15		0.002	0.02	2	0.029		0.00074	0.0074	1	0.038		0.00078	0.0078	1
Pyrene	129-00-0	2200	190000	mg/kg	0.063		0.0016	0.02	2	0.033		0.0016	0.02	2	0.014		0.0006	0.0074	1	0.016		0.00063	0.0078	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	55.1		0.6	0.62	1	27		0.56	0.58	1	19.9		0.33	0.34	1	13.1		0.4	0.41	1

Note:
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10 - Result exceeds PADEP Non-residential soil direct contact MSC
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Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-87					AOI9-BH-15-88					AOI9-BH-15-89					AOI9-BH-15-90				
				Sample Date	6/17/2015					6/17/2015					6/8/2015					6/11/2015				
				Sample depth (ft bgs)	2.5-3					4-6					2-4					2.5-3				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	269		10.1	35.3	5,000	100		5	17.6	5,000	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.09***	0.21	50	ND	U	***0.45***	1.1	500	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.075	0.35	50	ND	U	0.37	1.8	500	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	134		1.2	3.5	500	105		0.59	1.8	500	NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.5				50	8.7				500	NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	6.7		0.096	0.35	50	5.7		0.48	1.8	500	NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	118		0.71	3.5	500	79.1		0.35	1.8	500	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	21.2		0.12	0.35	50	22.4		0.61	1.8	500	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.17	0.35	50	ND	U	0.85	1.8	500	NA					NA				
Toluene	108-88-3	100	10000	mg/kg	212		1.1	3.5	500	0.95	J	0.55	1.8	500	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	699		2	10.6	500	116		1	5.3	500	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.23				5	0.22				1	NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	0.045	J	0.0049	0.051	5	0.048		0.00076	0.0078	1	NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.016	J	0.013	0.051	5	0.0054	J	0.002	0.0078	1	NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.0049	0.051	5	0.0012	J	0.00074	0.0078	1	NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.0074	J	0.0045	0.051	5	0.0029	J	0.00069	0.0078	1	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0078	0.051	5	0.0015	J	0.0012	0.0078	1	NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	0.008	J	0.0033	0.051	5	0.004	J	0.00051	0.0078	1	NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.13		0.0044	0.051	5	0.11		0.00067	0.0078	1	NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	21.5		0.072	0.51	50	9.6		0.022	0.16	20	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.14		0.0051	0.051	5	0.17		0.00078	0.0078	1	NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.049	J	0.0041	0.051	5	0.019		0.00063	0.0078	1	NA					NA				
METALS																								
Lead	7439-92-1	450	190000	mg/kg	31.7		0.44	0.46	1	8.8		0.39	0.4	1	69.9		0.42	0.43	1	313		0.43	0.44	1

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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-91					AOI9-BH-15-92					AOI9-BH-15-93					AOI9-BH-15-94				
				Sample Date	6/17/2015					8/7/2015					8/7/2015					8/7/2015				
				Sample depth (ft bgs)	3.5-4					4-6					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	500		5	17.3	5,000	65.6		0.85	3	500	NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.44***	1	500	ND	U	0.0014	0.0033	1	NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.37	1.7	500	ND	U	0.0012	0.0055	1	NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	167		5.8	17.3	5,000	35.3		1	3	500	NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	9.1				500	0.026				1	NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	9		0.47	1.7	500	0.081		0.0015	0.0055	1	NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	129		3.5	17.3	5,000	4.6		0.06	0.3	50	NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	38.5		0.6	1.7	500	0.32		0.0019	0.0055	1	NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.84	1.7	500	ND	U	0.0027	0.0055	1	NA					NA				
Toluene	108-88-3	100	10000	mg/kg	171		5.4	17.3	5,000	4.1		0.093	0.3	50	NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	837		9.8	52	5,000	17.1		0.17	0.89	50	NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.28				5	0.21				10	NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	0.28		0.0037	0.039	5	ND	U	0.0087	0.09	10	NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.029	J	0.0098	0.039	5	ND	U	0.023	0.09	10	NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.0076	J	0.0037	0.039	5	ND	U	0.0086	0.09	10	NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.013	J	0.0034	0.039	5	ND	U	0.0079	0.09	10	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.0082	J	0.0059	0.039	5	ND	U	0.014	0.09	10	NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	0.022	J	0.0025	0.039	5	ND	U	0.0059	0.09	10	NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.63		0.0033	0.039	5	ND	U	0.0078	0.09	10	NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	59.5		0.054	0.39	50	3.7		0.013	0.09	10	NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.99		0.0039	0.039	5	ND	U	0.009	0.09	10	NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.11		0.0031	0.039	5	ND	U	0.0072	0.09	10	NA					NA				
METALS																								
Lead	7439-92-1	450	190000	mg/kg	18		0.33	0.34	1	16.9		0.59	0.61	1	120		0.45	0.47	1	14.4		0.43	0.45	1

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Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-95					AOI9-BH-15-96					AOI9-BH-15-97					AOI9-BH-15-98					AOI9-BH-15-99				
				Sample Date	8/4/2015					8/4/2015					8/7/2015					8/5/2015					8/5/2015				
				Sample depth (ft bgs)	2-4					2-4					4-6					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	NA					NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	NA					NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	NA					NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	NA					NA					NA					NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	NA					NA					NA					NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	NA					NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	NA					NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	NA					NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	NA					NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	NA					NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	NA					NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	NA					NA					NA					NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	NA					NA					NA					NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	NA					NA					NA					NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	NA					NA					NA					NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	NA					NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	NA					NA					NA					NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	NA					NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	450	190000	mg/kg	432		0.33	0.34	1	857		0.41	0.42	1	40.2		0.4	0.42	1	30.2		0.66	0.68	1	15.7		0.44	0.46	1

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				Sample Date	6/10/2015					6/10/2015					8/5/2015					8/5/2015					6/9/2015				
				Sample depth (ft bgs)	3.5-4.5					4.5-5					4-6					2-4					2.5-3				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	0.0076	J	0.0033	0.012	1	52.9		0.65	2.3	500	NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.003	0.007	1	ND	U	***0.058***	0.14	50	NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0025	0.012	1	ND	U	0.049	0.23	50	NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0039	0.012	1	1.6		0.077	0.23	50	NA					NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.043				1	1.2				50	NA					NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0032	0.012	1	ND	U	0.062	0.23	50	NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0024	0.012	1	0.46		0.046	0.23	50	NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.004	0.012	1	4		0.079	0.23	50	NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0057	0.012	1	ND	U	0.11	0.23	50	NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0036	0.012	1	0.19	J	0.071	0.23	50	NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	0.0076	J	0.0066	0.035	1	1.1		0.13	0.69	50	NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.21				20	0.25				1	NA					NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	2.1		0.024	0.25	20	0.09		0.00071	0.0073	1	NA					NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	5.1		0.063	0.25	20	0.011		0.0019	0.0073	1	NA					NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	5		0.023	0.25	20	0.0047	J	0.0007	0.0073	1	NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	8.8		0.022	0.25	20	0.0081		0.00065	0.0073	1	NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	2.6		0.038	0.25	20	0.0042	J	0.0011	0.0073	1	NA					NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	6.6		0.016	0.25	20	0.0092		0.00048	0.0073	1	NA					NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.81		0.021	0.25	20	0.84		0.00064	0.0073	1	NA					NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	1.1		0.035	0.25	20	2.4		0.01	0.073	10	NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	6.5		0.025	0.25	20	1		0.00073	0.0073	1	NA					NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	12.3		0.02	0.25	20	0.07		0.00059	0.0073	1	NA					NA					NA				
METALS																												
Lead	7439-92-1	450	190000	mg/kg	602		0.62	0.64	1	12.1		0.35	0.36	1	368		0.46	0.47	1	9.2		0.32	0.33	1	199		0.5	0.51	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-106					AOI9-BH-15-107					AOI9-BH-15-108					AOI9-BH-15-110				
				Sample Date	6/9/2015					7/31/2015					7/31/2015					6/10/2015				
				Sample depth (ft bgs)	3.5-4					2-4					2-4					2-2.5				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0013	0.0046	1	57.1		1.3	4.5	1000	NA					11.4		0.075	0.26	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0012	0.0027	1	ND	U	***0.057***	0.13	50	NA					ND	U	***0.066***	0.16	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.00097	0.0046	1	ND	U	0.048	0.22	50	NA					ND	U	0.055	0.26	50
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0015	0.0046	1	19.9		1.5	4.5	1000	NA					5.1		0.088	0.26	50
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.025				1	1.2				50	NA					1.1				50
Benzene	71-43-2	0.5	330	mg/kg	0.006		0.0012	0.0046	1	ND	U	0.061	0.22	50	NA					ND	U	0.071	0.26	50
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.00092	0.0046	1	6.5		0.045	0.22	50	NA					0.51		0.053	0.26	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.0031	J	0.0016	0.0046	1	2.1		0.078	0.22	50	NA					0.27		0.09	0.26	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	0.025		0.0022	0.0046	1	ND	U	0.11	0.22	50	NA					ND	U	0.13	0.26	50
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0014	0.0046	1	ND	U	0.07	0.22	50	NA					ND	U	0.081	0.26	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	0.0026	J	0.0026	0.014	1	27.4		0.13	0.67	50	NA					0.38	J	0.15	0.78	50
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.25				1	0.22				1	NA					0.3				1
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.00071	0.0073	1	0.0028	J	0.00076	0.0078	1	NA					ND	U	0.00086	0.0088	1
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.0019	0.0073	1	ND	U	0.002	0.0078	1	NA					0.0039	J	0.0023	0.0088	1
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.0007	0.0073	1	ND	U	0.00074	0.0078	1	NA					ND	U	0.00085	0.0088	1
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.00064	0.0073	1	ND	U	0.00069	0.0078	1	NA					ND	U	0.00078	0.0088	1
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0011	0.0073	1	ND	U	0.0012	0.0078	1	NA					0.0014	J	0.0014	0.0088	1
Chrysene	218-01-9	230	190000	mg/kg	ND	U	0.00048	0.0073	1	ND	U	0.00051	0.0078	1	NA					0.0025	J	0.00058	0.0088	1
Fluorene	86-73-7	3800	190000	mg/kg	0.0033	J	0.00063	0.0073	1	0.0057	J	0.00067	0.0078	1	NA					0.0057	J	0.00077	0.0088	1
Naphthalene	91-20-3	25	190000	mg/kg	0.015		0.001	0.0073	1	0.69		0.0011	0.0078	1	NA					0.83		0.0012	0.0088	1
Phenanthrene	85-01-8	10000	190000	mg/kg	0.009		0.00073	0.0073	1	0.0054	J	0.00078	0.0078	1	NA					ND	U	0.00088	0.0088	1
Pyrene	129-00-0	2200	190000	mg/kg	ND	U	0.00059	0.0073	1	0.0048	J	0.00063	0.0078	1	NA					0.0073	J	0.00071	0.0088	1
METALS																								
Lead	7439-92-1	450	190000	mg/kg	10		0.4	0.41	1	15.9		0.39	0.4	1	106		0.54	0.56	1	16.9		0.45	0.46	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-110DSRTF					AOI9-BH-15-111					AOI9-BH-15-113					AOI9-BH-15-114				
				Sample Date	5/28/2015					7/30/2015					7/30/2015					7/22/2015				
				Sample depth (ft bgs)	4-5					2-4					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0021	0.0072	1	ND	U	0.0014	0.0048	1	NA					22.4		0.082	0.29	50
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0018	0.0043	1	ND	U	0.0012	0.0029	1	NA					ND	U	***0.073***	0.17	50
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0015	0.0072	1	ND	U	0.001	0.0048	1	NA					ND	U	0.061	0.29	50
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0024	0.0072	1	ND	U	0.0016	0.0048	1	NA					10.4		0.096	0.29	50
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.029				1	0.024				1	NA					1.4				50
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.002	0.0072	1	ND	U	0.0013	0.0048	1	NA					0.69		0.078	0.29	50
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0015	0.0072	1	ND	U	0.00098	0.0048	1	NA					2.7		0.058	0.29	50
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0025	0.0072	1	ND	U	0.0017	0.0048	1	NA					0.71		0.099	0.29	50
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0035	0.0072	1	ND	U	0.0024	0.0048	1	NA					ND	U	0.14	0.29	50
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0022	0.0072	1	ND	U	0.0015	0.0048	1	NA					0.73		0.09	0.29	50
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0041	0.022	1	ND	U	0.0028	0.015	1	NA					5		0.16	0.86	50
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.24				1	0.21				1	NA					0.25				10
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.001	0.01	1	ND	U	0.00074	0.0076	1	NA					0.12		0.0082	0.084	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.0027	0.01	1	ND	U	0.0019	0.0076	1	NA					0.18		0.022	0.084	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.00099	0.01	1	ND	U	0.00072	0.0076	1	NA					0.16		0.0081	0.084	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.00092	0.01	1	0.0025	J	0.00067	0.0076	1	NA					0.33		0.0074	0.084	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.0016	0.01	1	0.0019	J	0.0012	0.0076	1	NA					0.11		0.013	0.084	10
Chrysene	218-01-9	230	190000	mg/kg	ND	U	0.00068	0.01	1	ND	U	0.0005	0.0076	1	NA					0.21		0.0055	0.084	10
Fluorene	86-73-7	3800	190000	mg/kg	ND	U	0.0009	0.01	1	ND	U	0.00066	0.0076	1	NA					0.26		0.0073	0.084	10
Naphthalene	91-20-3	25	190000	mg/kg	0.0024	J	0.0015	0.01	1	ND	U	0.0011	0.0076	1	NA					31.5		0.12	0.84	100
Phenanthrene	85-01-8	10000	190000	mg/kg	0.0026	J	0.001	0.01	1	ND	U	0.00076	0.0076	1	NA					0.51		0.0084	0.084	10
Pyrene	129-00-0	2200	190000	mg/kg	0.0018	J	0.00084	0.01	1	0.0084		0.00061	0.0076	1	NA					0.37		0.0068	0.084	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	12.6		0.63	0.65	1	11.7		0.46	0.48	1	2,810		0.53	0.55	1	551		0.45	0.47	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-115DSRTF					AOI9-BH-15-116					AOI9-BH-15-117					AOI9-BH-15-118				
				Sample Date	5/28/2015					7/29/2015					7/29/2015					7/29/2015				
				Sample depth (ft bgs)	6-8					2-4					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.1	0.36	50	NA					NA					ND	U	0.0017	0.006	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.091***	0.21	50	NA					NA					ND	U	0.0015	0.0036	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.076	0.36	50	NA					NA					ND	U	0.0013	0.006	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.12	0.36	50	NA					NA					ND	U	0.002	0.006	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	1.6				50	NA					NA					0.027				1
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.097	0.36	50	NA					NA					ND	U	0.0016	0.006	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.072	0.36	50	NA					NA					ND	U	0.0012	0.006	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	0.52		0.12	0.36	50	NA					NA					ND	U	0.0021	0.006	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.17	0.36	50	NA					NA					ND	U	0.0029	0.006	1
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.11	0.36	50	NA					NA					ND	U	0.0019	0.006	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.2	1.1	50	NA					NA					ND	U	0.0034	0.018	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.18				1	NA					NA					0.21				10
Anthracene	120-12-7	350	190000	mg/kg	0.035		0.00093	0.0095	1	NA					NA					0.014	J	0.0086	0.088	10
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.0036	J	0.0024	0.0095	1	NA					NA					0.062	J	0.023	0.088	10
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.0043	J	0.00091	0.0095	1	NA					NA					0.056	J	0.0084	0.088	10
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.0065	J	0.00084	0.0095	1	NA					NA					0.14		0.0078	0.088	10
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.0035	J	0.0015	0.0095	1	NA					NA					0.037	J	0.014	0.088	10
Chrysene	218-01-9	230	190000	mg/kg	0.0047	J	0.00063	0.0095	1	NA					NA					0.093		0.0058	0.088	10
Fluorene	86-73-7	3800	190000	mg/kg	0.1		0.00083	0.0095	1	NA					NA					ND	U	0.0076	0.088	10
Naphthalene	91-20-3	25	190000	mg/kg	0.058		0.0013	0.0095	1	NA					NA					0.018	J	0.012	0.088	10
Phenanthrene	85-01-8	10000	190000	mg/kg	0.094		0.00095	0.0095	1	NA					NA					0.072	J	0.0088	0.088	10
Pyrene	129-00-0	2200	190000	mg/kg	0.03		0.00077	0.0095	1	NA					NA					0.12		0.0071	0.088	10
METALS																								
Lead	7439-92-1	450	190000	mg/kg	94.6		0.51	0.53	1	305		0.52	0.54	1	354		0.38	0.39	1	96.3		0.6	0.62	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
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* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
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Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	S-118DSRTF					AOI9-BH-15-119					AOI9-BH-15-120					AOI9-BH-15-121				
				Sample Date	6/11/2015					7/24/2015					7/28/2015					7/29/2015				
				Sample depth (ft bgs)	6-8					2-4					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0025	0.0087	1	NA					ND	U	0.0015	0.0052	1	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0022	0.0052	1	NA					ND	U	0.0013	0.0031	1	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0018	0.0087	1	NA					ND	U	0.0011	0.0052	1	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0029	0.0087	1	NA					ND	U	0.0018	0.0052	1	NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.036				1	NA					0.036				1	NA				
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0024	0.0087	1	NA					0.051		0.0014	0.0052	1	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0017	0.0087	1	NA					ND	U	0.0011	0.0052	1	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.003	0.0087	1	NA					ND	U	0.0018	0.0052	1	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0042	0.0087	1	NA					ND	U	0.0025	0.0052	1	NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0027	0.0087	1	NA					0.019		0.0016	0.0052	1	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0049	0.026	1	NA					0.0062	J	0.003	0.016	1	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.27				1	NA					0.22				20	NA				
Anthracene	120-12-7	350	190000	mg/kg	0.005	J	0.001	0.01	1	NA					0.045	J	0.016	0.17	20	NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.046		0.0026	0.01	1	NA					0.13	J	0.043	0.17	20	NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.075		0.00099	0.01	1	NA					0.15	J	0.016	0.17	20	NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.12		0.00091	0.01	1	NA					0.23		0.015	0.17	20	NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.06		0.0016	0.01	1	NA					0.12	J	0.026	0.17	20	NA				
Chrysene	218-01-9	230	190000	mg/kg	0.047		0.00068	0.01	1	NA					0.19		0.011	0.17	20	NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.004	J	0.0009	0.01	1	NA					ND	U	0.015	0.17	20	NA				
Naphthalene	91-20-3	25	190000	mg/kg	0.018		0.0015	0.01	1	NA					0.13	J	0.024	0.17	20	NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.027		0.001	0.01	1	NA					0.11	J	0.017	0.17	20	NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.053		0.00083	0.01	1	NA					0.18		0.014	0.17	20	NA				
METALS																								
Lead	7439-92-1	450	190000	mg/kg	583		0.53	0.55	1	3,310		0.39	0.4	1	534		0.6	0.62	1	408		0.53	0.55	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 6
Summary of Sub-Surface Soil Analytical Results
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Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-122					AOI9-BH-15-123					AOI9-BH-15-124					AOI9-BH-15-125				
				Sample Date	7/22/2015					7/23/2015					7/28/2015					7/28/2015				
				Sample depth (ft bgs)	2-2.5					4-6					2-4					2-4				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0016	0.0057	1	NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0015	0.0034	1	NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0012	0.0057	1	NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0019	0.0057	1	NA					NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.036				1	NA					NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.0016	0.0057	1	NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0012	0.0057	1	NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.002	0.0057	1	NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0028	0.0057	1	NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0018	0.0057	1	NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0033	0.017	1	NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.18				10	NA					NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	0.13		0.0078	0.08	10	NA					NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.44		0.02	0.08	10	NA					NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.43		0.0076	0.08	10	NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.97		0.007	0.08	10	NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.21		0.012	0.08	10	NA					NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	0.46		0.0053	0.08	10	NA					NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.04	J	0.0069	0.08	10	NA					NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	0.2		0.011	0.08	10	NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.44		0.008	0.08	10	NA					NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.74		0.0064	0.08	10	NA					NA					NA				
METALS																								
Lead	7439-92-1	450	190000	mg/kg	577		0.4	0.42	1	162		0.44	0.46	1	857		0.53	0.55	1	209		0.42	0.43	1

Note:
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Q - Qualifier
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DF - Dilution factor
ND - Not detected
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NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
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B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

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Philadelphia, Pennsylvania

Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-126					AOI9-BH-15-127					AOI9-BH-15-128					AOI9-BH-15-129				
				Sample Date	7/28/2015					6/26/2015					6/22/2015					6/22/2015				
				Sample depth (ft bgs)	2-4					6-8					4-6					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																								
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0022	0.0076	1	7.8		0.7	2.5	500	ND	U	0.099	0.34	50	ND	U	0.0025	0.0087	1
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0019	0.0046	1	ND	U	***0.62***	1.5	500	ND	U	***0.088***	0.21	50	ND	U	0.0022	0.0052	1
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0016	0.0076	1	ND	U	0.52	2.5	500	ND	U	0.073	0.34	50	ND	U	0.0018	0.0087	1
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0026	0.0076	1	2.2	J	0.83	2.5	500	ND	U	0.12	0.34	50	ND	U	0.0029	0.0087	1
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.041				1	12.3				500	1.2				50	0.039				1
Benzene	71-43-2	0.5	330	mg/kg	0.029		0.0021	0.0076	1	ND	U	***0.67***	2.5	500	ND	U	0.094	0.34	50	ND	U	0.0024	0.0087	1
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0015	0.0076	1	ND	U	0.5	2.5	500	ND	U	0.07	0.34	50	ND	U	0.0018	0.0087	1
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0026	0.0076	1	ND	U	0.85	2.5	500	2.9		0.12	0.34	50	ND	U	0.003	0.0087	1
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0037	0.0076	1	ND	U	1.2	2.5	500	ND	U	0.17	0.34	50	ND	U	0.0042	0.0087	1
Toluene	108-88-3	100	10000	mg/kg	0.0081		0.0024	0.0076	1	ND	U	0.77	2.5	500	ND	U	0.11	0.34	50	ND	U	0.0027	0.0087	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0043	0.023	1	3.3	J	1.4	7.4	500	ND	U	0.2	1	50	ND	U	0.005	0.026	1
SEMI-VOLATILE ORGANIC COMPOUNDS																								
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.21				10	0.31				20	0.26				5	0.16				50
Anthracene	120-12-7	350	190000	mg/kg	0.63		0.0093	0.096	10	0.97		0.016	0.16	20	1.5		0.0043	0.044	5	3.1		0.051	0.53	50
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	2.4		0.024	0.096	10	0.086	J	0.041	0.16	20	0.31		0.011	0.044	5	26.5		0.13	0.53	50
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	1.6		0.0091	0.096	10	0.1	J	0.015	0.16	20	0.15		0.0042	0.044	5	21.8		0.05	0.53	50
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	3.1		0.0084	0.096	10	0.21		0.014	0.16	20	0.13		0.0039	0.044	5	40.2		0.046	0.53	50
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.85		0.015	0.096	10	0.04	J	0.025	0.16	20	0.039	J	0.0068	0.044	5	9.3		0.081	0.53	50
Chrysene	218-01-9	230	190000	mg/kg	2.5		0.0063	0.096	10	0.12	J	0.011	0.16	20	0.4		0.0029	0.044	5	23.6		0.035	0.53	50
Fluorene	86-73-7	3800	190000	mg/kg	0.39		0.0083	0.096	10	5.1		0.014	0.16	20	1.7		0.0038	0.044	5	0.33	J	0.046	0.53	50
Naphthalene	91-20-3	25	190000	mg/kg	3		0.013	0.096	10	3.6		0.022	0.16	20	0.13		0.0062	0.044	5	1.3		0.074	0.53	50
Phenanthrene	85-01-8	10000	190000	mg/kg	2.4		0.0096	0.096	10	10.8		0.016	0.16	20	4.9		0.0044	0.044	5	5		0.053	0.53	50
Pyrene	129-00-0	2200	190000	mg/kg	4.1		0.0077	0.096	10	0.92		0.013	0.16	20	0.93		0.0036	0.044	5	33.1		0.042	0.53	50
METALS																								
Lead	7439-92-1	450	190000	mg/kg	304		0.53	0.55	1	19.4		0.34	0.35	1	68.1		0.43	0.44	1	2,240		0.42	0.44	1

Note:
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PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
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Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

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Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-130					AOI9-BH-15-131					AOI9-BH-15-133					AOI9-BH-15-135					AOI9-BH-15-136				
				Sample Date	6/8/2015					6/8/2015					6/8/2015					6/11/2015					6/11/2015				
				Sample depth (ft bgs)	2.5-3					3-3.5					3-3.5					2.5-3					2.5-3				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																												
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	ND	U	0.0016	0.0055	1	NA					NA					NA					NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	0.0014	0.0033	1	NA					NA					NA					NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.0012	0.0055	1	NA					NA					NA					NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	ND	U	0.0018	0.0055	1	NA					NA					NA					NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	0.025				1	NA					NA					NA					NA				
Benzene	71-43-2	0.5	330	mg/kg	0.013		0.0015	0.0055	1	NA					NA					NA					NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	ND	U	0.0011	0.0055	1	NA					NA					NA					NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	ND	U	0.0019	0.0055	1	NA					NA					NA					NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	0.0027	0.0055	1	NA					NA					NA					NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.0017	0.0055	1	NA					NA					NA					NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	ND	U	0.0031	0.016	1	NA					NA					NA					NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																												
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.25				1	NA					NA					NA					NA				
Anthracene	120-12-7	350	190000	mg/kg	0.0025	J	0.00088	0.0091	1	NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	0.016		0.0023	0.0091	1	NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	0.019		0.00087	0.0091	1	NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	0.043		0.0008	0.0091	1	NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	0.015		0.0014	0.0091	1	NA					NA					NA					NA				
Chrysene	218-01-9	230	190000	mg/kg	0.026		0.0006	0.0091	1	NA					NA					NA					NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.0015	J	0.00079	0.0091	1	NA					NA					NA					NA				
Naphthalene	91-20-3	25	190000	mg/kg	0.01		0.0013	0.0091	1	NA					NA					NA					NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.021		0.00091	0.0091	1	NA					NA					NA					NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.03		0.00073	0.0091	1	NA					NA					NA					NA				
METALS																												
Lead	7439-92-1	450	190000	mg/kg	74.1		0.48	0.5	1	21.1		0.45	0.47	1	14.9		0.44	0.46	1	10.5		0.37	0.38	1	13.7		0.3	0.31	1

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U - Compound analyzed but not detected
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B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

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Analyte	Cas Number	PADEP Non-residential Subsurface Soil MSC	PADEP Non-residential Soil Direct Contact MSC	Sample Name	AOI9-BH-15-137					S-135SRTF					S-136SRTF				
				Sample Date	6/11/2015					5/29/2015					7/23/2015				
				Sample depth (ft bgs)	3.5-4					6-8					4-6				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																			
1,2,4-Trimethylbenzene	95-63-6	35	640	mg/kg	91.8		0.76	2.7	500	ND	U	0.11	0.39	50	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.005	4.3	mg/kg	ND	U	***0.67***	1.6	500	ND	U	***0.1***	0.24	50	NA				
1,2-Dichloroethane (EDC)	107-06-2	0.5	98	mg/kg	ND	U	0.56	2.7	500	ND	U	0.083	0.39	50	NA				
1,3,5-Trimethylbenzene	108-67-8	9.3	550	mg/kg	34		0.89	2.7	500	0.78		0.13	0.39	50	NA				
1-Bromo-4-Fluorobenzene (Bromofluorobenzene)	460-00-4	NS	NS	mg/kg	13.7				500	1.6				50	NA				
Benzene	71-43-2	0.5	330	mg/kg	ND	U	0.72	2.7	500	0.22	J	0.11	0.39	50	NA				
Ethylbenzene	100-41-4	70	10000	mg/kg	5.3		0.54	2.7	500	ND	U	0.079	0.39	50	NA				
Isopropylbenzene (Cumene)	98-82-8	2500	10000	mg/kg	4.2		0.92	2.7	500	1		0.14	0.39	50	NA				
Methyl Tertiary Butyl Ether	1634-04-4	2	3700	mg/kg	ND	U	1.3	2.7	500	ND	U	0.19	0.39	50	NA				
Toluene	108-88-3	100	10000	mg/kg	ND	U	0.83	2.7	500	ND	U	0.12	0.39	50	NA				
Xylenes, Total (Dimethylbenzene)	1330-20-7	1000	9100	mg/kg	12.5		1.5	8	500	1	J	0.22	1.2	50	NA				
SEMI-VOLATILE ORGANIC COMPOUNDS																			
2-Fluorobiphenyl	321-60-8	NS	NS	mg/kg	0.25				10	0.24				1	NA				
Anthracene	120-12-7	350	190000	mg/kg	ND	U	0.0076	0.078	10	0.001	J	0.00096	0.0099	1	NA				
Benzo(A)Anthracene	56-55-3	320	190000	mg/kg	ND	U	0.02	0.078	10	ND	U	0.0025	0.0099	1	NA				
Benzo(A)Pyrene	50-32-8	46	190000	mg/kg	ND	U	0.0074	0.078	10	0.002	J	0.00095	0.0099	1	NA				
Benzo(B)Fluoranthene	205-99-2	170	190000	mg/kg	ND	U	0.0069	0.078	10	0.0035	J	0.00087	0.0099	1	NA				
Benzo(G,H,I)Perylene	191-24-2	180	190000	mg/kg	ND	U	0.012	0.078	10	0.0038	J	0.0015	0.0099	1	NA				
Chrysene	218-01-9	230	190000	mg/kg	ND	U	0.0051	0.078	10	0.0019	J	0.00065	0.0099	1	NA				
Fluorene	86-73-7	3800	190000	mg/kg	0.47		0.0067	0.078	10	0.0041	J	0.00086	0.0099	1	NA				
Naphthalene	91-20-3	25	190000	mg/kg	13.2		0.011	0.078	10	0.0049	J	0.0014	0.0099	1	NA				
Phenanthrene	85-01-8	10000	190000	mg/kg	0.49		0.0078	0.078	10	0.0062	J	0.00099	0.0099	1	NA				
Pyrene	129-00-0	2200	190000	mg/kg	0.079		0.0063	0.078	10	0.0052	J	0.0008	0.0099	1	NA				
METALS																			
Lead	7439-92-1	450	190000	mg/kg	18.2		0.45	0.46	1	12.4		0.55	0.57	1	174		0.42	0.44	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - medium specific concentrations
mg/kg - Milligrams per kilogram
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed
* Site Specific Standard for lead is used (2,240 mg/kg)
[1] : Sample is duplicate of proceeding sample

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Subsurface Soil MSC
10 - Result exceeds PADEP Non-residential soil direct contact MSC
15 - MDL/RL exceeds either PADEP Non-residential Subsurface Soil MSC

Table 7
Summary of Soil TCLP Lead Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	AOI	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
		Location	AOI9-BH-15-6					AOI9-BH-15-16					AOI9-BH-15-17					AOI9-BH-15-18					AOI9-BH-15-18D				
		Sample name	AOI9_BH-15-6_0-2_070115~30152679					AOI9_BH-15-16_4-6_071015~30153116					AOI9_BH-15-17_4-6_071015~30153116					AOI9_BH-15-18_4-6_071015~30153116					AOI9_BH-15-18D_4-6_071015~30153116				
		Sample Date	7/1/2015					7/10/2015					7/10/2015					7/10/2015					7/10/2015				
		Units	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
METALS - TCLP																											
Lead	7439-92-1	ug/l	410					5,400					580					900					2,000				

Analyte	CAS Number	AOI	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
		Location	AOI9-BH-15-19					AOI9-BH-15-20					AOI9-BH-15-28					AOI9-BH-15-29					AOI9-BH-15-40				
		Sample name	AOI9_BH-15-19_4-6_071015~30153116					AOI9_BH-15-20_6-7_061615K~30151035					AOI9_BH-15-28_4-6_062415~30152009					AOI9_BH-15-29_4-6_062315~30151642					AO19_BH-15-40_6-8_072415~30154428				
		Sample Date	7/10/2015					6/16/2015					6/24/2015					6/23/2015					7/24/2015				
		Units	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
METALS - TCLP																											
Lead	7439-92-1	ug/l	2,400					1000					15,700					2,700					2,300				

Analyte	CAS Number	AOI	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
		Location	AOI9-BH-15-41					AOI9-BH-15-53					AOI9-BH-15-58					AOI9-BH-15-60A					AOI9-BH-15-82				
		Sample name	AOI9_BH-15-41_4-6_061115~30150777					AOI9_BH-15-53_4-6_061115~30150777					AOI9_BH-15-58_0-2_071315~30153250					AOI9_BH-15-60A_2-4_063015~30152270					AOI9_BH-15-82_1.25-1.75_061215~30150775				
		Sample Date	6/12/2015					6/11/2015					7/13/2015					6/30/2015					6/12/2015				
		Units	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
METALS - TCLP																											
Lead	7439-92-1	ug/l	6,500					1,900					400					3,100					7,600				

Analyte	CAS Number	AOI	AOI 9					AOI 9					AOI 9					AOI 9				
		Location	AOI9-BH-15-113					AOI9-BH-15-119					AOI9-BH-15-129					AOI9-BH-15-146				
		Sample name	AOI9_BH-15-113_2-4_073015~30155109					AO19_BH-15-119_2-4_072415~30154428					AOI9_BH-15-129_4-6_062215~30151524					AOI9_BH-15-146_0-2_110415~JC7761				
		Sample Date	7/30/2015					7/24/2015					6/22/2015					11/4/2015				
		Units	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
METALS - TCLP																						
Lead	7439-92-1	ug/l	830					440					1,200					65,600		58	2500	25

Note:
CAS - Chemical Abstract Number
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
5,400 : Result exceeds Environmental Protection Agency's Hazardous Toxicity value of 5,000 ug/L (October 2009)

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 MW-1SRTF 11/9/2015 AOI9_MW-1SRTF_110915~JC8209					AOI 9 MW-2SRTF 1/21/2009 MW-2SRTF_1/21/2009					AOI 9 MW-2SRTF 8/14/2009 MW-2 SRTF					AOI 9 MW-2SRTF 3/11/2015 MW-2SRTF_030915					AOI 9 MW-2SRTF 8/14/2015 MW-2SRTF-20150814~JC1635					AOI 9 MW-2SRTF 11/11/2015 AOI9_MW-2SRTF_111115~JC8319					AOI 9 MW-3SRTF 1/21/2009 MW-3SRTF_1/21/2009					AOI 9 MW-3SRTF 8/14/2015 MW-3SRTF-20150814~JC1635					AOI 9 RW-A 1/20/2009 RW-A_012009					AOI 9 RW-A 8/12/2009 RW-A				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																			
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.07				1	0.061				1	NA					NA					NA					0.06				1	NA					0.06				1	0.058				1
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.22	2	1	NA					1,800		1	100	50	630		0.93	10	5	624		2.2	20	10	262		2.2	20	10	NA					672		1.1	10	5	NA					18		1	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0086	0.02	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0079	0.019	1	ND	U	0.0083	0.019	1	ND	U	0.01	0.03	1	ND	U	0.008	0.019	1	ND	U	0.0098	0.03	1	ND	U	0.01	0.029	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	5	10	10	ND	U	1	4	4	ND	U	1.5	5	5	ND	U	1.8	10	10	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	0.9	5	5	ND	U	0.5	1	1	ND	U	1	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.29	2	1	NA					530		1	8	4	460		0.87	10	5	522		2.9	20	10	170		0.29	2	1	NA					133		1.5	10	5	NA					32		1	2	1
Benzene	71-43-2	5	0.74		0.24	0.5	1	1,200		5	10	10	1,400		0.5	50	50	574		1	2.5	5	1,230		2.4	5	10	165		0.24	0.5	1	91		0.5	1	1	95.8		1.2	2.5	5	36		0.5	1	1	5		0.5	1	1
Ethylbenzene	100-41-4	700	ND	U	0.27	1	1	1,900		5	10	10	1,500		0.8	50	50	980		2	5	5	1,460		2.7	10	10	109		0.27	1	1	450		5	10	10	121		1.3	5	5	40		0.5	1	1	8		0.8	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	12.9		0.23	1	1	78		5	20	10	73		1	8	4	96		1.3	5	5	130		2.3	10	10	76.7		0.23	1	1	30		0.5	2	1	71.4		1.2	5	5	43		0.5	2	1	27		1	2	1
Methyl Tertiary Butyl Ether	1634-04-4	20	70.4		0.24	1	1	130		5	10	10	75		0.5	4	4	43.7		1.3	5	5	82.5		2.4	10	10	23.8		0.24	1	1	9		0.5	1	1	9.4		1.2	5	5	ND	U	0.5	1	1	ND	U	0.5	1	1
Toluene	108-88-3	1000	1.1		0.16	1	1	510		5	10	10	150		0.7	4	4	86.2		1.1	5	5	179		1.6	10	10	25		0.16	1	1	640		5	10	10	17.5		0.81	5	5	ND	U	0.5	1	1	ND	U	0.7	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	1.4		0.17	1	1	12,000		25	50	50	7,800		0.8	50	50	513		1	5	5	617		1.7	10	10	109		0.17	1	1	3,100		5	10	10	172		0.83	5	5	13		0.5	1	1	4		0.8	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																				
Anthracene	120-12-7	66	0.293		0.013	0.1	1	NA					NA					ND	U	0.021	0.11	1	ND	U	0.013	0.1	1	0.142		0.014	0.11	1	NA					ND	U	0.013	0.1	1	NA					NA				
Benzo(A)Anthracene	56-55-3	3.6	0.241		0.019	0.05	1	NA					NA					ND	U	0.012	0.11	1	ND	U	0.019	0.05	1	0.16		0.021	0.056	1	NA					ND	U	0.019	0.05	1	NA					NA				
Benzo(A)Pyrene	50-32-8	0.2	0.193		0.03	0.05	1	NA					NA					ND	U	0.013	0.11	1	ND	U	0.03	0.05	1	0.153		0.033	0.056	1	NA					ND	U	0.03	0.05	1	NA					NA				
Benzo(B)Fluoranthene	205-99-2	1.2	0.252		0.021	0.1	1	NA					NA					ND	U	0.011	0.11	1	ND	U	0.021	0.1	1	0.225		0.023	0.11	1	NA					ND	U	0.021	0.1	1	NA					NA				
Benzo(G,H,I)Perylene	191-24-2	0.26	0.184		0.026	0.1	1	NA					NA					ND	U	0.016	0.11	1	ND	U	0.026	0.1	1	0.138		0.029	0.11	1	NA					ND	U	0.026	0.1	1	NA					NA				
Chrysene	218-01-9	1.9	0.291		0.015	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.012	0.11	1	ND	U	0.015	0.1	1	0.168		0.017	0.11	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1
Fluorene	86-73-7	1900	1.49		0.027	0.1	1	ND	U	1	5	1	ND	U	1	5	1	0.419		0.018	0.11	1	0.64		0.027	0.1	1	0.541		0.03	0.11	1	ND	U	1	5	1	0.421		0.027	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1
Naphthalene	91-20-3	100	293		0.052	4	4	310		10	48	10	250		1	47	10	113		0.075	2.1	2	278		0.066	5	5	31.3		0.015	1.1	1	82		1	5	1	67.6	E	0.013	0.1	1	31		0.9	5	1	ND	U	1	50	1
Phenanthrene	85-01-8	1100	1.69		0.016	0.1	1	ND	U	1	5	1	ND	U	1	5	1	0.296		0.022	0.11	1	0.41		0.016	0.1	1	0.7		0.018	0.11	1	ND	U	1	5	1	0.334		0.016	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1
Pyrene	129-00-0	130	f		0.013	0.1	1	ND	U	1	5	1	ND	U	1	5	1	0.112		0.016	0.11	1	0.186		0.013	0.1	1	0.642		0.015	0.11	1	ND	U	1	5	1	0.183		0.013	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1
METAL																																																				
Lead	7439-92-1	5	24.9		2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	5.7		2.3	3	1	4.4		2.3	3	1	ND	U	0.05	1	1	4		2.3	3	1	ND	U	0.05	1	1	1.4		0.05	1	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be considered an estimate
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <2500 ug/l
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS <2500 ug/l

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 RW-A 11/9/2015 AOI9_RW-A_110915~JC8209 | | | | | AOI 9 RW-B 1/21/2009 RW-B_1/21/2009 | | | | | AOI 9 RW-B 8/14/2009 RW-B SRTF | | | | | AOI 9 RW-B 8/14/2015 RW-BSRTF-20150814~JC1635 | | | | | AOI 9 RW-B5 1/21/2009 RW-B5_1/21/2009 | | | | | AOI 9 RW-B5 8/14/2009 RW-B5 SRTF | | | | | AOI 9 S-74D1SRTF 8/13/2009 S-740 SRTF | | | | | AOI 9 S-74D1SRTF 3/12/2015 S-74D1SRTF_031215 | | | | | AOI 9 S-74D1SRTF 8/13/2015 S-74D1SRTF-20150813~JC1635 | | | | | AOI 9 S-74D1SRTF* 11/10/2015 AOI9_S-74D1SRTF_111015~JC8209 | | | | |
|---|---|---

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-74D1SRTF 12/3/2015 AOI9_S-74D1SRTF_120315					AOI 9 S-74D2SRTF 8/13/2009 S-74I SRTF					AOI 9 S-74D2SRTF 3/12/2015 S-74D2SRTF_031215					AOI 9 S-74D2SRTF 8/14/2015 S-74D2SRTF-20150814~JC1635					AOI 9 S-74D2SRTF 12/3/2015 AOI9_S-74D2SRTF_120315					AOI 9 S-74SRTF 1/21/2009 S-74SRTF_1/21/2009					AOI 9 S-74SRTF 8/13/2009 S-74 SRTF					AOI 9 S-74SRTF 3/4/2015 S-74SRTF-030415					AOI 9 S-74SRTF 11/11/2015 AOI9_S-74SRTFDUP_111115~JC8319					AOI 9 S-74SRTF 11/11/2015 AOI9_S-74SRTF_111115~JC8319				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																							
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.059				1	NA					NA					NA					0.05				1	0.061				1	NA					NA					NA									
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.12	1	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	0.12	1	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	12.2		0.22	2	1	5		0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	NA					ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0079	0.019	1	NA					ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0082	0.019	1	ND	U	0.0083	0.019	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.36	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.36	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.12	1	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	NA										ND	U	1	2	1	ND	U	0.17	2	1	2.8		0.29	2	1	1.2	J	0.29	2	1
Benzene	71-43-2	5	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	14.1		0.24	0.5	1	5.9		0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.23	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.23	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.4	1	1	8		0.27	1	1	3.7		0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.14	1	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.14	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.26	1	1	0.41	J	0.23	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	1.3		0.17	1	1	1		0.5	1	1	0.48	J	0.26	1	1	0.37	J	0.24	1	1	0.4	J	0.17	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1
Toluene	108-88-3	1000	ND	U	0.13	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.13	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	0.69	J	0.16	1	1	0.31	J	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.55	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.55	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	14.3		0.17	1	1	5.7		0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																							
Anthracene	120-12-7	66	NA					NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	NA					NA					NA					NA					ND	U	0.021	0.1	1	ND	U	0.014	0.11	1	ND	U	0.014	0.11	1
Benzo(A)Anthracene	56-55-3	3.6	NA					NA					ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	NA					NA					NA					NA					ND	U	0.012	0.1	1	0.0619		0.021	0.056	1	0.287		0.021	0.056	1
Benzo(A)Pyrene	50-32-8	0.2	NA					NA					ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	NA					NA					NA					NA					ND	U	0.012	0.1	1	0.089		0.033	0.056	1	0.314		0.033	0.056	1
Benzo(B)Fluoranthene	205-99-2	1.2	NA					NA					ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	NA					NA					NA					NA					ND	U	0.01	0.1	1	ND	U	0.023	0.11	1	0.378		0.023	0.11	1
Benzo(G,H,I)Perylene	191-24-2	0.26	NA					NA					ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	NA					NA					NA					NA					ND	U	0.016	0.1	1	ND	U	0.029	0.11	1	0.2		0.029	0.11	1
Chrysene	218-01-9	1.9	NA					ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	NA					ND	U	1	5	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.017	0.11	1	0.303		0.017	0.11	1
Fluorene	86-73-7	1900	NA					ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	NA					ND	U	1	5	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.03	0.11	1	ND	U	0.03	0.11	1
Naphthalene	91-20-3	100	NA					ND	U	1	5	1	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	1	5	1	ND	U	1	5	1	ND	U	0.036	0.1	1	0.986		0.015	0.11	1	0.828		0.015	0.11	1
Phenanthrene	85-01-8	1100	NA					ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	NA					ND	U	1	5	1	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.018	0.11	1	0.264		0.018	0.11	1
Pyrene	129-00-0	130	NA					ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	1	5	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.015	0.11	1	0.442		0.015	0.11	1
METAL																																																						
Lead	7439-92-1	5	NA					ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	NA					ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	5.6		2.3	3	1	7		2.3	3	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
			S-74SRTF					S-75SRTF					S-75SRTF					S-75SRTF					S-76DSRTF					S-76DSRTF					S-76DSRTF					S-76DSRTF					S-76DSRTF				
			12/3/2015					1/20/2009					8/13/2009					3/4/2015					8/20/2015					1/22/2009					8/12/2009					3/12/2015					8/13/2015				
			AOI9_S-74SRTF_120315					S-75SRTF_012009					S-75 SRTF					S-75SRTF-030415					S-75SRTF-20150820~JC1984					S-76DSRTF_012209					S-76D SRTF					S-76DSRTF_031215					DUP-003_031215					S-76DSRTF-20150813~JC1635				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.06				1	0.063				1	NA					NA					0.07				1	0.072				1	NA					NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.12	1	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	NA					ND	U	0.0098	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0087	0.02	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.03	1	ND	U	0.0081	0.02	1	ND	U	0.0079	0.019	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.36	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.12	1	1	NA					ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	NA					ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1
Benzene	71-43-2	5	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	1		0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.23	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	3		0.5	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.14	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.26	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	ND	U	0.17	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	1		0.5	1	1	ND	U	0.5	1	1	9.3		0.26	1	1	8.9		0.26	1	1	6.6		0.24	1	1
Toluene	108-88-3	1000	ND	U	0.13	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	1		0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.55	1	1	ND	U	0.5	1	1	1		0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	17		0.5	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																		
Anthracene	120-12-7	66	NA					NA					NA					ND	U	0.022	0.11	1	ND	U	0.014	0.11	1	NA					NA					ND	U	0.02	0.1	1	ND	U	0.02	0.1	1	ND	U	0.013	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	NA					NA					NA					ND	U	0.013	0.11	1	ND	U	0.021	0.056	1	NA					NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.019	0.05	1
Benzo(A)Pyrene	50-32-8	0.2	NA					NA					NA					ND	U	0.013	0.11	1	ND	U	0.033	0.056	1	NA					NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.03	0.05	1
Benzo(B)Fluoranthene	205-99-2	1.2	NA					NA					NA					ND	U	0.011	0.11	1	ND	U	0.023	0.11	1	NA					NA					ND	U	0.01	0.1	1	ND	U	0.01	0.1	1	ND	U	0.021	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	NA					NA					NA					ND	U	0.017	0.11	1	ND	U	0.029	0.11	1	NA					NA					ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	0.026	0.1	1
Chrysene	218-01-9	1.9	NA					ND	U	0.9	5	1	ND	U	1	5	1	ND	U	0.013	0.11	1	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1
Fluorene	86-73-7	1900	NA					ND	U	0.9	5	1	ND	U	1	5	1	ND	U	0.018	0.11	1	ND	U	0.03	0.11	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1
Naphthalene	91-20-3	100	NA					ND	U	0.9	5	1	ND	U	1	5	1	ND	U	0.039	0.11	1	ND	U	0.015	0.11	1	ND	U	1	5	1	ND	U	1	5	1	0.129		0.036	0.1	1	0.108		0.036	0.1	1	0.313		0.013	0.1	1
Phenanthrene	85-01-8	1100	NA					ND	U	0.9	5	1	ND	U	1	5	1	ND	U	0.023	0.11	1	ND	U	0.018	0.11	1	ND	U	1	5	1	ND	U	1	5	1	0.287		0.021	0.1	1	ND	U	0.021	0.1	1	0.145		0.016	0.1	1
Pyrene	129-00-0	130	NA					ND	U	0.9	5	1	ND	U	1	5	1	ND	U	0.016	0.11	1	ND	U	0.015	0.11	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1
METAL																																																		
Lead	7439-92-1	5	NA					ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	2.9	B	2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	3	3	1	ND	U	2.3	3	1

Note:
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Qualifiers:
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Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-76DSRTF 11/11/2015 AOI9_S-76DSRTF_111115~JC8320					AOI 9 S-76SRTF 1/20/2009 S-76SRTF_012009					AOI 9 S-76SRTF 8/12/2009 S-76 SRTF					AOI 9 S-76SRTF 3/4/2015 S-76SRTF-030415					AOI 9 S-76SRTF 8/20/2015 S-76SRTF-20150820~JC1984					AOI 9 S-76SRTF 11/4/2015 AOI9_S-76SRTF_110415~JC7880					AOI 9 S-77SRTF 1/20/2009 S-77SRTF_012009					AOI 9 S-77SRTF 8/12/2009 S-77 SRTF					AOI 9 S-77SRTF 3/3/2015 S-77SRTF-030315					AOI 9 S-77SRTF 8/19/2015 S-77SRTF-20150819~JC1937				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																			
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.06				1	0.045				1	NA					NA					NA					0.06				1	0.062				1	NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.22	2	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0086	0.02	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0083	0.019	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.29	2	1	NA					ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	NA					NA					ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1
Benzene	71-43-2	5	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.27	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.23	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	0.32	J	0.23	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	8.8		0.24	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	0.5	J	0.24	1	1	1.4		0.24	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	5.2		0.24	1	1
Toluene	108-88-3	1000	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.17	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																				
Anthracene	120-12-7	66	ND	U	0.013	0.1	1	NA					NA					ND	U	0.022	0.11	1	ND	U	0.014	0.11	1	ND	U	0.013	0.1	1	NA					NA					ND	U	0.021	0.11	1	ND	U	0.014	0.11	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.019	0.05	1	NA					NA					ND	U	0.012	0.11	1	ND	U	0.021	0.056	1	ND	U	0.019	0.05	1	NA					NA					ND	U	0.012	0.11	1	ND	U	0.02	0.054	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.03	0.05	1	NA					NA					ND	U	0.013	0.11	1	ND	U	0.033	0.056	1	ND	U	0.03	0.05	1	NA					NA					ND	U	0.013	0.11	1	ND	U	0.032	0.054	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.021	0.1	1	NA					NA					ND	U	0.011	0.11	1	ND	U	0.023	0.11	1	ND	U	0.021	0.1	1	NA					NA					ND	U	0.011	0.11	1	ND	U	0.023	0.11	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.026	0.1	1	NA					NA					ND	U	0.017	0.11	1	ND	U	0.029	0.11	1	ND	U	0.026	0.1	1	NA					NA					ND	U	0.016	0.11	1	ND	U	0.028	0.11	1
Chrysene	218-01-9	1.9	ND	U	0.015	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.013	0.11	1	ND	U	0.017	0.11	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.012	0.11	1	ND	U	0.016	0.11	1
Fluorene	86-73-7	1900	ND	U	0.027	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.018	0.11	1	ND	U	0.03	0.11	1	0.119		0.027	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.018	0.11	1	ND	U	0.029	0.11	1
Naphthalene	91-20-3	100	ND	U	0.013	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.038	0.11	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.037	0.11	1	ND	U	0.014	0.11	1
Phenanthrene	85-01-8	1100	ND	U	0.016	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.022	0.11	1	ND	U	0.018	0.11	1	0.205		0.016	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.022	0.11	1	ND	U	0.017	0.11	1
Pyrene	129-00-0	130	ND	U	0.013	0.1	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.016	0.11	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.016	0.11	1	ND	U	0.014	0.11	1
METAL																																																				
Lead	7439-92-1	5	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	2.7	B	2.3	3	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
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*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 S-78SRTF 1/20/2009 S-78SRTF_012009 | | | | | AOI 9 S-78SRTF 8/12/2009 S-78 SRTF | | | | | AOI 9 S-78SRTF 3/10/2015 S-78SRTF_031015 | | | | | AOI 9 S-78SRTF 8/18/2015 S-78SRTF-20150818~JC1804 | | | | | AOI 9 S-78SRTF 11/5/2015 AOI9_S-78SRTF_110515~JC7880 | | | | | AOI 9 S-79SRTF 1/21/2009 S-79SRTF_1/21/2009 | | | | | AOI 9 S-79SRTF 8/12/2009 S-79 SRTF | | | | | AOI 9 S-79SRTF 3/9/2015 S-79SRTF_030915 | | | | | AOI 9 S-79SRTF 8/18/2015 S-79SRTF-20150818~JC1804 | | | | | AOI 9 S-80SRTF 1/21/2009 S-80SRTF_1/21/2009 | | | | |
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Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 S-80SRTF 8/12/2009 S-80 SRTF | | | | | AOI 9 S-80SRTF 3/9/2015 S-80SRTF_030915 | | | | | AOI 9 S-80SRTF 8/18/2015 S-80SRTF-20150818~JC1804 | | | | | AOI 9 S-81SRTF 1/20/2009 S-81SRTF_012009 | | | | | AOI 9 S-81SRTF 8/11/2009 S-81 SRTF | | | | | AOI 9 S-81SRTF 3/10/2015 S-81SRTF_031015 | | | | | AOI 9 S-81SRTF 8/11/2015 S-81SRTF-20150811~JC1634 | | | | | AOI 9 S-81SRTF 11/4/2015 AOI9_S-81SRTF_110415~JC7880 | | | | | AOI 9 S-82SRTF 1/21/2009 S-82SRTF_1J21/2009 | | | | | AOI 9 S-82SRTF 8/11/2009 S-82 SRTF | | | | |
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Table 8
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AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
			S-82SRTF					S-82SRTF					S-83SRTF					S-83SRTF					S-83SRTF					S-105SRTF					S-105SRTF					S-105SRTF				
			3/3/2015					8/19/2015					1/20/2009					3/3/2015					8/19/2015					1/20/2009					8/12/2009					3/6/2015				
			S-82SRTF-030315					S-82SRTF-20150819~JC1937					S-83SRTF_012009					S-83SRTF-030315					S-83SRTF-20150819~JC1937					S-105SRTF_012009					S-105 SRTF					S-105SRTF_030615				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																									
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.07				1	NA					NA					0.07				1	0.056				1	NA					NA					0.08				1
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.93	10	5	ND	U	0.22	2	1	NA					ND	U	0.19	2	1	ND	U	0.22	2	1	NA					ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	NA				
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0081	0.02	1	ND	U	0.0082	0.019	1	ND	U	0.0099	0.03	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.012	0.028	1	ND	U	0.0099	0.03	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	1.5	5	5	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.5	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.87	10	5	ND	U	0.29	2	1	NA					ND	U	0.17	2	1	ND	U	0.29	2	1	NA					ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	NA				
Benzene	71-43-2	5	ND	U	1	2.5	5	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	0.24	J	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	0.3	J	0.24	0.5	1	5		0.5	1	1
Ethylbenzene	100-41-4	700	ND	U	2	5	5	ND	U	0.27	1	1	ND	U	0.5	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	0.31	J	0.27	1	1	2		0.5	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	1.3	5	5	ND	U	0.23	1	1	ND	U	0.5	2	1	ND	U	0.26	1	1	0.55	J	0.23	1	1	ND	U	0.5	2	1	ND	U	1	2	1	1.8		0.26	1	1	3.1		0.23	1	1	ND	U	0.5	2	1
Methyl Tertiary Butyl Ether	1634-04-4	20	5.9		1.3	5	5	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.5	1	1
Toluene	108-88-3	1000	ND	U	1.1	5	5	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.22	1	1	0.23	J	0.16	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	2		0.5	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	1	5	5	ND	U	0.17	1	1	ND	U	0.5	1	1	ND	U	0.2	1	1	0.34	J	0.17	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	0.53	J	0.17	1	1	15		0.5	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																									
Anthracene	120-12-7	66	ND	U	0.02	0.1	1	ND	U	0.016	0.12	1	NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	NA					NA					ND	U	0.021	0.1	1	ND	U	0.013	0.1	1	NA				
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.012	0.1	1	ND	U	0.023	0.062	1	NA					ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	NA					NA					ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	NA				
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.012	0.1	1	ND	U	0.036	0.062	1	NA					ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	NA					NA					ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	NA				
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.01	0.1	1	ND	U	0.026	0.12	1	NA					ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	NA					NA					ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	NA				
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.016	0.1	1	ND	U	0.032	0.12	1	NA					ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	NA					NA					ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	NA				
Chrysene	218-01-9	1.9	ND	U	0.012	0.1	1	ND	U	0.019	0.12	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	1	5	1
Fluorene	86-73-7	1900	ND	U	0.017	0.1	1	ND	U	0.033	0.12	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	ND	U	1	5	1
Naphthalene	91-20-3	100	ND	U	0.036	0.1	1	ND	U	0.016	0.12	1	ND	U	1	5	1	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.036	0.1	1	0.16		0.013	0.1	1	ND	U	1	5	1
Phenanthrene	85-01-8	1100	ND	U	0.021	0.1	1	ND	U	0.02	0.12	1	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	ND	U	1	5	1
Pyrene	129-00-0	130	ND	U	0.015	0.1	1	ND	U	0.017	0.12	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1
METAL																																									
Lead	7439-92-1	5	ND	U	3	3	1	2.9	B	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	3	3	1	2.9	B	2.3	3	1	ND	U	0.05	1	1

Note:
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Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-106SRTF 8/13/2009 S-106 SRTF					AOI 9 S-106SRTF 3/9/2015 S-106SRTF_030915					AOI 9 S-106SRTF 8/14/2015 S-106SRTF-20150814~JC1635					AOI 9 S-106SRTF 11/10/2015 AOI9_S-106SRTF_111015~JC8209					AOI 9 S-106DSRTF 3/13/2015 S-106DSRTF_031315					AOI 9,11 S-106DSRTF 1/22/2009 S-106DSRTF_012209					AOI 9,11 S-106DSRTF 8/13/2009 S-106D SRTF					AOI 9,11 S-106DSRTF 8/13/2015 S-106DSRTF-20150813~JC1635					AOI 9,11 S-106DSRTF 11/10/2015 AOI9_S-106DSRTF_111015~JC8209					AOI 9 S-108SRTF 8/11/2009 S-108 SRTF				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																			
1,1,2,2-Tetrachloroethane	79-34-5	0.13	0.065				1	NA					NA					NA					NA					0.07				1	0.088				1	NA					NA					0.062				1
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	0.23	J	0.22	2	1	ND	U	0.19	2	1	NA					ND	U	1	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.01	0.03	1	ND	U	0.0081	0.02	1	ND	U	0.0097	0.023	1	ND	U	0.0081	0.019	1	ND	U	0.0081	0.02	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0079	0.018	1	ND	U	0.0094	0.022	1	ND	U	0.01	0.029	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.3	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	0.17	2	1	NA					ND	U	1	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	1	2	1
Benzene	71-43-2	5	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.21	0.5	1	2		0.5	1	1	ND	U	0.5	1	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1
Ethylbenzene	100-41-4	700	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.4	1	1	2		0.5	1	1	ND	U	0.8	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	0.26	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.23	1	1	0.36	J	0.23	1	1	ND	U	1	2	1
Methyl Tertiary Butyl Ether	1634-04-4	20	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1	12.3		0.26	1	1	27		0.5	1	1	98		0.5	1	1	17.6		0.24	1	1	3.8		0.24	1	1	ND	U	0.5	1	1
Toluene	108-88-3	1000	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.22	1	1	1		0.5	1	1	ND	U	0.7	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.7	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.2	1	1	14		0.5	1	1	ND	U	0.8	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.8	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																				
Anthracene	120-12-7	66	NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1	ND	U	0.02	0.1	1	NA					NA					NA					ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA				
Benzo(A)Anthracene	56-55-3	3.6	NA					ND	U	0.012	0.1	1	ND	U	0.019	0.051	1	ND	U	0.021	0.056	1	ND	U	0.012	0.1	1	NA					NA					NA					ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA				
Benzo(A)Pyrene	50-32-8	0.2	NA					ND	U	0.012	0.1	1	ND	U	0.03	0.051	1	ND	U	0.033	0.056	1	ND	U	0.012	0.1	1	NA					NA					NA					ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA				
Benzo(B)Fluoranthene	205-99-2	1.2	NA					ND	U	0.01	0.1	1	ND	U	0.022	0.1	1	ND	U	0.023	0.11	1	ND	U	0.01	0.1	1	NA					NA					NA					ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA				
Benzo(G,H,I)Perylene	191-24-2	0.26	NA					ND	U	0.016	0.1	1	ND	U	0.027	0.1	1	ND	U	0.029	0.11	1	ND	U	0.016	0.1	1	NA					NA					NA					ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA				
Chrysene	218-01-9	1.9	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.016	0.1	1	ND	U	0.017	0.11	1	ND	U	0.012	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	50	1
Fluorene	86-73-7	1900	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	ND	U	0.03	0.11	1	ND	U	0.017	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	1	50	1
Naphthalene	91-20-3	100	ND	U	1	5	1	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1	18.2		0.15	1.1	10	0.222		0.036	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	50	1
Phenanthrene	85-01-8	1100	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	0.137		0.018	0.11	1	ND	U	0.021	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	1	50	1
Pyrene	129-00-0	130	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.014	0.1	1	ND	U	0.015	0.11	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	50	1
METAL																																																				
Lead	7439-92-1	5	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	3	3	1	ND	U	0.05	1	1	1.4		0.05	1	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-108SRTF 3/3/2015 S-108SRTF-030315					AOI 9 S-108SRTF 8/19/2015 S-108SRTF-20150819~JC1937					AOI 9 S-109SRTF 8/11/2009 S-109 SRTF					AOI 9 S-109SRTF 11/11/2015 AOI9_S-109SRTF_111115~JC8319					AOI 9 S-110DSRTF 8/12/2015 S-110DSRTF-20150812~JC1377					AOI 9 S-110DSRTF 11/11/2015 AOI9_S-110DSRTF_111115~JC8320					AOI 9 S-110SRTF 8/11/2009 S-110 SRTF					AOI 9 S-110SRTF 3/10/2015 S-110SRTF_031015					AOI 9 S-110SRTF 8/14/2015 S-110SRTF-20150814~JC1634					AOI 9 S-110SRTF 11/5/2015 AOI9_S-110SRTF_110515~JC7880				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.058				1	NA					NA					NA					0.062				1	NA					NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.22	2	1	0.34	J	0.22	2	1	ND	U	0.22	2	1	970		1	10	5	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0081	0.02	1	ND	U	0.008	0.019	1	ND	U	0.01	0.029	1	ND	U	0.0082	0.019	1	ND	U	0.0091	0.021	1	ND	U	0.0085	0.02	1	ND	U	0.01	0.03	1	ND	U	0.0081	0.02	1	ND	U	0.0079	0.019	1	ND	U	0.0084	0.02	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.18	1	1	5.4		0.18	1	1	5.7		0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	300		1	10	5	ND	U	0.17	2	1	0.64	J	0.29	2	1	ND	U	0.29	2	1
Benzene	71-43-2	5	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.24	0.5	1	0.35	J	0.24	0.5	1	0.3	J	0.24	0.5	1	3		0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	300		0.8	5	5	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	1	2	1	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	120		1	2	1	ND	U	0.26	1	1	1		0.23	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	ND	U	0.26	1	1	ND	U	0.24	1	1	7		0.5	1	1	4		0.24	1	1	31.7		0.24	1	1	43.9		0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1
Toluene	108-88-3	1000	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.7	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	2		0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.8	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	880		0.8	5	5	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.02	0.1	1	ND	U	0.014	0.11	1	NA					ND	U	0.014	0.11	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.023	0.11	1	0.383		0.013	0.1	1	ND	U	0.013	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.012	0.1	1	ND	U	0.02	0.055	1	NA					ND	U	0.021	0.056	1	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA					ND	U	0.013	0.11	1	0.371		0.019	0.05	1	ND	U	0.019	0.05	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.012	0.1	1	ND	U	0.032	0.055	1	NA					ND	U	0.033	0.056	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA					ND	U	0.014	0.11	1	0.342		0.03	0.05	1	ND	U	0.03	0.05	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.01	0.1	1	ND	U	0.023	0.11	1	NA					ND	U	0.023	0.11	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA					ND	U	0.011	0.11	1	0.381		0.021	0.1	1	ND	U	0.021	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.016	0.1	1	ND	U	0.029	0.11	1	NA					ND	U	0.029	0.11	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA					ND	U	0.017	0.11	1	1.18		0.026	0.1	1	ND	U	0.026	0.1	1
Chrysene	218-01-9	1.9	ND	U	0.012	0.1	1	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	0.017	0.11	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	50	1	ND	U	0.013	0.11	1	0.394		0.015	0.1	1	ND	U	0.015	0.1	1
Fluorene	86-73-7	1900	ND	U	0.017	0.1	1	ND	U	0.03	0.11	1	ND	U	1	5	1	ND	U	0.03	0.11	1	ND	U	0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	1	50	1	ND	U	0.019	0.11	1	0.453		0.027	0.1	1	ND	U	0.027	0.1	1
Naphthalene	91-20-3	100	ND	U	0.036	0.1	1	ND	U	0.014	0.11	1	ND	U	1	5	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	300		1	50	1	ND	U	0.039	0.11	1	0.445		0.013	0.1	1	ND	U	0.013	0.1	1
Phenanthrene	85-01-8	1100	ND	U	0.021	0.1	1	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	0.018	0.11	1	ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	1	50	1	ND	U	0.023	0.11	1	0.684		0.016	0.1	1	ND	U	0.016	0.1	1
Pyrene	129-00-0	130	ND	U	0.015	0.1	1	ND	U	0.015	0.11	1	ND	U	1	5	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	50	1	ND	U	0.017	0.11	1	0.632		0.013	0.1	1	ND	U	0.013	0.1	1
METAL																																																			
Lead	7439-92-1	5	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	4.5		0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1

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Philadelphia, Pennsylvania

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			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	0.08				1	NA					NA					NA					NA					NA					NA					0.057				1	NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	4		1	2	1	0.87	J	0.19	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1	258		0.93	10	5	107		1.1	10	5	148		1.1	10	5	1,100		1	20	10	37.3		0.19	2	1	0.89	J	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0094	0.022	1	ND	U	0.0081	0.02	1	ND	U	0.023	0.053	1	ND	U	0.0084	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1.5	5	5	ND	U	0.9	5	5	ND	U	0.9	5	5	ND	U	1	2	2	ND	U	0.3	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	2		1	2	1	0.23	J	0.17	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	75.1		0.87	10	5	29.6		1.5	10	5	46.6		1.5	10	5	370		1	4	2	24.1		0.17	2	1	1.5	J	0.29	2	1
Benzene	71-43-2	5	86		0.5	1	1	29.2		0.21	0.5	1	5.4		0.24	0.5	1	2.9		0.24	0.5	1	993		1	2.5	5	785		1.2	2.5	5	1,080		5.9	13	25	510		0.5	10	10	137		0.21	0.5	1	344		2.4	5	10
Ethylbenzene	100-41-4	700	7		0.8	1	1	2.6		0.4	1	1	0.38	J	0.27	1	1	ND	U	0.27	1	1	256		2	5	5	94.5		1.3	5	5	140		1.3	5	5	890		0.8	10	10	94.3		0.4	1	1	7.2		0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	110		1	2	1	49.4		0.26	1	1	19.4		0.23	1	1	14.2		0.23	1	1	98.4		1.3	5	5	40.3		1.2	5	5	51.3		1.2	5	5	180		1	4	2	29.6		0.26	1	1	45.9		0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	83		0.5	1	1	20.9		0.26	1	1	5.6		0.24	1	1	22.3		0.24	1	1	21.7		1.3	5	5	27.4		1.2	5	5	31.1		1.2	5	5	5		0.5	2	2	1.7		0.26	1	1	12.1		0.24	1	1
Toluene	108-88-3	1000	5		0.7	1	1	3.9		0.22	1	1	ND	U	0.16	1	1	0.37	J	0.16	1	1	215		1.1	5	5	183		0.81	5	5	337		0.81	5	5	37		0.7	2	2	5		0.22	1	1	4		0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	6		0.8	1	1	9.8		0.2	1	1	0.86	J	0.17	1	1	ND	U	0.17	1	1	924		1	5	5	321		0.83	5	5	495		0.83	5	5	2,100		0.8	10	10	66.6		0.2	1	1	4.3		0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.022	0.11	1	ND	U	0.013	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	NA					ND	U	0.012	0.1	1	0.0535		0.019	0.05	1	ND	U	0.019	0.05	1	ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA					ND	U	0.013	0.11	1	ND	U	0.019	0.05	1
Benzo(A)Pyrene	50-32-8	0.2	NA					ND	U	0.012	0.1	1	0.063		0.03	0.05	1	ND	U	0.03	0.05	1	ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA					ND	U	0.013	0.11	1	ND	U	0.03	0.05	1
Benzo(B)Fluoranthene	205-99-2	1.2	NA					ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA					ND	U	0.011	0.11	1	ND	U	0.021	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	NA					ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA					ND	U	0.017	0.11	1	ND	U	0.026	0.1	1
Chrysene	218-01-9	1.9	ND	U	1	50	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	0.013	0.11	1	ND	U	0.015	0.1	1
Fluorene	86-73-7	1900	450		1	50	1	4.39		0.017	0.1	1	3.76		0.027	0.1	1	2.91		0.027	0.1	1	2.46		0.017	0.1	1	1.96		0.027	0.1	1	1.7		0.027	0.1	1	ND	U	1	5	1	0.161		0.018	0.11	1	0.249		0.027	0.1	1
Naphthalene	91-20-3	100	ND	U	1	50	1	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	69.2		0.036	1	1	35.2		0.013	1	1	16.8		0.13	1	10	180		1	47	10	4.75		0.039	0.11	1	1.34		0.013	0.1	1
Phenanthrene	85-01-8	1100	730		1	50	1	2.32		0.021	0.1	1	0.654		0.016	0.1	1	0.507		0.016	0.1	1	1.68		0.021	0.1	1	1.09		0.016	0.1	1	1.07		0.016	0.1	1	ND	U	1	5	1	0.11		0.023	0.11	1	0.161		0.016	0.1	1
Pyrene	129-00-0	130	ND	U	1	50	1	ND	U	0.015	0.1	1	0.147		0.013	0.1	1	ND	U	0.013	0.1	1	0.0803	J	0.015	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	0.016	0.11	1	ND	U	0.013	0.1	1
METAL																																																			
Lead	7439-92-1	5	4.4		0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	19.1		0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-113SRTF 11/4/2015 AOI9_S-113SRTF_110415~JC7880					AOI 9 S-114SRTF 8/11/2009 S-114 SRTF					AOI 9 S-114SRTF 1/21/2015 S-114SRTF-20150121_1532829					AOI 9 S-114SRTF 3/10/2015 S-114SRTF_031015					AOI 9 S-114SRTF 8/11/2015 S-114SRTF-20150811~JC1634					AOI 9 S-114SRTF 11/6/2015 AOI9_S-114SRTF_110615~JC8008					AOI 9 S-115DSRTF 8/12/2015 S-115DSRTF-20150812~JC1377					AOI 9 S-115DSRTF 11/11/2015 AOI9_S-115DSRTF_111115~JC8320					AOI 9 S-115SRTF 8/11/2009 S-115 SRTF					AOI 9 S-115SRTF 3/11/2015 S-115SRTF_031115				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.086				1	0.076				1	NA					NA					NA					NA					NA					0.069				1	NA				
1,2,4-Trimethylbenzene	95-63-6	62	0.5	J	0.22	2	1	6,100		1	400	200	200		0.5	3	5	1,880		1.9	20	10	539		1.1	10	5	662		1.1	10	5	0.67	J	0.22	2	1	ND	U	0.22	2	1	1,400		1	40	20	2.9		0.19	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0084	0.02	1	0.057		0.01	0.03	1	ND	U	0.01	0.0095	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0081	0.019	1	ND	U	0.0085	0.02	1	ND	U	0.0083	0.019	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	1	20	20	ND	U	0.5	3	5	ND	U	3	10	10	ND	U	0.9	5	5	ND	U	0.9	5	5	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	20	20	ND	U	0.3	1	1
1,3,5-Trimethylbenzene	108-67-8	53	0.53	J	0.29	2	1	1,900		1	40	20	74		0.5	3	5	647		1.7	20	10	176		1.5	10	5	220		1.5	10	5	0.57	J	0.29	2	1	ND	U	0.29	2	1	680		1	40	20	79.8		0.17	2	1
Benzene	71-43-2	5	152		0.24	0.5	1	3,200		0.5	20	20	250		0.5	3	5	1,410		2.1	5	10	654		1.2	2.5	5	487		1.2	2.5	5	0.63		0.24	0.5	1	0.44	J	0.24	0.5	1	1,800		0.5	20	20	421		1	2.5	5
Ethylbenzene	100-41-4	700	8.7		0.27	1	1	2,300		0.8	20	20	140		0.5	3	5	1,640		4	10	10	471		1.3	5	5	352		1.3	5	5	ND	U	0.27	1	1	ND	U	0.27	1	1	1,300		0.8	20	20	71.8		0.4	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	15.1		0.23	1	1	320		1	40	20	37		0.5	3	5	121		2.6	10	10	44.4		1.2	5	5	45.8		1.2	5	5	0.25	J	0.23	1	1	ND	U	0.23	1	1	270		1	40	20	38.9		0.26	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	0.85	J	0.24	1	1	66		0.5	20	20	17		0.5	3	5	4.6	J	2.6	10	10	19.1		1.2	5	5	19.3		1.2	5	5	59.4		0.24	1	1	59		0.24	1	1	ND	U	0.5	20	20	ND	U	0.26	1	1
Toluene	108-88-3	1000	1.6		0.16	1	1	12,000		0.7	200	200	490		0.5	3	5	6,640		22	100	100	2,160		8.1	50	50	1,320		3.2	20	20	0.21	J	0.16	1	1	ND	U	0.16	1	1	180		0.7	20	20	34.3		0.22	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	2.6		0.17	1	1	19,000		0.8	200	200	1000		0.5	3	5	10,800		20	100	100	3,110		8.3	50	50	3,210		3.3	20	20	0.73	J	0.17	1	1	ND	U	0.17	1	1	1,800		0.8	20	20	83.9		0.2	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.013	0.1	1	NA					0.2	J	0.1	0.1	1	0.167		0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.02	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.019	0.05	1	NA					ND	U	0.1	0.1	1	ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA					ND	U	0.012	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.03	0.05	1	NA					ND	U	0.1	0.1	1	ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA					ND	U	0.012	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.021	0.1	1	NA					ND	U	0.1	0.1	1	ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA					ND	U	0.01	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.026	0.1	1	NA					ND	U	0.1	0.1	1	ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA					ND	U	0.016	0.1	1
Chrysene	218-01-9	1.9	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	0.1	0.1	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	0.012	0.1	1
Fluorene	86-73-7	1900	ND	U	0.027	0.1	1	ND	U	1	5	1	0.8		0.1	0.1	1	1.05		0.017	0.1	1	0.344		0.027	0.1	1	0.397		0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	1	5	1	0.299		0.017	0.1	1
Naphthalene	91-20-3	100	0.636		0.013	0.1	1	880		1	240	50	73		0.1	0.1	1	220		0.18	5	5	53.5		0.013	1	1	54		0.013	1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	310		1	47	10	56.2		0.036	1	1
Phenanthrene	85-01-8	1100	ND	U	0.016	0.1	1	6		1	5	1	0.6		0.1	0.1	1	1.06		0.021	0.1	1	0.313		0.016	0.1	1	0.324		0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	1	5	1	0.194		0.021	0.1	1
Pyrene	129-00-0	130	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	0.1	0.1	1	0.209		0.015	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	0.015	0.1	1
METAL																																																			
Lead	7439-92-1	5	ND	U	2.3	3	1	13.2		0.05	1	1	1.1		0.082	0.082	1	3.6		3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	10.1		0.05	1	1	ND	U	3	3	1

Note:
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Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-115SRTF 8/14/2015 S-115SRTF-20150814~JC1634					AOI 9 S-115SRTF 11/6/2015 AOI9_S-115SRTF_110615~JC8008					AOI 9 S-116SRTF 8/11/2009 S-116 SRTF					AOI 9 S-116SRTF 3/11/2015 S-116SRTF_031115					AOI 9 S-116SRTF 8/14/2015 S-116SRTF-20150814~JC1634					AOI 9 S-116SRTF 11/9/2015 AOI9_S-116SRTF_110915~JC8209					AOI 9 S-117SRTF 8/11/2009 S-117 SRTF					AOI 9 S-117SRTF 3/6/201 5S-117SRTF_030615					AOI 9 S-117SRTF 8/14/2015 S-117SRTF-20150814~JC1634					AOI 9 S-117SRTF 11/9/2015 AOI9_S-117SRTF_110915~JC8209				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.062				1	NA					NA					NA					0.052				1	NA					NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	1.1	J	1.1	10	5	5.3		0.45	4	2	3		1	2	1	ND	U	0.19	2	1	0.32	J	0.22	2	1	0.26	J	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	1.3	J	0.22	2	1	0.49	J	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.008	0.019	1	ND	U	0.0085	0.02	1	ND	U	0.01	0.03	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0085	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.019	1	ND	U	0.0084	0.02	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.9	5	5	ND	U	0.36	2	2	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	98.3		1.5	10	5	57.6		0.59	4	2	12		1	2	1	ND	U	0.17	2	1	1.8	J	0.29	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	0.47	J	0.29	2	1	ND	U	0.29	2	1
Benzene	71-43-2	5	1,070		59	130	250	581		5.9	13	25	31		0.5	1	1	ND	U	0.21	0.5	1	27.4		0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	0.49	J	0.24	0.5	1	ND	U	0.24	0.5	1
Ethylbenzene	100-41-4	700	159		1.3	5	5	57.5		0.54	2	2	14		0.8	1	1	ND	U	0.4	1	1	4.7		0.27	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	0.55	J	0.27	1	1	ND	U	0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	172		1.2	5	5	151		0.47	2	2	10		1	2	1	ND	U	0.26	1	1	70.2		0.23	1	1	0.86	J	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	1.2		0.23	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	1.9	J	1.2	5	5	ND	U	0.47	2	2	4		0.5	1	1	ND	U	0.26	1	1	44.3		0.24	1	1	0.37	J	0.24	1	1	NA					ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1
Toluene	108-88-3	1000	131		0.81	5	5	64.7		0.32	2	2	3		0.7	1	1	ND	U	0.22	1	1	12		0.16	1	1	0.37	J	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	0.28	J	0.16	1	1	0.2	J	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	265		0.83	5	5	149		0.33	2	2	9		0.8	1	1	ND	U	0.2	1	1	8.6		0.17	1	1	0.61	J	0.17	1	1	2		0.8	1	1	ND	U	0.2	1	1	0.9	J	0.17	1	1	1.2		0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.021	0.11	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1	NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA					ND	U	0.012	0.11	1	ND	U	0.019	0.05	1	ND	U	0.021	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.019	0.05	1	ND	U	0.021	0.056	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA					ND	U	0.013	0.11	1	ND	U	0.03	0.05	1	ND	U	0.033	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.03	0.05	1	ND	U	0.033	0.056	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA					ND	U	0.011	0.11	1	ND	U	0.021	0.1	1	ND	U	0.023	0.11	1	NA					ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	ND	U	0.023	0.11	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA					ND	U	0.016	0.11	1	ND	U	0.026	0.1	1	ND	U	0.029	0.11	1	NA					ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	ND	U	0.029	0.11	1
Chrysene	218-01-9	1.9	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	5	1	ND	U	0.012	0.11	1	ND	U	0.015	0.1	1	ND	U	0.017	0.11	1	ND	U	1	50	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	0.017	0.11	1
Fluorene	86-73-7	1900	0.363		0.027	0.1	1	0.392		0.027	0.1	1	ND	U	1	5	1	ND	U	0.018	0.11	1	ND	U	0.027	0.1	1	ND	U	0.03	0.11	1	ND	U	1	50	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	ND	U	0.03	0.11	1
Naphthalene	91-20-3	100	42.2		0.013	1	1	4.7		0.013	0.1	1	7		1	5	1	ND	U	0.037	0.11	1	0.591		0.013	0.1	1	ND	U	0.015	0.11	1	ND	U	1	50	1	ND	U	0.036	0.1	1	0.278		0.013	0.1	1	ND	U	0.015	0.11	1
Phenanthrene	85-01-8	1100	0.3		0.016	0.1	1	0.303		0.016	0.1	1	ND	U	1	5	1	ND	U	0.022	0.11	1	ND	U	0.016	0.1	1	ND	U	0.018	0.11	1	ND	U	1	50	1	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	ND	U	0.018	0.11	1
Pyrene	129-00-0	130	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	5	1	ND	U	0.016	0.11	1	ND	U	0.013	0.1	1	ND	U	0.015	0.11	1	ND	U	1	50	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1	ND	U	0.015	0.11	1
METAL																																																			
Lead	7439-92-1	5	2.3	B	2.3	3	1	2.5	B	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-118DSRTF 8/12/2015 S-118DSRTF-20150812~JC1377					AOI 9 S-118DSRTF 11/11/2015 AOI9_S-118DSRTF_111115~JC8320					AOI 9 S-118SRTF 8/12/2009 S-118 SRTF					AOI 9 S-118SRTF 3/6/2015 S-118SRTF_030615					AOI 9 S-118SRTF 8/18/2015 S-118SRTF-20150818~JC1804					AOI 9 S-118SRTF 11/9/2015 AOI9_S-118SRTF_110915~JC8209					AOI 9 S-119SRTF 8/12/2009 S-119 SRTF					AOI 9 S-119SRTF 3/6/2015 S-119SRTF_030615					AOI 9 S-119SRTF 3/6/2015 DUP_001_030615					AOI 9 S-119SRTF 8/18/2015 S-119SRTF-20150818~JC1804				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																			
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.055				1	NA									NA									0.058				1	NA					NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.22	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	0.46	J	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0085	0.02	1	ND	U	0.0085	0.02	1	ND	U	0.01	0.028	1	ND	U	0.0081	0.02	1	ND	U	0.0079	0.019	1	ND	U	0.0086	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.02	1	ND	U	0.0078	0.018	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1
Benzene	71-43-2	5	ND	U	0.24	0.5	1	0.65		0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.26	1	1	ND	U	0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	3.9		0.24	1	1	189		0.24	1	1	6		0.5	1	1	ND	U	0.26	1	1	0.61	J	0.24	1	1	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1
Toluene	108-88-3	1000	ND	U	0.16	1	1	0.27	J	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	0.96	J	0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.023	0.11	1	ND	U	0.014	0.11	1	ND	U	0.014	0.11	1	NA					ND	U	0.02	0.1	1	ND	U	0.02	0.1	1	ND	U	0.013	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.019	0.05	1	ND	U	0.019	0.05	1	NA					ND	U	0.013	0.11	1	ND	U	0.021	0.056	1	ND	U	0.021	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.019	0.05	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	NA					ND	U	0.014	0.11	1	ND	U	0.033	0.056	1	ND	U	0.033	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.03	0.05	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	NA					ND	U	0.011	0.11	1	ND	U	0.023	0.11	1	ND	U	0.023	0.11	1	NA					ND	U	0.01	0.1	1	ND	U	0.01	0.1	1	ND	U	0.021	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	NA					ND	U	0.017	0.11	1	ND	U	0.029	0.11	1	ND	U	0.029	0.11	1	NA					ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	0.026	0.1	1
Chrysene	218-01-9	1.9	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	1	50	1	ND	U	0.013	0.11	1	ND	U	0.017	0.11	1	ND	U	0.017	0.11	1	ND	U	1	25	1	ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1
Fluorene	86-73-7	1900	ND	U	0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	1	50	1	ND	U	0.019	0.11	1	ND	U	0.03	0.11	1	ND	U	0.03	0.11	1	ND	U	1	25	1	ND	U	0.017	0.1	1	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1
Naphthalene	91-20-3	100	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	50	1	ND	U	0.039	0.11	1	ND	U	0.015	0.11	1	ND	U	0.015	0.11	1	ND	U	1	25	1	ND	U	0.036	0.1	1	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1
Phenanthrene	85-01-8	1100	ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	1	50	1	ND	U	0.023	0.11	1	ND	U	0.018	0.11	1	ND	U	0.018	0.11	1	ND	U	1	25	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	0.137		0.016	0.1	1
Pyrene	129-00-0	130	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	1	50	1	ND	U	0.017	0.11	1	ND	U	0.015	0.11	1	ND	U	0.015	0.11	1	ND	U	1	25	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.013	0.1	1
METAL																																																			
Lead	7439-92-1	5	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	3	3	1	ND	U	2.3	3	1

Note:
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Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 S-119SRTF 11/9/2015 AOI9_S-119SRTF_110915~JC8209 | | | | | AOI 9 S-120SRTF 8/13/2009 S-120 SRTF | | | | | AOI 9 S-120SRTF 8/13/2009 S-120I SRTF | | | | | AOI 9 S-120SRTF 3/9/2015 S-120SRTF_030915 | | | | | AOI 9 S-120SRTF 8/18/2015 S-120SRTF-20150818~JC1804 | | | | | AOI 9 S-120SRTF 11/10/2015 AOI9_S-120SRTF_111015~JC8209 | | | | | AOI 9 S-120DSRTF 3/13/2015 S-120DSRTF_031315 | | | | | AOI 9,11 S-120DSRTF 8/13/2015 S-120DSRTF-20150813~JC1635 | | | | | AOI 9,11 S-120DSRTF 11/10/2015 AOI9_S-120DSRTF_111015~JC8209 | | | | | AOI 9 S-121SRTF 8/12/2009 S-121 SRTF | | | | |
|---|---|---

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Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-121SRTF 3/9/2015 S-121SRTF_030915					AOI 9 S-121SRTF 8/18/2015 S-121SRTF-20150818~JC1804					AOI 9 S-122SRTF 8/13/2009 S-122 SRTF					AOI 9 S-122SRTF 3/10/2015 S-122SRTF_031015					AOI 9 S-122SRTF 8/18/2015 S-122SRTF-20150818~JC1804					AOI 9 S-122SRTF 11/5/2015 AOI9_S-122SRTF_110515~JC7880					AOI 9 S-123SRTF 8/13/2009 S-123 SRTF					AOI 9 S-123SRTF 3/10/2015 S-123SRTF_031015					AOI 9 S-124SRTF 8/12/2009 S-124 SRTF					AOI 9 S-124SRTF 3/9/2015 S-124SRTF_030915				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.079				1	NA						NA					NA					0.063				1	NA					0.071				1	NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.19	2	1	ND	U	0.22	2	1	19		1	10	5	5		0.19	2	1	1.4	J	0.22	2	1	1.2	J	0.22	2	1	430		1	50	25	12.6		0.19	2	1	6		1	2	1	ND	U	0.19	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0081	0.02	1	ND	U	0.008	0.019	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.01	0.024	1	ND	U	0.01	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	1	5	5	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	1	1	1	ND	U	0.3	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.17	2	1	ND	U	0.29	2	1	290		1	10	5	119		0.17	2	1	38.4		0.29	2	1	23		0.29	2	1	880		1	50	25	8		0.17	2	1	ND	U	1	2	1	ND	U	0.17	2	1
Benzene	71-43-2	5	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	1,800		0.5	50	50	120		0.21	0.5	1	64.9		0.24	0.5	1	49.9		0.24	0.5	1	390		0.5	25	25	7.9		0.21	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.4	1	1	ND	U	0.27	1	1	56		0.8	5	5	27.2		0.4	1	1	11.7		0.27	1	1	8.9		0.27	1	1	320		0.8	25	25	4.3		0.4	1	1	4		0.8	1	1	ND	U	0.4	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	1.8		0.26	1	1	1.3		0.23	1	1	240		1	10	5	171		0.26	1	1	166		0.23	1	1	162		0.23	1	1	180		1	2	1	17.2		0.26	1	1	14		1	2	1	0.96	J	0.26	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	0.72	J	0.26	1	1	1.3		0.24	1	1	140		0.5	5	5	39.5		0.26	1	1	41.8		0.24	1	1	57.6		0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	5		0.5	1	1	ND	U	0.26	1	1
Toluene	108-88-3	1000	ND	U	0.22	1	1	ND	U	0.16	1	1	51		0.7	5	5	39		0.22	1	1	31.9		0.16	1	1	28.3		0.16	1	1	32		0.7	1	1	ND	U	0.22	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.2	1	1	ND	U	0.17	1	1	49		0.8	5	5	30.8		0.2	1	1	18.4		0.17	1	1	19.1		0.17	1	1	710		0.8	25	25	5.1		0.2	1	1	8		0.8	1	1	ND	U	0.2	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.023	0.11	1	ND	U	0.013	0.1	1	NA					1.06		0.02	0.1	1	0.627		0.013	0.1	1	1.13		0.013	0.1	1	NA					0.112		0.021	0.11	1	NA					0.119		0.02	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.013	0.11	1	ND	U	0.019	0.052	1	NA					0.395		0.012	0.1	1	0.156		0.019	0.05	1	0.386		0.019	0.05	1	NA					ND	U	0.012	0.11	1	NA					ND	U	0.012	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.014	0.11	1	ND	U	0.03	0.052	1	NA					0.204		0.012	0.1	1	0.0811		0.03	0.05	1	0.21		0.03	0.05	1	NA					ND	U	0.013	0.11	1	NA					ND	U	0.012	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.011	0.11	1	ND	U	0.022	0.1	1	NA					0.237		0.01	0.1	1	ND	U	0.021	0.1	1	0.252		0.021	0.1	1	NA					ND	U	0.011	0.11	1	NA					ND	U	0.01	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.017	0.11	1	ND	U	0.027	0.1	1	NA					0.11		0.016	0.1	1	ND	U	0.026	0.1	1	0.136		0.026	0.1	1	NA					ND	U	0.016	0.11	1	NA					ND	U	0.016	0.1	1
Chrysene	218-01-9	1.9	ND	U	0.013	0.11	1	ND	U	0.016	0.1	1	ND	U	1	5	1	0.442		0.012	0.1	1	0.152		0.015	0.1	1	0.33		0.015	0.1	1	ND	U	1	50	1	ND	U	0.012	0.11	1	ND	U	1	5	1	ND	U	0.012	0.1	1
Fluorene	86-73-7	1900	0.181		0.019	0.11	1	0.257		0.028	0.1	1	21		1	5	1	6.07		0.017	1	1	4.94		0.027	0.1	1	8.18		0.13	0.5	5	64		1	50	1	0.569		0.018	0.11	1	ND	U	1	5	1	ND	U	0.017	0.1	1
Naphthalene	91-20-3	100	ND	U	0.039	0.11	1	ND	U	0.014	0.1	1	310		1	25	5	27.2		0.036	1	1	4.52		0.013	0.1	1	ND	U	0.013	0.1	1	1,400		1	100	2	ND	U	0.037	0.11	1	ND	U	1	5	1	ND	U	0.036	0.1	1
Phenanthrene	85-01-8	1100	ND	U	0.023	0.11	1	ND	U	0.016	0.1	1	47		1	5	1	7.47		0.021	1	1	4.8		0.016	0.1	1	11.2		0.08	0.5	5	280		1	50	1	1.05		0.022	0.11	1	ND	U	1	5	1	0.168		0.021	0.1	1
Pyrene	129-00-0	130	ND	U	0.017	0.11	1	ND	U	0.014	0.1	1	14		1	5	1	1.36		0.015	0.1	1	0.546		0.013	0.1	1	1.42		0.013	0.1	1	ND	U	1	50	1	ND	U	0.016	0.11	1	ND	U	1	5	1	ND	U	0.015	0.1	1
METAL																																																			
Lead	7439-92-1	5	ND	U	3	3	1	ND	U	2.3	3	1	8.5		0.05	1	1	12.8		3	3	1	6.2		2.3	3	1	3.3		2.3	3	1	54.2		0.05	1	1	4.4		3	3	1	2.8		0.05	1	1	ND	U	3	3	1

Note:
CAS - Chemical Abstract Number
PADEP - Pennsylvania Department of Environmental Protection
MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard
NA - Not analyzed

*: The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation

Qualifiers:
U - Compound analyzed but not detected
J - Compound detected between the RL and MDL. Result should be consider
E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9					AOI 9				
			S-124SRTF					S-125SRTF					S-125SRTF					S-125SRTF					S-126SRTF					S-126SRTF					S-126SRTF					S-126SRTF				
			8/18/2015					8/12/2009					3/9/2015					8/18/2015					8/13/2009					3/9/2015					3/9/2015					8/20/2015				
			S-124SRTF-20150818~JC1804					S-125 SRTF					S-125SRTF_030915					S-125SRTF-20150818~JC1804					S-126 SRTF					S-126SRTF_030915					DUP_002_030915					S-126SRTF-20150820~JC1984				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																									
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					0.068				1	NA					NA					0.061				1	NA					NA					NA				1	NA				
1,2,4-Trimethylbenzene	95-63-6	62	0.36	J	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0083	0.019	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0076	0.018	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0081	0.02	1	ND	U	0.0084	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1
Benzene	71-43-2	5	0.94		0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	0.24	J	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1
Ethylbenzene	100-41-4	700	0.4	J	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	0.71	J	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	0.27	J	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.5	1	1	ND	U	0.26	1	1
Toluene	108-88-3	1000	0.51	J	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	0.19	J	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	1.3		0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	0.44	J	0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																									
Anthracene	120-12-7	66	ND	U	0.014	0.11	1	NA					ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	NA					ND	U	0.02	0.1	1	ND	U	0.02	0.1	1	ND	U	0.014	0.11	1	NA					ND	U	0.022	0.11	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.021	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.019	0.052	1	NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	0.531		0.021	0.056	1	NA					ND	U	0.013	0.11	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.033	0.056	1	NA					ND	U	0.012	0.1	1	ND	U	0.03	0.052	1	NA					ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	0.471		0.033	0.056	1	NA					ND	U	0.014	0.11	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.023	0.11	1	NA					ND	U	0.01	0.1	1	ND	U	0.022	0.1	1	NA					ND	U	0.01	0.1	1	ND	U	0.01	0.1	1	0.647		0.023	0.11	1	NA					ND	U	0.011	0.11	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.029	0.11	1	NA					ND	U	0.016	0.1	1	ND	U	0.027	0.1	1	NA					ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	0.451		0.029	0.11	1	NA					ND	U	0.017	0.11	1
Chrysene	218-01-9	1.9	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.016	0.1	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.012	0.1	1	0.438		0.017	0.11	1	ND	U	1	50	1	ND	U	0.013	0.11	1
Fluorene	86-73-7	1900	ND	U	0.03	0.11	1	ND	U	1	5	1	ND	U	0.017	0.1	1	0.106		0.028	0.1	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.017	0.1	1	ND	U	0.03	0.11	1	ND	U	1	50	1	ND	U	0.019	0.11	1
Naphthalene	91-20-3	100	0.304		0.015	0.11	1	ND	U	1	5	1	ND	U	0.036	0.1	1	0.132		0.014	0.1	1	ND	U	1	5	1	ND	U	0.036	0.1	1	ND	U	0.036	0.1	1	0.152		0.015	0.11	1	ND	U	1	50	1	ND	U	0.039	0.11	1
Phenanthrene	85-01-8	1100	0.117		0.018	0.11	1	ND	U	1	5	1	ND	U	0.021	0.1	1	0.124		0.016	0.1	1	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	0.368		0.018	0.11	1	ND	U	1	50	1	ND	U	0.023	0.11	1
Pyrene	129-00-0	130	ND	U	0.015	0.11	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.014	0.1	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	0.673		0.015	0.11	1	ND	U	1	50	1	ND	U	0.016	0.11	1
METAL																																									
Lead	7439-92-1	5	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1

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Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 S-127SRTF 8/20/2015 S-127SRTF-20150820~JC1984 | | | | | AOI 9 S-128SRTF 8/13/2009 S-128 SRTF | | | | | AOI 9 S-128SRTF 3/4/2015 S-128SRTF-030415 | | | | | AOI 9 S-128SRTF 8/20/2015 S-128SRTF-20150820~JC1984 | | | | | AOI 9 S-129SRTF 8/12/2009 S-129 SRTF | | | | | AOI 9 S-129SRTF 3/10/2015 S-129SRTF_031015 | | | | | AOI 9 S-129SRTF 8/14/2015 S-129SRTF-20150814~JC1634 | | | | | AOI 9 S-130SRTF 8/13/2009 S-130 SRTF | | | | | AOI 9 S-130SRTF 3/6/2015 S-130SRTF_030615 | | | | | AOI 9 S-130SRTF 8/21/2015 S-130SRTF-20150821~JC2128 | | | | |
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Summary of Groundwater Analytical Results
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Philadelphia, Pennsylvania

| Analyte | CAS Number | PADEP Non-residential Used Aquifer TDS <2500 ug/l | AOI 9 S-130SRTF 11/10/2015 AOI9_S-130SRTF_111015~JC8209 | | | | | AOI 9 S-131SRTF 8/13/2009 S-131 SRTF | | | | | AOI 9 S-131SRTF 3/6/2015 S-131SRTF_030615 | | | | | AOI 9 S-131SRTF 8/21/2015 S-131SRTF-20150821~JC2128 | | | | | AOI 9 S-131SRTF 8/21/2015 S-131SRTFD-20150821~JC2128 | | | | | AOI 9 S-132SRTF 8/11/2009 S-132 SRTF | | | | | AOI 9 S-132SRTF 3/4/2015 S-132SRTF-030415 | | | | | AOI 9 S-132SRTF 8/21/2015 S-132SRTF-20150821~JC2128 | | | | | AOI 9 S-132SRTF 11/11/2015 AOI9_S-132SRTF_111115~JC8319 | | | | | AOI 9 S-133SRTF 8/11/2009 S-133 SRTF | | | | |
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Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-133SRTF 3/3/2015 S-133SRTF-030315					AOI 9 S-133SRTF 8/19/2015 S-133SRTF-20150819~JC1937					AOI 9 S-133SRTF 8/19/2015 S-133SRTFD-20150819~JC1937					AOI 9 S-133SRTF 11/6/2015 AOI9_S-133SRTF_110615~JC8008					AOI 9 S-134SRTF 8/12/2009 S-134 SRTF					AOI 9 S-134SRTF 3/3/2015 S-134SRTF-030315					AOI 9 S-134SRTF 8/19/2015 S-134SRTF-20150819~JC1937					AOI 9 S-134SRTF 11/4/2015 AOI9_S-134SRTF_110415~JC7880					AOI 9 S-135SRTF 8/11/2015 S-135SRTF-20150811~JC1634					AOI 9 S-135SRTF 11/6/2015 AOI9_S-135SRTF_110615~JC8008				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																		
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					NA					NA					0.062				1	NA					NA					NA					NA					NA				
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1	ND	U	1	2	1	ND	U	0.19	2	1	ND	U	0.22	2	1	ND	U	0.22	2	1	2.9		0.22	2	1	1.2	J	0.22	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0081	0.02	1	ND	U	0.0083	0.019	1	ND	U	0.0081	0.019	1	ND	U	0.0087	0.02	1	ND	U	0.01	0.029	1	ND	U	0.0081	0.02	1	ND	U	0.0082	0.019	1	ND	U	0.0074	0.017	1	ND	U	0.0081	0.019	1	ND	U	0.01	0.023	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	1	1	1	ND	U	0.3	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.18	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	ND	U	1	2	1	ND	U	0.17	2	1	ND	U	0.29	2	1	ND	U	0.29	2	1	35.5		0.29	2	1	16.7		0.29	2	1
Benzene	71-43-2	5	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.21	0.5	1	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	188		0.24	0.5	1	122		0.24	0.5	1
Ethylbenzene	100-41-4	700	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.8	1	1	ND	U	0.4	1	1	ND	U	0.27	1	1	ND	U	0.27	1	1	6.8		0.27	1	1	1.8		0.27	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	1	2	1	ND	U	0.26	1	1	ND	U	0.23	1	1	ND	U	0.23	1	1	32		0.23	1	1	8.4		0.23	1	1
Methyl Tertiary Butyl Ether	1634-04-4	20	0.42	J	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1	0.44	J	0.24	1	1	2		0.5	1	1	ND	U	0.26	1	1	ND	U	0.24	1	1	ND	U	0.24	1	1	0.6	J	0.24	1	1	ND	U	0.24	1	1
Toluene	108-88-3	1000	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.7	1	1	ND	U	0.22	1	1	ND	U	0.16	1	1	ND	U	0.16	1	1	8		0.16	1	1	3.1		0.16	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.8	1	1	ND	U	0.2	1	1	ND	U	0.17	1	1	ND	U	0.17	1	1	49.5		0.17	1	1	19.8		0.17	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.02	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1	NA					ND	U	0.02	0.1	1	ND	U	0.014	0.11	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1	ND	U	0.014	0.11	1
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.012	0.1	1	ND	U	0.019	0.051	1	ND	U	0.019	0.05	1	ND	U	0.02	0.054	1	NA					ND	U	0.012	0.1	1	ND	U	0.021	0.056	1	ND	U	0.019	0.05	1	0.051		0.019	0.05	1	ND	U	0.02	0.053	1
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.012	0.1	1	ND	U	0.03	0.051	1	ND	U	0.03	0.05	1	ND	U	0.032	0.054	1	NA					ND	U	0.012	0.1	1	ND	U	0.033	0.056	1	ND	U	0.03	0.05	1	ND	U	0.03	0.05	1	ND	U	0.031	0.053	1
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.01	0.1	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	ND	U	0.023	0.11	1	NA					ND	U	0.01	0.1	1	ND	U	0.023	0.11	1	ND	U	0.021	0.1	1	ND	U	0.021	0.1	1	ND	U	0.022	0.11	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.016	0.1	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	ND	U	0.028	0.11	1	NA					ND	U	0.016	0.1	1	ND	U	0.029	0.11	1	ND	U	0.026	0.1	1	ND	U	0.026	0.1	1	ND	U	0.028	0.11	1
Chrysene	218-01-9	1.9	ND	U	0.012	0.1	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	0.012	0.1	1	ND	U	0.017	0.11	1	ND	U	0.015	0.1	1	ND	U	0.015	0.1	1	ND	U	0.016	0.11	1
Fluorene	86-73-7	1900	ND	U	0.017	0.1	1	ND	U	0.027	0.1	1	ND	U	0.027	0.1	1	ND	U	0.029	0.11	1	ND	U	1	5	1	ND	U	0.017	0.1	1	ND	U	0.03	0.11	1	ND	U	0.027	0.1	1	0.169		0.027	0.1	1	ND	U	0.029	0.11	1
Naphthalene	91-20-3	100	ND	U	0.036	0.1	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1	ND	U	1	5	1	ND	U	0.036	0.1	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	0.013	0.1	1	ND	U	0.014	0.11	1
Phenanthrene	85-01-8	1100	ND	U	0.021	0.1	1	ND	U	0.016	0.1	1	ND	U	0.016	0.1	1	ND	U	0.017	0.11	1	ND	U	1	5	1	ND	U	0.021	0.1	1	ND	U	0.018	0.11	1	ND	U	0.016	0.1	1	0.222		0.016	0.1	1	ND	U	0.017	0.11	1
Pyrene	129-00-0	130	ND	U	0.015	0.1	1	ND	U	0.014	0.1	1	ND	U	0.013	0.1	1	ND	U	0.015	0.11	1	ND	U	1	5	1	ND	U	0.015	0.1	1	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	0.156		0.013	0.1	1	ND	U	0.014	0.11	1
METAL																																																			
Lead	7439-92-1	5	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1	ND	U	2.3	3	1

Note:
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MSC - Medium Specific Concentrations
ug/l - Micrograms per liter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
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Qualifiers:
U - Compound analyzed but not detected
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E - Exceed the calibration range
B - Compound found in blank

Exceedances:
10 - Result exceeds PADEP Non-residential Used Aquifer TDS <25
15 - MDL exceeds either PADEP Non-residential Used Aquifer TDS

Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 S-136SRTF 8/19/2015 S-136SRTF-20150819~JC1937					AOI 9 S-136SRTF 11/6/2015 AOI9_S-136SRTF_110615~JC8008					AOI 9 WPA-1 1/20/2009 WPA-1_012009					AOI 9 WPA-1 8/12/2009 WPA-1					AOI 9 WPA-2 1/20/2009 WPA-2_012009					AOI 9 WPA-2 8/12/2009 WPA-2					AOI 9 WPA-3 1/20/2009 WPA-3_012009					AOI 9 WPA-3 8/12/2009 WPA-3					AOI 9 WPA-5 1/20/2009 WPA-5_012009					AOI 9 WPA-5 8/12/2009 WPA-5				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																			
1,1,2,2-Tetrachloroethane	79-34-5	0.13	NA					NA					0.07				1	0.059				1	0.07				1	0.057				1	0.07				1	0.053				1	0.07				1	0.054				1
1,2,4-Trimethylbenzene	95-63-6	62	ND	U	0.22	2	1	ND	U	0.22	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0081	0.019	1	ND	U	0.0088	0.02	1	ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0097	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	0.18	1	1	ND	U	0.18	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.5	1	1	ND	U	1	1	1
1,3,5-Trimethylbenzene	108-67-8	53	ND	U	0.29	2	1	ND	U	0.29	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1	NA					ND	U	1	2	1
Benzene	71-43-2	5	ND	U	0.24	0.5	1	ND	U	0.24	0.5	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	1		0.5	1	1	ND	U	0.5	1	1
Ethylbenzene	100-41-4	700	ND	U	0.27	1	1	ND	U	0.27	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	1		0.5	1	1	ND	U	0.8	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ND	U	0.23	1	1	ND	U	0.23	1	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.5	2	1	ND	U	1	2	1	ND	U	0.5	2	1	ND	U	1	2	1	16		0.5	2	1	2		1	2	1
Methyl Tertiary Butyl Ether	1634-04-4	20	0.85	J	0.24	1	1	0.35	J	0.24	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1	ND	U	0.5	1	1
Toluene	108-88-3	1000	ND	U	0.16	1	1	ND	U	0.16	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1	ND	U	0.5	1	1	ND	U	0.7	1	1
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	ND	U	0.17	1	1	ND	U	0.17	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1	ND	U	0.5	1	1	ND	U	0.8	1	1
SEMI-VOLATILE ORGANIC COMPOUNDS																																																			
Anthracene	120-12-7	66	ND	U	0.014	0.11	1	ND	U	0.013	0.1	1	NA					NA					NA					NA					NA					NA					NA					NA				
Benzo(A)Anthracene	56-55-3	3.6	ND	U	0.02	0.055	1	ND	U	0.019	0.05	1	NA					NA					NA					NA					NA					NA					NA					NA				
Benzo(A)Pyrene	50-32-8	0.2	ND	U	0.032	0.055	1	ND	U	0.03	0.05	1	NA					NA					NA					NA					NA					NA					NA					NA				
Benzo(B)Fluoranthene	205-99-2	1.2	ND	U	0.023	0.11	1	ND	U	0.021	0.1	1	NA					NA					NA					NA					NA					NA					NA					NA				
Benzo(G,H,I)Perylene	191-24-2	0.26	ND	U	0.029	0.11	1	ND	U	0.026	0.1	1	NA					NA					NA					NA					NA					NA					NA					NA				
Chrysene	218-01-9	1.9	ND	U	0.017	0.11	1	ND	U	0.015	0.1	1	ND	U	***10***	50	1	ND	U	1	5	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.9	5	1	ND	U	1	5	1	ND	U	1	5	1	ND	U	1	5	1
Fluorene	86-73-7	1900	ND	U	0.03	0.11	1	ND	U	0.027	0.1	1	ND	U	10	50	1	ND	U	1	5	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.9	5	1	ND	U	1	5	1	ND	U	10	50	1	ND	U	1	5	1
Naphthalene	91-20-3	100	ND	U	0.014	0.11	1	ND	U	0.013	0.1	1	ND	U	10	50	1	ND	U	1	5	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.9	5	1	ND	U	1	5	1	ND	U	10	50	1	ND	U	1	5	1
Phenanthrene	85-01-8	1100	ND	U	0.017	0.11	1	ND	U	0.016	0.1	1	ND	U	10	50	1	ND	U	1	5	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.9	5	1	ND	U	1	5	1	ND	U	10	50	1	ND	U	1	5	1
Pyrene	129-00-0	130	ND	U	0.015	0.11	1	ND	U	0.013	0.1	1	ND	U	10	50	1	ND	U	1	5	1	ND	U	0.9	5	1	ND	U	1	50	1	ND	U	0.9	5	1	ND	U	1	5	1	ND	U	10	50	1	ND	U	1	5	1
METAL																																																			
Lead	7439-92-1	5	2.8	B	2.3	3	1	ND	U	2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1	ND	U	0.05	1	1

Note:
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ug/l - Micrograms per liter
Q - Qualifier
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Table 8
Summary of Groundwater Analytical Results
AOI 9 Remedial Investigation Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	PADEP Non-residential Used Aquifer TDS <2500 ug/l	AOI 9 WPB-2 1/21/2009 WPB-2_1/21/2009					AOI 9 WPB-2 8/14/2009 WPB-2 SRTF					AOI 9 WPB-3 1/21/2009 WPB-3_1/21/2009					AOI 9 WPB-4 1/21/2009 WPB-4_1/21/2009					AOI 9 WPB-4 8/14/2009 WPB-4 SRTF					AOI 9 WPB-4 8/21/2015 WPB-4-20150821~JC2128					AOI 9 WPB-5 1/21/2009 WPB-5_1/21/2009					AOI 9 WPB-5 8/14/2009 WPB-5 SRTF					AOI 9 WPB-5 11/11/2015 AOI9_WPB-5SRTF_111115~JC8319				
			Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
VOLATILE ORGANIC COMPOUNDS																																																	
1,1,2,2-Tetrachloroethane	79-34-5	0.13	0.06				1	0.07				1	0.07				1	0.07				1	0.051				1	NA					0.05				1	0.092				1	NA									
1,2,4-Trimethylbenzene	95-63-6	62	NA					2,400		1	40	20	NA					NA					160		1	2	1	1	J	0.22	2	1	NA					3,900		1	100	50	1,800		11	100	50					
1,2-Dibromoethane (EDB)	106-93-4	0.05	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0098	0.029	1	ND	U	0.0098	0.029	1	ND	U	0.01	0.029	1	ND	U	0.0083	0.019	1	ND	U	0.0099	0.03	1	ND	U	0.01	0.029	1	ND	U	0.0083	0.019	1				
1,2-Dichloroethane (EDC)	107-06-2	5	ND	U	10	20	20	ND	U	1	20	20	ND	U	5	10	10	ND	U	0.5	1	1	ND	U	1	1	1	ND	U	0.18	1	1	ND	U	5	10	10	ND	U	1	25	25	ND	U	1.8	10	10				
1,3,5-Trimethylbenzene	108-67-8	53	NA					810		1	40	20	NA					NA					42		1	2	1	0.32	J	0.29	2	1	NA					1,300		1	100	50	532		2.9	20	10				
Benzene	71-43-2	5	3,500		10	20	20	3,600		0.5	20	20	1,300		5	10	10	ND	U	0.5	1	1	66		0.5	1	1	61.2		0.24	0.5	1	7,100		50	100	100	7,100		0.5	50	50	6,510		12	25	50				
Ethylbenzene	100-41-4	700	1,500		10	20	20	1,600		0.8	20	20	1,100		5	10	10	ND	U	0.5	1	1	36		0.8	1	1	0.78	J	0.27	1	1	1,600		5	10	10	2,300		0.8	50	50	2,020		13	50	50				
Isopropylbenzene (Cumene)	98-82-8	3500	58		10	40	20	71		1	40	20	34		5	20	10	ND	U	0.5	2	1	24		1	2	1	9.2		0.23	1	1	82		5	20	10	1,100		1	50	25	160		2.3	10	10				
Methyl Tertiary Butyl Ether	1634-04-4	20	4,800		10	20	20	2,600		0.5	20	20	190		5	10	10	ND	U	0.5	1	1	12		0.5	1	1	ND	U	0.24	1	1	11,000		50	100	100	5,400		0.5	25	25	325		2.4	10	10				
Toluene	108-88-3	1000	18,000		50	100	100	14,000		0.7	200	200	120		5	10	10	ND	U	0.5	1	1	5		0.7	1	1	1.8		0.16	1	1	1,800		5	10	10	3,100		0.7	25	25	208		1.6	10	10				
Xylenes, Total (Dimethylbenzene)	1330-20-7	10000	18,000		50	100	100	18,000		0.8	200	200	2,500		5	10	10	ND	U	0.5	1	1	38		0.8	1	1	2.4		0.17	1	1	19,000		50	100	100	24,000		0.8	50	50	1,860		1.7	10	10				
SEMI-VOLATILE ORGANIC COMPOUNDS																																																		
Anthracene	120-12-7	66	NA					NA					NA					NA					NA					ND	U	0.014	0.11	1	NA					NA					0.203		0.014	0.11	1				
Benzo(A)Anthracene	56-55-3	3.6	NA					NA					NA					NA					NA					0.205		0.02	0.054	1	NA					NA					0.17		0.021	0.056	1				
Benzo(A)Pyrene	50-32-8	0.2	NA					NA					NA					NA					NA					0.267		0.032	0.054	1	NA					NA					0.158		0.033	0.056	1				
Benzo(B)Fluoranthene	205-99-2	1.2	NA					NA					NA					NA					NA					0.312		0.023	0.11	1	NA					NA					0.188		0.023	0.11	1				
Benzo(G,H,I)Perylene	191-24-2	0.26	NA					NA					NA					NA					NA					0.262		0.028	0.11	1	NA					NA					0.19		0.029	0.11	1				
Chrysene	218-01-9	1.9	ND	U	***10***	52	10	ND	U	1	24	5	ND	U	***10***	50	1	ND	U	1	5	1	ND	U	1	24	5	0.222		0.017	0.11	1	ND	U	***10***	50	1	ND	U	1	24	5	0.194		0.017	0.11	1				
Fluorene	86-73-7	1900	ND	U	10	52	10	ND	U	1	24	5	ND	U	10	50	1	ND	U	1	5	1	ND	U	1	24	5	ND	U	0.029	0.11	1	ND	U	10	50	1	36		1	24	5	1.36		0.03	0.11	1				
Naphthalene	91-20-3	100	430		10	52	10	510		1	24	5	270		10	50	1	ND	U	1	5	1	ND	U	1	24	5	0.637		0.014	0.11	1	680		10	50	1	2,900		1	240	50	378		0.073	5.6	5				
Phenanthrene	85-01-8	1100	ND	U	10	52	10	ND	U	1	24	5	ND	U	10	50	1	ND	U	1	5	1	ND	U	1	24	5	0.302		0.017	0.11	1	ND	U	10	50	1	47		1	24	5	1.43		0.018	0.11	1				
Pyrene	129-00-0	130	ND	U	10	52	10	ND	U	1	24	5	ND	U	10	50	1	ND	U	1	5	1	ND	U	1	24	5	0.422		0.015	0.11	1	ND	U	10	50	1	26		1	24	5	0.547		0.015	0.11	1				
METAL																																																		
Lead	7439-92-1	5	7.9		0.05	1	1	ND	U	0.05	1	1	21.8		0.05	1	1	1.4		0.05	1	1	ND	U	0.05	1	1	4.8		2.3	3	1	ND	U	0.05	1	1	ND	U	0.05	1	1	69.5		2.3	3	1				

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Table 9
Summary of Indoor Air Quality Analytical Results
AOI 9 Remedial Investigations Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	OSHA PEL TWA	EPA RSL	Location	BB					BB					BB_BG					BB_BG					MB					MB					MB_BG				
				Sample	BB_031215					BB_080515					BB_BG_031215					BB_BG_080515					MB_031215					MB_080515					MB_BG_031215				
				Date	3/12/2015					8/5/2015					3/12/2015					8/5/2015					3/12/2015					8/5/2015					3/12/2015				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
1,1,1-Trichloroethane	71-55-6	1,900,000	22,000	ug/m3	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1
1,1,2,2-Tetrachloroethane	79-34-5	35,000	NS	ug/m3	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	7,600,000	130,000	ug/m3	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1
1,1,2-Trichloroethane	79-00-5	45,000	0.77	ug/m3	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1
1,1-Dichloroethane	75-34-3	400,000	7.7	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,1-Dichloroethene	75-35-4	NS	880	ug/m3	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1
1,2,4-Trichlorobenzene	120-82-1	NS	8.8	ug/m3	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1
1,2,4-Trimethylbenzene	95-63-6	NS	31	ug/m3	1.23		0.07	0.98	1	4.42		0.07	0.98	1	1.13		0.07	0.98	1	2.51		0.07	0.98	1	3.93		0.07	0.98	1	1.08		0.07	0.98	1	1.52		0.07	0.98	1
1,2-Dibromoethane	106-93-4	153,670	NS	ug/m3	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1
1,2-Dichlorobenzene	95-50-1	300,000	880	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,2-Dichloroethane	107-06-2	202,370	NS	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,2-Dichloroethene (Cis)	156-59-2	790,000	NS	ug/m3	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1
1,2-Dichloroethene (Trans)	156-60-5	NS	NS	ug/m3	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1
1,2-Dichloropropane	78-87-5	350,000	1.2	ug/m3	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1
1,2-Dichlorotetrafluoroethane	76-14-2	7,000,000	NS	ug/m3	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1
1,3,5-Trimethylbenzene	108-67-8	NS	NS	ug/m3	ND	U	0	0.98	1	1.33		0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1	1.28		0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1
1,3-Dichlorobenzene	541-73-1	NS	NS	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,3-Dichloropropene (Cis)	10061-01-5	NS	NS	ug/m3	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1
1,3-Dichloropropene (Trans)	10061-02-6	NS	NS	ug/m3	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1
1,3-Hexachlorobutadiene	87-68-3	NS	0.56	ug/m3	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1
1,4-Dichlorobenzene	106-46-7	450,000	1.1	ug/m3	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1
Acetone	67-64-1	2,400,000	140,000	ug/m3	ND	U	0.04	0.48	1	55.6		0.04	0.48	1	ND	U	0.04	0.48	1	54.1		0.04	0.48	1	ND	U	0.04	0.48	1	34.1		0.04	0.48	1	ND	U	0.04	0.48	1
Benzene	71-43-2	31,950	1.6	ug/m3	**1.69**		0.06	0.64	1	**9.58**		0.06	0.64	1	1.41		0.06	0.64	1	**4.15**		0.06	0.64	1	**2.59**		0.06	0.64	1	1.53		0.06	0.64	1	**1.98**		0.06	0.64	1
Bromodichloromethane	75-27-4	NS	NS	ug/m3	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1
Bromoform	75-25-2	5,000	11	ug/m3	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1
Bromomethane	74-83-9	80,000	22	ug/m3	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1
Carbon Disulfide	75-15-0	62,280	3,100	ug/m3	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1
Carbon Tetrachloride	56-23-5	62,910	2	ug/m3	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1
Chlorobenzene	108-90-7	350,000	220	ug/m3	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1
Chloroethane	75-00-3	2,600,000	44,000	ug/m3	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1
Chloroform	67-66-3	240,000	0.53	ug/m3	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	**1.22**		0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1
Chloromethane	74-87-3	206,500	390	ug/m3	1.16		0.06	0.41	1	1.01		0.06	0.41	1	0.93		0.06	0.41	1	0.99		0.06	0.41	1	1.03		0.06	0.41	1	1.03		0.06	0.41	1	1.09		0.06	0.41	1
Dibromochloromethane	124-48-1	NS	NS	ug/m3	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1
Dichlorodifluoromethane	75-71-8	4,950,000	440	ug/m3	2.92		0.08	0.99	1	2.52		0.08	0.99	1	2.52		0.08	0.99	1	2.72		0.08	0.99	1	2.52		0.08	0.99	1	2.62		0.08	0.99	1	2.82		0.08	0.99	1
Ethylbenzene	100-41-4	435,000	4.9	ug/m3	ND	U	0.07	0.87	1	2.43		0.07	0.87	1	ND	U	0.07	0.87	1	1.13		0.07	0.87	1	1.87		0.07	0.87	1	ND	U	0.07	0.87	1	1		0.07	0.87	1
Methyl Butyl Ketone	591-78-6	410,000	130	ug/m3	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1
Methyl Ethyl Ketone	78-93-3	590,000	22,000	ug/m3	1		0.04	0.59	1	2.36		0.04	0.59	1	0.83		0.04	0.59	1	2.51		0.04	0.59	1	0.94		0.04	0.59	1	1.27		0.04	0.59	1	0.68		0.04	0.59	1
Methyl Isobutyl Ketone	108-10-1	410,000	13,000	ug/m3	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1
Methyl Tert-Butyl Ether	1634-04-4	NS	47	ug/m3	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1
Methylene Chloride	75-09-2	86,810	1,200	ug/m3	0.82		0.12	0.78	1	1.44		0.12	0.78	1	ND	U	0.12	0.78	1	47.7		0.12	0.78	1	ND	U	0.12	0.78	1	1.36		0.12	0.78	1	ND	U	0.12	0.78	1
Styrene	100-42-5	425,970	4,400	ug/m3	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1
Tetrachloroethene	127-18-4	678,240	47	ug/m3	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1
Toluene	108-88-3	753,700	22,000	ug/m3	4.29		0.05	0.75	1	16.5		0.05	0.75	1	4.03		0.05	0.75	1	11.2		0.05	0.75	1	9.53		0.05	0.75	1	5.88		0.05	0.75	1	5.39		0.05	0.75	1
Trichloroethene	79-01-6	537,400	3	ug/m3	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1
Trichlorofluoromethane	75-69-4	5,600,000	3,100	ug/m3	1.52		0.1	1.12	1	1.63		0.1	1.12	1	1.24		0.1	1.12	1	2.14		0.1	1.12	1	1.35		0.1	1.12	1	1.4		0.1	1.12	1	1.35		0.1	1.12	1
Vinyl Acetate	108-05-4	NS	880	ug/m3	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1
Vinyl Chloride	75-01-4	2,560	2.8	ug/m3	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1
Xylenes (M&P)	79601-23-1	435,000	NS	ug/m3	2.56		0.13	0.87	1	11		0.13	0.87	1	2.43		0.13	0.87	1	5.17		0.13	0.87	1	8.56		0.13	0.87	1	2.78		0.13	0.87	1	3.87		0.13	0.87	1
Xylenes (O)	95-47-6	435,000	440	ug/m3	1		0.07	0.87	1	4.17		0.07	0.87	1	0.91		0.07	0.87	1	1.87		0.07	0.87	1	3.04		0.07	0.87	1	0.87		0.07	0.87	1	1.35		0.07	0.87	1

Note:

OSHA PEL TWA - Occupational Safety and Health Administration Total Weight Average Permissible Exposure Limit

EPA RSL - Environmental Protection Agency Regional Screenign Level
ug/m3 - Micrograms per cubic meter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard

Qualifiers:
U - Compound analyzed but not detected
+ NYSDOH ELAP does not offer certification for this analyte / matrix / method
D - Diluted Sample

Exceedances:
10 - Result exceeds OSHA PEL TWA
10 - Result exceeds EPA RSL
15 - MDL exceeds standard

Table 9
Summary of Indoor Air Quality Analytical Results
AOI 9 Remedial Investigations Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	OSHA PEL TWA	EPA RSL	Location	MB_BG					PH_1					PH_1					PH_1					PH_1					PH_2					PH_2					PH_3				
				Sample	MB_BG_080515					PH_1_031215					DUP_001_031215					PH_1_080515					DUP_001_080515					PH_2_031215					PH-2_080515					PH_3_031215				
				Date	8/5/2015					3/12/2015					3/12/2015					8/5/2015					8/5/2015					3/12/2015					8/5/2015					3/12/2015				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
1,1,1-Trichloroethane	71-55-6	1,900,000	22,000	ug/m3	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1
1,1,2,2-Tetrachloroethane	79-34-5	35,000	NS	ug/m3	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	7,600,000	130,000	ug/m3	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1
1,1,2-Trichloroethane	79-00-5	45,000	0.77	ug/m3	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1
1,1-Dichloroethane	75-34-3	400,000	7.7	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,1-Dichloroethene	75-35-4	NS	880	ug/m3	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1
1,2,4-Trichlorobenzene	120-82-1	NS	8.8	ug/m3	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1
1,2,4-Trimethylbenzene	95-63-6	NS	31	ug/m3	21.6		0.07	0.98	1	ND	U	0.07	0.98	1	ND	U	0.07	0.98	1	1.23		0.07	0.98	1	1.18		0.07	0.98	1	**100**		0.07	0.98	1	**36.8**		0.07	0.98	1	2.26		0.07	0.98	1
1,2-Dibromoethane	106-93-4	153,670	NS	ug/m3	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1
1,2-Dichlorobenzene	95-50-1	300,000	880	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,2-Dichloroethane	107-06-2	202,370	NS	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,2-Dichloroethene (Cis)	156-59-2	790,000	NS	ug/m3	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1
1,2-Dichloroethene (Trans)	156-60-5	NS	NS	ug/m3	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1
1,2-Dichloropropane	78-87-5	350,000	1.2	ug/m3	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1
1,2-Dichlorotetrafluoroethane	76-14-2	7,000,000	NS	ug/m3	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1
1,3,5-Trimethylbenzene	108-67-8	NS	NS	ug/m3	5.11		0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1	31.9		0	0.98	1	11		0	0.98	1	ND	U	0	0.98	1
1,3-Dichlorobenzene	541-73-1	NS	NS	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,3-Dichloropropene (Cis)	10061-01-5	NS	NS	ug/m3	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1
1,3-Dichloropropene (Trans)	10061-02-6	NS	NS	ug/m3	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1
1,3-Hexachlorobutadiene	87-68-3	NS	0.56	ug/m3	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1
1,4-Dichlorobenzene	106-46-7	450,000	1.1	ug/m3	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1
Acetone	67-64-1	2,400,000	140,000	ug/m3	42.8		0.04	0.48	1	ND	U	0.04	0.48	1	ND	U	0.04	0.48	1	26.8		0.04	0.48	1	27.8		0.04	0.48	1	ND	U	0.04	0.48	1	36.5		0.04	0.48	1	ND	U	0.04	0.48	1
Benzene	71-43-2	31,950	1.6	ug/m3	1.6		0.06	0.64	1	0.93		0.06	0.64	1	0.99		0.06	0.64	1	1.34		0.06	0.64	1	1.44		0.06	0.64	1	**69.4**		0.06	0.64	1	**4.79**		0.06	0.64	1	**1.63**		0.06	0.64	1
Bromodichloromethane	75-27-4	NS	NS	ug/m3	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1
Bromoform	75-25-2	5,000	11	ug/m3	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1
Bromomethane	74-83-9	80,000	22	ug/m3	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1
Carbon Disulfide	75-15-0	62,280	3,100	ug/m3	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1
Carbon Tetrachloride	56-23-5	62,910	2	ug/m3	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1
Chlorobenzene	108-90-7	350,000	220	ug/m3	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1
Chloroethane	75-00-3	2,600,000	44,000	ug/m3	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1
Chloroform	67-66-3	240,000	0.53	ug/m3	**1.17**		0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1
Chloromethane	74-87-3	206,500	390	ug/m3	1.01		0.06	0.41	1	1.14		0.06	0.41	1	1.05		0.06	0.41	1	0.97		0.06	0.41	1	0.93		0.06	0.41	1	1.01		0.06	0.41	1	1.05		0.06	0.41	1	0.91		0.06	0.41	1
Dibromochloromethane	124-48-1	NS	NS	ug/m3	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1
Dichlorodifluoromethane	75-71-8	4,950,000	440	ug/m3	2.52		0.08	0.99	1	2.57		0.08	0.99	1	2.67		0.08	0.99	1	2.57		0.08	0.99	1	2.47		0.08	0.99	1	2.62		0.08	0.99	1	2.62		0.08	0.99	1	2.57		0.08	0.99	1
Ethylbenzene	100-41-4	435,000	4.9	ug/m3	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	**52.9**		0.07	0.87	1	**6.25**		0.07	0.87	1	0.96		0.07	0.87	1
Methyl Butyl Ketone	591-78-6	410,000	130	ug/m3	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1
Methyl Ethyl Ketone	78-93-3	590,000	22,000	ug/m3	1.98		0.04	0.59	1	0.68		0.04	0.59	1	ND	U	0.04	0.59	1	1.18		0.04	0.59	1	1.18		0.04	0.59	1	4.75		0.04	0.59	1	1.45		0.04	0.59	1	0.83		0.04	0.59	1
Methyl Isobutyl Ketone	108-10-1	410,000	13,000	ug/m3	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1
Methyl Tert-Butyl Ether	1634-04-4	NS	47	ug/m3	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1
Methylene Chloride	75-09-2	86,810	1,200	ug/m3	1.79		0.12	0.78	1	0.89		0.12	0.78	1	0.85		0.12	0.78	1	1.59		0.12	0.78	1	1.36		0.12	0.78	1	ND	U	0.12	0.78	1	1.75		0.12	0.78	1	ND	U	0.12	0.78	1
Styrene	100-42-5	425,970	4,400	ug/m3	1.53		0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	1.06		0.08	0.85	1	1.19		0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1
Tetrachloroethene	127-18-4	678,240	47	ug/m3	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	3.87		0.12	1.36	1	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1
Toluene	108-88-3	753,700	22,000	ug/m3	5.61		0.05	0.75	1	2.56		0.05	0.75	1	2.49		0.05	0.75	1	4.44		0.05	0.75	1	4.67		0.05	0.75	1	287	D	0.09	1.51	2	28.4		0.05	0.75	1	4.44		0.05	0.75	1
Trichloroethene	79-01-6	537,400	3	ug/m3	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1
Trichlorofluoromethane	75-69-4	5,600,000	3,100	ug/m3	1.4		0.1	1.12	1	1.24		0.1	1.12	1	1.24		0.1	1.12	1	1.29		0.1	1.12	1	1.46		0.1	1.12	1	1.4		0.1	1.12	1	1.24		0.1	1.12	1	1.29		0.1	1.12	1
Vinyl Acetate	108-05-4	NS	880	ug/m3	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1
Vinyl Chloride	75-01-4	2,560	2.8	ug/m3	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1
Xylenes (M&P)	79601-23-1	435,000	NS	ug/m3	3.3		0.13	0.87	1	1.95		0.13	0.87	1	2		0.13	0.87	1	2.87		0.13	0.87	1	2.95		0.13	0.87	1	210		0.13	0.87	1	32.9		0.13	0.87	1	4.26		0.13	0.87	1
Xylenes (O)	95-47-6	435,000	440	ug/m3	3.82		0.07	0.87	1	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	1.09		0.07	0.87	1	1.04		0.07	0.87	1	82.5		0.07	0.87	1	13		0.07	0.87	1	1.65		0.07	0.87	1

Note:

OSHA PEL TWA - Occupational Safety and Health Administration Total Weight Average Permissible Exposure Limit

EPA RSL - Environmental Protection Agency Regional Screenign Level
ug/m3 - Micrograms per cubic meter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard

Qualifiers:
U - Compound analyzed but not detected
+ NYSDOH ELAP does not offer certification for this analyte / matrix / method
D - Diluted Sample

Exceedances:
10 - Result exceeds OSHA PEL TWA
10 - Result exceeds EPA RSL
15 - MDL exceeds standard

Table 9
Summary of Indoor Air Quality Analytical Results
AOI 9 Remedial Investigations Report
Philadelphia Energy Solutions Facility
Philadelphia, Pennsylvania

Analyte	CAS Number	OSHA PEL TWA	EPA RSL	Location	PH_3					PH_BG					PH_BG				
				Sample	PH-3_080515					PH_BG_031215					PH_BG_080515				
				Date	8/5/2015					3/12/2015					8/5/2015				
				Unit	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF	Result	Q	MDL	RL	DF
1,1,1-Trichloroethane	71-55-6	1,900,000	22,000	ug/m3	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1	ND	U	0.12	1.09	1
1,1,2,2-Tetrachloroethane	79-34-5	35,000	NS	ug/m3	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1	ND	U	0.1	1.37	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	7,600,000	130,000	ug/m3	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1	ND	U	0.11	1.53	1
1,1,2-Trichloroethane	79-00-5	45,000	0.77	ug/m3	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1	ND	U	0.14	1.09	1
1,1-Dichloroethane	75-34-3	400,000	7.7	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,1-Dichloroethene	75-35-4	NS	880	ug/m3	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1	ND	U	0.07	0.79	1
1,2,4-Trichlorobenzene	120-82-1	NS	8.8	ug/m3	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1	ND	U	0.13	1.48	1
1,2,4-Trimethylbenzene	95-63-6	NS	31	ug/m3	1.97		0.07	0.98	1	1.38		0.07	0.98	1	1.52		0.07	0.98	1
1,2-Dibromoethane	106-93-4	153,670	NS	ug/m3	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1	ND	U	0.13	1.54	1
1,2-Dichlorobenzene	95-50-1	300,000	880	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,2-Dichloroethane	107-06-2	202,370	NS	ug/m3	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1	ND	U	0.07	0.81	1
1,2-Dichloroethene (Cis)	156-59-2	790,000	NS	ug/m3	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1	ND	U	0.05	0.79	1
1,2-Dichloroethene (Trans)	156-60-5	NS	NS	ug/m3	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1	ND	U	0.06	0.79	1
1,2-Dichloropropane	78-87-5	350,000	1.2	ug/m3	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1	ND	U	0.14	0.92	1
1,2-Dichlorotetrafluoroethane	76-14-2	7,000,000	NS	ug/m3	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1	ND	U	0.12	1.4	1
1,3,5-Trimethylbenzene	108-67-8	NS	NS	ug/m3	ND	U	0	0.98	1	ND	U	0	0.98	1	ND	U	0	0.98	1
1,3-Dichlorobenzene	541-73-1	NS	NS	ug/m3	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1	ND	U	0.07	1.2	1
1,3-Dichloropropene (Cis)	10061-01-5	NS	NS	ug/m3	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1	ND	U	0.08	0.91	1
1,3-Dichloropropene (Trans)	10061-02-6	NS	NS	ug/m3	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1	ND	U	0.14	0.91	1
1,3-Hexachlorobutadiene	87-68-3	NS	0.56	ug/m3	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1	ND	U	0.18	2.13	1
1,4-Dichlorobenzene	106-46-7	450,000	1.1	ug/m3	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1	ND	U	0.09	1.2	1
Acetone	67-64-1	2,400,000	140,000	ug/m3	26.7		0.04	0.48	1	ND	U	0.04	0.48	1	26		0.04	0.48	1
Benzene	71-43-2	31,950	1.6	ug/m3	1.44		0.06	0.64	1	**1.66**		0.06	0.64	1	1.15		0.06	0.64	1
Bromodichloromethane	75-27-4	NS	NS	ug/m3	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1	ND	U	0.17	1.34	1
Bromoform	75-25-2	5,000	11	ug/m3	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1	ND	U	0.25	2.07	1
Bromomethane	74-83-9	80,000	22	ug/m3	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1	ND	U	0.07	0.78	1
Carbon Disulfide	75-15-0	62,280	3,100	ug/m3	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1	ND	U	0.05	0.62	1
Carbon Tetrachloride	56-23-5	62,910	2	ug/m3	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1	ND	U	0.14	1.26	1
Chlorobenzene	108-90-7	350,000	220	ug/m3	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1	ND	U	0.07	0.92	1
Chloroethane	75-00-3	2,600,000	44,000	ug/m3	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1	ND	U	0.06	0.53	1
Chloroform	67-66-3	240,000	0.53	ug/m3	ND	U	0.12	0.98	1	ND	U	0.12	0.98	1	**9.81**		0.12	0.98	1
Chloromethane	74-87-3	206,500	390	ug/m3	1.07		0.06	0.41	1	1.09		0.06	0.41	1	0.93		0.06	0.41	1
Dibromochloromethane	124-48-1	NS	NS	ug/m3	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1	ND	U	0.19	1.7	1
Dichlorodifluoromethane	75-71-8	4,950,000	440	ug/m3	2.57		0.08	0.99	1	2.67		0.08	0.99	1	2.72		0.08	0.99	1
Ethylbenzene	100-41-4	435,000	4.9	ug/m3	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1	ND	U	0.07	0.87	1
Methyl Butyl Ketone	591-78-6	410,000	130	ug/m3	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1	ND	U+	0.05	0.82	1
Methyl Ethyl Ketone	78-93-3	590,000	22,000	ug/m3	1.33		0.04	0.59	1	0.59		0.04	0.59	1	1.47		0.04	0.59	1
Methyl Isobutyl Ketone	108-10-1	410,000	13,000	ug/m3	ND	U	0	0.82	1	ND	U	0	0.82	1	ND	U	0	0.82	1
Methyl Tert-Butyl Ether	1634-04-4	NS	47	ug/m3	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1	ND	U	0.05	0.72	1
Methylene Chloride	75-09-2	86,810	1,200	ug/m3	2.21		0.12	0.78	1	ND	U	0.12	0.78	1	1.32		0.12	0.78	1
Styrene	100-42-5	425,970	4,400	ug/m3	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1	ND	U	0.08	0.85	1
Tetrachloroethene	127-18-4	678,240	47	ug/m3	ND	U	0.12	1.36	1	ND	U	0.12	1.36	1	6.31		0.12	1.36	1
Toluene	108-88-3	753,700	22,000	ug/m3	5.57		0.05	0.75	1	3.84		0.05	0.75	1	5.39		0.05	0.75	1
Trichloroethene	79-01-6	537,400	3	ug/m3	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1	ND	U	0.17	1.07	1
Trichlorofluoromethane	75-69-4	5,600,000	3,100	ug/m3	1.29		0.1	1.12	1	1.29		0.1	1.12	1	1.52		0.1	1.12	1
Vinyl Acetate	108-05-4	NS	880	ug/m3	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1	ND	U	0.06	0.7	1
Vinyl Chloride	75-01-4	2,560	2.8	ug/m3	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1	ND	U	0.06	0.51	1
Xylenes (M&P)	79601-23-1	435,000	NS	ug/m3	3.78		0.13	0.87	1	3		0.13	0.87	1	2.65		0.13	0.87	1
Xylenes (O)	95-47-6	435,000	440	ug/m3	1.26		0.07	0.87	1	1.09		0.07	0.87	1	1.04		0.07	0.87	1

Note:

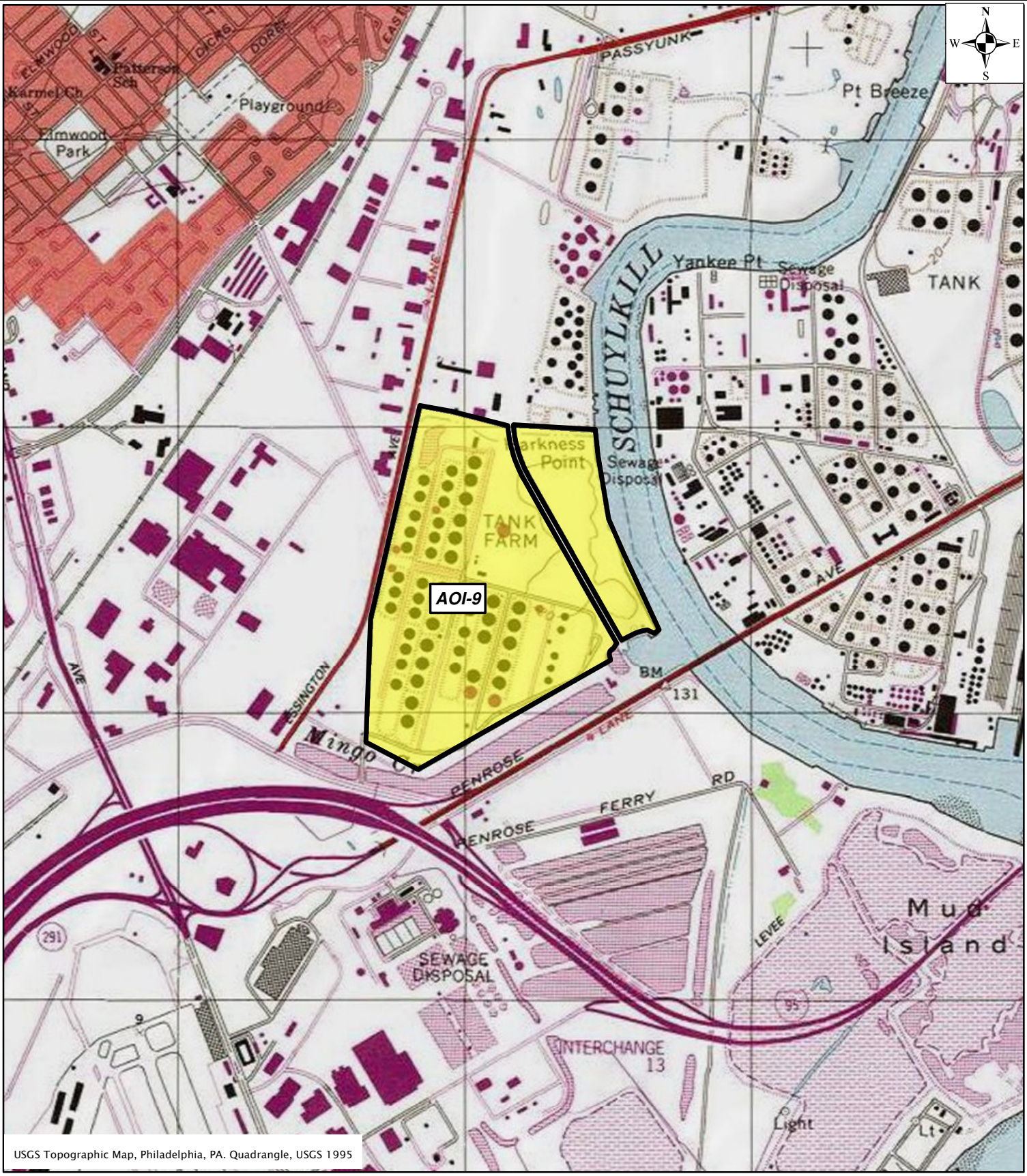
OSHA PEL TWA - Occupational Safety and Health Administration Total Weight Average Permissible Exposure Limit

EPA RSL - Environmental Protection Agency Regional Screenign Level
ug/m3 - Micrograms per cubic meter
Q - Qualifier
MDL - Method detection limit
RL - Reporting limit
DF - Dilution factor
ND - Not detected
NS - No standard

Qualifiers:
U - Compound analyzed but not detected
+ NYSDOH ELAP does not offer certification for this analyte / matrix / method
D - Diluted Sample

Exceedances:
10 - Result exceeds OSHA PEL TWA
10 - Result exceeds EPA RSL
15 - MDL exceeds standard

FIGURES



USGS Topographic Map, Philadelphia, PA. Quadrangle, USGS 1995

EVERGREEN

Evergreen Resources
Management Operations

2 Righter Parkway, Suite 200
Wilmington, DE 19803

Figure 1: Site Location Map
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery

Philadelphia Pennsylvania

Job Number	Scale: 1" = 1,500'	Date
2574601	0 750 1,500 Feet	October 1, 2015

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 1- Site Location Map_100115.mxd



Legend

AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

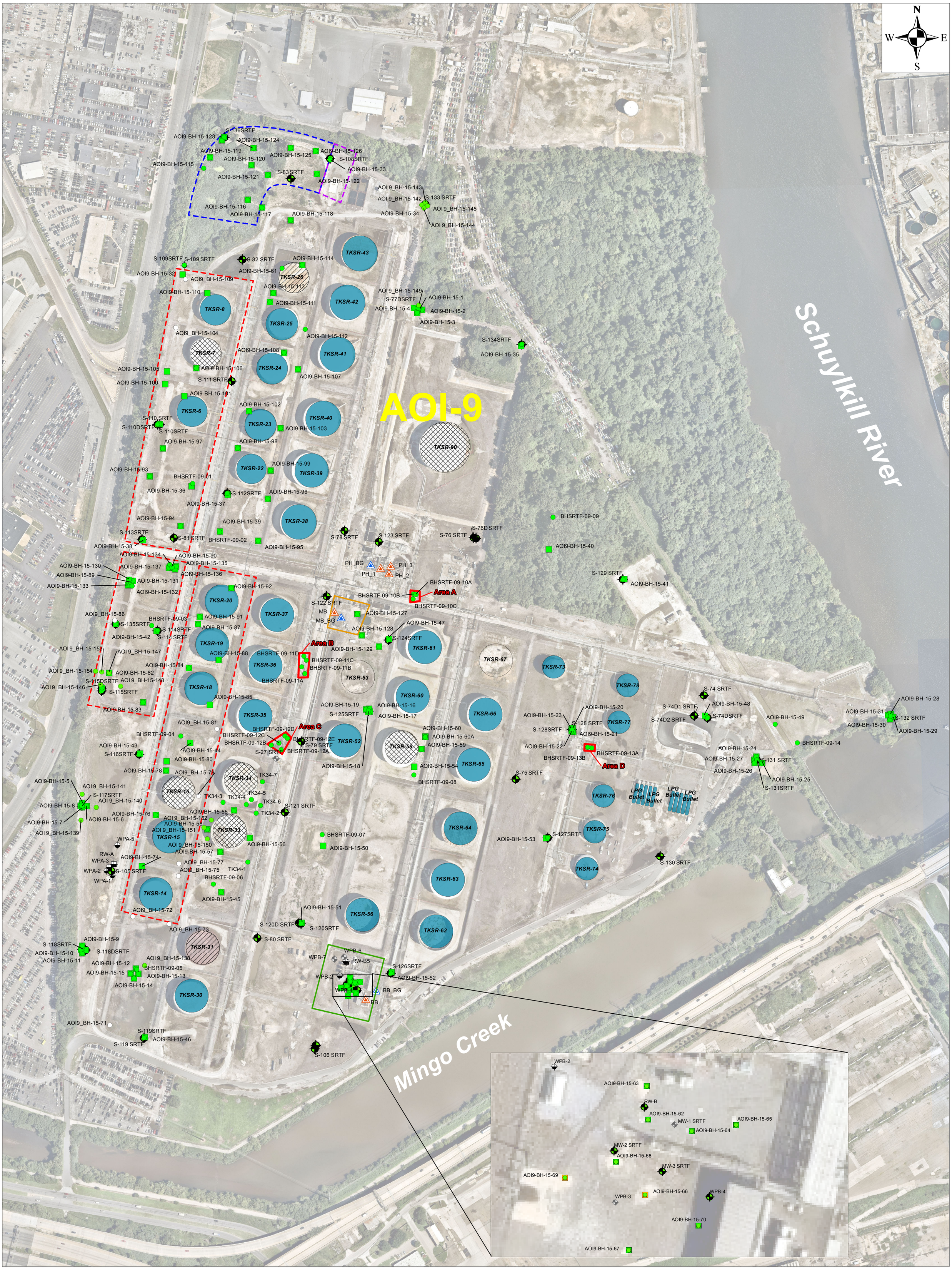
Figure 2: Site Plan
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 90 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 2 - Site Plan_rev12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:31:43 AM



Legend

- Soil Borings Not Sampled Due To No Observation of Leaded Tank Bottom Material
- Surface Soil Boring Location
- Subsurface Soil Boring Location
- Approximate Ambient Air Sample Location
- Approximate Indoor Air Sample Location
- Monitoring Well Sampled
- Shallow Monitoring Well Location
- Shallow/Intermediate Monitoring Well Location
- Shallow/Intermediate Recovery Well Location
- Deep Monitoring Well Location
- Shallow/Intermediate/Deep Monitoring Well Location

- Damaged/Abandoned/Unable to Locate
- Tank Closed in Place
- Tank with Release Assessment
- Tank in Service
- Removed Tank
- PADEP Inspection Areas (June 24, 2009)
- AOI Boundary
- Blending Building and T-100 Area
- Maintenance Building Area

Past Potential Disposal Areas
(Gulf Oil Company, Notification of Hazardous Waste Sites, 1981)

- Leaded Sludge
- Leaded Tank Bottom
- Oily Sludge Holding Lagoon

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

Figure 3: Completed Activities
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 90 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 3 - AOI-9 Completed Activities_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 12:24:57 PM

N
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S

AOI-9

Interpreted Extent of Lower/Middle Clay

Schuylkill River

Mingo Creek

AOI9-BH-15-123 S-136SRTF AOI9-BH-15-124 AOI9-BH-15-119 AOI9-BH-15-125 AOI9-BH-15-126 AOI9-BH-15-120 S-108SRTF AOI9-BH-15-115 AOI9-BH-15-33 S-83 SRTF AOI9-BH-15-121 AOI9-BH-15-122 AOI 9_BH-15-143 AOI 9_BH-15-142 S-133 SRTF AOI9-BH-15-116 AOI 9_BH-15-145 AOI9-BH-15-117 AOI9-BH-15-118 AOI9-BH-15-34 AOI 9_BH-15-144

S-109SRTF S-109 SRTF S-82 SRTF AOI9-BH-15-114 AOI9-BH-15-61 AOI9-BH-15-32 AOI9_BH-15-109 AOI9-BH-15-113 AOI9-BH-15-110 AOI9-BH-15-111 AOI 9_BH-15-149 S-77DSRTF AOI9-BH-15-1 AOI9-BH-15-4 AOI9-BH-15-2 AOI9-BH-15-3 AOI9_BH-15-104 AOI9-BH-15-112 S-134SRTF AOI9-BH-15-35 AOI9-BH-15-108 AOI9-BH-15-105 AOI9-BH-15-106 AOI9-BH-15-107 AOI9-BH-15-100 S-111 SRTF AOI9-BH-15-101 AOI9-BH-15-102 S-110 SRTF S-110DSRTF AOI9-BH-15-103 S-110SRTF AOI9-BH-15-97 AOI9-BH-15-98 AOI9-BH-15-99 AOI9-BH-15-93 BHSRTF-09-01 AOI9-BH-15-36 S-112SRTF AOI9-BH-15-96 AOI9-BH-15-37 AOI9-BH-15-94 AOI9-BH-15-39 S-113SRTF S-81 SRTF BHSRTF-09-02 S-78 SRTF S-123 SRTF S-76 SRTF S-76D SRTF BHSRTF-09-09 AOI9-BH-15-38 AOI9-BH-15-95 AOI9-BH-15-40 AOI9-BH-15-134 AOI9-BH-15-90 AOI9-BH-15-130 AOI9-BH-15-137 AOI9-BH-15-135 AOI9-BH-15-89 AOI9-BH-15-136 S-129 SRTF AOI9-BH-15-131 AOI9-BH-15-41 AOI9-BH-15-133 AOI9-BH-15-92 AOI9-BH-15-132 BHSRTF-09-10A BHSRTF-09-10B BHSRTF-09-10C S-122 SRTF AOI9_BH-15-86 AOI9-BH-15-91 AOI9-BH-15-127 BHSRTF-09-03 AOI9-BH-15-47 S-135SRTF AOI9-BH-15-87 AOI9-BH-15-128 S-114SRTF S-124SRTF AOI9-BH-15-42 S-114 SRTF AOI9-BH-15-129 AOI 9_BH-15-153 AOI 9_BH-15-147 AOI9-BH-15-88 BHSRTF-09-11D BHSRTF-09-11C AOI9-BH-15-84 BHSRTF-09-11B AOI 9_BH-15-154 AOI9-BH-15-82 BHSRTF-09-11A S-115DSRTF AOI 9_BH-15-148 AOI 9_BH-15-146 S-115SRTF AOI9-BH-15-85 AOI9-BH-15-83 AOI9-BH-15-19 AOI9-BH-15-16 S-125SRTF AOI9-BH-15-17 AOI9_BH-15-81 BHSRTF-09-12D BHSRTF-09-04 BHSRTF-09-12C AOI9-BH-15-60 AOI9-BH-15-60A BHSRTF-09-12E AOI9-BH-15-43 BHSRTF-09-12B S-79 SRTF AOI9-BH-15-59 AOI9-BH-15-44 S-27 SRTF BHSRTF-09-12A AOI9-BH-15-23 AOI9-BH-15-20 S-74 SRTF S-74D1 SRTF AOI9-BH-15-48 S-116SRTF AOI9-BH-15-80 AOI9-BH-15-18 S-128SRTF S-128 SRTF S-74DSRTF AOI9-BH-15-49 AOI9-BH-15-31 AOI9-BH-15-28 AOI9-BH-15-78 AOI9_BH-15-79 AOI9-BH-15-54 AOI9-BH-15-21 S-74D2 SRTF S-132 SRTF AOI9-BH-15-30 AOI9-BH-15-29 AOI9-BH-15-5 TK34-7 BHSRTF-09-08 AOI9-BH-15-22 BHSRTF-09-14 AOI9-BH-15-24 AOI 9_BH-15-141 TK34-3 TK34-4 TK34-5 BHSRTF-09-13B BHSRTF-09-13A AOI9-BH-15-27 S-131 SRTF S-117SRTF AOI 9_BH-15-140 TK34-6 S-121 SRTF S-75 SRTF AOI9-BH-15-26 AOI9-BH-15-25 AOI9-BH-15-8 AOI9-BH-15-55 TK34-2 AOI9-BH-15-7 AOI9-BH-15-6 AOI9-BH-15-76 AOI 9_BH-15-152 S-131SRTF AOI9-BH-15-58 AOI 9_BH-15-139 AOI 9_BH-15-151 BHSRTF-09-07 AOI9-BH-15-53 S-127SRTF WPA-5 AOI 9_BH-15-150 AOI9-BH-15-56 AOI9-BH-15-50 AOI9-BH-15-57 RW-A AOI9-BH-15-74 S-130 SRTF WPA-3 AOI9_BH-15-77 WPA-2 S-105 SRTF AOI9_BH-15-75 TK34-1 BHSRTF-09-06 WPA-1 AOI9-BH-15-45 AOI9_BH-15-72 AOI9-BH-15-51 S-120D SRTF S-120SRTF AOI9_BH-15-73 S-80 SRTF AOI9-BH-15-9 S-118SRTF WPB-6 WPB-7 RW-B5 S-118DSRTF AOI9-BH-15-10 AOI 9_BH-15-138 AOI9-BH-15-11 AOI9-BH-15-12 S-126SRTF BHSRTF-09-05 AOI9-BH-15-15 WPB-2 AOI9-BH-15-52 AOI9-BH-15-13 AOI9-BH-15-14 WPB-4 AOI9_BH-15-71 S-119SRTF AOI9-BH-15-46 S-119 SRTF S-106 SRTF

WPB-2 AOI9-BH-15-63 RW-B AOI9-BH-15-62 MW-1 SRTF AOI9-BH-15-65 AOI9-BH-15-64 MW-2 SRTF AOI9-BH-15-68 MW-3 SRTF AOI9-BH-15-69 AOI9-BH-15-66 WPB-4 WPB-3 AOI9-BH-15-70 AOI9-BH-15-67

Legend

- Surface Soil Boring Location
- Subsurface Soil Boring Location
- Shallow Monitoring Well Location
- Shallow/Intermediate Monitoring Well Location
- Shallow/Intermediate Recovery Well Location
- Deep Monitoring Well Location
- Shallow/Intermediate/Deep Monitoring Well Location
- Damaged/Abandoned/Unable to Locate
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

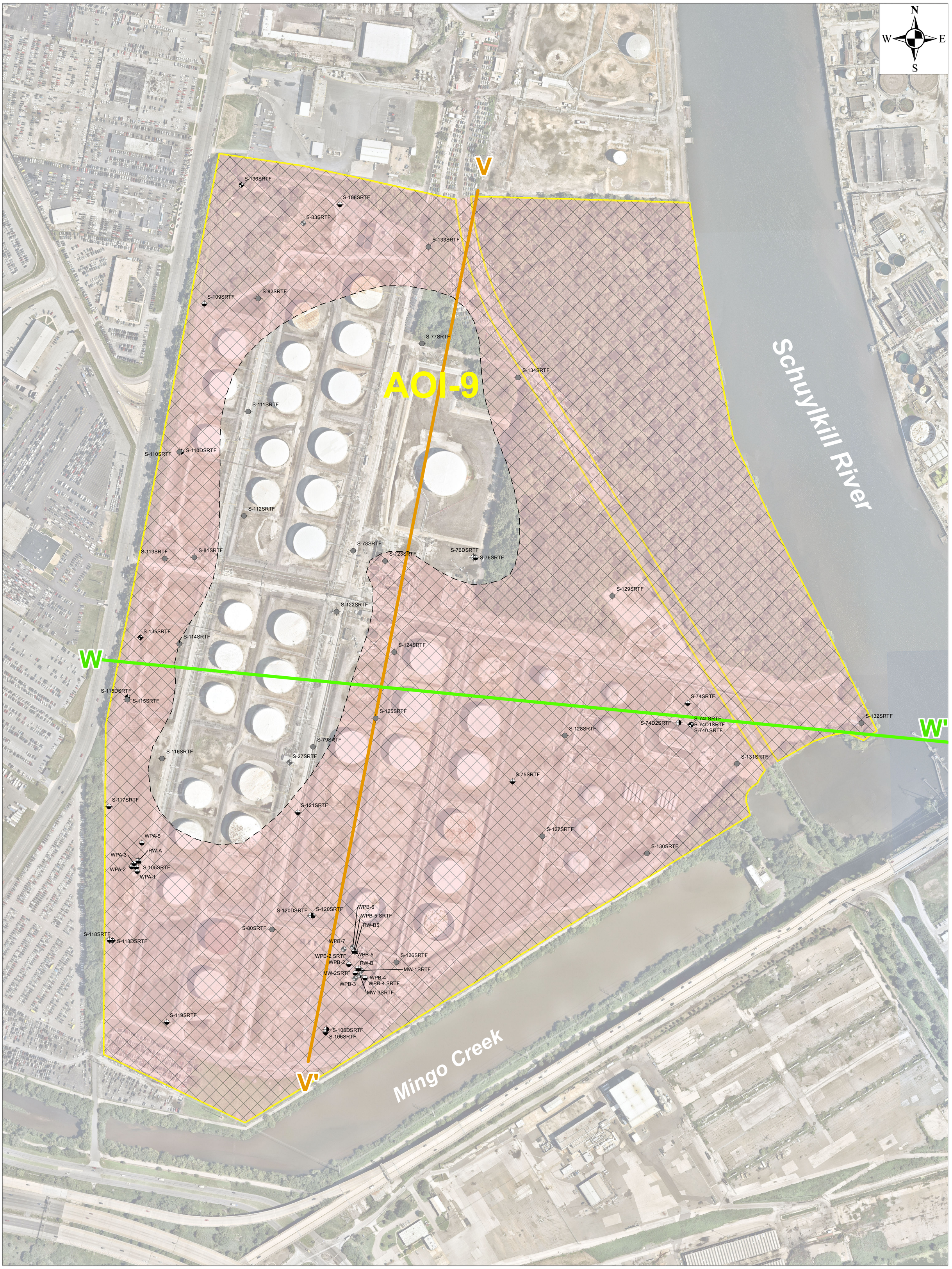
Figure 4: Interpreted Extent of Lower/Middle Clay
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 90 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 4 - Interpreted Extent of Clay_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:41:33 AM



Legend

- Well Abandoned/Destroyed/Unable to Locate
- Shallow/Intermediate Monitoring Well
- Shallow Monitoring Well
- Deep Monitoring Well
- Shallow/Interm/Deep Monitoring Well
- Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Recovery Well

- V-V' Cross Section Location
- W-W' Cross Section Location
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

Figure 5: Geologic Cross Section Location Plan
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 5 - Geologic Cross Section Location Plan_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:41:56 AM

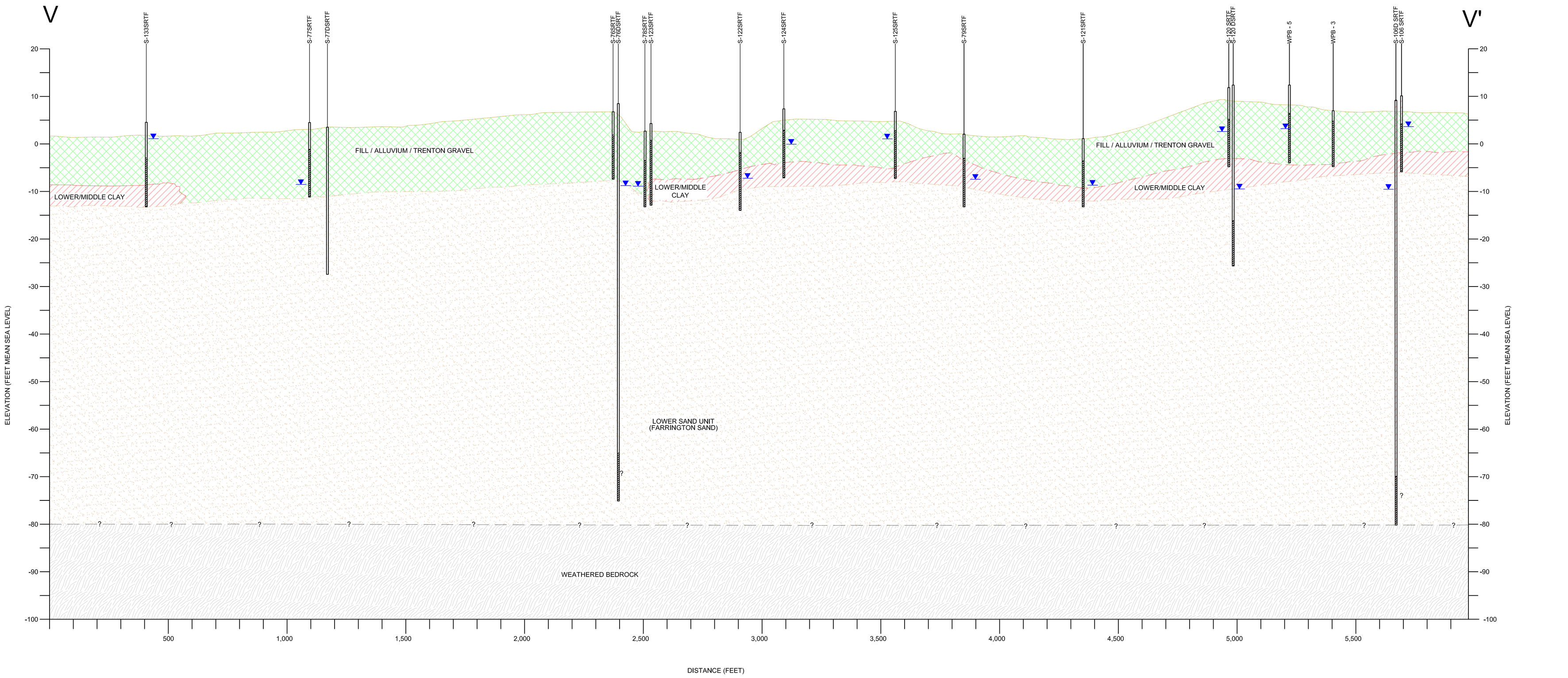
N — S

NOTES:

1. DEPTH OF SCHUYLKILL RIVER FROM SIMULATION OF GROUNDWATER FLOW IN THE POTOMIC-RARITAN-MAGOTHY AQUIFER SYSTEM NEAR THE DEFENSE SUPPLY CENTER PHILADELPHIA, AND THE POINT BREEZE REFINERY, SOUTHERN PHILADELPHIA COUNTY, PENNSYLVANIA BY CURTIS L. SCHREFFLER DATED 2001.
2. LITHOLOGY BASED ON INTERPOLATION FROM AVAILABLE NEW AND HISTORIC WELL / SOIL BORING LOGS.
3. DEPTH TO WEATHERED BEDROCK WAS INTERPOLATED FROM NEW/HISTORIC WELL / SOIL BORING LOGS AND FROM FIGURE 3-11 GENERALIZED CROSS SECTION A -A -A , DATED 13 NOVEMBER 1992 FROM DAMES & MOORE, RCRA VERIFICATION INVESTIGATION REPORT, CHEVRON REFINERY, 1992. CROSS SECTION RENAMED N-C'.
4. WELL CONSTRUCTION INFORMATION IS NOT AVAILABLE FOR ALL WELLS SHOWN ON THIS CROSS SECTION.
5. THIS PROFILE REPRESENTS A GENERALIZED SOIL CROSS SECTION INTERPRETED FROM WIDELY SPACED BORINGS. SOIL AND GROUNDWATER MAY VARY IN TYPE, LOCATION, ELEVATION, AND ENVIRONMENTAL AND ENGINEERING PROPERTIES BETWEEN POINTS OF EXPLORATION. ANY EXTRAPOLATIONS BETWEEN BORINGS HAVE BEEN INTERPRETED USING GENERALLY ACCEPTED GEOLOGIC, ENVIRONMENTAL, AND ENGINEERING PRACTICE AND PRINCIPLES. VARIATIONS IN SUBSURFACE CONDITIONS SHOULD BE EXPECTED BETWEEN BORINGS.

LEGEND:

- FILL / ALLUVIUM / TRENTON GRAVEL (UNDIFFERENTIATED)
- CLAY
- SAND
- WEATHERED BEDROCK
- GROUNDWATER LEVEL
- S-120SRTF LOCATION ID
- WELL CASING/BOREHOLE
- WELL SCREEN
- ? — ? — INFERRED CONTACTS



10 0 2 4 10
VERTICAL SCALE IN FEET

200 0 100 200
HORIZONTAL SCALE IN FEET

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Project
PES PHILADELPHIA REFINERY
PHILADELPHIA COUNTY **PENNSYLVANIA**

Drawing Title
GEOLOGIC CROSS SECTION V-V'

Project No. **2574601**	Figure No. **6a**
Date **8 September 2009**	
Scale **1"=200' HOR. 1"=10' VER.**	
Drn. By **JEM/ KW**	
Last Revised **11 December 2015**	Of

Filename: \\langan.com\data\DT\data6\2574601\Cadd Data – 2574601\Dwg\Geologic Cross-Section V-V'_12-11-15.dwg Date: 12/16/2015 Time: 13:06 User: mhagan Style Table: Langan.stb Layout: D Size Sheet (Bottom)

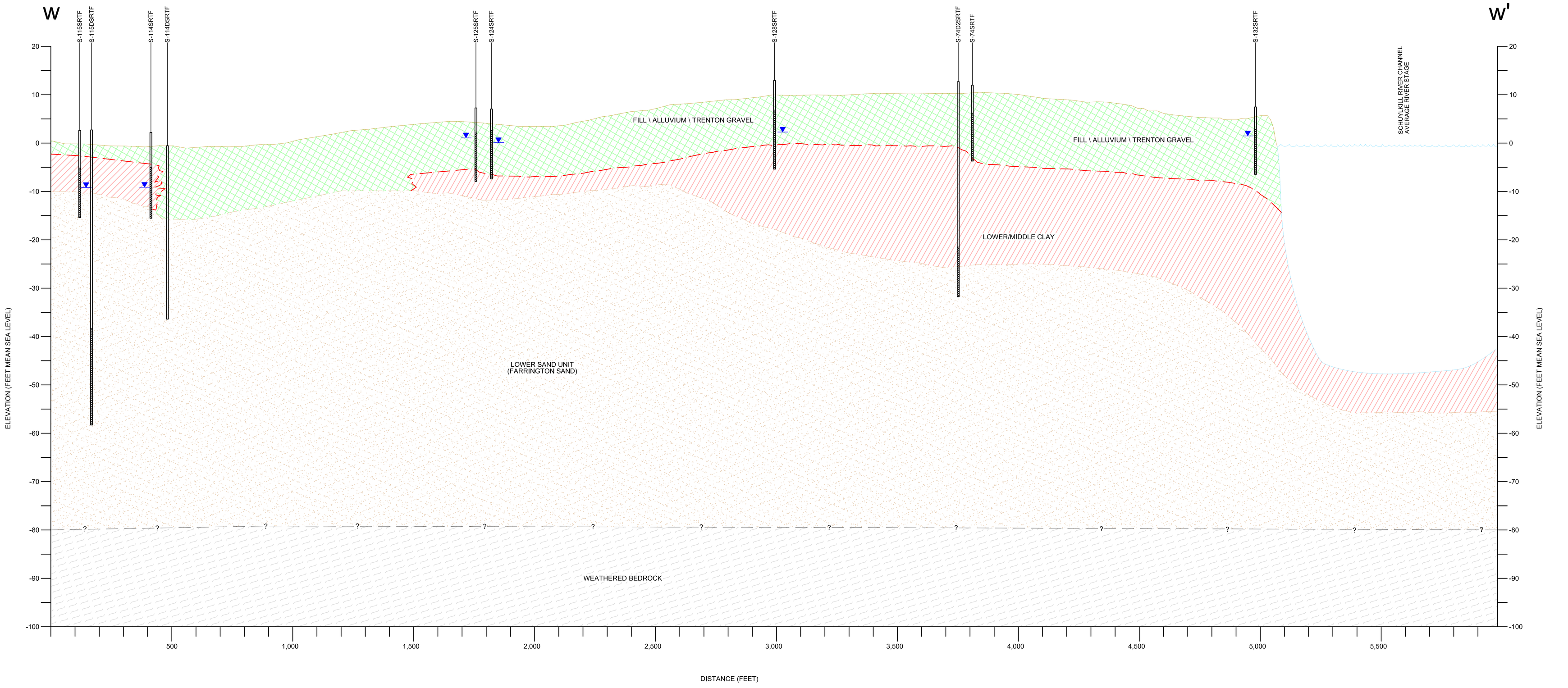
W — E

NOTES:

1. DEPTH OF SCHUYLKILL RIVER FROM SIMULATION OF GROUNDWATER FLOW IN THE POTOMIC-RARITAN-MAGOTHY AQUIFER SYSTEM NEAR THE DEFENSE SUPPLY CENTER PHILADELPHIA, AND THE POINT BREEZE REFINERY, SOUTHERN PHILADELPHIA COUNTY, PENNSYLVANIA BY CURTIS L. SCHREFFLER DATED 2001.
2. LITHOLOGY BASED ON INTERPOLATION FROM AVAILABLE NEW AND HISTORIC WELL / SOIL BORING LOGS.
3. DEPTH TO WEATHERED BEDROCK AND CLAY BENEATH THE SCHUYKILL RIVER IS INTERPOLATED FROM NEW/HISTORIC WELL / SOIL BORING LOGS AND FROM FIGURE 3-11 GENERALIZED CROSS SECTION A -A -A , DATED 13 NOVEMBER 1992 FROM DAMES & MOORE, RCRA VERIFICATION INVESTIGATION REPORT, CHEVRON REFINERY, 1992. CROSS SECTION RENAMED N-C-J
4. WELL CONSTRUCTION INFORMATION IS NOT AVAILABLE FOR ALL WELLS SHOWN ON THIS CROSS SECTION.
5. THIS PROFILE REPRESENTS A GENERALIZED SOIL CROSS SECTION INTERPRETED FROM WIDELY SPACED BORINGS. SOIL AND GROUNDWATER MAY VARY IN TYPE, LOCATION, ELEVATION, AND ENVIRONMENTAL AND ENGINEERING PROPERTIES BETWEEN POINTS OF EXPLORATION. ANY EXTRAPOLATIONS BETWEEN BORINGS HAVE BEEN INTERPRETED USING GENERALLY ACCEPTED GEOLOGIC, ENVIRONMENTAL, AND ENGINEERING PRACTICE AND PRINCIPLES. VARIATIONS IN SUBSURFACE CONDITIONS SHOULD BE EXPECTED BETWEEN BORINGS.

LEGEND:

- FILL / ALLUVIUM / TRENTON GRAVEL (UNDIFFERENTIATED)
- CLAY
- SAND
- WEATHERED BEDROCK
- GROUNDWATER LEVEL
- S-120SRTF LOCATION ID
- WELL CASING/BOREHOLE
- WELL SCREEN
- ——?—— ——?—— INFERRED CONTACTS



10 0 2 4 10
VERTICAL SCALE IN FEET

200 0 100 200
HORIZONTAL SCALE IN FEET

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

Project: **PES PHILADELPHIA REFINERY**
PHILADELPHIA COUNTY **PENNSYLVANIA**

Drawing Title: **GEOLOGIC CROSS SECTION W-W'**

Project No. **2574601**	Figure No. **6b**
Date **8 September 2009**	
Scale **1"=200' HOR. 1"=10' VER.**	
Drn. By **JEM/ KW**	
Last Revised **11 December 2015**	Of

Filename: \\longan.com\data\DT\data6\2574601\Cadd Data – 2574601\Dwg\Geologic Cross-Section W-W'_12-11-15.dwg Date: 12/16/2015 Time: 12:44 User: mhagan Style Table: Longan.stb Layout: D Size Sheet (Bottom)

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AOI-9

-8.5
-8
-7.5
-7
-9
-7
-7.5
-8
-8.5
-9

Schuylkill River

Mingo Creek

nearmap

Legend

- Shallow Monitoring Well
- Deep Monitoring Well
- Shallow/Interm/Deep Monitoring Well
- Shallow/Intermediate Monitoring Well
- S74DSRTF -4.5247 — Well Not Used in Contouring
- Groundwater Flow Direction
- Groundwater Contour (ft.amsl)
- Inferred Groundwater Contour (ft. amsl)
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.

Figure 7: Groundwater Elevations (August 2015)
Lower Sand Connected Wells
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: JR
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 7 - Groundwater Elevations (August 2015) - Lower Sand Connected Wells_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:54:56 AM

N
W E
S

AOI-9

Schuylkill River

Mingo Creek

-4 -4 -2 -2 0 2 0 -8 -2 -4 -6 -8 0 2 4 4 4 -6 -4 -2

S-136SRTF -2.0293
S-108SRTF -1.937
S-83SRTF -4.24
S-133SRTF 0.277
S-109SRTF NM
S-82SRTF 0.06
S-77SRTF -8.17
S-134SRTF 0.865
S-110SRTF -7.506
S-78SRTF -8.61
S-76SRTF -0.39
S-129SRTF 3.406
S-124SRTF 0.456
S-74SRTF NM
S-125SRTF 1.441
S-128SRTF 2.904
S-132SRTF 2.263
S-131SRTF 4.095
S-75SRTF 2.99
S-127SRTF 3.708
S-130SRTF 2.323
S-117SRTF -8.737
WPA-5 NM
WPA-3 NM
RW-A NM
WPA-2 NM
S-105SRTF -5.97
WPA-1 NM
S-120SRTF 2.688
S-80SRTF -1.53
S-118SRTF -8.868
WPB-5 NM
RW-B5 NM
S-126SRTF 4.289
WPB-2 NM
RW-B 3.92
MW-1SRTF 4.443115
MW-2SRTF 3.89
WPB-4 4.0587
MW-3SRTF 4.01
S-119SRTF -1.805
S-106SRTF 3.98

Legend

- Well Abandoned/Destroyed/Unable to Locate
- Shallow/Intermediate Monitoring Well
- Shallow Monitoring Well
- Shallow/Interm/Deep Monitoring Well
- Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Recovery Well
- S-118SRTF -8.868 — Well Not Used in Contouring
- Groundwater Flow Direction
- Groundwater Contour (ft. amsl)
- Inferred Groundwater Contour (ft. amsl)
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. Groundwater elevations were obtained from the August 2015 gauging event performed by Aquaterra Technologies Incorporated.
3. Groundwater elevations from S-110, S-117, and S-118 were not used to generate groundwater contours as the wells are screened across the Lower/Middle Caly and assumed to be reflective of composite head values.
4. ft. amsl = feet above mean sea level

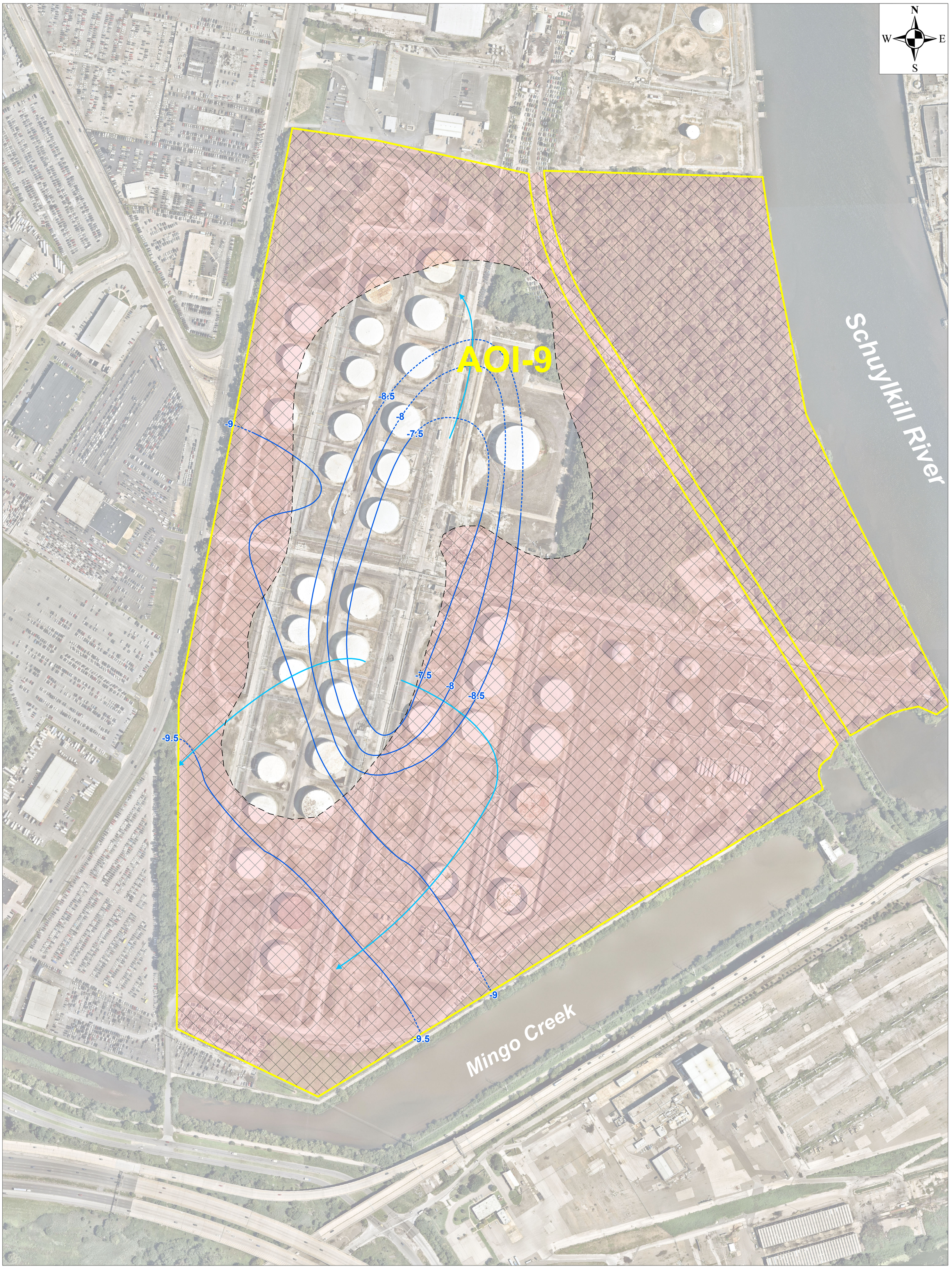
Figure 8: Groundwater Elevations (August 2015)
Wells Above Lower/Middle Clay
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: JR
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 8 - Groundwater Elevations (August 2015) - Wells Above Lower_Middle Clay_12-28-15.mxd Date: 12/29/2015 User: vmiller Time: 9:00:34 AM



Legend

- Groundwater Flow Direction
- Groundwater Contour (ft. amsl)
- Inferred Groundwater Contour (ft. amsl)
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. Groundwater elevations were obtained from the November 2015 gauging event performed by Aquaterra Technologies Incorporated.
3. ft. amsl = feet above mean sea level

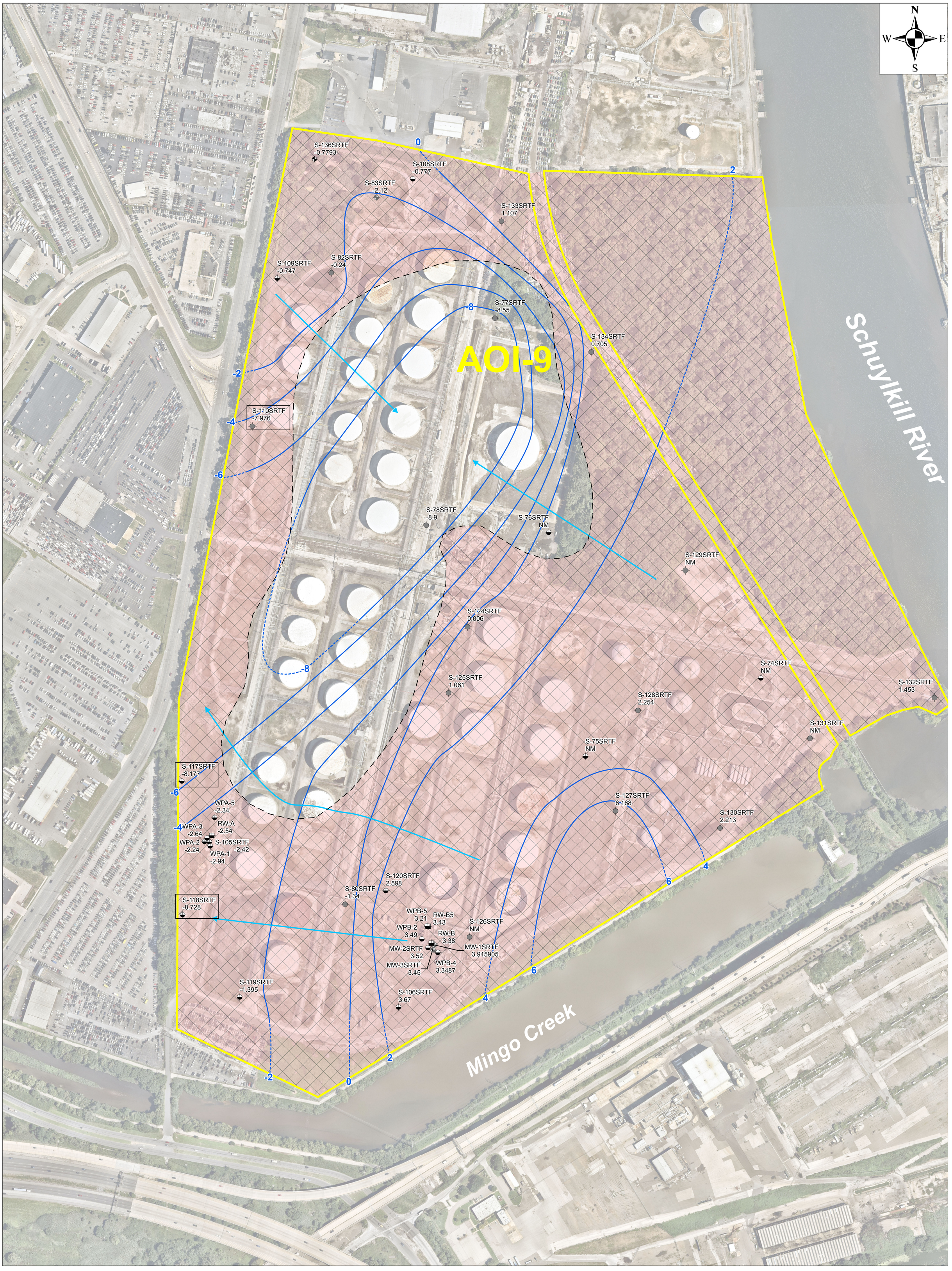
Figure 9: Groundwater Elevations (November 2015)
Lower Sand Connected Wells
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: JR
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 9 - Groundwater Elevations (November 2015) - Lower Sand Connected Wells_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:47:55 AM



Legend

- Well Abandoned/Destroyed/Unable to Locate
- Shallow/Intermediate Monitoring Well
- Shallow Monitoring Well
- Shallow/Interm/Deep Monitoring Well
- Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Recovery Well
- S-118SRTF -8.728 — Well Not Used in Contouring
- Groundwater Flow Direction
- Groundwater Contour (ft. amsl)
- Inferred Groundwater Contour (ft. amsl)
- Interpreted Extent of Lower/Middle Clay
- AOI Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. Groundwater elevations were obtained from the November 2015 gauging event performed by Aquaterra Technologies Incorporated.
3. Groundwater elevations from S-110, S-117, and S-118 were not used to generate groundwater contours as the wells are screened across the Lower/Middle Caly and assumed to be reflective of composite head values.
4. ft amsl = feet above mean sea level

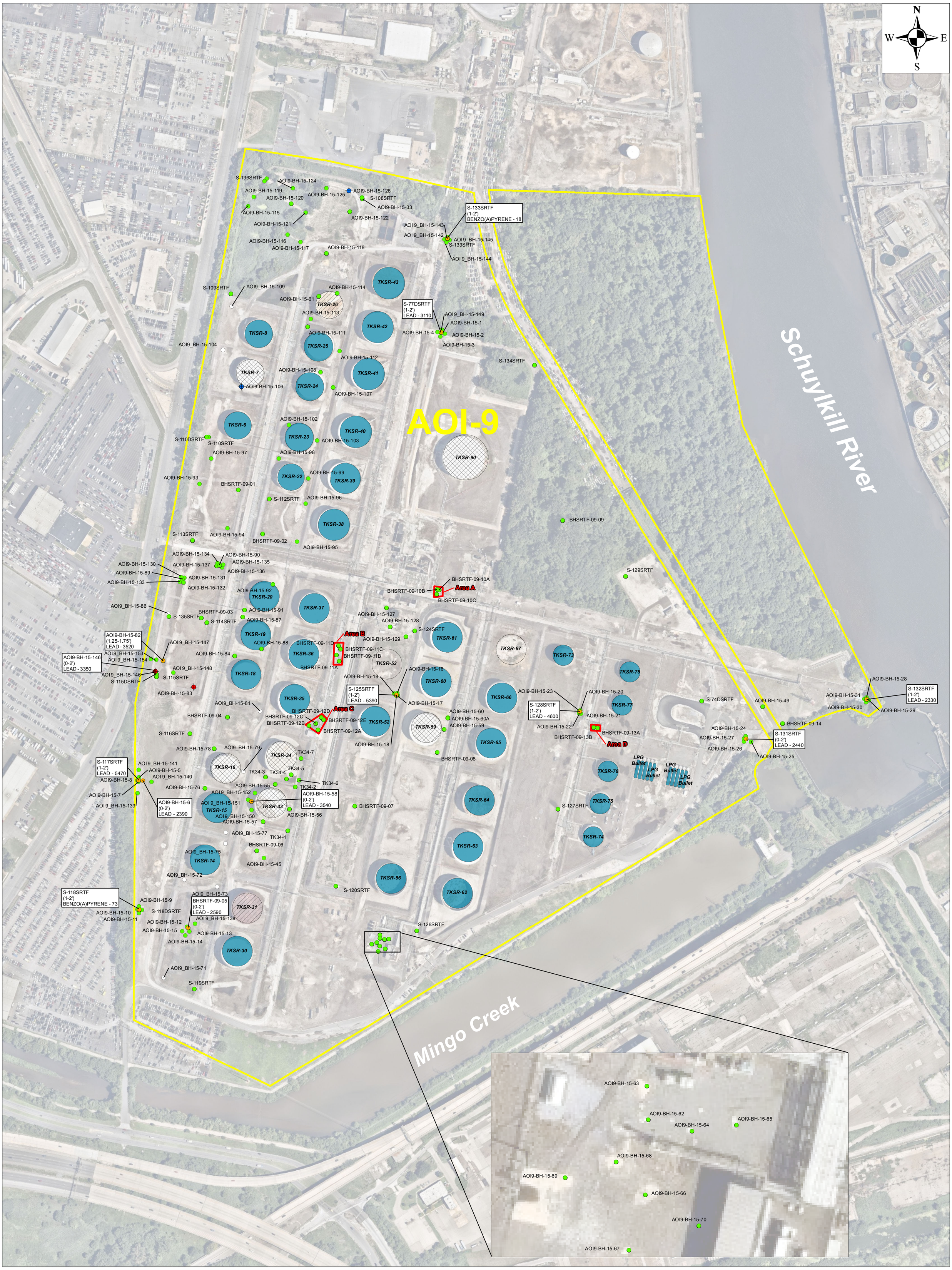
Figure 10: Groundwater Elevations (November 2015)
Wells Above Lower/Middle Clay
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 180 360 Feet

SCALE: 1" = 180'
DATE: December 28, 2015
DRN. BY: JR
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 10 - Groundwater Elevations (November 2015) - Wells Above Lower_Middle Clay_12-28-15.mxd Date: 12/29/2015 User: vmiller Time: 9:12:09 AM



Legend

- Surface Soil Boring Location with Observed Leaded Tank Bottom Material
- Surface Soil Boring Location with Documented Leaded Tank Bottom Material
- Surface Soil Boring Location with No Exceedance of Direct Contact MSCs and/or Lead SSS
- Surface Soil Boring Location with an Exceedance of Direct Contact MSCs and/or Lead SSS
- Completed Soil Boring with No Sample Collected
- Tank Closed in Place
- Tank with Release Assessment
- Tank in Service
- Removed Tank
- PADEP Inspection Areas (June 24, 2009)
- AOI-9 SRTF Boundary

Site-Specific Standard
Lead - 2,240 mg/kg

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. All exceedances displayed in milligrams per kilogram (mg/kg).

Figure 11: Summary of Surface Soil Sample Exceedances
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

SCALE: 1" = 200'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 11 - Summary of Surface Soil Exceedances_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:50:58 AM

N
W E
S

AOI-9

Schuylkill River

Mingo Creek

S-136SRTF
AOI9-BH-15-124
AOI9-BH-15-119
AOI9-BH-15-125
AOI9-BH-15-126
AOI9-BH-15-120
AOI9-BH-15-121
AOI9-BH-15-122
AOI9-BH-15-116
AOI9-BH-15-117
AOI9-BH-15-118
S-133SRTF
AOI9-BH-15-114
AOI9-BH-15-32
AOI9-BH-15-113
AOI9-BH-15-110
AOI9-BH-15-111
AOI9-BH-15-1
AOI9-BH-15-4
AOI9-BH-15-2
AOI9-BH-15-3
AOI9-BH-15-108
AOI9-BH-15-35
AOI9-BH-15-105
AOI9-BH-15-106
AOI9-BH-15-107
AOI9-BH-15-100
AOI9-BH-15-101
AOI9-BH-15-102
S-110DSRTF
S-110SRTF
AOI9-BH-15-103
AOI9-BH-15-97
AOI9-BH-15-98
AOI9-BH-15-93
AOI9-BH-15-99
BHSRTF-09-01
AOI9-BH-15-36
S-112SRTF
AOI9-BH-15-96
AOI9-BH-15-37
AOI9-BH-15-39
AOI9-BH-15-94
BHSRTF-09-02
AOI9-BH-15-38
AOI9-BH-15-95
AOI9-BH-15-40
AOI9-BH-15-90
AOI9-BH-15-130
AOI9-BH-15-137
AOI9-BH-15-135
AOI9-BH-15-89
AOI9-BH-15-136
AOI9-BH-15-131
AOI9-BH-15-133
AOI9-BH-15-41
AOI9-BH-15-92
AOI9-BH-15-91
AOI9-BH-15-127
AOI9-BH-15-87
AOI9-BH-15-128
AOI9-BH-15-47
S-135SRTF
AOI9-BH-15-42
AOI9-BH-15-129
AOI9-BH-15-88
AOI9-BH-15-82
AOI9-BH-15-84
S-115DSRTF
AOI9-BH-15-85
AOI9-BH-15-83
AOI9-BH-15-19
AOI9-BH-15-16
AOI9-BH-15-17
AOI9-BH-15-23
AOI9-BH-15-20
AOI9-BH-15-48
AOI9-BH-15-31
AOI9-BH-15-28
AOI9-BH-15-29
AOI9-BH-15-30
S-128SRTF
AOI9-BH-15-21
AOI9-BH-15-22
AOI9-BH-15-60
AOI9-BH-15-60A
AOI9-BH-15-59
AOI9-BH-15-54
AOI9-BH-15-18
AOI9-BH-15-24
AOI9-BH-15-27
AOI9-BH-15-26
AOI9-BH-15-25
AOI9-BH-15-43
AOI9-BH-15-44
AOI9-BH-15-80
AOI9-BH-15-78
AOI9-BH-15-5
AOI9-BH-15-6
AOI9-BH-15-8
AOI9-BH-15-7
AOI9-BH-15-76
AOI9-BH-15-55
AOI9-BH-15-58
AOI9-BH-15-56
AOI9-BH-15-57
AOI9-BH-15-50
AOI9-BH-15-53
AOI9-BH-15-74
AOI9-BH-15-45
AOI9-BH-15-51
AOI9-BH-15-9
AOI9-BH-15-10
S-118DSRTF
AOI9-BH-15-11
AOI9-BH-15-12
AOI9-BH-15-15
AOI9-BH-15-13
AOI9-BH-15-14
AOI9-BH-15-52
AOI9-BH-15-46

TKSR-43
TKSR-26
TKSR-8
TKSR-42
TKSR-25
TKSR-7
TKSR-41
TKSR-24
TKSR-6
TKSR-23
TKSR-40
TKSR-90
TKSR-22
TKSR-39
TKSR-38
TKSR-20
TKSR-37
TKSR-19
TKSR-36
TKSR-18
TKSR-35
TKSR-52
TKSR-59
TKSR-65
TKSR-34
TKSR-16
TKSR-15
TKSR-33
TKSR-14
TKSR-64
TKSR-63
TKSR-56
TKSR-62
TKSR-31
TKSR-30
TKSR-61
TKSR-67
TKSR-73
TKSR-53
TKSR-60
TKSR-66
TKSR-78
TKSR-77
TKSR-76
TKSR-75
TKSR-74
LPG Bullet
LPG Bullet
LPG Bullet
LPG Bullet

Area A
Area B
Area C
Area D

AOI9-BH-15-63
AOI9-BH-15-62
AOI9-BH-15-64
AOI9-BH-15-65
AOI9-BH-15-68
AOI9-BH-15-69
(3-4')
1,2,4-TMB - 660
AOI9-BH-15-66
(3-4')
1,2,4-TMB - 681
AOI9-BH-15-70
AOI9-BH-15-67

Legend

- Subsurface Soil Boring Location with Observed Leaded Tank Bottom Material
- Subsurface Soil Boring Location with No Exceedance of Direct Contact MSCs
- Subsurface Soil Boring Location with an Exceedance of Direct Contact MSCs
- Tank Closed in Place
- Tank with Release
- Tank in Service
- Removed Tank
- PADEP Inspection Areas (June 24,
- AOI-9 SRTF Boundary

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. All exceedances displayed in milligrams per kilogram (mg/kg).

Figure 12: Summary of Subsurface Soil Sample Exceedances
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 100 200 400 Feet

SCALE: 1" = 200'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 12 - Summary of Subsurface Soil Exceedances_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:52:03 AM

AOI-9

Schuylkill River

	S-111SRTF	S-111SRTF	S-111SRTF	S-111SRTF
	8/11/2009	3/10/2015	8/19/2015	11/5/2015
VOCS				
Benzene	86	29.2	5.4	2.9
Methyl Tertiary Butyl Ether	83	20.9	5.6	22.3

	S-110DSRTF	S-110DSRTF
	8/12/2015	11/11/2015
VOCS		
1,2-Dichloroethane	5.4	5.7
Methyl Tertiary Butyl Ether	31.7	43.9

	S-110SRTF	S-110SRTF	S-110SRTF	S-110SRTF
	8/11/2009	3/10/2015	8/14/2015	11/5/2015
VOCS				
1,2,4-Trimethylbenzene	970	ND	ND	ND
1,3,5-Trimethylbenzene	300	ND	ND	ND
SVOCS				
Benzo(A)Pyrene	NA	ND	0.342	ND
Benzo(G,H,I)Perylene	NA	ND	1.18	ND
Naphthalene	300	ND	0.445	ND

	S-112SRTF	S-112SRTF	S-112SRTF
	3/11/2015	8/18/2015	11/5/2015
VOCS			
1,2,4-Trimethylbenzene	258	107	148
1,3,5-Trimethylbenzene	75.1	29.6	46.6
Benzene	993	785	1080
Methyl Tertiary Butyl Ether	21.7	27.4	31.1

	S-78SRTF	S-78SRTF	S-78SRTF	S-78SRTF	S-78SRTF
	1/20/2009	8/12/2009	3/10/2015	8/18/2015	11/5/2015
VOCS					
Benzene	14	22	16.2	24.4	22.8
Methyl Tertiary Butyl Ether	65	58	4.1	5.9	8.2
METALS					
Lead	2.3	1.3	6.1	6.4	6.9

	S-123SRTF	S-123SRTF
	8/13/2009	3/10/2015
VOCS		
1,2,4-Trimethylbenzene	430	12.6
1,3,5-Trimethylbenzene	880	8
Benzene	390	7.9
SVOCS		
Naphthalene	1,400	ND
METALS		
Lead	54.2	4.4

	S-122SRTF	S-122SRTF	S-122SRTF	S-122SRTF
	8/13/2009	3/10/2015	8/18/2015	11/5/2015
VOCS				
1,3,5-Trimethylbenzene	290	119	38.4	23
Benzene	1,800	120	64.9	49.9
Methyl Tertiary Butyl Ether	140	39.5	41.8	57.6
SVOCS				
Benzo(A)Pyrene	NA	0.204	0.0811	0.21
Naphthalene	310	27.2	4.52	ND
METALS				
Lead	8.5	12.8	6.2	3.3

	S-74SRTF	S-74SRTF	S-74SRTF	S-74SRTF
	8/13/2009	3/4/2015	11/11/2015	12/3/2015
VOCS				
Benzene	ND	14.1	5.9	ND
SVOCs				
Benzo(A)Pyrene	ND	0.089	0.314	NA
Metal				
Lead	ND	5.6	7	NA

	S-74D1SRTF	S-74D1SRTF	S-74D1SRTF*	S-74D1SRTF
	8/13/2009	8/13/2015	11/10/2015	12/3/2015
VOCs				
1,2,4-Trimethylbenzene	ND	ND	3,630	ND
1,3,5-Trimethylbenzene	ND	ND	820	ND
Benzene	ND	ND	5,290	ND
Ethylbenzene	ND	ND	2,610	ND
Methyl Tertiary Butyl Ether	ND	1.3	704	1.3
Xylenes, Total	ND	ND	11,300	ND

	S-132SRTF	S-132SRTF	S-132SRTF
	3/4/2015	8/21/2015	11/11/2015
VOCs			
Benzene	ND	ND	7.1

	S-81SRTF	S-81SRTF	S-81SRTF	S-81SRTF	S-81SRTF
	1/20/2009	8/11/2009	3/10/2015	8/11/2015	11/4/2015
VOCS					
1,2,4-Trimethylbenzene	NA	3,900	55.9	23.7	108
1,3,5-Trimethylbenzene	NA	1,200	91.4	60.5	107
Benzene	340	170	82.5	172	205
Ethylbenzene	240	2,000	91.9	129	12.7
Methyl Tertiary Butyl Ether	87	24	ND	5.3	9.1
SVOCS					
Naphthalene	92	590	81.7	59.9	6.12
METALS					
Lead	7.7	13.6	13.7	7.6	9.5

	S-113SRTF	S-113SRTF	S-113SRTF	S-113SRTF
	8/11/2009	3/10/2015	8/11/2015	11/4/2015
VOCS				
1,2,4-Trimethylbenzene	1,100	37.3	0.89 J	0.5
1,3,5-Trimethylbenzene	370	24.1	1.5 J	0.53
Benzene	510	137	344	152
Ethylbenzene	890	94.3	7.2	8.7
SVOCS				
Naphthalene	180	4.75	1.34	0.636
METALS				
Lead	19.1	ND	ND	ND

	S-135SRTF	S-135SRTF
	8/11/2015	11/6/2015
VOCS		
Benzene	188	122

	S-114SRTF	S-114SRTF	S-114SRTF	S-114SRTF
	8/11/2009	3/10/2015	8/11/2015	11/6/2015
VOCS				
1,2,4-Trimethylbenzene	6,100	1,880	539	662
1,2-Dibromethane	0.057	ND	ND	ND
1,3,5-Trimethylbenzene	1,900	647	176	220
Benzene	3,200	1,410	654	487
Ethylbenzene	2,300	1,640	471	352
Methyl Tertiary Butyl Ether	66	4.6 J	19.1	19.3
Toluene	12,000	6,640	2,160	1320
Xylenes, Total	19,000	10,800	3,110	3210
SVOCS				
Naphthalene	880	220	53.5	54
METALS				
Lead	13.2	3.6	ND	ND

	S-79SRTF	S-79SRTF	S-79SRTF	S-79SRTF
	1/21/2009	8/12/2009	3/9/2015	8/18/2015
METALS				
Lead	96	ND	ND	ND

	S-115DSRTF	S-115DSRTF
	8/12/2015	11/11/2015
VOCS		
Methyl Tertiary Butyl Ether	59.4	59

	S-115SRTF	S-115SRTF	S-115SRTF	S-115SRTF
	8/11/2009	3/11/2015	8/14/2015	11/6/2015
VOCS				
1,2,4-Trimethylbenzene	1,400	2.9	1.1 J	5.3
1,3,5-Trimethylbenzene	680	79.8	98.3	57.6
Benzene	1,800	421	1,070	581
Ethylbenzene	1,300	71.8	159	57.5
SVOCS				
Naphthalene	310	56.2	42.2	4.7
METALS				
Lead	10.1	ND	2.3 B	2.5

	S-120DSRTF	S-120DSRTF	S-120DSRTF
	3/13/2015	8/13/2015	11/10/2015
VOCS			
Methyl Tertiary Butyl Ether	76.1	64.3	ND

	S-120SRTF	S-120SRTF	S-120SRTF	S-120SRTF
	8/13/2009	3/9/2015	8/18/2015	11/10/2015
VOCS				
Methyl Tertiary Butyl Ether	21	ND	ND	ND

	S-130SRTF	S-130SRTF	S-130SRTF	S-130SRTF
	8/13/2009	3/6/2015	8/21/2015	11/10/2015
SVOCS				
Benzo(A)Pyrene	NA	0.241	0.13	0.215

	S-116SRTF	S-116SRTF	S-116SRTF	S-116SRTF
	8/11/2009	3/11/2015	8/14/2015	11/9/2015
VOCS				
Benzene	31	ND	27.4	ND
Methyl Tertiary Butyl Ether	4	ND	44.3	0.37

	S-126SRTF	S-126SRTF	S-126SRTF
	8/13/2009	3/9/2015	8/20/2015
SVOCS			
Benzo(A)Pyrene	NA	ND	0.471
Benzo(G,H,I)Perylene	NA	ND	0.451

	S-118DSRTF	S-118DSRTF
	8/12/2015	11/11/2015
VOCs		
Methyl Tertiary Butyl Ether	ND	189

	RW-A	RW-A	RW-A
	1/20/2009	8/12/2009	11/9/2015
VOCS			
Benzene	36	5	10.3

	S-106DSRTF	S-106DSRTF	S-106DSRTF	S-106DSRTF	S-106DSRTF
	1/22/2009	8/13/2009	3/13/2015	8/13/2015	11/10/2015
VOCS					
Methyl Tertiary Butyl Ether	27	98	12.3	17.6	ND

	WPB-5	WPB-5	WPB-5	WPB-5
	1/21/2009	8/14/2009	3/14/2015	11/11/2015
VOCS				
1,2,4-Trimethylbenzene	NA	3,900	3,600	1,800
1,3,5-Trimethylbenzene	NA	1,300	920	532
Benzene	7,100	7,100	7,210	6,510
Ethylbenzene	1,600	2,300	1,540	2,020
Methyl Tertiary Butyl Ether	11,000	5,400	321	325
Toluene	1,800	3,100	208	208
Xylenes, Total	19,000	24,000	7,270	1,860
SVOCS				
Benzo(A)Pyrene	NA	NA	0.234	0.158
Benzo(G,H,I)Perylene	NA	NA	0.28	0.19
Naphthalene	680	2,900	342	378
Metals				
Lead	ND	ND	17	69.5

	RW-B5	RW-B5
	1/21/2009	8/14/2009
VOCS		
1,2,4-Trimethylbenzene	NA	2,400
1,3,5-Trimethylbenzene	NA	780
Benzene	4,100	4,900
Ethylbenzene	1,000	1,600
Methyl Tertiary Butyl Ether	6,600	2,800
Toluene	2,000	570
Xylenes, Total	8,700	11,000
SVOCS		
Naphthalene	290	460

	RW-B	RW-B	RW-B
	1/21/2009	8/14/2009	8/14/2015
VOCS			
1,2,4-Trimethylbenzene	NA	1,600	159
1,3,5-Trimethylbenzene	NA	480	159
Benzene	1,200	2400 E	1,970
Ethylbenzene	780	1,000	253
Methyl Tertiary Butyl Ether	1,100	1,200	115
SVOCS			
Naphthalene	330	320	326

	WPB-2	WPB-2
	1/21/2009	8/14/2009
VOCS		
1,2,4-Trimethylbenzene	NA	2,400
1,3,5-Trimethylbenzene	NA	810
Benzene	3,500	3,600
Ethylbenzene	1,500	1,600
Methyl Tertiary Butyl Ether	4,800	2,600
Toluene	18,000	14,000
Xylenes, Total	18,000	18,000
SVOCS		
Naphthalene	430	510
METALS		
Lead	7.9	ND

	MW-1SRTF
	11/9/2015
VOCS	
Methyl Tertiary Butyl Ether	70.4
SVOCs	
Naphthalene	293
Metal	
Lead	24.9

	MW-2SRTF	MW-2SRTF	MW-2SRTF	MW-2SRTF	MW-2SRTF
	1/21/2009	8/14/2009	3/11/2015	8/14/2015	11/11/2015
VOCS					
1,2,4-Trimethylbenzene	NA	1,800	630	624	262
1,3,5-Trimethylbenzene	NA	530	460	522	170
Benzene	1,200	1,400	574	1,230	165
Ethylbenzene	1,900	1,500	980	1,460	109
Methyl Tertiary Butyl Ether	130	75	43.7	82.5	23.8
Xylenes, Total	12,000	7,800	513	617	109
SVOCS					
Naphthalene	310	250	113	278	31.3
METALS					
Lead	ND	ND	ND	5.7	4.4

	MW-3SRTF	MW-3SRTF
	1/21/2009	8/14/2015
VOCS		
1,2,4-Trimethylbenzene	NA	672
1,3,5-Trimethylbenzene	NA	133
Benzene	91	95.8

	WPB-3
	1/21/2009
VOCS	
Benzene	1,300
Ethylbenzene	1,100
Methyl Tertiary Butyl Ether	190
SVOCS	
Naphthalene	270
METALS	
Lead	21.8

	WPB-4	WPB-4	WPB-4
	1/21/2009	8/14/2009	8/21/2015
VOCS			
1,2,4-Trimethylbenzene	NA	160	1
Benzene	ND	66	61.2
SVOCS			
Benzo(A)Pyrene	NA	NA	0.267
Benzo(G,H,I)Perylene	NA	NA	

GROUNDWATER SCREENING CRITERIA

Analyte	CAS Number	PADEP Non-residential Used Aquifer MCS TDS <2500 ug/l
VOCS		
1,2,4-Trimethylbenzene	95-63-6	62
1,3,5-Trimethylbenzene	108-67-8	53
Benzene	71-43-2	5
Ethylbenzene	100-41-4	700
Methyl Tertiary Butyl Ether	1634-04-4	20
Toluene	108-88-3	1000
Xylenes, Total	1330-20-7	10000
SVOCS		
Benzo(A)Pyrene	50-32-8	0.2
Benzo(G,H,I)Perylene	191-24-2	0.26
Naphthalene	91-20-3	100
METALS		
Lead	7439-92-1	5

Legend

- Monitoring Well with Apparent LNAPL Thickness
- Groundwater Sample with No Exceedance During 2015
- Groundwater Sample with an Exceedance During 2015
- Tank Closed in Place
- Tank with Release
- Tank in Service
- Removed Tank
- PADEP Inspection Areas (June 24, 2009)
- AOI-9 SRTF Boundary
- 10 — Result Exceeds PADEP Non-Residential Used Aquifer MSC TDS <2500 ug/L

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. " * " The results from the S-74D1 groundwater sample collected 11/10/2015 are inconsistent with historical data. The well was resampled on 12/3/2015 for confirmation of the detected levels of VOCs. Based on the confirmation sampling and historic results, the 11/10/2015 results are considered an anomaly and are not used for data interpretation.
3. Groundwater exceedances or criteria displayed in micrograms per liter (mg/L).

Figure 13: Summary of Groundwater Sample Exceedances
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

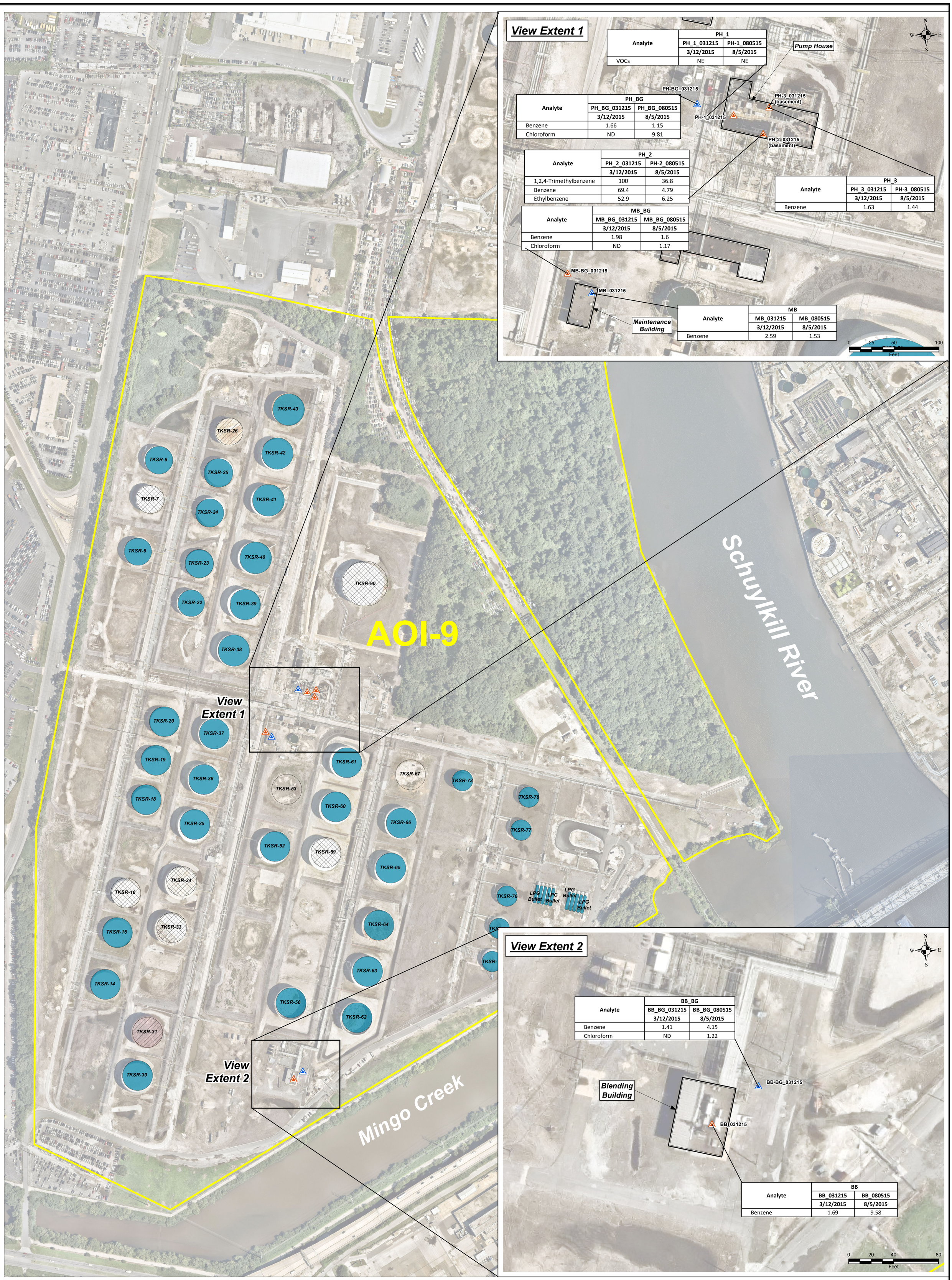
Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 200 400 Feet

SCALE: 1" = 200'
DATE: December 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

0 15 30 60 Feet

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 13- Summary of GW Sample Exceedances_12-28-15.mxd Date: 12/29/2015 User: mmking Time: 10:07:49 AM



Legend

- Approximate Ambient Air Sample
- Approximate Indoor Air Sample
- Tank Closed in Place
- Tank with Release
- Tank in Service
- Removed Tank
- AOI Boundary

Analyte	CAS Number	EPA RSL	OSHA PELs
1,2,4-Trimethylbenzene	95-63-6	31	NS
Benzene	71-43-2	1.6	31,950
Chloroform	67-66-3	0.53	240,000
Ethylbenzene	100-41-4	4.9	435,000

Notes:
1. Aerial imagery provided by Nearmap.com, dated 7/29/2015.
2. All air sample locations are approximate.
3. All air sample results are below OSHA PELs.
4. All exceedances and criterial displayed in micrograms per cubic meter (ug/m3).

Figure 14: Summary of Indoor Air Sample Locations and Results
AOI-9 Remedial Investigation Report
PES Philadelphia Refinery
Philadelphia, Pennsylvania

Evergreen Resources Management Operations
2 Righter Parkway, Suite 200
Wilmington, DE 19803

0 100 200 400 Feet

SCALE: 1" = 200'
DATE: NOVEMBER 28, 2015
DRN. BY: MH
CKD. BY: KM
JOB#: 2574602

Path: \\langan.com\data\DYL\data6\2574601\ArcGIS\MapDocuments\AOI 9 RIR 2015\Figure 14 - Indoor Air Sample Locations and Results_12-28-15.mxd Date: 12/28/2015 User: mmking Time: 11:54:04 AM