

# Remedial Investigation Report

AOI-7

Girard Point Refinery

3144 Passyunk Avenue

Philadelphia Energy Solutions Complex

Philadelphia, Pennsylvania

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# 1. Introduction

This Remedial Investigation (RI) Report (RIR) has been prepared for Area of Interest (AOI) 7, also known as Girard Point Fuels Processing Area, at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) Refining Complex (facility). Sunoco Inc. (R&M) (Sunoco) transferred the facility, also known as the Philadelphia Refining Complex, to PES on September 8, 2012. Sunoco retained the remediation liability prior to this date. The remediation liability was transferred to Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) on December 30, 2013. The remediation program is currently being performed under a Buyer Seller Agreement signed by Sunoco, PES, and the Pennsylvania Department of Environmental Protection (PADEP) in September 2012.

Site remediation at the facility is ongoing as part of previously-established programs and the 2012 Buyer Seller Agreement. The facility has operated, and is planning to continue to operate, as an oil refinery, marketing terminal, and petrochemical complex.

## 1.1 Facility Description

The facility is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. Portions of the facility occupy both the eastern and western Schuylkill River banks. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. The area surrounding the property is characterized by a mixture of residential, commercial, and industrial properties. Current operations at the facility consist of the production of fuels and basic petrochemicals for the chemical industry.

AOI 7, also known as the Girard Point Fuels Processing Area, encompasses approximately 130 acres and is located on the east side of the Schuylkill River. AOI 7 is bordered by Lanier Avenue/AOI 3 to the east, Pennypacker Avenue/AOI 6 to the south and Schuylkill River to the west and north (Figures 1 and 2). The entire western and northern boundary of AOI 7 along the Schuylkill River is bound by a sheet pile wall. The extent of the sheet pile wall is shown on Figure 2.

## 1.2 Facility Operational History and Current Use

The facility has a long history of petroleum transportation, storage, and processing. The oldest portion of the facility started petroleum related activities in the 1860s, when the Atlantic Refining Company was established as an oil distribution center. In the 1900s, crude oil processing began and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals, such as acids and ammonia, were also produced at the facility for a time. The facility has operated continuously as a refining, product distribution, and storage facility. Use of the facility has remained similar following the transfer of ownership to PES.

AOI 7 formerly contained a fluid catalytic cracker (FCC) unit, carbon monoxide (CO) CO boiler, sulfur plant, East and West Sludge Basin - RCRA Tank, Hazardous Waste Incinerator, and crude units. Based on review of historical reports and aerial photographs, early refining units in AOI 7 were built in the 1940s. AOI 7 currently consists of crude units, FCC and alkylation units, flares, cooling towers and above ground storage tanks (ASTs). The ASTs contain primarily naphtha crude,





waste oil, and cat charge stocks. Eight liquefied petroleum gas (LPG) tanks are located in the south-central portion of this area. A wastewater treatment plant (WWTP) is located along the southwestern portion of AOI 7 and an associated oil-water separator in the northeastern portion of AOI 7. Four clean closed RCRA hazardous waste ASTs are also located in the western portion of AOI 7 approximately 150 feet north of the WWTP. There are a total of 8 occupied buildings in AOI 7, including 4 control rooms (buildings 711, 6622, 6625, and 6626), Electrical Building 450, Firehouse Building 442, Maintenance Building 440, and the Canteen Building 595

There are a total of five Solid Waste Management Units (SWMUs Nos. 87, 88, 89, 90, and 91) located in AOI 7 that were addressed in several previous Resource Conservation and Recovery Act (RCRA) investigations as part of the United States Environmental Protection Agency (USEPA) Corrective Action process and during the Act 2 site characterization activities. These SWMUs include three in the NW Fill Area (SWMU 87 Buried Lead Sludge Area 1, SWMU 88 Buried Lead Sludge Area 72 and SWMU 89 Buried Lead Sludge Area 73); SWMU 90 Storage Tank Area/Buried Lead Sludge Area 74 and SWMU 91 Storage Tank Areas/Buried Lead Areas 5, as shown on Figure 2.

On July 12, 2011, Sunoco reported a hydrocarbon sheen on the Schuylkill River to the National Response Center. The sheen was directly adjacent to the Girard Point No. 3 Separator. In response to the sheen on the river, Sunoco investigated the source of hydrocarbons to the river through the installation of monitoring wells and exploratory excavation around a process sewer junction box associated with the 137 Crude Unit. The monitoring wells demonstrated measurable oil on the water table, and the exploratory excavation revealed integrity issues with the junction box. Interim actions completed to address these findings included sealing the junction box and associated bulkhead penetration with concrete. Construction of a ten recovery well hydraulic control system was completed on August 23, 2012. Groundwater and Light Non-Aqueous Phase Liquid (LNAPL) are extracted using pneumatic submersible pumps, and total fluids pass through an oil/water separator. Water is discharged to an onsite process sewer, and LNAPL is recovered in a 1,100-gallon holding tank and recycled by the refinery. Since the start-up of the system through December 2016 17,226,885 gallons of water and 111,648 gallons of LNAPL have been recovered by the system. Performance of this system is documented in the Semi-Annual, Groundwater Remediation Status Reports submitted to the PADEP. Details and/or modifications to this interim action will be documented in the Cleanup Plan.

Groundwater gauging of select monitoring wells in AOI 7 occurs on an annual basis during the second quarter of each year. Annual gauging activities and results are reported in Quarterly Reports prepared by Evergreen.

### **1.3 Regulatory History/Overview**

Sunoco and the PADEP entered into a Consent Order & Agreement (CO&A) in December 2003 with respect to the facility. Sunoco's Phase I Remedial Plan (Phase I Plan), dated November 2003, was included as an attachment to the CO&A. In accordance with the CO&A and Phase I Plan, a Current Conditions Report and Comprehensive Remedial Plan (CCR) was prepared by Sunoco in June 2004. The Phase I Plan and the CCR divided the facility into 11 AOIs, and presented a prioritization of the AOIs based on specific risk factors. The CCR also presented the Phase II remedial approach and schedule to characterize each of the 11 AOIs, and to conduct Phase I and II





corrective action activities in accordance with the 2003 CO&A and the Phase I Plan. Since 2003, Sunoco has performed site characterization activities at all 11 AOIs in accordance with the 2003 CO&A. Sunoco has prepared and submitted a corresponding Site Characterization Report (SCR) for each AOI in accordance with the Revised Phase II Corrective Action Activities schedule that was included in the CCR.

In October 2006, Sunoco submitted a notice of intent to remediate (NIR) to the PADEP for the facility, entering the facility into the Act 2 program. This NIR was later updated and submitted to the PADEP in November 2014 in order to revise the ownership identity to PES and the remediator identity to Evergreen. In November 2011, the facility was formally entered into the PA One Cleanup Program with the USEPA Region III and PADEP. In November 2011, Sunoco submitted a revised Work Plan for Sitewide Approach Under the One Cleanup Program (Work Plan for Sitewide Approach). As previously discussed, characterization and remediation work at the facility is currently being performed under the September 2012 Buyer Seller Agreement signed by Sunoco, PES, and the PADEP.

The following provides a timeline of major events and submissions for the facility and AOI 7:

#### **2004**

- The PADEP and USEPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or One-Cleanup Program)," which clarifies how sites remediated under Pennsylvania's Voluntary Cleanup Program may satisfy RCRA corrective action requirements through characterization and attainment of remediation standards established under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2).
- Langan prepared the CCR for the Philadelphia Refinery and Belmont Terminal.

#### **2005**

- PADEP, USEPA, and Sunoco agreed that the One Cleanup Program would benefit the project by merging the remediation obligations under the various programs into one streamlined approach which would be conducted under the existing 2003 CO&A.

#### **2006**

- Sunoco submitted a NIR to the PADEP for the Philadelphia Refinery thereby entering the facility, with the exception of Belmont Terminal, into the Act 2 program.

#### **2010**

- Sunoco submitted a Site Characterization Work Plan (Work Plan) to the PADEP and USEPA on May 26, 2010. This work plan summarized proposed activities to be completed to characterize AOI 7 in accordance with the objectives of the CCR. The Work Plan also included proposed activities to characterize the five leaded tank bottom RCRA SWMUs in AOI 7.
- Submittal of a Site Characterization/Remedial Investigation Report (SCR/RIR) in September 2010 for AOI 7 that documented the results of the characterization activities completed in accordance with the 2010 Work Plan.





## 2011

- On November 8, 2011, the USEPA provided an acknowledgment letter to Sunoco formally accepting the Sunoco Facility into the One Cleanup Program.
- Sunoco submitted the Work Plan for Site Wide Approach to document the site-wide remedial approach extending beyond the requirements of the 2003 CO&A. The PADEP and USEPA reviewed and provided input to this report. Sunoco submitted a letter of commitment stating the facility will be remediated according to the Work Plan for Site Wide Approach.

## 2012

- Sunoco submitted a Site Characterization/Remedial Investigation Report for AOI 7.
- Sunoco transferred the facility to PES.
- Sunoco, PES, and PADEP signed the Buyer-Seller Agreement which established the environmental remediation and management obligations of Sunoco and PES following the sale of the facility.

## 2013

- The legacy remediation liability for environmental impacts existing prior to the conveyance of the facility to PES was transferred from Sunoco to Evergreen.
- The PADEP provided Evergreen comments on the 2012 SCR/RIR.

## 2014

- Evergreen submitted an updated NIR to the PADEP for the facility.

## 2015

- Langan, on behalf of Evergreen, submitted a Human Health Risk Assessment (HHRA) Report to establish a site-specific standard (SSS) for lead in soil at the facility, the Belmont Terminal, and the Sunoco Partners Marcus Hook Industrial Complex (Langan, 2015).
- The HHRA was approved by the PADEP in a letter dated May 6, 2015 establishing a SSS of 2,240 milligrams per kilogram (mg/kg) for lead in soil.

Evergreen submitted a Work Plan in April 2016 to the PADEP describing characterization activities to be performed in AOI 7 to complete the RIR activities. On April 7, 2016 the PADEP, Evergreen and GHD met to discuss the Work Plan. The PADEP provided comments to the Work Plan via email on April 13, 2016. In accordance with the Work Plan for Site Wide Approach, Evergreen is submitting this RIR for AOI 7 to formally satisfy the requirements of Act 2 as specified in 25 PA Code §250.408. This RIR describes site characterization work conducted following the last submittal (2012 SCR/RIR). Activities that have been performed in order to complete characterization as required by an RIR under Act 2 include:

- Additional characterization of surface soil (0 to 2 feet below ground surface [ft. bgs] interval) and subsurface soil (2 to 15 ft. bgs) including targeted soil investigations in potential contaminant source areas, such as historic product handling and storage locations, former hazardous waste tanks, open storage tank incident areas, and known product releases.





- Horizontal and vertical delineation of impacts in soils.
- Additional soil sampling in areas with LNAPL.
- Additional groundwater sampling from monitoring wells not containing LNAPL.
- Collection groundwater samples beneath LNAPL samples.
- Delineation of LNAPL.
- Evaluation of LNAPL mobility.
- Investigation of the potential vapor intrusion to indoor air pathway at occupied buildings.
- Collection of air samples above LNAPL plumes.
- Qualitative evaluation of contaminant fate and transport.

As discussed with the PADEP, Stantec, and Evergreen during a meeting conducted in September 2015, Evergreen is in the process of developing a site-wide MODFLOW model to perform quantitative fate and transport modeling. Following the approval of this and other RIRs, Evergreen intends to submit a Cleanup Plan, pursuant to 25 PA Code §250.410, which will present remedies chosen to allow attainment of the selected remediation standards in soil and groundwater.

In accordance with Act 2, the required public and municipal notices for this report have been prepared and issued. Appendix A includes a copy of the original facility NIR, the updated facility NIR, as well as the report notices and their proof of receipt/publication.

## **1.4 Selection of Constituents of Concern**

A list of the constituents of concern (COCs) in soil and groundwater for AOI 7 is included as Table 1. This list is an updated listing of the compounds identified in the Work Plan as the COCs for the facility under Pennsylvania One Cleanup Program and will be referred to as the petroleum short list. This list includes all current constituents from the Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E of PADEP's Closure Requirements for Underground Storage Tank Systems, with the exception of the waste oil parameters. In May 2009, two additional COCs, 1,2,4- trimethylbenzene (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP. The COC listing for groundwater was also revised in 2012 to follow the soil COC listing. The additional compounds added to the groundwater COC list included anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, and benzo(b)fluoranthene.

Additional compounds were added to Evergreen short list for AOI 7 in three of the investigation areas during the 2016 sampling events. Mercury and hexavalent chromium were added to the soil sampling for the borings completed to investigate soils in the vicinity of the incinerator, sludge basins and the hazardous waste tanks.





## **1.5 Selection of Applicable Standards and Screening Levels**

The media of concern for AOI 7 include soil and groundwater. The potential vapor intrusion into indoor air exposure pathway was also evaluated through the collection of the indoor air samples. The approach for attaining Act 2 remediation standards for the media of concern is described below by media. As the current and anticipated future use of the facility is industrial, standards for non-residential properties were chosen for comparison.

### **1.5.1 Soil**

All soil results were screened using a multi-step process, as described in this section. Soil results were first screened against the PADEP non-residential, used aquifer (total dissolved solids [TDS] <2,500 micrograms per liter [ $\mu\text{g/l}$ ]) medium specific concentrations (MSCs) developed by the PADEP to implement the Statewide Health Standard (SHS). The following process was used to select the soil SHS for each COC:

- The highest value of either 100 times the groundwater MSC or the generic value MSC was selected to represent the soil to groundwater numeric value.
- The selected used aquifer, non-residential soil to groundwater numeric value was then compared with the non-residential direct contact value (0 to 2 feet or 2 to 15 ft. bgs, as applicable).
- The more stringent of the soil to groundwater value and the direct contact value was selected as the soil MSC, otherwise referred to as the SHS, for initial comparison of soil sample results.

The SHS value is usually driven by the soil-to-groundwater MSC, and the soil-to-groundwater pathway will be addressed in the groundwater investigation presented in this report. In order to further evaluate the risk posed by the concentrations of COCs which were detected above their respective SHS, the next step is to compare all of the soil analytical results to the non-residential direct contact MSCs. Soil sample locations that will require further pathway evaluation or require a remedial measure in order to attain a standard under Act 2 were identified through comparison to the non-residential direct contact MSCs.

An exception to this soil screening process exists for lead. On February 24, 2015, Evergreen submitted a Human Health Risk Assessment Report to PADEP which presented the development of a risk-based SSS for lead in soil. In a letter dated May 6, 2015, PADEP approved the report, and a non-residential direct contact site-specific numerical standard for lead of 2,240 milligram per kilogram (mg/kg) was established. This SSS is used in place of the default 0 to 2 ft. bgs direct contact standard for lead.

### **1.5.2 Groundwater**

Groundwater sample analytical results were screened against the PADEP MSCs for non-residential properties overlying used aquifers with TDS less than or equal to 2,500  $\mu\text{g/l}$  (SHS). Where constituent concentrations are above the SHS, Evergreen evaluated application of the site-specific remediation standard using the pathway elimination option.





### **1.5.3 Potential Vapor Intrusion into Indoor Air**

Indoor and ambient air sample results collected in AOI 7 were screened against the USEPA Region 3 Regional Screening Levels (RSLs) for Industrial Air Target Risk (TR)= $1e^{-6}$ , Target Hazard Quotient (HQ)=0.1 (updated May 2016); the PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (January 2017); and the Occupational Safety and Health Association (OSHA) Permissible Exposure Limits (PELs). The National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLVs) were used for compounds without established OSHA PELs. In accordance with the PADEP Vapor Guidance, since indoor air is the only potential exposure pathway, the results were also compared to the USEPA Region 3 RSLs for Industrial Air TR= $1e^{-5}$  and Target Hazard Quotient (HQ)=0.1. These values were used as the threshold to indicate whether additional controls will be necessary to address vapor intrusion. Any such controls will be presented in the Cleanup Plan.

## **2. Environmental Setting**

This section summarizes the geologic framework and general hydrogeologic properties of sedimentary deposits and bedrock underlying the south Philadelphia area, with emphasis near the facility. A brief discussion of historical and present-day topography and hydrology is also included. This section provides a regional context from which sedimentary deposits observed beneath AOI 7 can be classified and characterized for the purposes of this RIR. Much of the information presented in this section was summarized during conceptualization of a site geologic model that is being used in the development of a numerical groundwater flow model by Stantec as presented in the AOI 1 RIR (Stantec, 2016).

In general, the groundwater resources and stratigraphic framework of the facility area have been well-documented through a variety of data sources, including previous groundwater resource investigations dating back to the early 1900s, state and federal geologic mapping projects, groundwater modeling studies, and consultant site characterization and remedial investigation reports. Those data sources are summarized herein. In large part, available well and test boring logs from previous on-site and local subsurface investigations were the most valuable resource in evaluating the local subsurface stratigraphy. As such, subsurface information from approximately 750 well and test boring logs was considered in the evaluation of regional conditions. A database of stratigraphic "picks" on interpreted vertical lithologic unit boundaries (and, where possible, geologic formations) was also developed and includes all identified records of boreholes completed to bedrock at and near the facility. The purpose of the "picks" database was to archive interpretation of individual borehole lithologies to bedrock, so that stratigraphic profiles could be developed for this RIR and the Schreffler lithologic model (Schreffler, 2001) could be refined and updated for site-specific use at the facility (Stantec, 2016). One stratigraphic profile was developed for use in this RIR and is presented herein to support evaluation of the lithologic character, geographic extent, and thickness of each geologic unit identified. A structure contour map of the bedrock surface was also developed and used to support the discussion presented below.





## **2.1 Hydrology and Topography**

The facility occupies a large area adjacent to the Schuylkill River near its confluence with the Delaware River. This region has a long history of human influence and disturbance, dating back to the early 17th Century when European settlers first arrived. The following sections present a brief discussion of the significant land surface morphologic changes that are apparent when comparing modern environments and topography to that shown on historical maps.

### **2.1.1 Historical Topography and Natural Depositional Environments**

The City of Philadelphia Archives and several online archival resources have catalogued and provide free access to copies of many historical maps of Philadelphia. Based on a review of many of those maps, much of the land area occupied by the present-day Philadelphia Refinery was formerly tidal marsh and lowlands that once fringed the Schuylkill River. Figure 3 presents a geo-referenced United States Geological Survey (USGS) topographic map from 1898 (20-foot contour interval). The map indicates that several small tributary streams, digitized on-screen and shown as blue lines, formerly dissected that marshland and presumably would have exchanged water with the tidal Schuylkill River on a semi-diurnal basis. Several islands were also present throughout the lowlands, most notably League Island, which are interpreted as erosional remnants of uplands that formed sometime after deposition of the Trenton "gravel" sediments (discussed in detail below).

At that time, relatively higher topography was apparent north and west of the Schuylkill River, near Gibson's Point. South and east of that general area, the Schuylkill River coursed through a distinctive meander around Point Breeze, and appeared to have formed an erosive cut bank along present-day AOI 2 where higher elevations were present (and favoring point bar deposition north of AOI 10). A southwest/northeast trending ridge of higher elevation was also present south of Point Breeze near AOI 4 and between those two areas of higher elevation a stream was mapped to have been present. That stream appears to have originated in southern AOI 1 and flowed southwest through AOIs 3 and 7, towards its confluence with the Schuylkill River. Numerous other small streams and ditches draining the lowlands surrounding Hollander Creek were also noted. Additional historic maps indicate that by 1900, an earthen dike had been constructed along the banks of the lower Schuylkill River, and sluices were present at each stream/ditch confluence. Other maps show wooden pilings in places along the Schuylkill River. In general, the construction of containment dikes, sluices, and shoreline hardening would have altered the natural tidal exchange between the Schuylkill River and these historic creeks, thereby limiting the natural accretion of sediment in the marshes that once fringed the river. Moreover, the modifications indicated on these maps would have altered the pre-existing tidal regime and dynamic equilibrium of the Schuylkill River.

### **2.1.2 Post-Industrialization**

Figure 3 indicates that by 1898, storage of petroleum near Point Breeze and Gibson Point had already begun. According to archived records, much of the remaining tidal marsh and lowland environments nearby were reclaimed and routinely dewatered for farming practices around this same time period (mostly on the west side of the Schuylkill River). Industrialization warranted further land filling activity and shoreline hardening, including bulk-heading and filling of the tributary streams that modified and generally raised the antecedent topography into its present-day





configuration. Farms were displaced in favor of industrial and commercial land uses. Although some clusters of residential property and open space exist or have existed near the facility, most land in south Philadelphia is presently and has been used for industrial and commercial purposes for over 100 years (IST, 1998).

Light Detection and Ranging (LiDAR) data obtained from the USGS (USGS, 2010) and topographic contours published in 2007 by the City of Philadelphia indicate that present-day topography is relatively flat in the study area, and land surface elevations generally range from a few feet below sea-level near Mingo Creek to approximately 30 feet above sea level near the eastern boundary of the Philadelphia Refinery in AOIs 1 and 8 [referenced to the North American Vertical Datum of 1988 (NAVD 88)] (Figure 4). Although subtle, the high-resolution LiDAR model displays topographically low areas that based on location, likely correlate to the locations of former stream valleys (e.g., Franklin Delano Roosevelt Park). In addition to raising the land surface, much of the filled areas were either paved and/or rendered relatively impervious (Figure 5), which decreased rates of recharge to the water table and necessitated the construction of numerous sewers to convey stormwater runoff (and also sewage) to the Schuylkill and Delaware Rivers.

## **2.2 Regional Geology and Hydrogeologic Conditions**

The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within 2 miles of the "Fall Line," where crystalline bedrock of the Appalachian foothills intersects the ground surface (outcrops) (Figure 6). The Atlantic Coastal Plain is a physiographic province that is defined as having relatively flat topography and as being underlain by a characteristic wedge of unconsolidated sediments that thicken in a southeasterly direction, away from sediment source areas in the Appalachian Mountains. These sediments were deposited atop a sloping bedrock surface in complex fluvial, estuarine, and marginal marine environments along the passive Atlantic margin. Overall, subsidence of the Piedmont land surface in conjunction with cyclical sea-level fluctuations have been the primary controlling mechanisms driving periods of deposition, non-deposition and erosion in the Atlantic Coastal Plain (Trapp, 1992). In general, the resulting sedimentary record in the vicinity of the Philadelphia Refinery is complex, largely incomplete, and under-represented by only Cretaceous and Quaternary deposits, separated by a regional disconformity (Stantec, 2012). A summary of those deposits is presented below.

### **2.2.1 Coastal Plain Deposits**

#### **2.2.1.1 Anthropogenic Fill**

For reasons discussed, much of the facility and surrounding area is underlain by historical fill material, which was placed for the purpose of reclaiming lowlands along the banks of the tidal Delaware and Schuylkill Rivers during industrialization. These fill materials are heterogeneous in nature and have been described on borehole logs by others as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where antecedent topography was highest to greater than 50 feet where it was used as railroad ballast just east of the Philadelphia Refinery. Within the locations of former stream valleys and marshes (Figure 3), the historical fill material is generally 20 feet or greater in thickness.





The fill materials may contain isolated lenses of groundwater (perched groundwater) where coarse or granular materials are separated from the underlying water table by low permeability sediments. The fill may also be saturated and/or in hydraulic connection with the water table along the axes of former stream channels, where the water-table appears to intersect the fill, or where the fill was placed on marshland. However, at most locations across the Philadelphia Refinery, the fill layer occurs above the regional water-table under average head conditions.

#### **2.2.1.2 Quaternary Deposits**

Quaternary sedimentary deposits are present beneath the Philadelphia Refinery and are generally representative of geologically-recent cycles of deposition and erosion that occurred within the last 200,000 years. These cycles of sedimentation were the result of a series of glacial and interglacial periods, namely the Illinoian and Wisconsin glaciations, separated by an intervening interglacial period and followed by the present interglacial period through the Holocene (Sevon et al., 1999). Depositional environments through this Period were primarily controlled by sea-level and the successive down-cutting and infilling of ancestral river valleys, primarily that of the Schuylkill and Delaware Rivers (Owens and Minard, 1979). Details of the Quaternary deposits present at the Philadelphia Refinery are described below.

##### **2.2.1.2.1 Recent (Holocene) Alluvium**

Predominantly gray, muddy deposits with occasional sandy, gravelly, and organic-rich lenses comprise the most-recent alluvium present at the Philadelphia Refinery. These sediments were deposited in dynamic floodplain, channel, and marsh environments through the Holocene. As noted, the upper surface of alluvium, in most places covered by fill, defines the antecedent topography that pre-dated development of the Philadelphia Refinery area. This geologic unit is generally present below an elevation of approximately 20 feet NAVD 88. The alluvium ranges in thickness from a few feet at higher elevations, away from the present Schuylkill and Delaware River estuaries, to approximately 15 feet within the former floodplains of buried tributary streams. However, adjacent to and fringing these major river estuaries, apparent marsh deposits accreted in freshwater environments to as much as 60 feet thick (to elevations as low as approximately -60 feet NAVD 88) as sea-level transgressed and flooded the incised river valleys through the Holocene. Figure 3 provides some estimation of how extensive the tidal marshes once were prior to development, generally along the Schuylkill River south of and surrounding Point Breeze. A stratigraphic profile location map is presented on Figure 7. Stratigraphic profile A-A' supports this interpretation and distribution of the most recent alluvial deposits across the Philadelphia Refinery (Figure 8).

Similar to the fill described above, most recent alluvium at the facility has limited water-bearing capacity due to its fine-grained texture. However, heterogeneities within the alluvium may allow for the presence of localized seasonal perched groundwater resulting from the percolation of recharge water. Within former marsh areas along the Schuylkill and Delaware River estuaries, the regional water-table occurs within the Holocene alluvium. At locations distal to the rivers and where the Schuylkill River appears to have eroded older alluvial deposits (e.g., along the western periphery of AOI 2), the Holocene alluvium occurs above the regional water-table and is unsaturated.





#### **2.2.1.2.2 Pleistocene Alluvium ("Trenton Gravel")**

Geologically-recent glacial outwash deposits, commonly referred to informally as the Trenton "gravel", have long been recognized in the vicinity of southeastern Pennsylvania along the Delaware River valley. Sevon and Braun (2000) provide a comprehensive map of glacial deposits in Pennsylvania, including the presence of sand and gravel outwash, interpreted as stratified drift, along the present Delaware River. Owens and Minard (1979) published a comprehensive summary of previous research into these deposits and subdivided the "Trenton gravel" into two distinct deposits (the Spring Lake and Van Sciver Lake beds) based on topographical position and lithology at those type sections. Low et al. (2002) indicate that in most places the Trenton gravel rests directly atop Cretaceous sediments and is overlain by younger alluvium of Holocene age near the Schuylkill River.

Based on literature review presented in the AOI 1 RIR (Stantec, 2016), the Trenton gravel was interpreted as a heterogeneous, stratified alluvial deposit of primarily sand and gravel, with occasional beds of clay and silt (the Van Sciver Lake beds), that resulted from glacial outwash through the Delaware River valley sometime after the Illinoian glacier receded. At the Philadelphia Refinery, the Trenton gravel is commonly described on boring logs as a brown, reddish-brown or, where stained, black, fine to coarse sand with lenses of gravel. The gravel fraction is often multicolored and comprised of a mixture of sub-angular to sub-rounded, sedimentary and metamorphic rocks derived from the Appalachian Piedmont. The Trenton gravel generally ranges in thickness from a few feet up to approximately 30 feet near the Philadelphia Refinery. It appears to be laterally continuous and its thickness depends on the antecedent Cretaceous topography that it filled and on the degree of erosion from above (Stantec, 2016). Along the Schuylkill River at the George C. Platt and Penrose Avenue bridges, and in places beneath the Delaware River, Greenman et al. (1961) mapped the Trenton gravel to be present beneath thick sections of Holocene alluvium to elevations near -60 feet NAVD 88, and those interpretations are shown on Figure 8.

The regional water-table at the Philadelphia Refinery most often occurs within the Trenton gravel, and, as a result of its stratigraphic position, this geologic unit forms the bulk of the unconfined aquifer (along with localized areas of saturated alluvium and fill). Published well records indicate that the Trenton gravel can be a prolific aquifer (Paulachok, 1991). Nevertheless, due to lateral changes in Trenton gravel thickness and to its heterogeneous character, hydraulic properties and groundwater yields can vary widely. Stantec reviewed published data and available on-site aquifer testing data regarding the hydraulic properties of the Trenton gravel and presented those data in the AOI 1 RIR (Stantec, 2016) which are included as Figures 9 and 10 in this report.

A nearly 7-day groundwater extraction test was conducted at recovery well RW-2 at the Philadelphia Refinery (IST, 1998). During testing, RW-2 was pumped at a constant rate of 225 gallons per minute (gpm). Distance-drawdown data analyzed along transects of observation wells suggested that the area of influence extended approximately 1,680 feet from the pumping well under relatively isotropic conditions. The hydraulic conductivity (k) was estimated to be greater than 400 feet per day (ft./d). More recently, a 24-hour pumping test was conducted at the former DSCP property at monitoring well DSCP-MW-65, a well that appears to be screened across the Trenton gravel and underlying sandy Cretaceous deposits (ARCADIS, 2013). Analysis of that data provided in the referenced report supports comparable aquifer properties at that site. However, it is noted





that during the test, the Trenton gravel was dewatered and individual aquifer  $k$  values could not be calculated/resolved. Other, in-situ, single well instantaneous displacement tests and short-duration pumping tests for remedial system design suggest a much lower  $k$  for the Trenton gravel, on average, but test results vary widely, from less than 1 ft./d to over 600 ft./d. The observed wide range in  $k$  values over relatively short distances is consistent with this geologic unit's lithologic heterogeneity.

### **2.2.1.3 Cretaceous Deposits**

Many studies of the Atlantic Coastal Plain near the Philadelphia Refinery have identified the presence of Cretaceous age sediments in the subsurface. These are the oldest sedimentary deposits in the area and are configured in a southeasterly-thickening wedge, overlain by the much younger Quaternary deposits described above and underlain by Piedmont crystalline bedrock. Greenman et al. (1961) detailed the age, character, configuration, and hydraulic properties of these deposits in southeastern Pennsylvania. At the time of that publication, the Cretaceous deposits were assigned primarily to the Raritan Formation and noted to represent three distinct, fining-upward cycles of non-marine sedimentation. Similarities to lithologic sequences identified on borehole logs were correlated to previously-identified strata at their type locality in New Jersey, where the deposits are much thicker and more easily distinguished. Other similar, near time-equivalent geologic formations of Cretaceous age were elsewhere identified in Maryland and Delaware (Jordan, 1962), and more recently authors began wholly referring to the Cretaceous deposits in south Philadelphia as the Potomac-Raritan-Magothy (PRM) aquifer system.

In south Philadelphia, the PRM aquifer system is subdivided into six geologic units in order of increasing age:

- The upper clay unit
- Upper sand unit
- Middle clay unit
- Middle sand unit
- Lower clay unit
- Lower sand unit (Schreffler, 2001)

Near the Philadelphia Refinery, it is generally true that these units thin, intercalate, and exhibit gradual facies changes that make separation of individual units difficult. Total thickness of PRM deposits at the facility ranges from 0 feet, where Quaternary deposits are present atop bedrock, to more than 100 feet within paleochannels incised into bedrock. A structure contour map of the top of the bedrock surface is included as Figure 11. Details of the individual units based on boring log records and published descriptions as presented in the AOI 1 RIR (Stantec, 20016) are presented below.

#### **2.2.1.3.1 Upper Clay Unit**

The upper clay unit is a variegated clay/silt that is sometimes discernible from older clay units of the PRM where sandy and gravelly. In general, it is thin when compared to the other PRM clay units in





south Philadelphia, and in places distal to the Delaware River the upper clay may be entirely absent (Greenman et al., 1961). On the basis of geophysical log signature, others have mapped the upper clay to be at least 0.5 feet thick and up to 30 feet thick at the Philadelphia Refinery, exhibiting its greatest thickness in northern portions of the study area while pinching out to the south (IST, 1998). At the Philadelphia Refinery, Stantec assigned the upper clay to first occurrences of light brown, tan, mauve, yellow, gray, and less-commonly, red sandy, silty clay beneath the Quaternary alluvium. However, overall stratigraphic correlation of the PRM across the facility supports the upper clay unit pinching out or being truncated by younger deposits throughout most of the AOIs (Figure 8).

The upper clay unit by nature acts as a confining or leaky confining bed. Where present, it creates hydraulic separation between the upper sand unit and water-table aquifer.

#### ***2.2.1.3.2 Upper Sand Unit***

The upper sand unit is a varicolored but predominantly brown to gray sand with varying amounts of gravel, clay, and silt (Greenman et al., 1961). Nearer the Philadelphia Refinery, it has been described as mostly silty and/or clayey fine to medium sand (IST, 1998). Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable, from the coarser and more heterogeneous Trenton gravel above. Stantec used color and lithologic changes, in addition to subtle changes in drilling conditions including Standard Penetration Test (SPT) blow counts, to make "picks" on upper sand occurrences (Stantec, 2016) to create the current geologic interpretation for the facility. In general, the upper sand appears restricted to northern portions of the refinery (AOIs 1, 2, 4, and 8) where it subcrops the Trenton gravel. The upper sand unit, where present, rarely exceeds 10 to 20 feet in total thickness.

The upper sand unit is an excellent aquifer where its thickness and extent are sufficient (Greenman et al., 1961). Aquifer testing of the upper sand unit in New Jersey has indicated that the aquifer has similar hydraulic properties to the middle and lower sand units where discrete (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any existing testing data for wells discretely screened across the upper sand unit from which to infer sole hydraulic properties (Stantec, 2016). The upper sand generally occurs in pockets beneath the Philadelphia Refinery and comprises a portion of the unconfined aquifer. Most wells that fully penetrate the unconfined aquifer in northern areas of the refinery may intersect and be influenced by the hydraulic properties of the upper sand.

#### ***2.2.1.3.3 Middle Clay Unit***

Whereas other clay units of the PRM are described as being sandy and gravelly in places, the middle clay unit is generally regarded as being a laterally extensive and uniformly massive confining bed of thick, red and white clay with very little sand (Greenman et al., 1961). Near the Philadelphia Refinery, others have found the middle clay to be nearly continuous in the subsurface (IST, 1998). Thicknesses of the middle clay unit generally range from approximately 20 feet, near the Belmont Terminal area, to just over 1 foot in southeastern AOI 1. While the middle clay appears to be everywhere present, at least on the eastern side of the Schuylkill River, its characteristically muddy texture can vary and become finely-laminated/bedded and intercalated with muddy sand. West of the Schuylkill River and particularly under areas north of Point Breeze, the middle clay unit (in





addition to most if not all of the PRM) appears to have been incised and completely removed by erosion. Downgradient, nearer AOI 9 and the George C. Platt Bridge, some pockets or thin lenses of middle and/or lower clay may be present under a thick section of Quaternary alluvium. At other locations beneath the Philadelphia Refinery, the middle and lower clay units appear to be in direct contact with each other, where the middle sand is absent (Stantec, 2016).

The middle clay unit, in places resting directly on and combining with the lower clay unit, acts as a significant confining bed at the Philadelphia Refinery. In a regional context, it creates hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer(s) of the middle and/or lower sand units.

#### ***2.2.1.3.4 Middle Sand Unit***

The middle sand unit is a light-colored, stratified, fine to coarse sand with occasional gravel and clay that was generally deposited in lenticular masses along the axes of troughs carved into the lower clay unit (Greenman et al., 1961). As such, it is by nature discontinuous in the subsurface. Stantec has mapped the presence of middle sand at the Philadelphia Refinery based on stratigraphic position and where present, is commonly described on boring logs as brown or orange sand and gravel. In some areas where the lower clay was entirely removed, it may be indistinguishable from and rest unconformably atop the lower sand unit. At those locations, Stantec used subtle changes in sample descriptions, including color and/or texture, of the sequences of sand below the middle clay to infer the contact between those units. The middle sand unit, where discernable from the lower sand, has been observed at thicknesses up to approximately 15 feet beneath the Philadelphia Refinery and is generally thickest in lenticular or tabular bodies.

Much like the other sand units of the PRM, the middle sand unit can be a prolific aquifer where it is laterally continuous and of sufficient thickness. Aquifer testing of the middle sand in New Jersey has indicated that the aquifer has similar hydraulic properties to the lower sand unit (Navoy and Carleton, 1995). At the Philadelphia Refinery, Stantec did not identify any wells discretely screened across the middle sand unit from which to infer sole hydraulic properties (Stantec, 2016). Most deep refinery wells are screened in the lower sand, or potentially across the lower and middle sand units, where hydraulically connected.

#### ***2.2.1.3.5 Lower Clay Unit***

Published descriptions of the lower clay unit indicate that it appears very similar to, and is sometimes inseparable from, the middle clay unit where the middle sand is absent. The lower clay is generally tough, red clay but is known from drilling records to contain softer zones of gray clay stratified with fine sand. The lower clay tends to exhibit its greatest thickness along the lateral margins of paleochannels in underlying bedrock, and can be thin to absent along the axes of paleochannels where eroded prior to deposition of the middle sand unit (Greenman et al., 1961). Of the PRM clay units, Stantec has interpreted the lower clay unit to be the least significant at the Philadelphia Refinery in terms of both its lateral extent and vertical thickness. (Stantec, 2016) This is based on stratigraphic correlation and likely the result of erosion prior to deposition of the middle sand. Generally gray and red, commonly sandy clay and muddy sand zones were assigned to the lower clay if observed below and distinguishable from the middle clay. Where present, the lower clay was observed at thicknesses ranging from less than 1 foot to no greater than 10 feet. The





lower clay appears to thicken and become more continuous to the south and east of the Philadelphia Refinery.

Where physically connected, the lower and middle clay units combine to form a significant confining bed at the Philadelphia Refinery. In a regional context, they create hydraulic separation between the unconfined aquifer and deeper, confined to semi-confined aquifer of the lower sand unit. The lower clay can also create localized areas of hydraulic separation between the lower and middle sands, where discretely present.

#### **2.2.1.3.6 Lower Sand Unit**

The lower sand unit is a varicolored but predominantly white to yellow sand with gravel, usually fining upward to a cap of fine to medium sand with occasional yellow and gray clay lenses. As further described below, the lower sand unit is the oldest of the PRM deposits and rests unconformably atop bedrock. The lower sand is generally thickest (up to 87 feet thick) along the axial troughs of paleochannels carved into bedrock by discharge through former positions of the Schuylkill and Delaware Rivers (Greenman et al., 1961). At the Philadelphia Refinery, the lower sand unit is present as a nearly continuous deposit, with the exception of some areas west of the Schuylkill River where it appears that the river entirely removed the PRM. Where present, the lower sand unit is observed to range in thickness from approximately 20 feet to a maximum of just over 50 feet, where it fills a bedrock paleochannel beneath a portion of AOI 1. Philadelphia Refinery borehole logs indicate that the lower sand unit is commonly yellow, white, and pale gray in color and predominantly medium to coarse sand with gravel, or gravel with sand. The lower sand's gravelly texture beneath the refinery has been well documented on drilling logs.

Of the PRM aquifer system, it can be argued that the lower sand unit was historically the most important groundwater resource in south Philadelphia. Figure 10 summarizes hydraulic information available for the lower sand unit, based on published aquifer testing results. Proximal to the Philadelphia Refinery at the Philadelphia Naval Shipyard (PNSY), a wealth of historical testing data is available for the lower sand unit and indicates an average  $k$  value of approximately 134 ft./d. Across the Delaware River in New Jersey,  $k$  values seem to be slightly higher. At the Philadelphia Refinery, there are several wells that appear to be discretely screened within the lower sand unit. However, Stantec did not identify any aquifer testing data derived from testing of onsite lower sand wells (Stantec, 2016). It is noted that Stantec recently installed two new AOI 4 monitoring wells screened within the lower sand unit aquifer. Those wells will be utilized for the collection of slug test data and for two short-duration, constant-rate pumping tests to estimate lower sand hydraulic properties at the Philadelphia Refinery. The data from this testing will be submitted in future Act 2 submittals.

### **2.2.2 Bedrock**

Bedrock beneath the Coastal Plain near south Philadelphia has been inferred from surface outcroppings above the "Fall Line," and has been described in the subsurface where penetrated by past drilling activities. Bosbyshell (2008) has mapped schist of the Wissahickon Formation to occur in Philadelphia along the "Fall Line" (Figure 6). Relatively small bodies of granitic gneiss, resulting from igneous intrusions into the country rock during metamorphism, can also be present. Most





boring log records of deep holes drilled at the Philadelphia Refinery indicate that schist is present beneath the Coastal Plain, in agreement with published maps.

Available data pertaining to the bedrock surface beneath the Philadelphia Refinery suggests that the surface generally dips to the southeast but contains local complexity. Greenman et al. (1961) recognized the presence of four paleochannels incised into bedrock and attributed those features to previous positions of the Schuylkill River. Two of those channels, referred to as the Schuylkill River and League Island Troughs by those authors, occur beneath parts of the Philadelphia Refinery and influence the total thickness of the Coastal Plain sedimentary sequence above them (Figure 11). Through boring log review, Stantec has identified additional detail in the bedrock surface beneath the Philadelphia Refinery, including a small bedrock paleochannel beneath the southern portion of AOI 1 that appears to be an extension of the League Island Trough, and a few localized bedrock surface highs (pinnacles) (Stantec, 2016).

In general, bedrock can store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). Bosbyshell (2008) indicates that the Wissahickon Formation can yield up to 20 gpm to wells in the mapped area above the "Fall Line." Balmer and Davis (1996) indicate that in Delaware County, Pennsylvania, the Wissahickon Formation is the most productive of the consolidated rock aquifers present in that county and can yield anywhere from 0 gpm to 300 gpm to wells (data from 127 wells). However, the wells included in their report were generally located above the "Fall Line" and were not screened below significant accumulations of Coastal Plain sediments. In general, when compared to the permeability and thickness of the Coastal Plain deposits, the water-bearing properties of the Wissahickon Formation beneath the Philadelphia Refinery are considered de-minimis.

### **3. Soil Investigation**

The following sections summarize the soil investigation activities performed in AOI 7. Previous investigations are summarized in Section 3.1. The site characterization activities conducted for this RIR in 2016 were completed by Aquaterra, Stantec, and GHD, on behalf of Evergreen. The goal of the 2016 activities was to characterize soil in potential source areas, such as historic product handling and storage locations, former hazardous waste tanks, open storage tank incident areas, and known product releases. In addition to collecting soil samples from borings advanced for the source-targeted soil investigations, soil samples were collected during monitoring well installation activities regardless of whether the area was expected to contain a source of petroleum compounds in soil.

All characterization fieldwork was performed in accordance with Evergreen's *Quality Assurance/Quality Control Plan and Field Procedures Manual* (Appendix B). Soil borings were advanced using a variety of methods including hand auger, backhoe, split spoons in conjunction with hollow stem augers, and split spoons driven using direct push methods. The general strategy for the investigation was to characterize soil in the 0 to 2 ft. bgs and greater than 2 ft. bgs intervals (unsaturated soil). Generally, subsurface soil samples were collected at the depth exhibiting the highest photoionization detector (PID) response and/or above the water table. Delineation was completed to the non-residential direct contact MSC and the numeric SSS (for lead). Table 2





summarizes the soil boring rationale and soil boring logs are included in Appendix C. All soil analytical results are summarized on Tables 3a and 3b, which compares the results to the 1) non-residential SHS (as previously defined in this report, the more stringent of the soil to groundwater numeric value and the direct contact value), 2) the non-residential direct contact MSC, and 3) the numeric SSS (for lead) (Soil Screening Levels). Samples were analyzed for the Petroleum Short List of compounds. Three samples were also analyzed for mercury and hexavalent chromium based on historic operations in specific areas. Analysis of soil samples was conducted by Lancaster Laboratories. All laboratory analytical reports from this investigation work are included in Appendix D.

### **3.1 Summary of Previous Soil Analytical Results**

To supplement data previously collected as part of the historical RCRA investigations, two additional site characterization/remedial investigations were completed in AOI 7 in 2010 and 2011. During these investigations, a total of 33 shallow soil borings and 15 new monitoring wells were installed in 2010 and an additional 21 monitoring wells were installed in 2011 to investigate LNAPL in the vicinity of the No. 3 and 4 Separators. Information from these investigation is presented in the 2010 SCR/RIR (Langan, 2010) and the 2012 SCR/RIR (Langan, 2012). The soil borings completed in the SWMU areas include; SWMU 87 (8 soil borings); SWMU 88 (6 soil borings); SWMU 89 (6 soil borings); SWMU 90 (8 soil borings); and SWMU 91 (5 soil borings). A total of 9 soil additional borings were advanced outside of the SWMU areas at unpaved areas. An additional 24 borings were completed in 2012 and 3 borings were completed in 2013 to support additional characterization activities. The data from all of the borings were analyzed for the Petroleum Short List. There was no evidence of leaded tank bottoms in the five SWMU areas, none of the soil samples had exceedances of the current non-residential direct contact MSCs or the numeric SSS (lead). A limited number of the soil samples had exceedances the current non-residential soil to groundwater MSCs for the ethylene bromide, benzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and 1,2-dichloroethane. The locations of the soil borings are shown on Figure 2, as historic soil borings, the soil data from these investigations is summarized in Tables 4a and 4b. The 2010 and 2012 SCR/RIR are included in Appendix I.

AOI 7 includes ASTs and many soil samples have been collected for tank characterization and closure under 25 PA Code Chapter 245, in addition to sampling completed as part of the Act 2/One Cleanup Program. Although the rationale and results of all of these soil sampling projects are not discussed in detail in this RIR, as they have been submitted to PADEP under 25 PA Code Chapter 245 reporting, they are relevant to the characterization of AOI 7 under Act 2. The analytical results for these tank-related assessments are included on Tables 4a and 4b, and the soil sample locations are shown on Figure 2 as historic sample locations. The investigation of select tank incidents was performed as part of the field effort for this RIR, and those results are discussed in the following sections.

### **3.2 Historic Product Handling/Storage Areas**

In order to investigate areas of historic product handling and storage, eleven soil borings (AOI7- BH-16-34 through BH-16-44) were advanced within the footprints of former tanks during the 2016 site characterization activities. Aerial photos were reviewed to identify locations of historically





removed ASTs. In the field, the former tank footprints were evaluated for evidence of impacts (i.e., surface staining, distressed vegetation). No visual impacts were noted during the field activities, so each soil boring was advanced in the center of each former tank footprint. None of the collected soil sample results exceeded the non-residential soil to groundwater or direct contact MSCs, or the numeric SSS (for lead).

### **3.3 Open Storage Tank Incidents**

Evergreen intends to address all open AOI 7 storage tank incidents for which it is responsible through the 25 PA Code Chapter 245 CAP Program under separate cover. In 2014, the PADEP provided Evergreen with a list of the open Evergreen tank incidents in the PADEP database for AOI-7 as summarized in Table 5. Soil characterization activities were conducted to further investigate several open storage tank incidents within AOI 7. For borings associated with storage tank incidents that involve releases within tank berms, soil analytical results are presented in this RIR for informational purposes only as they relate to overall AOI 7 soil characterization. These data will be used in separately prepared SCRs for the identified open storage tank incidents, which will be submitted under separate cover to the PADEP in order to satisfy the requirements of 25 PA Code Chapter 245. The following summarizes the incidents that the PADEP provided to Evergreen, available information for these tanks, completed investigation activities during the 2016 site characterization activities and whether this tank will have a separate SCRs submitted to fulfill the requirements of 25 PA Code Chapter 245.

This section also includes groundwater data from the 2016 site characterization activities, if applicable to the discussion of the Tank Incident. The groundwater results are further discussed in Section 4.

#### **3.3.1 UST 002/003, Incident 5825 and UST, Incident 5915**

Two underground storage tanks (UST 002 and UST 003) were reported to be in AOI 7 and were assigned incident numbers 5825 and 5915 by the PADEP. Evergreen reviewed their records and UST 002 and UST 003 are actually located in AOI 5. Therefore, no investigation was completed to address UST 002 and 003 as part of this AOI 7 RIR.

#### **3.3.2 Tank 270 (Former Tank Number GP 270, Former PADEP Tank 032A, Incident 40386)**

Tank 270 was an AST primarily used to store recovered oil. A release of approximately 2,720 gallons was reported to the PADEP on June 28, 2009. Incident No. 40386 was assigned to Tank 270 by the PADEP. Stantec submitted an SCR dated November 23, 2009 which detailed the excavation and soil sampling completed in response to the release. Stantec collected 15 soil samples at 0- to 6-inch intervals from the sidewalls of the excavation and analyzed the samples for the PADEP's short list of constituents for Fuel Oil No. #4, #5, #6, and waste oil. On November 6, 2013, PADEP approved that the SCR demonstrated that the SHS was achieved in soil for the Act 2 parameters. The PADEP re-affirmed this approval in an April 13, 2016 email to Evergreen.

A request to close the incident for Tank 270 will be included in the separate SCR to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.





### **3.3.3 Tank 271 (PADEP Tank 033A, Incident 29142)**

Tank 271 was an AST which formerly was used to store crude oil. Sunoco completed an in-place closure report on May 16, 2002. Soil samples were collected in June 2002 from six Geoprobe soil borings, GP1-GP-6. The samples were analyzed for PADEP Act 2 short list of parameters for Fuel Oil #4, #5, #6, and Lubricating Oils and Fluids. The samples GP-4 (1.5 to 2.0 ft. bgs) and GP-5 (1.5 to 2.0 ft. bgs) exceeded the nonresidential soil-to-groundwater MSCs for benzene. All of the soil results were below the non-residential direct contact MSC. Samples from the locations that exceeded the soil to groundwater MSCs were also analyzed using the Synthetic Precipitation Leaching Procedure (SPLP) for benzene. The SPLP result from GP-5 was non-detect. The SPLP result from GP-4 exceeded the non-residential groundwater MSC. Sunoco notified PADEP on June 26, 2002 of a reportable release from Tank 271 of an unknown quantity. PADEP responded on July 31, 2002 with an issue of a Notice of Violation (NOV) and incident No. 29142 was assigned to this release. Sunoco submitted a SCR for Tank 271 in December 2002.

Since none of the soil samples exceeded the non-residential direct contact MSC, no additional soil samples were collected from Tank 271 during the 2016 site characterization activities. A groundwater sample was collected in C-58 and C-136 during the 2016 site characterization activities to characterize groundwater downgradient of Tank 271. The results from C-58 and C-136 did not have any exceedances of the non-residential MSCs during the 2016 site characterization activities for benzene or any other COCs. This result was consistent with the 2010 groundwater sample from C-58 which did not have any exceedances of the non-residential groundwater MSCs.

Tank 271 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

### **3.3.4 Tank 272 (Former PADEP Tank 054A/034A, Incident 45694 and 42279)**

Tank 272 is an AST primarily used to store crude oil. On November 11, 1993, approximately 126 gallons of crude oil was reportedly released from Tank 272. The contaminated soil was removed for off-site treatment and the Pennsylvania Department of Environmental Resources (PADER the predecessor for the PADEP) was notified on November 12, 1993. Incident No. 45694 was assigned by the PADER. On March 8, 2011, an unknown quantity of crude oil was reportedly released and PADEP was notified on March 9, 2011. Incident No. 42279 was assigned to this incident. During the 2016 site characterization activities, four borings (BH-16-009 to BH-16-012) were completed for Tank 272. None of the soil results exceeded the non-residential soil to groundwater or direct contact MSCs, or the numeric SSS (for lead).

A groundwater sample was collected in C-58 and C-136 during the 2016 site characterization activities to characterize groundwater downgradient of Tank 272. The results from C-58 and C-136 did not have any exceedances of the non-residential MSCs during the 2016 site characterization activities. This result was consistent with the 2010 groundwater sample from C-58 which did not have any exceedances of the non-residential groundwater MSCs.

GP 272 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.





### **3.3.5 Tank 273 (Former PADEP Tank 035A, Incident 45697)**

Tank 273 is an AST primarily used to store residual oil. A release of approximately 78 gallons reportedly occurred on June 6, 1995. The impacted materials were removed by Sunoco. PADER was notified and Incident No. 45697 was assigned to this release. During the 2016 site characterization activities, four borings (BH-16-013 to BH-16-016) were completed for Tank 272. None of the soil results exceeded the non-residential soil to groundwater or direct contact MSC, or the numeric SSS (for lead). Groundwater was assessed by evaluating groundwater in downgradient well C-132. Groundwater results in C-132 were below the non-residential groundwater MSC during the 2016 site characterization activities.

Tank 273 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

### **3.3.6 Tank 275 (Former PADEP Tank 057A, Incident 45689)**

Tank 275 was an AST used primarily to store residual oil. A release of approximately 84 gallons reportedly occurred on September 16, 1991. Chevron notified PADER on September 17, 1991 and Incident No. 45689 was assigned by the PADER. The contaminated soil was removed and disposed of off site, as documented in the October 28, 1991 letter submitted to PADER. On May 25, 2006, a 30-Day Notification of Intent to Close Aboveground Storage Tanks was submitted to PADER with the intention of permanently closing and demolishing Tank 275. An Amended Tank Closure Report was completed on December 28, 2006 following the demolition of the tank. On January 7, 2008, a Tank Closure Confirmatory Sampling Activities Report was submitted for the closure of AST 275. Activities completed as part of the tank closure included; 6 perimeter soil samples, 3 subsurface from tank soils and 4 samples adjacent to an aboveground pipe line. Each soil sample was analyzed for PADEP Act 2 short list of parameters for Fuel Oil numbers 4, 5, and 6 and used motor oil (except lead). There were no exceedances in soil samples for nonresidential soil to groundwater or direct contact MSCs from these samples.

Since the soil sample data collected during the tank closure activities did not exceed the SHS, no additional soil data was collected as part of the 2016 characterization activities. Groundwater sampling in C-58, C-96 and C-131 characterized groundwater quality in the area of Tank 275. The two downgradient wells C-58 and C-96 did not have any exceedances of the groundwater non-residential MSCs during the 2016 site characterization activities. Side-gradient well C-131 had one detection of BaP which slightly exceeded the non-residential groundwater MSCs during one of the two groundwater sampling events. No other results exceeded the non-residential groundwater MSCs during both events.

GP 275 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

### **3.3.7 Tank 277 (Former PADEP Tank 039A, Incident 38132)**

Tank 277 was an AST used primarily to store heavy gas oil. On September 16, 2006, a 30-Day Notification of Intent to Close Aboveground Storage Tanks was submitted to PADEP with the intention of permanently closing and demolishing Tank 277. An Amended Tank Closure Report was completed on December 28, 2006 following the demolition of the tank. A Closure Confirmatory





Sampling Activities Report was submitted on September 12, 2007 which included the results from 12 samples. Each soil sample was analyzed for PADEP Act 2 short list of parameters for Fuel Oil numbers 4, 5, and 6 and used motor oil (except lead). None of the soil results exceeded the non-residential soil to groundwater or direct contact MSCs with the exception of 10 benzene samples which exceeded the soil to groundwater MSCs. All the samples met the non-residential direct contact MSC.

Since all of the data collected during the closure confirmation sampling met the non-residential direct contact MSC, no additional soil data was collected during the 2016 site characterization activities. Groundwater sampling in C-112 characterized groundwater quality in the area of Tank 277 during the 2016 site characterization activities. MW-112 did not have any exceedances of the non-residential groundwater MSCs during the 2016 site characterization activities.

### **3.3.8 Tank 281 (Former PADEP Tank 043A, Incident 5913 and 30777)**

Tank 281 is an AST used primarily to store heavy gas oil. On September 18, 1999, approximately 84 gallons was reported released from Tank 281. PADER was notified on September 19, 1999 and Incident No. 30777 was assigned by the PADEP. On November 24, 2001, approximately 200 gallons of gas oil was reportedly released from Tank 281. Free product was recovered and contaminated soil was removed to be disposed of off-site. PADEP was notified on November 24, 2001 and Incident No. 5913 was assigned by the PADER. During the 2016 site characterization activities, four borings (BH-16-005 to BH-16-008) were completed for Tank 281. None of the soil results exceeded the non-residential soil to groundwater or direct contact MSC, or the numeric SSS (for lead). Groundwater was assessed by evaluating groundwater in downgradient well C-96, which did not exceed the nonresidential groundwater MSCs in the 2016 site characterization activities.

Tank 281 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

### **3.3.9 Tank 1002 (PADEP Tank 139A, Incident 36456)**

Tank 1002 was an AST used primarily to store recovered oil. On April 14, 2004, Sunoco submitted notification of permanent closure of Tank 1002. On January 12, 2006, Sunoco submitted a 30-day Notification of Intent to Close Aboveground Storage Tanks letter to PADEP. Sunoco notified the PADEP of a release on May 2, 2005 and the PADEP assigned incident number 36456. On June 26, 2006, Sunoco submitted a 90 Day Site Characterization Status Report detailing the results of the five collected samples to document the closure activities. All of the soil results met the non-residential soil to groundwater and direct contact MSCs, with the exception of one sample which exceeded the non-residential soil to groundwater MSCs for benzene and naphthalene. All the soil results were below the non-residential direct contact MSC.

Since the data collected during the SCR activities did not exceed the non-residential direct contact MSC no additional soils samples were collected during the 2016 site characterization activities. Groundwater sampling in C-104 characterized groundwater quality in the area of Tank 1002 during the 2016 site characterization activities. C-104 did not have any exceedances of the groundwater non-residential groundwater MSC during the 2016 site characterization activities. C-104 did have exceedances of the non-residential MSCs in 2015 for benzo(a)pyrene in 2014 and 2015 and for





benzo(g,h,i)perylene in 2015. C-104 had no exceedances for all COCs during three sampling events in 2016.

Tank 1002 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

#### **3.3.10 GP 1100 (PADEP Tank 140A, Incident 36578)**

Tank 1100 was an AST used primarily to store slop oil/recovered oil. On April 14, 2004, Sunoco submitted notification of permanent closure of Tank 1100. Sunoco notified the PADEP of a release from Tank 1100 on May 31, 2006 based on the results of the soil characterization results. Sunoco submitted a 90-site characterization report to the PADEP which documented the results of the eight soil samples collected to support the tank closure. One soil sample had a benzene exceedance of the soil to groundwater MSC for benzene and another sample (GP-1100-CV2) had a Benzo(a)pyrene (BaP) exceedance of the non-residential direct contact MSC. None of the other soil results exceeded the soil to groundwater or direct contact MSCs. The 2016 site characterization activities completed delineation of the BaP sample that had direct contact MSC exceedance with borings BH-16-017 and BH-16-018. Groundwater was assessed by evaluating groundwater in downgradient wells C-157 and C-163 during the 2016 site characterization activities. Both C-157 and C-163 did not have exceedances of the groundwater non-residential SHS during the 2016 site characterization activities.

Tank 1100 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

#### **3.3.11 Tank 1108 (Former PADEP Tank 149A, Incident 45700)**

Tank 1108 was an AST used to primarily store fuel oil #6. A release from Tank 1198 was reported to the PADEP on September 6, 1998, and Incident No. 45700 was assigned. On May 17, 2000, Sunoco submitted an Aboveground Storage Tank System Closure Notification Form to PADEP with the intent to remove the tank. An Amended Registration Permanent Closure Report was submitted to PADEP on August 29, 2000. During the 2016 site characterization activities, three borings (BH-16-001 to BH-16-003) were completed for Tank 1180. BH-16-004 could not be installed due to access restrictions. None of the results from these borings exceeded the soil to groundwater or non-residential direct contact MSCs. Groundwater was assessed by evaluating groundwater in downgradient well C-54 during the 2016 site characterization activities. C-54 did not have any exceedances of the non-residential groundwater MSCs during the 2016 site characterization activities.

GP 1108 will be included in the separate SCR prepared for the tanks in AOI 7 to be submitted to the PADEP in accordance with 25 PA Code Chapter 245.

#### **3.3.12 UST M5, Incident 45686/45699 and UST M4, Incident 6134**

GPM005 (M5) was a fiberglass UST used to primarily store diesel oil. GPM004 (M4) was a fiberglass UST used to primarily store recovered oil. A leak was detected in M5 in September 1990, and the tank was taken out of service. Repairs to the UST M5 were complete in January 1991 and Incident No. 45686 was assigned to this incident by the PADER. USTs M5 and M4 were removed in





November 1997, and a closure report was submitted in June 1998. On May 8, 1998, Sunoco submitted a Notification of Reportable Release and Incident No. 45699/NOV was assigned to this release by the PADEP. PADEP sent a letter to Sunoco on March 17, 1999 and rescinded the NOV based on documentation received by PADEP indicating the UST was in compliance with the 1998 UST technical upgrade or closure requirements before December 22, 1998.

On March 2, 1999, a Site Assessment Report was submitted by Handex for UST M5/M4. The soil investigation activities completed during the tank removal in 1998 included the collection of eight soil samples. None of soil samples exceeded the soil to groundwater or direct contact MSCs. Groundwater samples collected from the excavation of UST M-5/4 had exceedances of the non-residential groundwater MSCs for benzene and toluene. Groundwater samples collected from wells C45, C60, C55, and C56 on August 26, 1998 did not have exceedances of the non-residential groundwater MSCs.

During the 2016 site characterization activities, a new monitoring well (C-172) was installed in the location of former UST M-5/4, as shown on Figure 2. Soil samples were collected during the monitoring well installation and the results of this sampling did not exceed the soil to groundwater or direct contact MSCs or the numeric SSS (for lead). Two groundwater sampling events were completed in C-172 during the 2016 site characterization activities and none of the groundwater results exceeded the non-residential groundwater MSCs.

### **3.4 Historic Releases**

The following section discusses known historic releases that were investigated as part of the AOI 7 characterization activities. As part of the remedial investigation under Act 2, historic releases that could have created sources for COCs in soil were identified based on the available information. In order to identify areas that would require further investigation, a review of internal facility files was completed. PADEP also reviewed its records and provided information on historic incidents.

Based on information obtained, targeted soil investigations were performed as described in the following subsections. This section also includes groundwater data from the 2016 site characterization activities, if applicable. The groundwater results are also further discussed in Section 4.

#### **3.4.1 Crude Oil at M Avenue at 1232 Unit**

There was a release from a 24-inch crude line that runs from Tank 272 to the 1232 Unit. Based on field observations and limited access, one soil boring (BH-16-027) was completed in the area potentially impacted by this release according to site personnel, which was reportedly at M Avenue near 1232. The 0 to 2 ft. bgs sample from BH-16-027 had no exceedances of the non-residential soil to groundwater or the direct contact MSC, or the numeric SSS (for lead). A deeper sample could not be completed due to refusal. Groundwater sampling in monitoring well C-163 and C-51 was completed during the 2016 site characterization activities and all the results were below the nonresidential groundwater MSCs.





#### **3.4.2 Slop Oil Backup from Sewer Near 1232 Unit**

According to site personnel, there was a reported backup in the slop oil line from the sewer which occurred near the bulkhead. Soil boring BH-16-028 was completed in the vicinity of this area, and groundwater sampling was completed in C-157 and C-163 as part of the 2016 site characterization activities. Both the 0 to 2 ft. bgs and the 2 to 15 ft. bgs soil samples from BH-16-028 did not exceed the non-residential soil to groundwater or direct contact MSC or the numeric SSS (for lead). The groundwater samples from C-157 and C-163 met the non-residential groundwater MSCs.

#### **3.4.3 Charge Line from Tank 284 to Tank 1232 Unit**

A former release from the charge line between Tank 284 and 1232 Unit was investigated. According to refinery personnel, the line runs outside of the tank berm in that area. Four soil borings, BH-16-019 to BH-16-022, and groundwater sampling in C-130 and C-51 were completed as part of the 2016 site characterization activities for this area. The soil results from these borings did not exceed the non-residential soil to groundwater or direct contact MSCs, or the numeric SSS (for lead). The groundwater results from C-130 and C-51 were below the groundwater non-residential SHS.

#### **3.4.4 9th and L Ave between Unit 433 and Tank 1232 Unit**

A former release occurred from a line which ran along L Avenue between 433 and 1232 Unit. Four soil borings, BH-16-023 to BH-16-026, and groundwater sampling from monitoring wells C-54, C-58 and C-136 were completed during the 2016 site characterization activities. Each boring had a 0 to 2 ft. bgs and 2 to 15 ft. bgs soil samples which did not exceed the non-residential soil to groundwater or direct contact MSC, or the numeric SSS (for lead), with the exception of BH-16-025 which has exceedances of the soil to groundwater MSCs for benzene and naphthalene. The groundwater results from C-54, C-58 and C-126 were below the groundwater non-residential MSC.

### **3.5 Additional Investigation Areas**

The following section discusses additional investigation areas that were investigated as part of the AOI 7 2016 site characterization activities. As part of the remedial investigation under Act 2, historical activities that could have impacted soil were identified based on the available information. In order to identify areas that would require further investigation, a review of internal facility files was completed.

Based on information obtained, targeted soil investigations were performed as described in the following subsections. This section also includes groundwater data from the 2016 site characterization activities, if applicable. The groundwater results are further discussed in Section 4.

#### **3.5.1 Former Incinerator**

No post closure data was available from the area of the former incinerator after it was closed, cleaned and partially dismantled in 1999. Although there were no documented releases from the incinerator, boring BH-16-045 was completed during the 2016 site characterization activities to verify that there were no impacts from the former incinerator. In addition to the COCs in Table 1, the soil sample was analyzed for hexavalent chromium and mercury. The soil sample from BH-16-045





had no exceedances of the non-residential soil to groundwater or direct contact MSCs, or the numeric SSS (for lead).

### **3.5.2 Former Sludge Basins**

The former sludge basins were closed in 1999 by power washing, testing the sump water, concrete coring and concrete analyses. All the collected data met appropriate criteria in 1999. The HDPE and concrete were then removed and the area backfilled. The 2016 site characterization activities completed soil boring BH-16-046 at the perimeter of the former sludge basins. In addition to the COCs in Table 1, the soil samples were analyzed for hexavalent chromium and mercury. The soil results from the 0 to 2 ft. bgs and 2 to 15 ft. bgs soil samples did not exceed the non-residential soil to groundwater or direct contact MSC, or the numeric SSS (for lead), with one exception. Mercury barely exceeded the SHS in the 0 to 2 ft. bgs soil sample but did not exceed the nonresidential direct contact MSC.

### **3.5.3 Former Hazardous Waste Tanks (1004-1007)**

No releases from these tanks were noted in any of the reviewed information. The 2016 site characterization activities included one boring, BH-16-047, from the location of these tanks. In addition to the COC list summarized in Table 1, soils were also analyzed for hexavalent chromium and mercury. None of the soil results exceeded the non-residential soil to groundwater or direct contact MSC, or the numeric SSS (for lead). No additional closure information was available for these tanks.

## **3.6 Delineation of Direct Contact MSC/SSS Exceedances**

In order to complete horizontal and vertical characterization in soil, areas exhibiting exceedances of the non-residential direct contact MSC and the SSS for lead were delineated. In one instance, the concentration of lead in historic sample BNA-10 from 2 to 4 ft. bgs was re-sampled for verification. These areas and associated investigations are described below.

- A historic soil sample collected in BNA-10 from 2 to 4 ft. bgs. had a lead detection above the numeric SSS for lead. BH-16-033 (2 to 4 ft. bgs) was completed to confirm this lead detection. Lead was not detected in this sample, so no additional soil samples were necessary for delineation for BNA -10.
- Lead had been reported exceeding the non-residential direct contact MSC in the 2010 SCR/RIR (Langan, 2010) for several samples. However, these data results were compared to the current numeric SSS for lead and none of these results exceeded the SSS, therefore no additional delineation was required for these historic lead results.
- One soil sample collected during investigation activities for Tank 1100 (GP-1100-CV2) had an exceedance of the direct contact standard for BAP. The soil samples from BH-16-017 and BH-16-018 delineated this exceedance for BaP.
- None of the data collected during the 2016 site characterization activities exceeded the non-residential direct contact MSCs.





### **3.7 Site Characterization in the 0-2 ft. bgs Interval, 2-15 ft. bgs Interval and Beneath LNAPL**

In response to PADEP comments to previous site characterization activities, additional soil sampling was completed to complete characterization in the 0 to 2 ft. bgs interval, 2 to 15 ft. bgs. Interval, and beneath LNAPL. These areas and associated investigations are described below.

- As shown on Figure 12a, none of the soil samples collected from the 0 to 2 ft. bgs interval during the 2016 site characterization activities exceeded the non-residential direct contact MSC and the numeric SSS (lead). Two locations exceeded the soil to groundwater MSCs, BH-16-025 (for benzene, naphthalene) and BH-16-046 (for mercury).
- The following locations had soil samples collected from the 2 to 15 ft. bgs. interval to complete site characterization in these areas since only shallow soil samples had been collected at these locations, not to delineate exceedances: BH-16-030 (for former C-169) , BH-16-031 (for former BH-10-20), BH-16-032-(for BH-12-56). All of the other 2016 borings included a 2 to 15 ft. bgs sample, if possible, to also address site characterization in this interval. None of the results from the samples collected from 2 to 15 ft. bgs exceeded the non-residential direct contact MSC, or the numeric SSS (for lead). Four locations exceeded the soil to groundwater MSCs for the following locations BH-16-025 (for benzene and naphthalene), BH-16-029 (benzene), BH-16-30 (benzene) or BH-16-43 (lead). The subsurface soil sampling results are presented on Figure 12b.
- Soil samples from BH-16-029 and BH-16-030 were specifically selected to be collected in the vicinity of monitoring wells C-143 and C-169, which have identified LNAPL to address the PADEP request for soil samples in LNAPL areas. None of the results from these samples exceeded the non-residential direct contact MSCs or the numeric SSS (lead). BH-16-029 and BH-16-030 exceeded the soil to groundwater MSC for benzene.

## **4. Groundwater Investigation**

### **4.1 Historic Groundwater Investigations**

Available well construction details are summarized in Table 6. Previous consulting reports describe and present results from various historic groundwater sampling events that have been conducted within AOI 7. All of the available analytical data for wells located in AOI 7, are presented in Table 7a and 7b and in the 2010 and 2012 SCR/RIR in Appendix I. Major groundwater sampling events summarized in Tables 7a and 7b include comprehensive events conducted in 2013 by Langan, and annual perimeter groundwater sampling events performed by Stantec. Review of the historic data show limited detections of lead, benzene and chrysene above the non-residential MSCs in groundwater.

### **4.2 Well Installation Activities**

This section describes well installation activities that were performed as part of the 2016 remedial investigation. Activities are discussed by purpose in order to clarify characterization goals. All fieldwork was performed in accordance with *Evergreen Field Procedures* (Appendix B). Monitoring





well locations are shown on Figure 2. Well logs, including both lithologic information and well construction details, are included in Appendix C. Well construction details are also summarized in Table 6. The following sections discuss the well installation strategy/rationale; however, a summary is also available as Table 2.

#### **4.2.1 LNAPL Delineation Monitoring Well Installation**

In order to better delineate LNAPL plumes interior to AOI 7, additional water-table monitoring wells, C-170 and C-171, were installed. Prior to the installation of the monitoring wells, well locations were cleared for subsurface utilities to 8 ft. bgs. using a hydrovac truck. Monitoring well installation activities were performed using hollow stem auger methods by Total Quality Drilling of Mullica, New Jersey under the oversight of GHD in July 2016. During borehole advancement, surface and subsurface soil samples were collected for laboratory analysis of the petroleum short list compounds. Continuous soil sampling using a split spoon sampler was performed. A GHD geologist screened soil with a PID and logged sample lithologies. LNAPL was not observed in either C-170 or C-171.

### **4.3 Groundwater Sampling Events**

A comprehensive characterization groundwater sampling event, consisting of 39 monitoring wells was conducted in July/August 2016. More focused events were conducted in May 2016 for C-104 and C-127 and in August/September 2016 for the newly installed wells (C-170, 171, and 173). All fieldwork was performed in accordance with *Evergreen Field Procedures* (Appendix B). Monitoring well locations are shown on Figure 2. All of the sampling was completed using low flow methodologies. All samples were analyzed for the petroleum short list COCs by Lancaster Laboratories, located in Lancaster, Pennsylvania.

Groundwater sampling analytical results, including all historic results for AOI 7, are summarized in Tables 7a, 7b, and 8 and in Appendix J. Groundwater results are also presented on Figures 19 and 20, for the water table and deep groundwater unit, respectively. Concentrations of the following COCs were detected above the non-residential MSC during the 2016 groundwater sampling events: benzene, isopropyl benzene, 1,2-dibromoethane (EDB), toluene, 1,2,4-TMB, xylenes, benzo(a)anthracene, benzo(a)pyrene, beno(g,h,i)pyrene, benzo(b)fluoranthene, chrysene, naphthalene, and lead. The following observations can be made concerning the groundwater exceedances.

- The groundwater MSC exceedances in C-57 and C-131 are delineated by non-detect concentrations in C-51, C-157 and C-163.
- The groundwater exceedances in C-146, C-150, C-152, C-161 and C-169 are associated with the 3 separator remedial system.
- The groundwater exceedance in C-62 is delineated by non-detect concentrations in C-106 and C-170.
- The remaining wells with groundwater MSC exceedances, C-104, C-127, C-145, and C-168, are located in close proximity to the bulkhead and do not have any wells that can delineate





these concentrations. The sample in C-168 was a groundwater sample collected beneath LNAPL.

- None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.

#### **4.4 Well Gauging Activities**

Stantec presently conducts annual groundwater and LNAPL gauging of all existing wells at the Philadelphia Refinery. The site-wide annual well gauging event, which is typically conducted during the second quarter of each year, is used to identify the presence of LNAPL and determine groundwater flow patterns. Liquid level measurements, groundwater contour figures, and product thickness figures are submitted to PADEP with the Philadelphia Refinery Remediation Program Groundwater Remediation Status Reports during the first half of each year. Groundwater elevation contours from the May 2016 annual gauging event are illustrated on Figure 13. In addition to the annual event, the wells included in the July and August 2016 groundwater sampling events were gauged as part of the September 2016 groundwater event and are shown on Figure 14.

## **5. Site-Specific Hydrogeologic Conditions**

In Section 2 above, details regarding the methodology and interpretation of regional geologic conditions were presented. The purpose of this discussion of site-specific conditions is to refine the regional hydrogeologic framework to summarize conditions observed beneath AOI 7, with an emphasis on groundwater occurrence, groundwater flow, and hydraulic head potentials. It is understood that although this RIR is designed to address subsurface conditions beneath AOI 7, PADEP has previously requested that investigations of individual AOIs look beyond the boundary of the AOI being investigated. As such, GHD has utilized well gauging from AOIs 5, 6, and 7. Groundwater contouring and evaluation of head conditions in the study area are included on Figures 13 and 15.

### **5.1 Geologic Formations and Units Observed**

On the basis of available lithologic data from boring logs, the principle of stratigraphic position, results of past investigations, review of historical maps, attempted correlation of observed lithologies across the study area to a published geologic framework (e.g., Quaternary deposits and the PRM aquifer system) documented in the AOI 1 RIR (Stantec, 2016), GHD has interpreted the following stratigraphy in the subsurface beneath AOI 7. A generalized stratigraphic column is included as Table 10 and the cross section through the facility, including AOI 7, is shown on Figure 8.

#### **5.1.1 Anthropogenic Fill**

Apparent fill is present everywhere beneath the existing land surface in AOI 7 and has been identified averaging approximately 10 feet. Stratigraphic Profile A – A' (Figure 8) presents the interpreted fill thickness in AOI 7.





### **5.1.2 Recent (Holocene) Alluvium**

Recent alluvial deposits that post-date the Trenton gravel are present beneath filled areas within AOI 7. In general, recent alluvium defines the antecedent topography that preceded industrialization at the Philadelphia Refinery. In large part, recent alluvium within the facility is fine-grained, brown to brownish gray silt/clay with occasional lenses of sand and gravel that commonly grades with depth to include some sand. In places, decomposing organic material has also been indicated. The thickness of the recent alluvium within AOI 7 has been observed to range from approximately 20 to 35 feet. The recent alluvium is the most significant units to occur beneath AOI 7, as shown on Figure 8.

### **5.1.3 Trenton "Gravel"**

The Trenton "gravel" does not occur throughout AOI 7. The Trenton "gravel" ranges in thickness from approximately 10 feet to pinching out along the boundary of AOI 7. Its predominant lithology appears to be silty, clayey, poorly-sorted sand with gravel, but includes secondary sandy gravel and clay/silt lithologies in lenses. As described site-wide, the Trenton gravel is a heterogeneous unit that is reflective of its depositional environment.

### **5.1.4 Upper Clay Unit/Upper Sand Unit/Middle Clay/Middle Sand/Lower Clay**

The PRM upper clay/upper sand/middle clay/middle sand and lower clay units are not interpreted to be present beneath AOI 7. It appears that these units were truncated by erosion prior to or contemporaneous with deposition of the Trenton "gravel". The Trenton "gravel" or alluvium (where the Trenton "gravel" is absent) rests unconformably above the Lower Sand unit as shown on Figure 8.

### **5.1.5 Lower Sand Unit**

In general, the lower sand coarsens with depth, from a dense fine to medium pale gray, pale yellow and white quartz sand to white and varicolored sandy gravel and gravelly sand. An area of sandy gravel has been mapped beneath AOI 7 in the Lower Sand Unit. The thickness of the lower sand in AOI 7 is approximately 20 feet.

### **5.1.6 Crystalline Bedrock**

Bedrock where encountered, has been described as moderately to highly-weathered mica schist. As shown on Figure 6, bedrock elevations beneath AOI 7 range from a maximum of approximately -60 feet NAVD 88, near the AOI 7/AOI 3 boundary, to a minimum of approximately -80 feet NAVD 88 in the northwest portion of AOI 7.

## **5.2 Aquifer Hydraulic Properties**

Two aquifers have been identified beneath AOI 7. In general, these are the water-table (unconfined) and lower (semi-confined) aquifers. Stantec identified and evaluated properties of those aquifers at the facility through review of approximately 300 well records as documented in the AOI 1 RIR (Stantec, 2016). Records reviewed included well gauging data and where available, lithologic logs, physical properties, and well/aquifer testing data. Hydrostratigraphic units were assigned by Stantec





to wells where possible using the stratigraphic profiles and nearby and deep boreholes as control points. Overall, approximately 90 percent of existing monitoring wells used at the facility are screened across the unconfined aquifer and are designed to intersect the water table. Of the remaining 10% screened in the lower aquifer, approximately 9% partially penetrate the lower sand and 1% are screened in either the middle sand, or across the middle clay.

It is noted that intervening PRM upper sand and middle sand aquifers do not appear to be present beneath AOI 7. It is also noted that hydraulic head potentials between the unconfined and lower aquifers are downward across AOI 7. These site-specific hydrogeologic conditions are discussed further below and are supported by Figures 13 and 15 which show groundwater elevation contours for both aquifers for 2016.

### **5.2.1 Methodology for Evaluation of Hydraulic Data**

For the purposes of evaluating hydraulic head, flow direction(s) and magnitudes of groundwater flow for the aquifers identified in this RIR, GHD reviewed 2015 and 2016 water levels from annual, site-wide gauging data within the facility. For wells gauged by GHD, depth-to-water measurements were collected with an optical interface probe and reported to the nearest hundredth of a foot. Water-table elevations were calculated using surveyed well top-of-casing elevations and, where necessary due to LNAPL accumulations, corrected using LNAPL density data from the nearest available LNAPL sample data (see Table 9) for density assignments and for gauging data.

### **5.2.2 Unconfined (Water-Table) Aquifer**

Beneath AOI 7, the unconfined aquifer is primarily composed of saturated portions of the fill and alluvium and the Trenton "gravel." On average, the saturated thickness of the unconfined aquifer beneath AOI 7 is approximately 20 to 30 feet. As a part of the AOI 1 RIR, Stantec (Stantec, 2016) mined existing data and has identified estimations of horizontal hydraulic conductivity ( $k_h$ ) for the unconfined aquifer from 15 in-situ aquifer (slug) tests and two, short-duration pumping tests (see Figure 9). None of these tests were identified in AOI 7. From those tests, estimated values of unconfined aquifer  $k_h$  vary two orders of magnitude across the facility. The wide range of estimated values of  $k_h$  is reflective of the heterogeneous nature of the Trenton gravel. Anomalously low values of  $k_h$  may also be the result of poor well-aquifer hydraulic communication related to inadequate well development, or fouling of the well screen. Stantec is presently evaluating potential values of reported unconfined aquifer  $k_h$  as a part of site-wide numerical model calibration and sensitivity analysis.

#### **5.2.2.1 Hydraulic Heads and Groundwater Flow**

As shown on Figure 14, water-table mounds are apparent in AOI 7. A few of these mounds are found immediately adjacent to the bulkhead and one is in the southeastern portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. The mounding in the southeast may be due to the lower permeability soils beneath the tank areas. There is also an area of groundwater depression in the southwestern portion of AOI 7. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours. Evaluation of groundwater mounding/depression is an





important component of understanding horizontal hydraulic gradients since they strongly influence contaminant fate and transport in an analytical or numerical model.

Groundwater flows to the west and north towards the river. The gradient towards the west is 0.001 ft./ft. and the gradient towards the north is 0.006 ft./ft. This pattern is consistent with the historical contours and supports that flow in AOI 7 is towards the river.

### **5.2.3 Semi-confined (Lower) Aquifer**

Groundwater flow within the lower aquifer beneath AOI 7 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the west under a hydraulic gradient of approximately 0.002 ft./ft.

GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 7. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 7 (2010 RIR and 2012 RIR).

Beneath the study area, the lower aquifer is primarily composed of saturated portions of the lower sand unit. On average, the saturated thickness of the lower aquifer beneath AOI 7 is approximately 25 feet. Evergreen has recently conducted slug and pumping tests on the lower aquifer in AOI 4 and AOI 9 in support of the facility wide fate and transport modeling.

## **6. LNAPL Investigation**

### **6.1 LNAPL Characterization Sampling**

Various petroleum products have been stored and distributed within AOI 7. Historic testing have been completed to characterize the LNAPL at the Site. The results of the tests are summarized in Appendix E and are discussed below. Stantec has gone back through the historic LNAPL sampling and has reclassified some of the LNAPL types as summarized in Table 11, these re-classifications are also included below.

#### **AOI 7, 2004**

In 2004, LNAPL samples from wells C-65, C-106, and C-107 were collected and submitted to Torkelson Geochemistry, Inc. (Torkelson) for analysis. Torkelson completed gas chromatograph analysis of the samples LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well C-65 is located near the northwestern corner of the bulkhead of AOI 7. Torkelson characterized the sample from C-65 as being extreme-severely weathered lube oil with residual oil (Langan 2004). Stantec reclassified this as heavy distillate in 2016.
- Well C-106 is located near the northwestern corner of the bulkhead of AOI 7. Torkelson characterized the sample from C-106 as being extremely weathered lube oil with middle distillate and gasoline (Langan 2004). Stantec reclassified this as heavy distillate in 2016.





- Well C-107 is located near the northwestern corner of the bulkhead of AOI 7. Torkelson characterized the sample from C-107 as being extremely weathered residual oil (Langan 2004). Stantec reclassified this LNAPL as heavy distillate in 2016.

#### **AOI 7, 2010**

In 2010, an LNAPL sample from well C-143 was collected and submitted to Torkelson for analysis. Torkelson completed gas chromatograph analysis of the samples LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well C-143 is located near the northwestern corner of the bulkhead of AOI 7. Torkelson characterized the sample from C-143 as being extremely weathered residual oil (Langan 2010). C-143 was not gauged during the 2016 site characterization activities since it no longer exists.

#### **AOI 7, 2012**

In 2012, LNAPL samples from wells C-147, C-148, C-150, C-151, C-152, C-153, C-154, C-161, C-162, C-166, C-167, and C-168 were collected and submitted to Torkelson for analysis. Torkelson completed gas chromatograph analysis of the samples LNAPL characterization data included product type, density, proportions of product, weathering, and similarities to other samples.

- Well C-168 is located near the northwestern corner of the bulkhead of AOI 7. LNAPL in this well has been classified as crude (Stantec, 2016).
- Wells C-147, C-148, C-152, and C-166 are located near the north northwestern corner of the bulkhead of AOI 7. LNAPL in these wells have been classified as crude (Stantec, 2016).
- Wells C-150 and C-151 are located near the northwestern corner of the bulkhead of AOI 7. LNAPL in these wells have been classified as crude (Stantec, 2016).
- Wells C-153, C-154, C-161, C-162, and C-167 are located near the north northwestern corner of the bulkhead of AOI 7. LNAPL in these wells have been classified as crude (Stantec, 2016).

## **6.2 LNAPL Distribution**

Numerous monitoring wells across AOI 7 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 79 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 13 wells with a maximum thickness of 2.45 feet at well C-106 during the May 2016 gauging. Figure 16 presents the May 2016 apparent LNAPL thicknesses from the annual gauging and Figure 17 presents the LNAPL thickness from the September 2016 gauging.

Based on review of the apparent LNAPL thickness data, observations suggest that LNAPL in C-150, C-152, and C-169 are controlled by the 3 separator remedial system as shown on Figure 17. LNAPL in C-64, C-97, C-146, and C-154 are located immediately adjacent to the 3 separator system and do show LNAPL thickness greater than in historic gauging events.

LNAPL in C-106 was delineated during the 2016 site characterization activities by C-170 and C-171. C-170 and C-171 could not be installed closer to C-106 due to a new 30-foot buffer along the bulkhead in this area that PES has created for safety reasons. The LNAPL thickness in C-106





during the 2016 gauging was greater than observed in historic LNAPL gauging events. Evaluation of a remedial action for the LNAPL in C-106 will be included in the Cleanup Plan.

LNAPL in C-168 is delineated by C-170 and the 3 separator system. LNAPL thickness in this well has been relatively constant based on current and historical data. Evaluation of the need for a remedial action for the LNAPL in C-168 will be included in the Cleanup Plan.

## **7. Vapor Intrusion**

The vapor intrusion pathway in AOI 7 was evaluated for potential receptors of vapors originating from subsurface soil or groundwater, in accordance with the PADEP, Land Recycling Program; Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2, January 2017 (VI Guidance).

### **7.1 Indoor Air Sampling**

Evergreen and PES identified 8 occupied buildings in AOI 7, including 4 control rooms, WTP Control Room, Electrical Building, Firehouse, 440 Building and the canteen. Indoor air and outdoor ambient (background) air samples were collected in March 2016, as summarized in Table 12 and shown on Figure 18. The samples collected in March 2016 are expected to represent relative worst-case indoor conditions during the heating season. Indoor air samples were collected at some of these locations in 2012 as summarized in Appendix K and summarized in Table 12.

A building survey and inspection was conducted to identify any potential indoor air sources of volatile organic compounds (VOCs) possibly already present within the building (e.g., smoking, cleaning products, building products, manufacturing chemicals, etc.), the number and frequency of occupants within the various buildings, and potential preferential migration pathways through the building slab (e.g., utility conduits, slab cracking, etc.). At each building GHD completed a Building Survey and Indoor Air Sampling Field Sheet, which is included in Appendix K.

Each indoor air sample location was selected based on occupancy and specific building characteristics such as building size and location of the occupied space within a building. The numbers of samples collected for each building was based on a combined approach from Appendix Z of the PADEP VI Guidance and professional judgement. Ambient samples were also collected to assess background conditions.

Indoor and ambient air samples were collected using 6-liter capacity Summa™ canisters in a suitable location(s) in each building at a representative breathing zone height (i.e., 3 to 5 feet above grade). Canisters were laboratory-certified clean in accordance with Appendix Z of the PADEP VI guidance. The canisters were fitted with a laboratory-calibrated critical orifice flow-regulation device sized to limit the indoor air sample collection flow rate to allow for 8-hour sample collection. Canisters maintained a minimum residual negative pressure of approximately 1 to 5 inches of mercury following sample collection. Written documentation of all field activities, conditions, and sampling processes, including names of field personnel, dates and times, etc. were recorded. Documentation included building designation, building use, building characteristics, occupant information, and weather conditions at the time of sampling (temperature (inside and outside),





barometric pressure, wind direction and speed, and humidity). This information is included in Appendix K.

Outdoor air sampling locations were selected for collection of an ambient air sample in AOI 7. The outdoor locations were set at the same general elevation of the samples in the buildings and were in a position that is generally upwind of the buildings being assessed.

Table 13 summarizes the indoor air data and compares the detected concentrations to the generic screening criteria. As shown in Table 13, all detected concentrations of constituents in indoor air were below the Pennsylvania generic non-residential SHS for indoor air. Since the SSS is being applied in AOI 7 but the VI pathway is the only exposure pathway, these data were also screened against and met the EPA RSL based on criteria calculated at the lower of a target cancer risk of  $1 \times 10^{-5}$  and a non-cancer hazard quotient of 0.1. The location of indoor and outdoor air samples is shown on Figure 18.

Additional indoor air sampling is not required as part of the remedial investigation, but one additional round will be conducted and reported in a future Act 2 deliverable as a confirmation that COCs are not detected in indoor and ambient air at levels unacceptable for occupational exposure.

## **7.2 Air Sampling over LNAPL Plumes**

In August 2016, three air samples (two locations and one duplicate) were collected to evaluate outdoor air quality in locations over NAPL plumes within AOI 7, at the request of the PADEP. The locations of these samples are shown on Figure 18 and the results are summarized in Table 14. These samples were collected from the breathing zone (3-5 feet above floor/ground level) using Summa® canisters with laboratory-provided regulators set to collect air over one continuous 8-hour period. The samples were packaged by field personnel and transported by FedEx to Lancaster Laboratories under Chain-of-Custody documentation for analysis of volatile organic compounds (VOCs) on the Act 2/One Cleanup program petroleum short list by EPA method TO-15.

Table 14 summarizes the outdoor air data and compares the detected concentrations to background concentrations. PADEP operates a network of air toxics monitoring stations that analyze for VOCs. Regional ambient air quality in the Philadelphia area where the refinery is located is best represented by data from the Marcus Hook monitoring station (latitude 39.8178, longitude - 75.4142). USEPA's background residential indoor air values are also included in Table 14 to determine whether detected concentrations are within background levels. As shown in Table 14, the results for the ambient air samples collected from over LNAPL in AOI-7 are within the background levels for this area. The location of indoor and outdoor air samples is shown on Figure 18. No additional sampling is proposed for the air quality over the LNAPL areas.

## **8. Quality Assurance/Quality Control**

All fieldwork conducted as part of the site characterization activities was performed in accordance with the methods outlined in Appendix B, Evergreen Field Procedures. Methods established by Evergreen to examine data quality are outlined in the Evergreen Data Usability Standard Operating Procedure (SOP). An assessment of analytical data collected as part of this investigation under the





SOP is also included in Appendix G in the data usability assessment. The following sections describe specific aspects of quality assurance/quality control procedures that pertain to the activities outlined in this report.

### **8.1 Equipment Decontamination**

All sampling equipment was either dedicated or decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent, potable water, and distilled water.

### **8.2 Equipment Calibration**

Air quality monitors used for both air monitoring and soil screening were calibrated prior to use. Both a zero calibration and a span calibration using gases of known concentration as recommended by the manufacturer (i.e., 100 parts per million by volume (ppm<sub>v</sub>) isobutylene for the photoionization sensor) were performed.

### **8.3 Sample Preservation**

Samples were placed directly into chemically preserved and/or non-preserved glassware provided by the analytical laboratory, as appropriate. All samples were preserved and shipped at a temperature of approximately 4°Celsius (C) or less by application of ice prior to shipment to the analytical laboratory. This temperature was maintained during shipment by placing ice in zip-top bags above, around, and below the sample containers.

### **8.4 Documentation**

Chain-of-custody forms were maintained throughout the sampling program to document sample acquisition, possession, and analysis. Chain-of-custody documentation accompanied all samples from the field to the laboratory. Each sample was assigned a unique identifier that was recorded in the field notes as well as on the chain-of-custody document.

## **9. Conceptual Site Model**

GHD's conceptual understanding of the present conditions identified at AOI 7 and nearby proximity is summarized as follows.

### **9.1 Description and Site Use**

- The Philadelphia Refinery is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania. The facility, which is located on industrial property, covers approximately 1,300 acres of land with access restricted by fencing and security measures. Current operations at the facility consist of the production of fuels and basic petrochemicals for the chemical industry.
- The area surrounding the facility is characterized by a mixture of residential, commercial, and industrial properties.





- AOI 7, also known as the Girard Point Fuels Processing Area, encompasses approximately 130 acres and is located on the east side of the Schuylkill River. AOI 7 is bordered by Lanier Avenue/AOI 3 to the east, Pennypacker Avenue/AOI 6 to the south and Schuylkill River to the west and north.
- The entire western and northern boundary of AOI 7 along the Schuylkill River is bound by a sheet pile wall.
- AOI 7 formerly contained a FCC unit, CO boiler, sulfur plant, East and West Sludge Basin - RCRA Tank, Hazardous Waste Incinerator, and crude units. AOI 7 currently consists of crude units, FCC and alkylation units, flares, cooling towers and ASTs. Eight LPG tanks are located in the south-central portion of this area. A WWTP is located along the southwestern portion of AOI 7. Four clean-closed RCRA hazardous waste ASTs are also located in the western portion of AOI 7 approximately 150 feet north of the WWTP. There are a total of 8 occupied buildings in AOI 7, including 4 control rooms (buildings 711, 6622, 6625, and 6626), Electrical Building 450, Firehouse Building 442, Maintenance Building 440, and the Canteen Building 595.
- There are a total of five SWMUs (SWMU Nos. 87, 88, 89, 90, and 91) located in AOI 7. These SWMUs include three in the NW Fill Area (SWMU 87 Buried Lead Sludge Area 1, SWMU 88 Buried Lead Sludge Area 72 and SWMU 89 Buried Lead Sludge Area 73); SWMU 90 Storage Tank Area/Buried Lead Sludge Area 74 and SWMU 91 Storage Tank Areas/Buried Lead Areas 5, as shown on Figure 2.

## **9.2 Geology and Hydrogeology**

### **9.2.1 Geologic Framework**

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within two miles of the "Fall Line."
- Beneath AOI 7, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous PRM aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 7.

### **9.2.2 Unconfined (Water-Table) Aquifer**

- Beneath AOI 7, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 1 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 7. However, aquifer tests have been conducted in other AOIs, and Evergreen is planning additional aquifer testing as part of the facility wide fate and transport numerical model.





- Water-table mounds are apparent in AOI 7. A few of these mounds are found immediately adjacent to the bulkhead and one is in the southeastern portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. The mounding in the southeast may be due to the lower permeability soils beneath the tank areas. There is also an area of groundwater depression in the southwestern portion of AOI 7. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours.
- Groundwater flows to the west and north towards the river. The gradient towards the west is 0.001 ft./ft. and the gradient towards the north is 0.006 ft./ft. This pattern is consistent with the historical contours and supports that flow in AOI 7 is towards the river.

### **9.2.3 Lower Aquifer (Semi-Confined)**

- Beneath AOI 7, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 1 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 7 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the west under a hydraulic gradient of approximately 0.002 ft./ft.
- GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 7. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 7 (2010 RIR and 2012 RIR).
- Evergreen has recently conducted slug and pumping tests on the lower aquifer in other AOIs in support off the facility wide fate and transport modeling.

## **9.3 Compounds of Concerns**

### **9.3.1 Soil**

- Soil delineations were performed to the non-residential direct contact MSC, and the numeric SSS (for lead) for COCs on the petroleum short list at all locations in AOI 7 and for hexavalent chromium and mercury at three locations in AOI 7.
- No soil samples collected during the 2016 site characterization activities exceeded the non-residential direct contact MSCs in AOI 7, leaving only one historic sample (GP-1100-CV) with a direct contact exceedance for BaP in AOI 7. This sample was delineated by the 2016 site characterization activities.





### **9.3.2 Groundwater**

- Two rounds of characterization groundwater sampling were completed in 2016 in addition to other sampling in 2011, 2012 and 2013 as a part of this RIR and groundwater samples were analyzed for the Act 2/One Cleanup Program petroleum short list COCs.
- Concentrations of the following COCs were detected above the non-residential MSC in the water table aquifer during the 2016 groundwater sampling events: benzene, isopropyl benzene, EDB, toluene, 1,2,4-TMB, xylenes, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead.
- None of the monitoring wells screened in the lower, semi-confined aquifer had exceedances of the non-residential groundwater MSCs.

### **9.3.3 Indoor/Ambient Air**

- An indoor and outdoor air sampling event was conducted on March 13, 2016, to represent ambient air and indoor air conditions during the heating season when levels of VOCs inside buildings are expected to be higher than during warmer months.
- None of the COCs were detected above the PADEP VI screening criteria or the USEPA RSLs.

## **9.4 LNAPL Distribution and Mobility**

- Numerous monitoring wells across AOI 7 have been gauged for LNAPL over the course of implementing the investigation and remediation programs. Stantec completed LNAPL and groundwater elevation gauging events in May 2016. During this event, 79 wells were gauged in the unconfined and semi-confined zones. LNAPL was detected in 11 wells with a maximum thickness of 2.45 feet at well C-106 during the May 2016 gauging.
- Based on review of the apparent LNAPL thickness data, LNAPL in C-150, C-152 and C-169 are controlled by the 3 separator remedial system. LNAPL in C-64, C-97, C-146 and C-154 are located immediately adjacent to the 3 separator system and do show LNAPL thickness greater than in historic gauging events. LNAPL in this area has been characterized as crude.
- LNAPL in C-106 was delineated during the 2016 site characterization activities by C-170 and C-171. The LNAPL thickness in C-106 during the 2016 gauging was greater than observed in historic LNAPL gauging events. LNAPL in this area has been characterized as heavy distillate.
- LNAPL in C-168 is delineated by C-170 and the 3 separator system. LNAPL thickness in this well has been relatively constant based on current and historical data. LNAPL in this area has been characterized as crude.

## **9.5 Qualitative Fate and Transport of Selected Compounds**

- A soil to groundwater model to evaluate the soil to groundwater pathway was not developed for the qualitative fate and transport assessment presented in this RIR. Rather, a qualitative-level assessment of groundwater data was warranted at this stage of the investigation.
- Of the COCs identified to be present in groundwater exceeding the non-residential MSC beneath AOI 7, the majority of these compounds are associated with monitoring wells (C-146,





C-150, C-152, C-161, and C-169 ) associated with the 3 separator system and therefore will be evaluated in the Cleanup Plan.

- The remaining groundwater concentrations are very low concentrations of semi-volatiles, with the exception of a few volatiles in C-168. Many of semi-volatile exceedances are of compounds that were not previously sampled prior to the 2016 site characterization activities. As discussed below:
  - The groundwater of BaP MSC exceedances in C-57 (BaP) and C-131 (BaP and Benzo(g,h,i) perylene) are delineated by non-detect concentrations in C-51, C-157, and C-163.
  - The groundwater exceedance in C-62 (BaP) is delineated by non-detect concentrations in C-106 and C-170.
  - The remaining wells with groundwater MSC exceedances, C-104 (BaP), C-127 (Benzo(g,h,i) perylene), C-145 (BaP), and C-168 (1,2,4-Trimethylbenzene, Benzene, Benzo(a)pyrene and Benzo(b)fluoranthene, Benzo(g,h,i) perylene) are located in close proximity to the bulkhead and do not have wells that can delineate these concentrations. The sample in C-168 was a groundwater sample collected beneath LNAPL.
- The most elevated concentrations of benzene and 1,2,4-Trimethylbenzene in unconfined aquifer groundwater correlate to locations beneath free-phase LNAPL (C-168). It should be noted that the groundwater sample from beneath LNAPL in C-106 did not have exceedances of the groundwater MSCs.
- The areas that are not proposed to be evaluated for remedial action in the Cleanup Plan have very low levels of semi-volatile compounds and are delineated by other monitoring wells or the bulkhead.
- Quantitative fate and transport analysis of selected dissolved-phase COCs in, and potentially across, AOI 7 aquifers, will be performed in general accordance with ACT 2 guidance to assess risk to potential receptors and to assess plume stability utilizing a 3-dimensional, steady-state, numerical groundwater flow (MODFLOW) model presently under development.

## **9.6 Potential Migration Pathways and Site Receptors**

- AOI 7 encompasses approximately 130 acres and is located on the east side of the Schuylkill River and access is restricted by fencing and security measures.
- PES is responsible for overall facility security and oversight of contractor safety, and PES implements PPE and work plan/permitting protocols that mitigate the potential for worker exposure to impacted soil, groundwater, and/or LNAPL through the direct contact pathway.
- AOI 7 areas with identified surface soil exceedances of the direct-contact MSC for BaP, have been delineated and remedies will be addressed in future Act 2 submissions, including a Facility-Wide Cleanup Plan.
- Concentrations of petroleum short list COCs identified through indoor and ambient air sampling met the PADEP indoor air criteria and the USEPA RSLs.





- Free-phase and residual LNAPL present beneath portions of AOI 7 appear to be contained within the property boundary and where present, of limited mobility.
- Dissolved-phase petroleum short list COCs, are present in unconfined aquifer groundwater at concentrations above their respective SHS MSCs within AOI 7 and adjacent to the river.
- None of the COCs exceeded the groundwater MSCs in the lower aquifer.
- The Schuylkill River is adjacent to, AOI 7 but the bulkhead separates the water table aquifer and the river.
- The unconfined aquifer is not utilized for municipal or nearby communal, potable water supply in south Philadelphia. Langan completed a potable well search in 2016 and did not identify any potable wells within 1 mile of the facility. The map showing the results of this survey is included in Appendix L.

## **10. Qualitative Fate and Transport Assessment**

On September 28, 2015, Evergreen's team of consultants met jointly with the PADEP to discuss the groundwater fate and transport modeling approach under Act 2 at the Philadelphia Refinery facility. At that time, it was collaboratively decided that individual AOI RIR submissions would include qualitative assessments of contaminant fate and transport, including an evaluation of plume stability, COC trends, and potential impacts to surface water. Findings and conclusions of the AOI specific, qualitative assessments of fate and transport will ultimately be used in a calibrated, steady-state MODFLOW model to perform quantitative fate and transport, including predictive simulations that will address cumulative mass loading to potential receptors.

The following discussion qualitatively summarizes factors that may influence contaminant fate and transport at AOI of the facility.

### **10.1 Geologic Framework**

As discussed in detail in Sections 2 and 5 of this report, the geologic framework present beneath and in close proximity to AOI 1 can be summarized as follows:

- The Philadelphia Refinery occurs within the up-dip limits of the Atlantic Coastal Plain, generally within two miles of the "Fall Line."
- Beneath AOI 7, the following Coastal Plain deposits may be present, in order of increasing depth/age: apparent fill, Quaternary alluvium [including Holocene and Pleistocene (Trenton "gravel") deposits], and the Cretaceous Potomac-Raritan-Magothy (PRM) aquifer system lower sand unit.
- The PRM upper clay, upper sand, middle sand, and lower clay are interpreted to have been cut or laterally "pinch" out in AOI 7.





## **10.2 Hydrogeology**

As summarized above and discussed in detail in Section 5 of this report, the geologic framework present beneath and in close proximity to AOI 7 supports the following hydrogeologic conditions:

- Two aquifers have been identified beneath the Philadelphia Refinery. In general, these are the water-table (unconfined) and a lower aquifer. Their properties are as follows.

### **10.2.1 Unconfined (Water-Table) Aquifer**

- Beneath AOI 7, the unconfined aquifer is primarily composed of saturated portions of unconsolidated materials primarily in the fill and alluvium, with lesser amount in the discontinuous Trenton "gravel".
- On average, the saturated thickness of the unconfined aquifer beneath AOI 7 is approximately 20 to 30 feet.
- No aquifer testing was identified in AOI 7. However, there have been aquifer tests in other parts of the refinery, and Evergreen has recently conducted additional aquifer testing in other AOIs as part of the facility wide fate and transport numerical model.
- Water-table mounds are apparent in AOI 7. A few of these mounds are found immediately adjacent to the bulkhead and one is in the southeastern portion of the site. The mounding along the bulkhead is due to the lower hydraulic conductivity of the bulkhead as compared to site soils. The mounding in the southeast may be due to the lower permeability soils beneath the tank areas. There is also an area of groundwater depression in the southwestern portion of AOI 7. Review of historic groundwater contours show that these contours are consistent with previous groundwater contours.
- Groundwater flows to the west and north towards the river. The gradient towards the west is 0.001 ft./ft. and the gradient towards the north is 0.006 ft./ft. This pattern is consistent with the historical contours and supports that flow in AOI 7 is towards the river.

### **10.2.2 Lower Aquifer (Semi-Confined)**

- Beneath AOI 7, the lower aquifer is primarily composed of saturated portions of the lower sand geologic unit.
- On average, the saturated thickness of the lower aquifer beneath AOI 7 is approximately 25 feet.
- Groundwater flow within the lower aquifer beneath AOI 7 has been contoured utilizing data from AOI 5, 6, and 7 wells, and the resultant potentiometric surfaces are shown on Figure 15 for synoptic well gauging events conducted in May 2016. The groundwater flow direction is to the west under a hydraulic gradient of approximately 0.002 ft./ft.
- GHD evaluated the vertical hydraulic head gradients for May and August 2016 between the unconfined and lower aquifer throughout AOI 7. There is a downward gradient between the unconfined and lower aquifers. These gradients are consistent with previous data collected in AOI 7 (2010 RIR and 2012 RIR).





- Evergreen has conducted slug and pumping tests on the lower aquifer in other AOIs in support off the facility wide fate and transport modeling.

### **10.3 Hydrogeology and Topography**

- LIDAR data collected in 2010 indicates that present-day topography is relatively flat within AOI 7 and proximity, where land surface elevations generally range from approximately 60 feet to just over 75 feet NAVD 88
- Within AOI 7, much of the surface area present is impervious or assumed to be of limited permeability.
- The Schuylkill River is directly adjacent to AOI 7.
- National Weather Service Online Weather Data (NOWData) for Philadelphia, Pennsylvania, indicates that since 1872, mean annual precipitation is approximately 42 inches (ranging from approximately 29 to 64 inches).
- Stormwater runoff within AOI 7 is managed by an onsite storm sewer system that during most storm events is managed by the refinery's Wastewater Treatment Plant. During longer and heavier rain events, stormwater is discharged through stormwater outfalls directly to the Schuylkill River.
- Natural recharge of the unconfined aquifer beneath AOI 7 and proximity is assumed to be spatially variable but limited in overall capacity as a result of: the high percentage of impervious surface coverage present; and, the fine-grained nature and extent of recent alluvial deposits above the water table.

### **10.4 Anthropogenic Features**

#### **10.4.1 Historic Fill**

Apparent fill is present beneath the existing land surface at most locations in AOI 7 and has been identified to be approximately 10 feet. The fill is generally heterogeneous in nature and is composed of an admixture of sand and gravel, mud, and anthropogenic debris included cinders, ash, bricks, cinder block, and metal.

#### **10.4.2 Active Remediation Systems**

Within AOI 7 there is one active remediation system (3 Separator System). Construction of a ten recovery well hydraulic control system was completed on August 23, 2012. Groundwater and LNAPL are extracted using pneumatic submersible pumps, and total fluids pass through an oil/water separator. Water is discharged to an onsite process sewer, and LNAPL is recovered in a 1,100-gallon holding tank and recycled by the refinery. Since the start-up of the system through December 2016, 17,226,885 gallons of water and 111,648 gallons of LNAPL have been recovered by the system, as presented in Appendix F. Performance of this system is documented in the Semi-Annual, Groundwater Remediation Status Reports submitted to the PADEP. In 2013, PES assumed primary responsibility for the 3 Separator System due to newer PES releases from the sewer system, which connects 137 Unit to the #4 separator, in the vicinity of the #3 separator.





## **10.5 Groundwater Constituents of Concern**

### **10.5.1 Unconfined (Water Table) Aquifer**

Concentrations of the following petroleum short list COCs were detected above the groundwater MSCs in unconfined aquifer groundwater during the 2016 characterization sampling events; benzene, isopropyl benzene, EDB, toluene, 1,2,4-TMB, xylenes, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene , benzo(b)fluoranthene, chrysene, naphthalene, and lead which is consistent with historic sampling for COCs that have been previously analyzed in AOI 7.

The areas that are not proposed to be evaluated for remedial action in the Cleanup Plan have very low levels of semi-volatile compounds and are delineated by other monitoring wells or the bulkhead. These compounds have generally not been sampled historically in AOI 7 and will need additional sampling to establish groundwater trends.

### **10.5.2 Lower Aquifer**

No concentrations of any COCs were detected above the groundwater MSCs in lower aquifer groundwater during 2016 characterization sampling events which is consistent with previous sampling events.

## **10.6 Potential Onsite and Offsite Receptors**

Based on the identified impacts to groundwater at AOI 7, GHD has evaluated the following as potential receptors.

- Vapor intrusion effecting potential occupants of buildings in AOI 7 was evaluated. The results did not exceed the PADEP VI screening levels or the EPA RSLs.
- The Schuylkill River could receive AOI 7 groundwater discharging to the river. Remediation systems are operational in AOI 7 to mitigate that potential by exhibiting hydraulic control in the vicinity of the 3 separator.
- Potable consumption of impacted groundwater could affect human health. No known potable supply wells exist at or in proximity to AOI 7.
- The PRM aquifer system is heavily utilized for water supply in New Jersey. The aquifers of that system, chiefly the lower sand unit, receive recharge via vertical leakage through confining units and direct recharge from younger deposits along their subcrop area in south Philadelphia. None of the COCs were above the groundwater MSCs in the lower Aquifer in AOI 7.

## **10.7 Plans for Quantitative Fate and Transport Analysis**

Stantec is presently developing a groundwater flow model, the Philadelphia Refinery Flow Model (PRFM), using the USGS MODFLOW2000 computer code and Groundwater Vistas Version 6 software. The MT3DMS contaminant transport module will be utilized to simulate predictive scenarios of the fate and transport of selected COCs in groundwater. The modeling is being performed to meet and demonstrate compliance with the PADEP Site-Specific Standard for remediation of pre-existing contamination under Act 2, Pennsylvania's Land Recycling Program.





Under Act 2 and in consideration of the One Cleanup Program, an analysis of the fate and transport of petroleum-related constituents is needed, in general, to assess risk to potential receptors, assess plume stability, and estimate time to project closure.

The PRFM will focus on groundwater movement within the Coastal Plain of south Philadelphia, Pennsylvania, near the Philadelphia Refinery. The model domain was adopted from an earlier USGS model developed by Schreffler (2001), later updated by Sloto (2012), and has been updated by Stantec to more-closely simulate site-specific groundwater flow conditions beneath the facility. Updates to the Schreffler (2001) model have included model layer refinement, grid discretization, updates to the model layer hydraulic properties using site-specific testing data, and the inclusion of drains to simulate losses to the sewers and/or localized pumping centers (e.g., Mingo Creek Pump Station). At the time of this report, it is anticipated that Stantec will present the PRFM to PADEP during the spring of 2017 for comment prior to utilization of the model in any fate and transport analyses at the refinery in support of a facility-wide Cleanup Plan, or a site-wide RIR to address cumulative loading of COCs to receptors.

## **11. Ecological Assessment**

The majority of AOI 7 is covered with soil, gravel, and impervious surfaces. The soil and gravel-covered portions of AOI 7 are not likely to serve as a breeding area, migratory stopover, or primary habitat for wildlife. In October 2016, a survey of endangered, threatened, and special concern wildlife and habitat was conducted by submitting a search request through the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Tool. The results of the PNDI search identified no known impacts by the PA Game Commission, the PA Fish and Boat Commission, and the U.S. Fish and Wildlife Service.

The PNDI search identified potential endangered species impacts that required further review by the PA Department of Conservation and Natural Resources (PADCNR). A no effect letter request was submitted to the PADCNR in October 2016. A response was received from the PADCNR on November 3, 2016 indicating that no impact is anticipated to the species of special concern. All ecological assessment documentation is included in Appendix H.

## **12. Community Relations Activities**

A Community Relation Plan (CRP) that includes public involvement with local residents to inform them of the anticipated investigations and remediation activities was completed as part of the original NIR submittal in 2006. A revised NIR was submitted in 2014. The purpose of the CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens to be informed of on-site activities related to the investigation activities at the Site. This plan incorporates aspects of public involvement under both PADEP's Act 2 program and USEPA's RCRA Corrective Action program. This report and future Act 2 reports will include the appropriate municipal and public notices in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper. As part of the CRP, Sunoco held an initial public meeting in the City of Philadelphia to present the strategy





and Evergreen will give status updates of the project at the CRP meeting on an as requested basis. A copy of the original NIR, the 2014 NIR and the Act 2 report notifications for this RIR are included in Appendix A.

## **13. Conclusions and Recommendations**

GHD has prepared this RIR for AOI 7 of the Philadelphia Refining Complex to satisfy the requirements of Act 2, as specified under 25 PA Code §250.408. The documented investigation activities were performed in general accordance with a 2011 revised Work Plan for Sitewide Approach Under the One Cleanup Program, and were conducted in support of Evergreen's commitment to remediate legacy environmental impacts that existed at the facility prior to its conveyance to PES in 2012 (Buyer-Seller Agreement). In support of those stated objectives, this report has described a comprehensive evaluation of available historical data pertaining to AOI 7, and has documented a remedial investigation strategy that included the collection of a significant amount of additional subsurface information in the time since previous AOI 7 Act 2 deliverables were submitted to PADEP (2010 and 2012 SCR/RIR). Investigations performed as a part of this report also considered and where relevant, sought to address PADEP comments directed towards previous RIR submissions for the facility.

The following summarizes the conclusions and recommendations regarding AOI 7.

### **13.1 Soil**

BaP was identified in one sample in AOI 7 surface soil samples at concentrations in excess of the direct-contact MSC. This sample has been delineated horizontally and vertically. Concentrations of COCs in all other collected soil samples (including subsurface soil) were below the non-residential direct contact MSC. Re-sampling this location may eliminate this remaining direct contact exceedance in AOI 7.

### **13.2 Groundwater**

#### **13.2.1 Unconfined (Water-Table) Aquifer**

Benzene, isopropyl benzene, EDB, toluene, 1,2,4-TMB, xylenes, benzo(a)anthracene, beno(a)pyrene, beno(g,h,i)pyrene, benzo(b)fluoranthene, chrysene, naphthalene, and lead exceeded the current non-residential MSCs in the unconfined aquifer.

The qualitative assessment has indicated that the monitoring wells (C-57, C-62, C-127, C-131 and C-145) have very low levels of semi-volatile compounds and are delineated by other monitoring wells or the bulkhead. The COCs exceeding the groundwater MSC in these wells have generally not been sampled historically in AOI 7 and additional sampling is recommended to establish groundwater trends. The results of this sampling will be submitted in future Act 2 submittals. All of the other monitoring wells with exceedances of the groundwater MSCs are proposed to be evaluated in the Cleanup Plan for potential remedial action.





### **13.2.2 Lower Aquifer**

None of the samples in the lower aquifer exceeded the non-residential MSCs in the Lower Aquifer, which is consistent with historic data in AOI 7 therefore no further assessment was completed for the Lower Aquifer in this RIR. As indicated above for the unconfined aquifer, a MODFLOW model will be utilized during quantitative fate and transport analyses to evaluate the Lower Aquifer for the facility.

### **13.3 Vapor Intrusion**

Concentrations of COCs in indoor and ambient air were evaluated in the eight occupied buildings in AOI 7 and there were no exceedances of the PADEP VI criteria. It is recommended that a second round of indoor air sampling be performed at these buildings to confirm that concentrations of petroleum short list COCs remain below the PADEP I criteria. Results of this sampling event will be reported to PADEP in a future Act 2 deliverable.

### **13.4 LNAPL**

LNAPL within AOI 7 has been delineated. The majority of LNAPL sampled was categorized as heavy distillate or crude. LNAPL recovery is ongoing, and will be further evaluated for optimization and efficiency as part of a Site-wide Cleanup Plan.

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[http://www.portal.state.pa.us/portal/server.pt/community/land\\_recycling\\_program/20541/state\\_wide\\_health\\_standards/1034862](http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/state_wide_health_standards/1034862).
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[http://www.portal.state.pa.us/portal/server.pt/community/land\\_recycling\\_program/20541/state\\_wide\\_health\\_standards/1034862](http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/state_wide_health_standards/1034862).
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[http://www.portal.state.pa.us/portal/server.pt/community/land\\_recycling\\_program/20541/state\\_wide\\_health\\_standards/1034862](http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/state_wide_health_standards/1034862).
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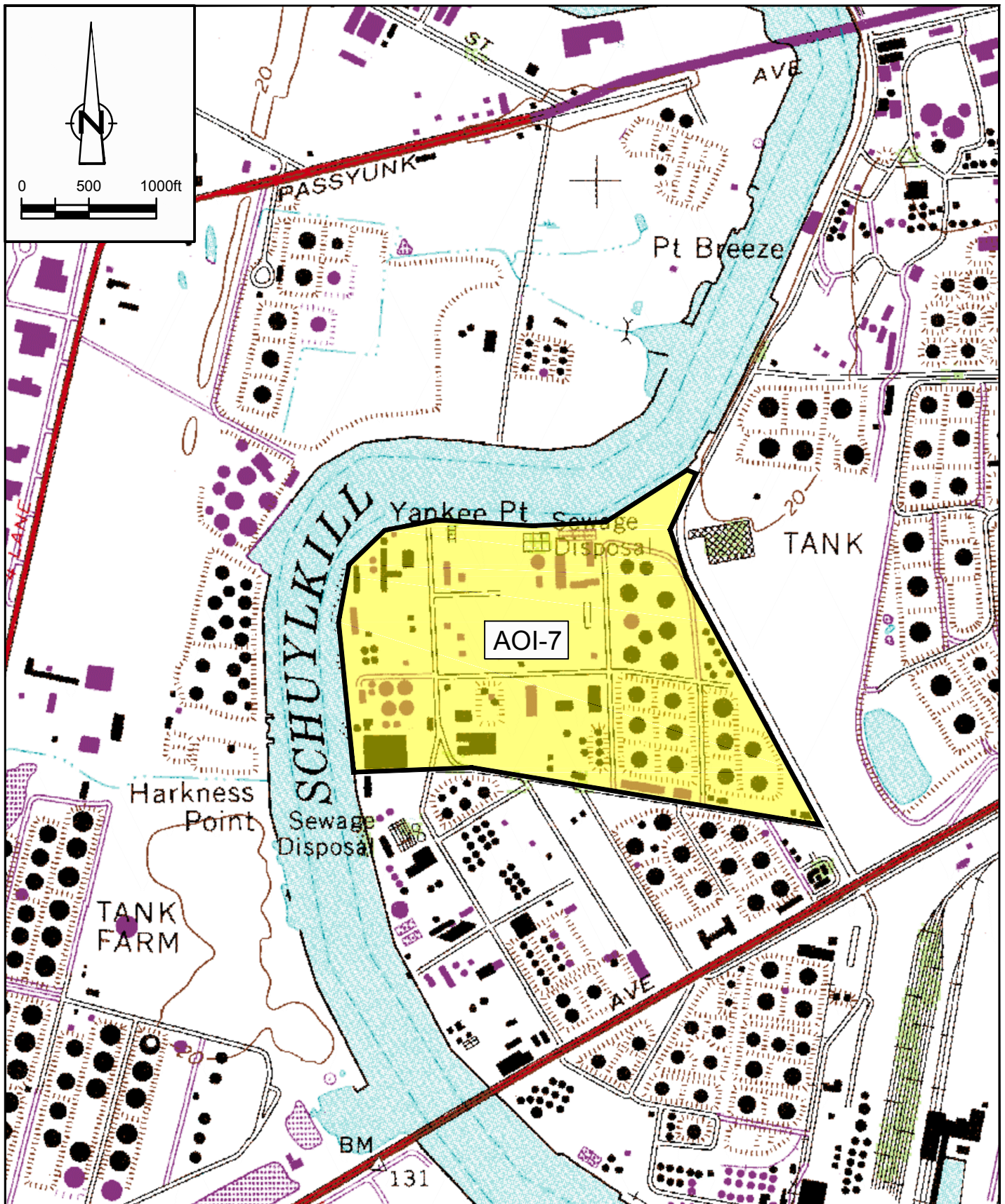




[http://www.portal.state.pa.us/portal/server.pt/community/land\\_recycling\\_program/20541/state\\_wide\\_health\\_standards/1034862](http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/20541/state_wide_health_standards/1034862).

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SOURCE: USGS QUADRANGLE MAP, PHILADELPHIA, PENNSYLVANIA, 1995



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 REMEDIAL INVESTIGATION REPORT

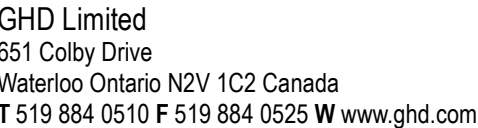
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Jun 1, 2017

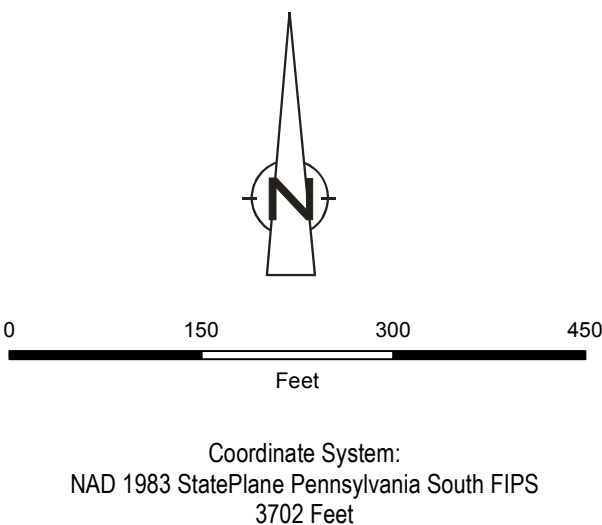
AOI 7 SITE LOCATION MAP

FIGURE 1





Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



- Legend**
- 2016 RI Groundwater Sample
  - 2016 RI Soil Sample
  - 2016 RI Soil Sample - not completed
  - Water Table Monitoring Well
  - Recovery Well
  - Deep Monitoring Well
  - Damaged Monitoring Well
  - Destroyed Monitoring Well
  - Monitoring Well (Unable to Locate)
  - Air Sample
  - Historical Soil Sample
  - Bulkhead
  - 3 Separator Remediation System
  - 3 Separator Remediation System
  - Existing Tank
  - Former Tank
  - Features Identified by Evergreen (not PA DEP Identids)
  - Solid Waste Management Unit
  - Area Of Interest

Original Size

## ANSI D

Bar is one inch on original size drawing

Project : 11109614  
Date: Mar 28, 2017

**EVERGREEN RESOURCES  
MANAGEMENT  
AOI-7 PHILADELPHIA  
REFINERY OPERATIONS**

## AOI 7 SITE PLAN

Figure No.

## FIGURE 2





SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

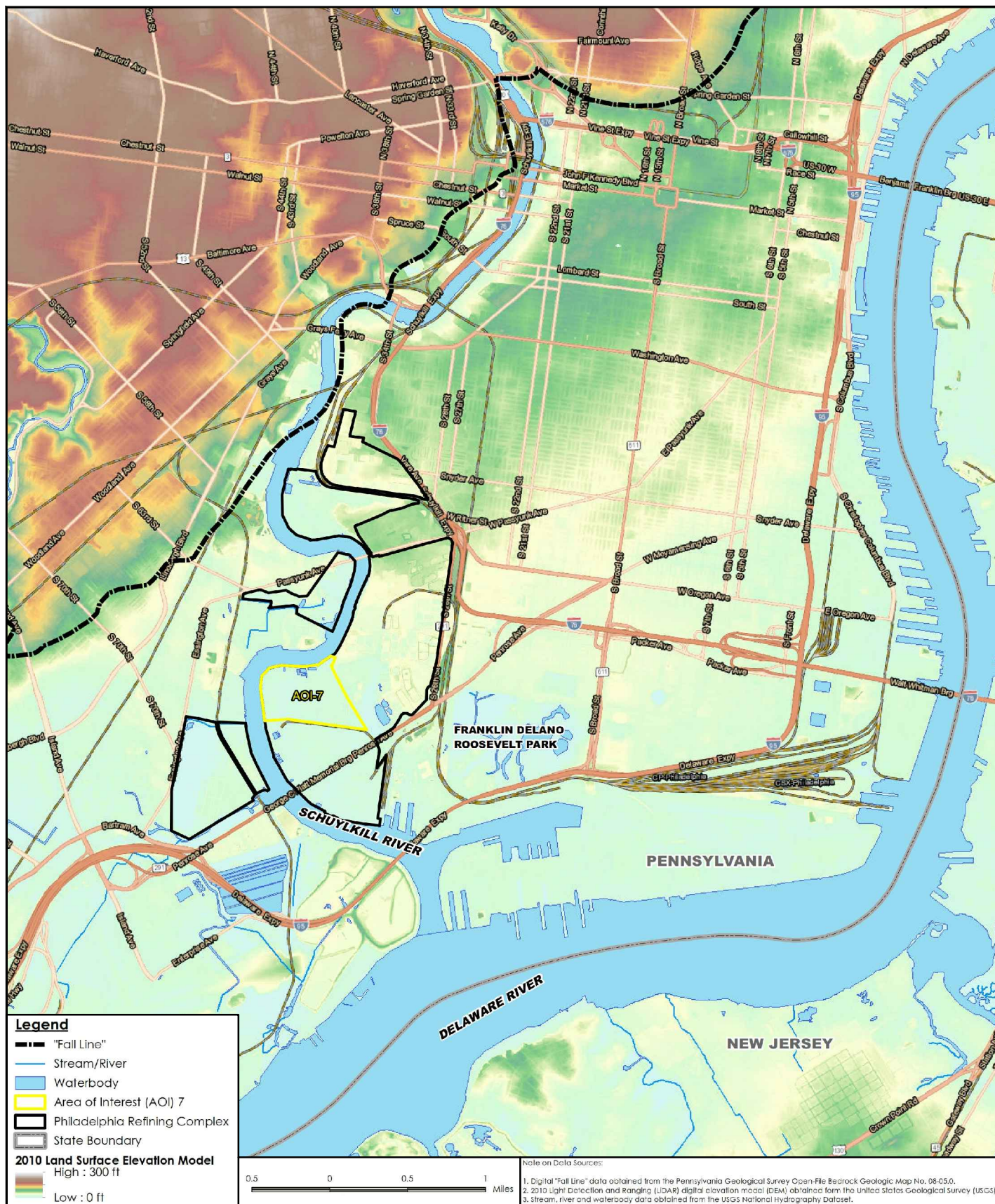


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 PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
 REMEDIAL INVESTIGATION REPORT  
 HISTORIC STREAM AND MARSH LOCATIONS  
 (CIRCA 1898)

11109614-01  
 Nov 7, 2016

FIGURE 3





SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.



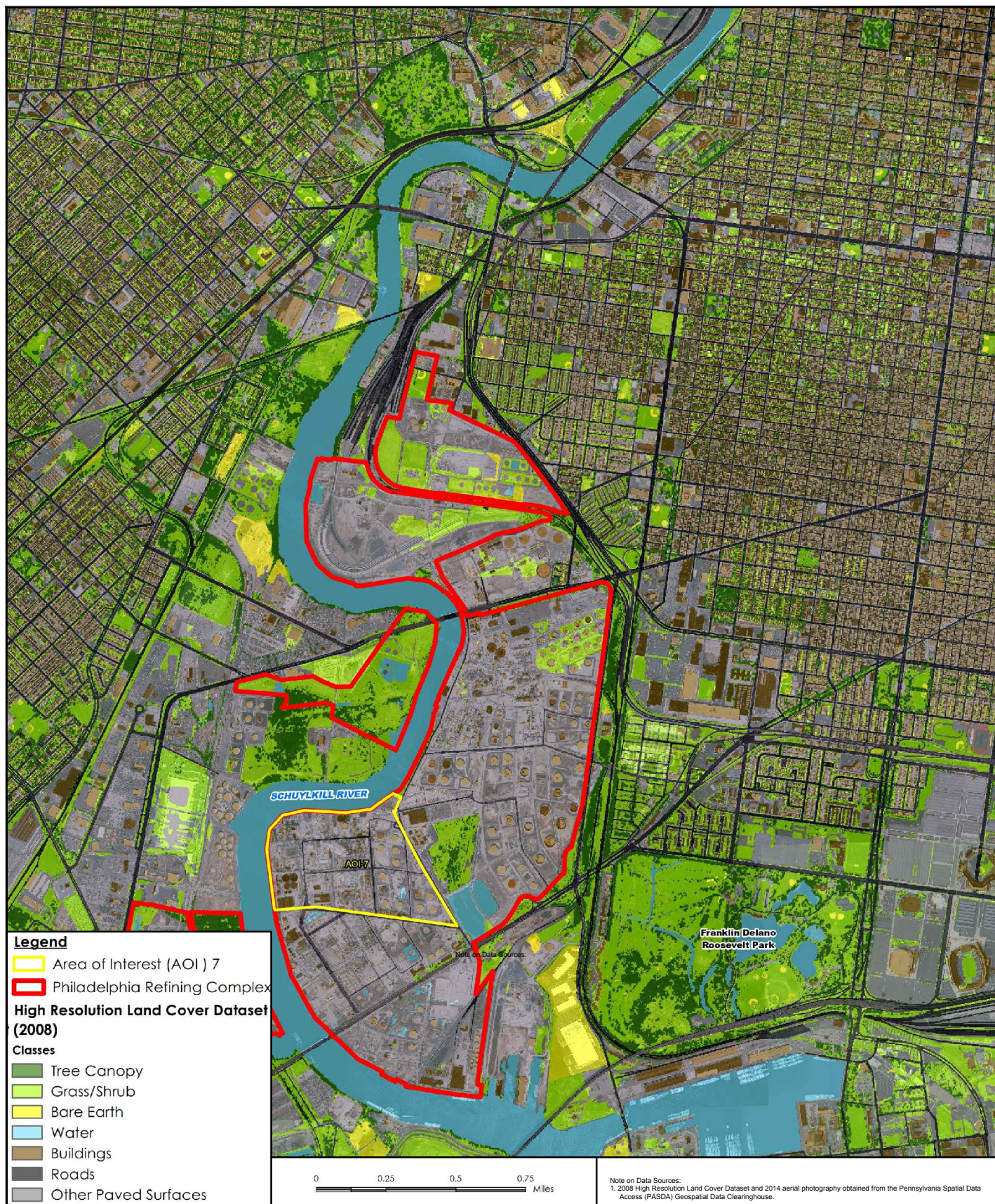
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 REMEDIAL INVESTIGATION REPORT

11109614-01  
 Dec 20, 2016

## GEOGRAPHIC SETTING

## FIGURE 4





SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

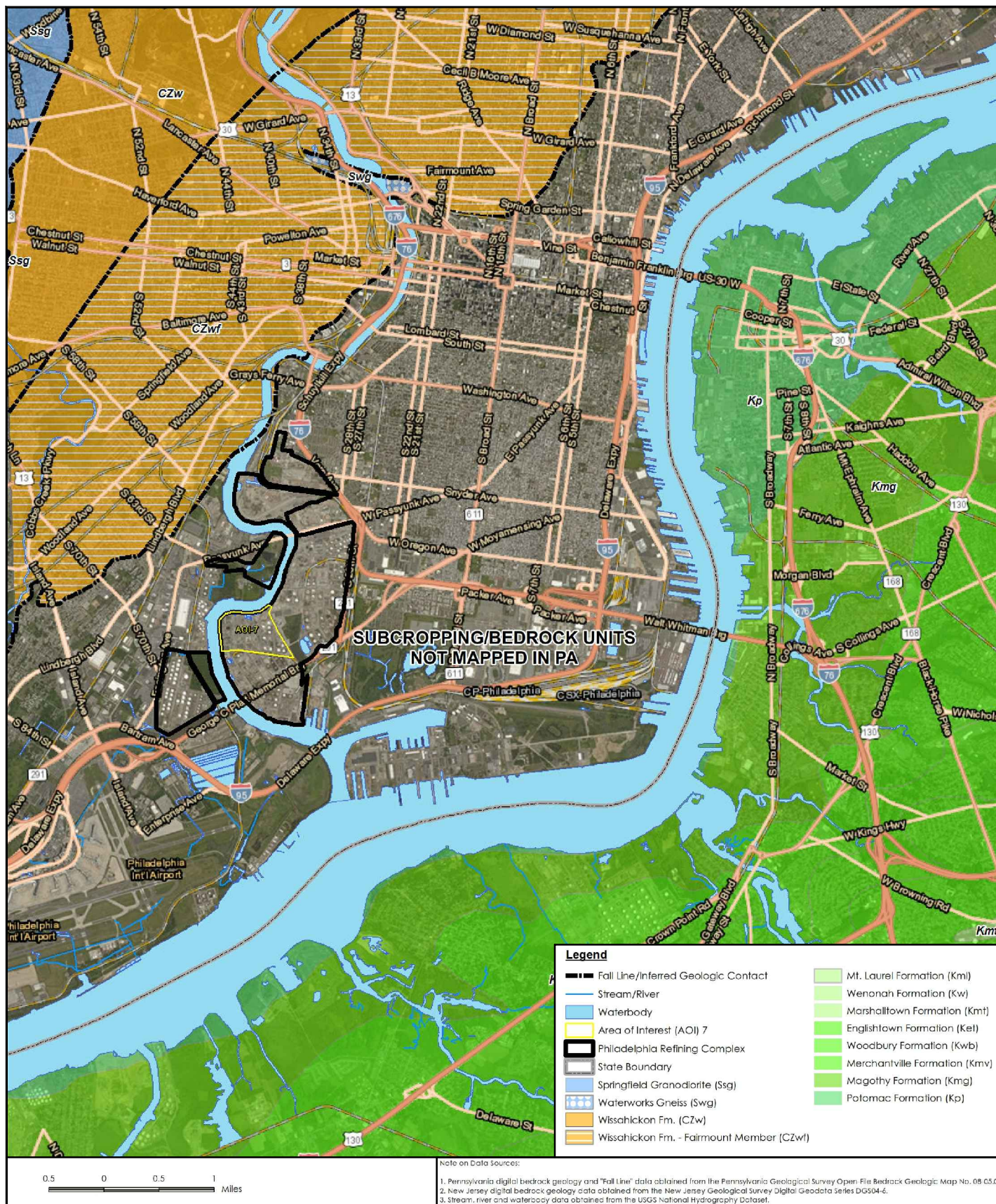


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 PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
 REMEDIAL INVESTIGATION REPORT  
 HIGH RESOLUTION LAND COVER DATASET  
 (2008) - CITY OF PHILADELPHIA

11109614-01  
 Dec 20, 2016

FIGURE 5





SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.



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 REMEDIAL INVESTIGATION REPORT

11109614-01

Dec 20, 2016

## GENERALIZED BEDROCK GEOLOGIC MAP

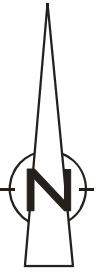
FIGURE 6





GHD Limited  
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Waterloo Ontario N2V 1C2 Canada  
T 519 884 0510 F 519 884 0525 W www.ghd.com

Source: Aerial: Microsoft product screen shot(s) reprinted  
with permission from Microsoft Corporation, June 2014



0 150 300 450  
Feet

Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet

- Legend**
- Stratigraphic Profile Boring Location
  - 2016 RI Groundwater Sample
  - 2016 RI Soil Sample
  - Water Table Monitoring Well
  - Recovery Well
  - Deep Monitoring Well
  - Damaged Monitoring Well
  - Destroyed Monitoring Well
  - Monitoring Well (Unable to Locate)
  - Historical Soil Sample
  - Stratigraphic Profile Location
  - Area Of Interest

Original Size

**ANSI D**

Bar is one inch on  
original size drawing

0 1"

Project : 11109614

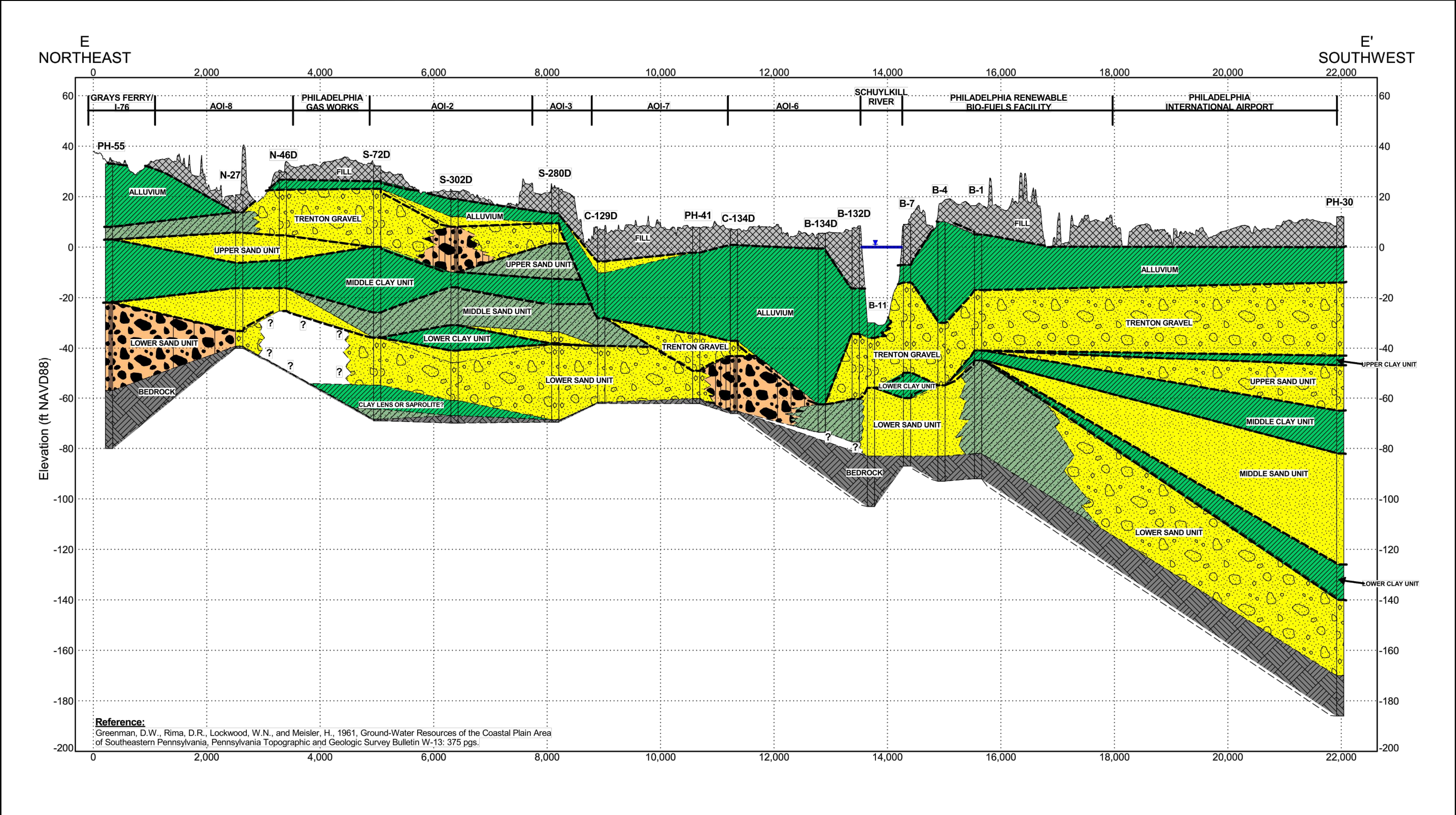
Date: Nov 25, 2016

**EVERGREEN RESOURCES  
MANAGEMENT  
AOI-7 PHILADELPHIA  
REFINERY OPERATIONS  
STRATIGRAPHIC PROFILE  
LOCATION MAP**

Figure No.

**FIGURE 7**





SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.

### GENERALIZED LITHOLOGY GRAPHICS

	Fill		Sand (incl. trace to little silt/clay/gravel)		Mud
	Sandy Gravel		Muddy Sand		Bedrock (incl. saprolite where indicated)
	Gravelly Sand		Sand with Lignite		

**Notes:**

1. Land surface profile obtained from a 2010 light detection and ranging (LIDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-55, PH-41, B-11, B-7, B-4, B-1 and PH-30 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those historic borings were estimated by Stantec in a GIS using a georeferenced image of Plate 1 of that report. Fill thicknesses interpreted by Stantec.
3. PH-55 terminal boring depth deeper than shown.
4. Water depths for the Schuylkill River were estimated using soundings provided on the National Oceanic and Atmospheric Administration (NOAA) navigation chart for the Delaware River, Philadelphia and Camden Waterfronts (Chart 12313). Mean lower low water (MLLW) depths were transformed to the North American Vertical Datum of 1988 (NAVD 88).
5. Stantec generalized lithologic data from available borehole logs into 8 categories as indicated for interpretive purposes.
6. Correlation between lithologies and, where applicable, geologic units is based on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile. Contacts dashed where inferred.
7. Vertical Exaggeration ~ 45 X

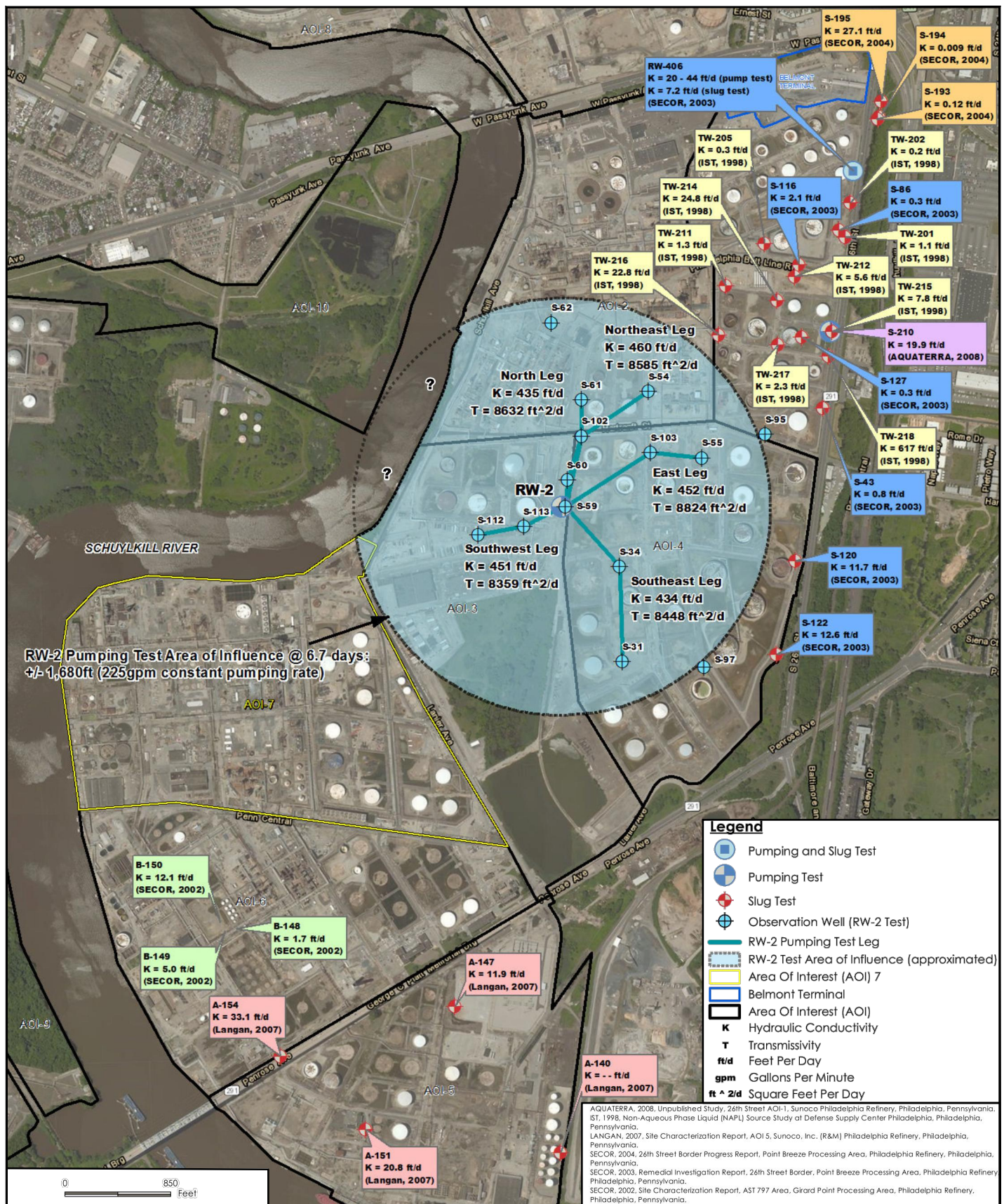
EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC  
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REMEDIAL INVESTIGATION REPORT

STRATIGRAPHIC PROFILE

11109614-01  
Nov 23, 2016

FIGURE 8



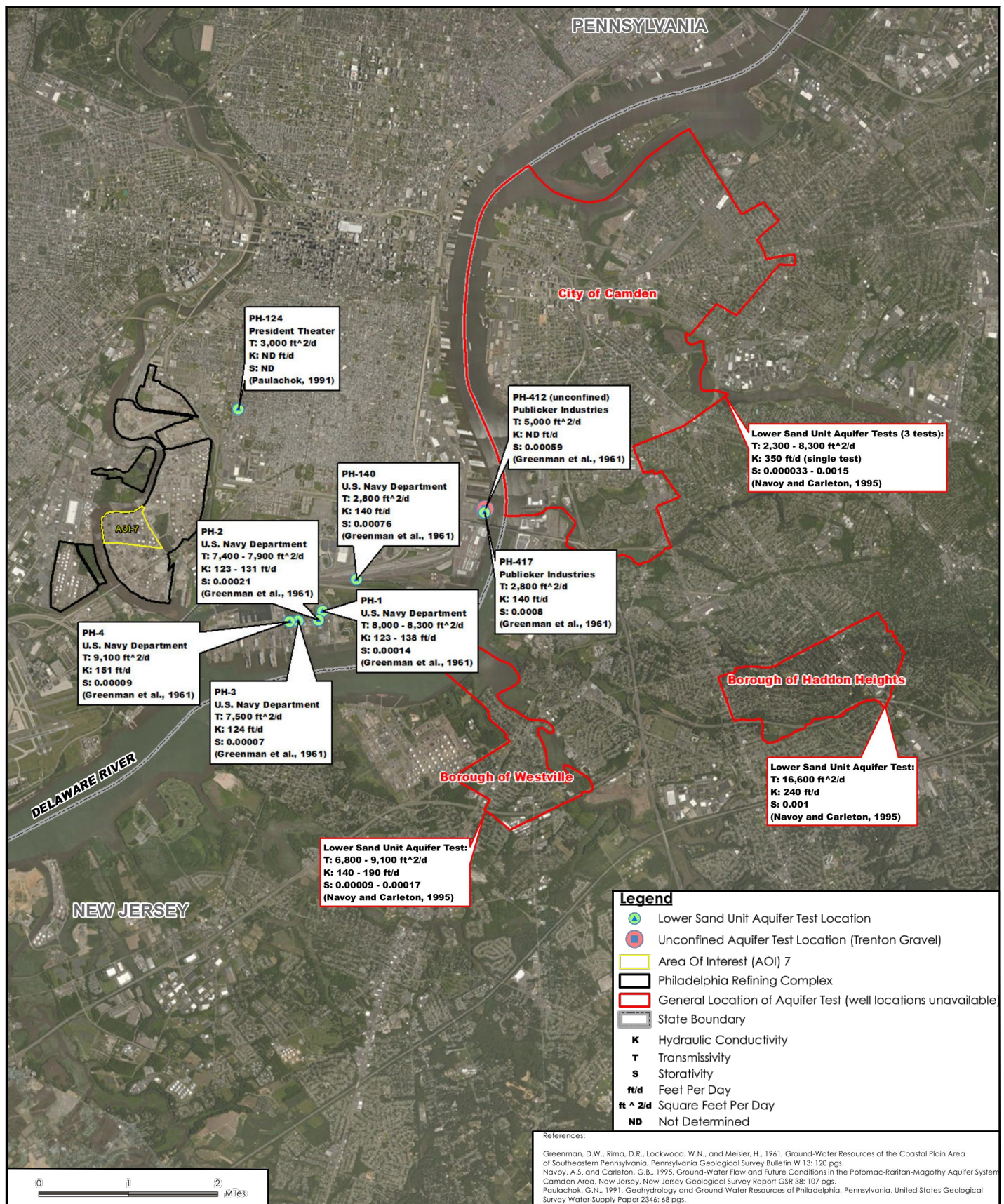


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 PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
 REMEDIAL INVESTIGATION REPORT  
 SUMMARY OF AVAILABLE AQUIFER TESTING DATA  
 FOR THE UNCONFINED AQUIFER

11109614-01  
 Jan 19, 2017

FIGURE 9



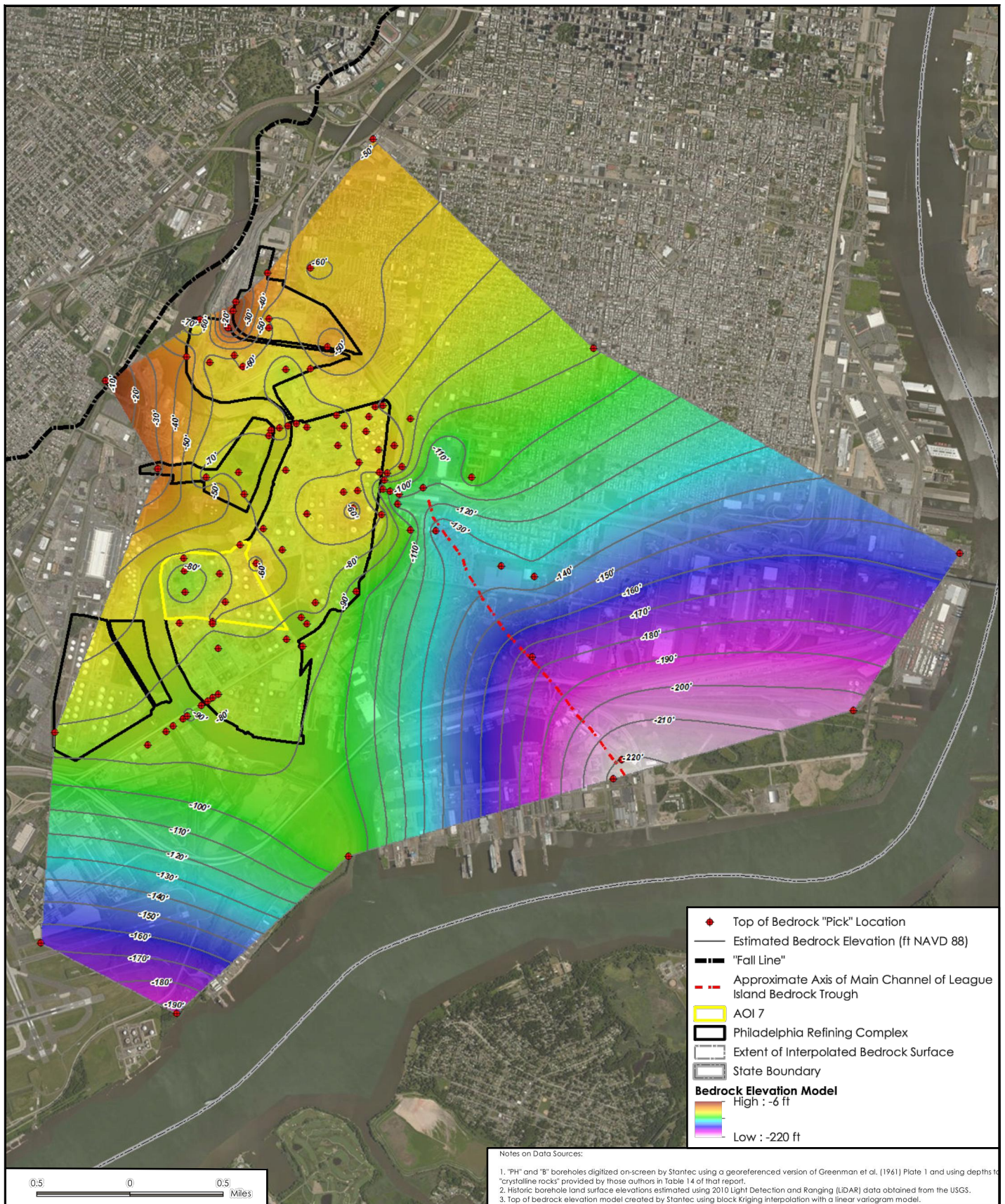


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PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
REMEDIAL INVESTIGATION REPORT  
SUMMARY OF PUBLISHED AQUIFER TESTING DATA FOR  
THE UNCONFINED AND LOWER AQUIFERS

11109614-01  
Jan 19, 2017

FIGURE 10





SOURCE: REMEDIAL INVESTIGATION REPORT, AREA OF INTEREST 1, PHILADELPHIA REFINERY COMPLEX, STANTEC 2016.

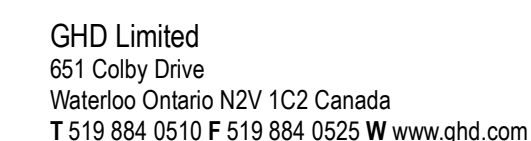


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 PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
 REMEDIAL INVESTIGATION REPORT  
**BEDROCK STRUCTURE CONTOUR MAP -  
 TOP OF BEDROCK**

11109614-01  
 Jan 19, 2017

FIGURE 11





Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



- Legend**
- 2016 RI Soil Sample (Exceeded MSC)
  - 2016 RI Soil Sample (Did Not Exceed MSC)
  - Historical Soil Sample (Exceeded Direct Contact)
  - Historical Soil Sample (Exceeded MSC)
  - Historical Soil Sample (Did Not Exceed MSC)
  - 2016 RI Groundwater Sample
  - Water Table Monitoring Well
  - Recovery Well
  - Deep Monitoring Well
  - Damaged Monitoring Well
  - Destroyed Monitoring Well
  - ▲ Monitoring Well (Unable to Locate)
  - Bulkhead
  - 3 Separator Remediation System
  - 3 Separator Remediation System
  - Existing Tank
  - Solid Waste Management Unit
  - Area Of Interest

ANSI D

Bar is one inch on  
original size drawing

0 

Date: Mar 28, 2017

## SURFACE SOIL SAMPLING RESULTS

Figure No.

**FIGURE 12a**

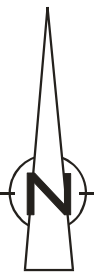






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651 Colby Drive  
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Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



0 150 300 450  
Feet

Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet

#### Legend

- 2016 RI Soil Sample (Exceeded MSC)
- 2016 RI Soil Sample (Did Not Exceed MSC)
- 2016 RI Groundwater Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Bulkhead
- 3 Separator Remediation System
- 3 Separator Remediation System
- Existing Tank
- Solid Waste Management Unit
- Area Of Interest

Original Size

ANSI D

Bar is one inch on  
original size drawing  
0 1"

Project: 11109614

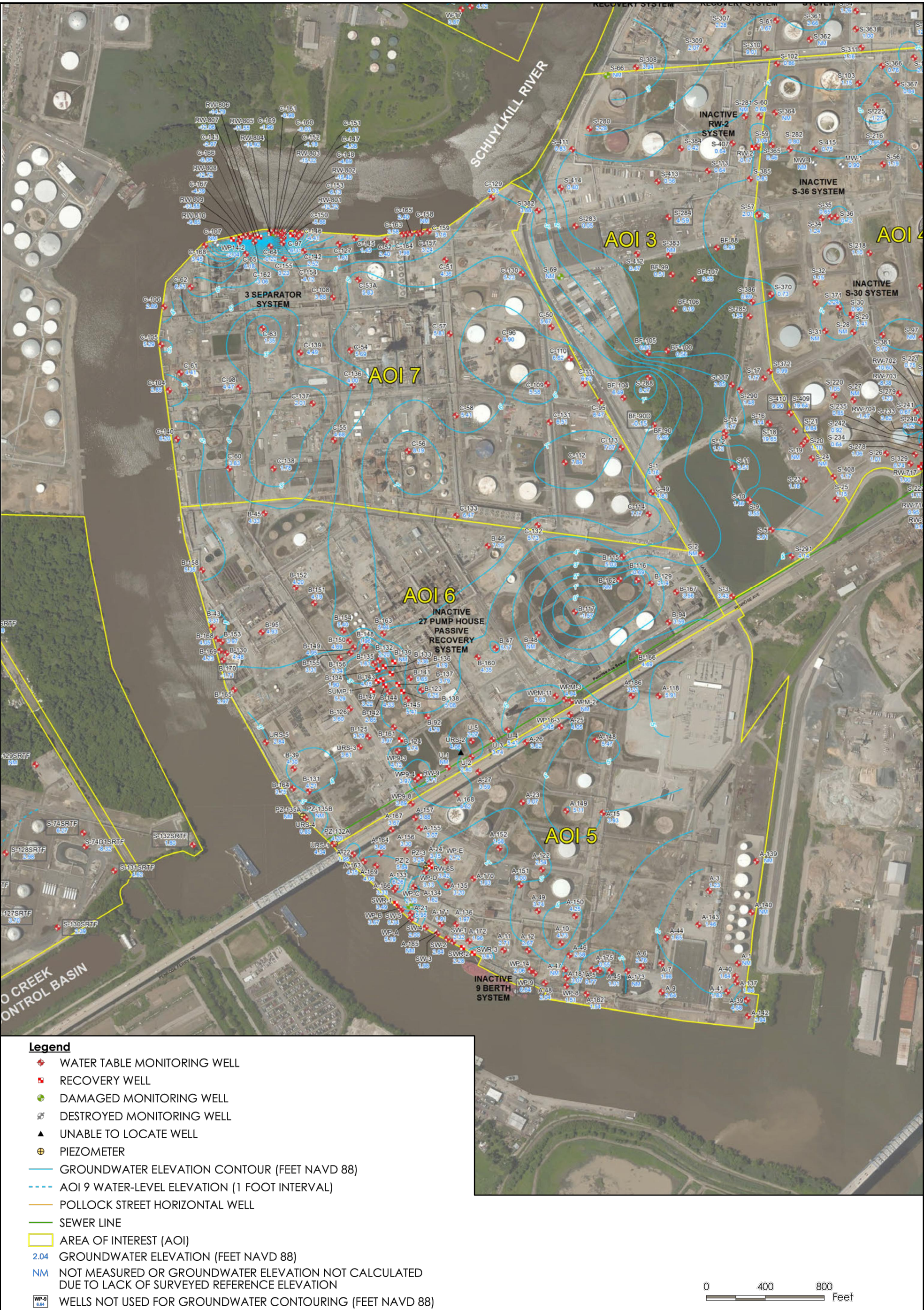
Date: Mar 28, 2017

EVERGREEN RESOURCES  
MANAGEMENT  
AOI-7 PHILADELPHIA  
REFINERY OPERATIONS  
SUB-SURFACE SOIL  
SAMPLING RESULTS

Figure No.

FIGURE 12b





SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.



EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC  
PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
REMEDIAL INVESTIGATION REPORT  
STANTEC WATER TABLE AQUIFER  
GROUNDWATER ELEVATION MAP - MAY 2016

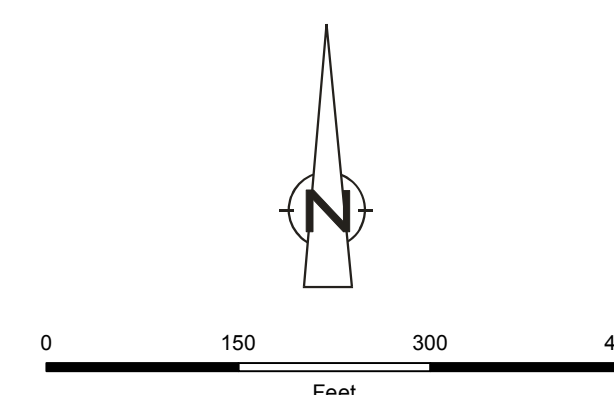
11109614-01  
Nov 24, 2016

FIGURE 13





Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet


**Legend**

- Legend**
- Groundwater Measurement (ft msl)
  - 2016 RI Soil Sample
  - Water Table Monitoring Well
  - Recovery Well
  - Deep Monitoring Well
  - Damaged Monitoring Well
  - Destroyed Monitoring Well
  - ▲ Monitoring Well (Unable to Locate)
  - Historical Soil Sample
  - Bulkhead
  - Groundwater Elevation Contour (ft msl)
  - 3 Separator Remediation System
  - 3 Separator Remediation System
  - Solid Waste Management Unit
  - Area Of Interest

Original Size

ANSI D

Bar is one inch on  
original size drawing

0 

Project: 11109614

Date: Dec 19, 2016

**EVERGREEN RESOURCES  
MANAGEMENT - AOI-7**

# WATER TABLE GROUNDWATER ELEVATIONS SEPTEMBER 2016

Figure No.

**FIGURE 14**





**Legend**

LOWER AQUIFER MONITORING WELL

DESTROYED MONITORING WELL

GROUNDWATER ELEVATION CONTOUR (FEET NAVD 88)

POLLOCK STREET HORIZONTAL WELL

SEWER LINE

AREA OF INTEREST (AOI)

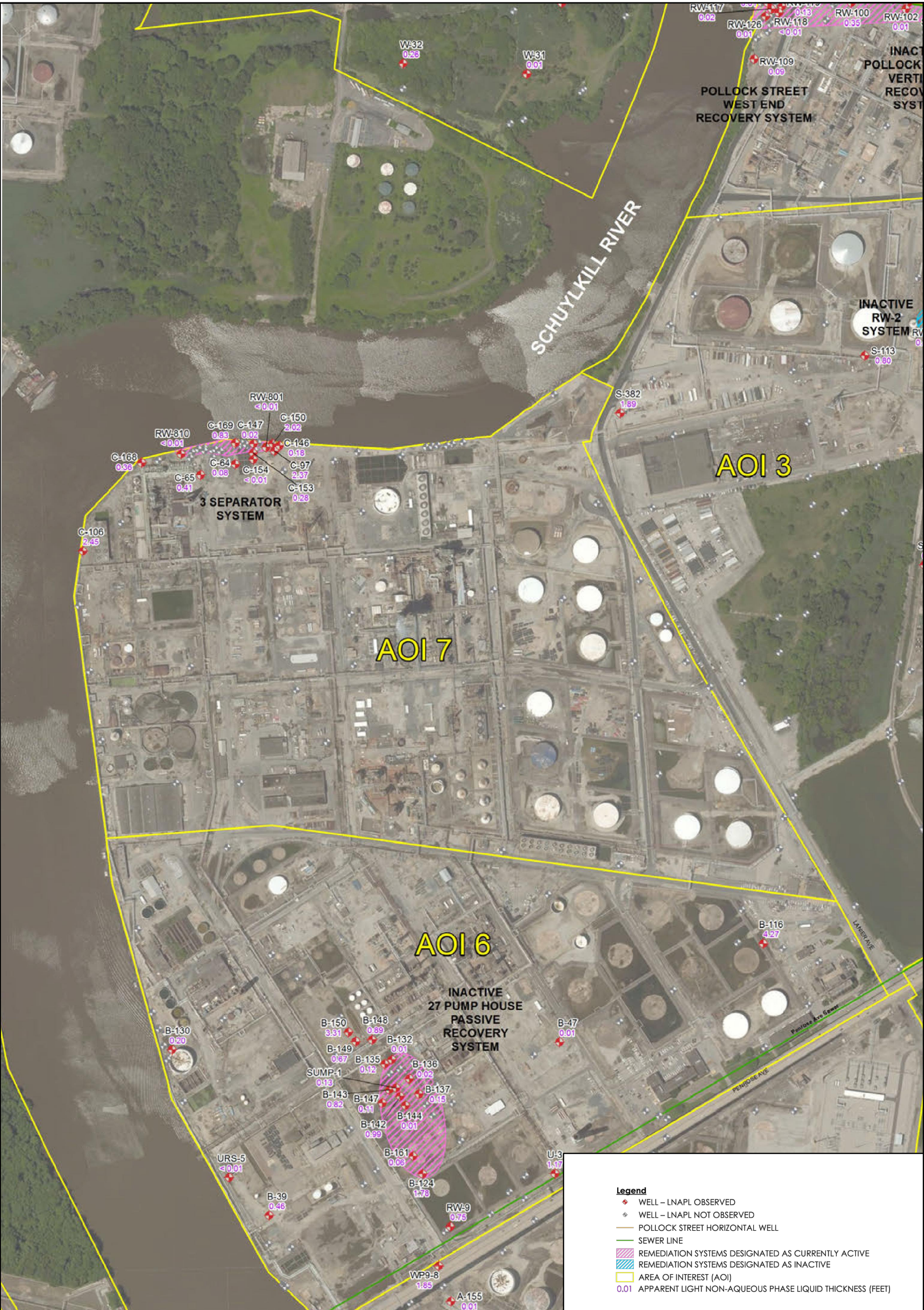
-5.74 GROUNDWATER ELEVATION (FEET NAVD 88)

NM NOT MEASURED OR GROUNDWATER ELEVATION NOT CALCULATED DUE TO LACK OF SURVEYED REFERENCE ELEVATION

B-133D -4.88 WELL NOT USED FOR GROUNDWATER CONTOURING (FEET NAVD 88)

SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.





SOURCE: PHILADELPHIA REFINERY REMEDIATION PROGRAM GROUNDWATER REMEDIATION STATUS REPORT, FIRST HALF 2016, STANTEC, 2016.



EVERGREEN RESOURCES MANAGEMENT OPERATIONS LLC  
PHILADELPHIA REFINERY - 3144 PASSYUNK AVENUE, PHILADELPHIA, PA  
REMEDIAL INVESTIGATION REPORT  
LNAPL OCCURENCE AND REMEDIAL SYSTEMS,  
MAY 2016

11109614-01  
Nov 7, 2016

FIGURE 16





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Source: Aerial: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation



0 150 300 450  
Feet

Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet

- Legend**
- LNAPL Thickness
  - 2016 RI Groundwater Sample
  - 2016 RI Soil Sample
  - Water Table Monitoring Well
  - Recovery Well
  - Deep Monitoring Well
  - Damaged Monitoring Well
  - Destroyed Monitoring Well
  - Monitoring Well (Unable to Locate)
  - Historical Soil Sample
  - Bulkhead
  - Existing Tank
  - Former Tank
  - 3 Separator Remediation System
  - 3 Separator Remediation System
  - Solid Waste Management Unit
  - Area Of Interest

Original Size

ANSI D

Bar is one inch on  
original size drawing

0 1"

Project : 11109614

Date: Dec 19, 2016

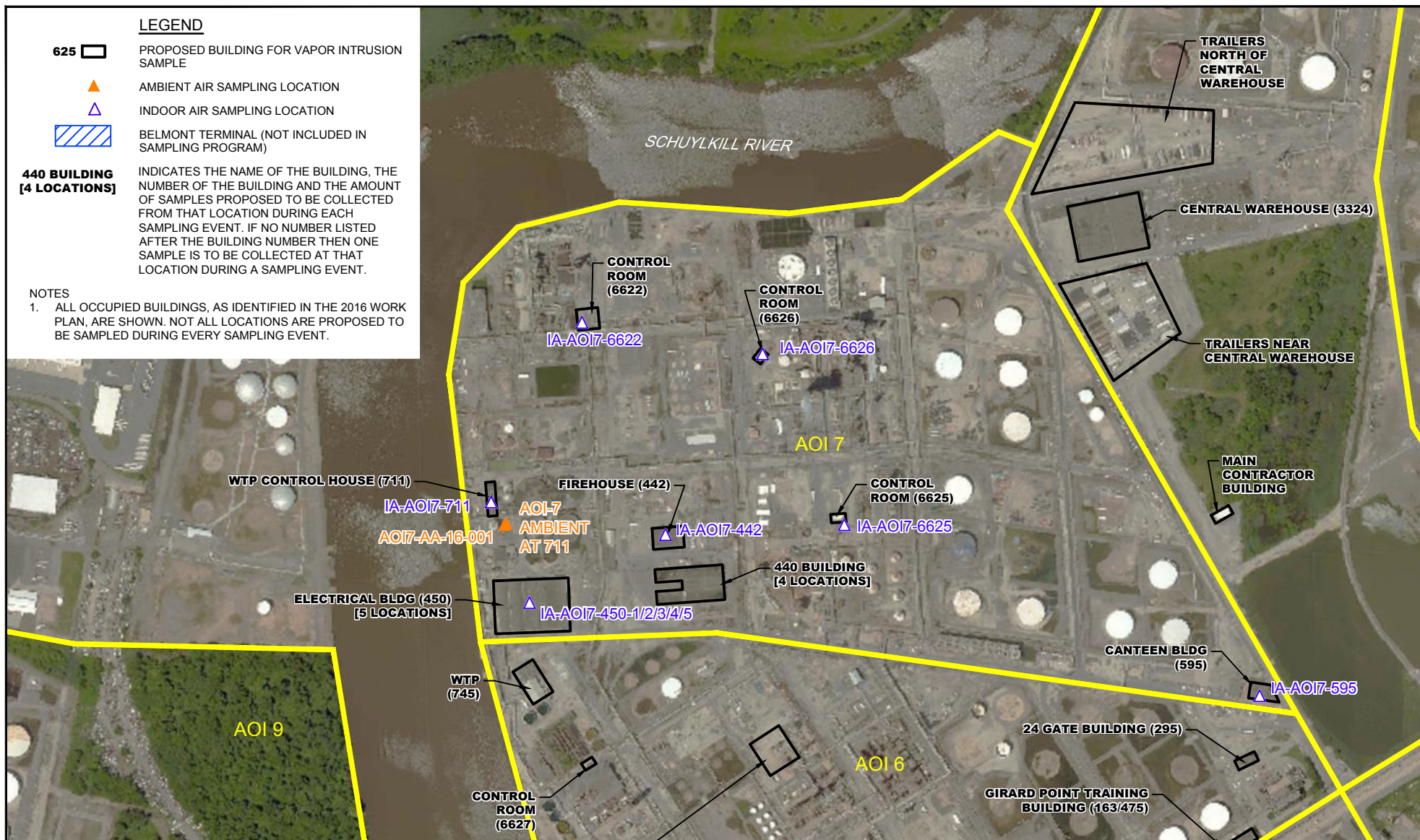
EVERGREEN RESOURCES  
MANAGEMENT - AOI-7

LNAPL OCCURENCES  
SEPTEMBER 2016

Figure No.

FIGURE 17





Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date: June 2014, Accessed: 2016.

0 300 600ft

Coordinate System:  
PENNSYLVANIA SOUTH  
NAD83



PHILADELPHIA ENERGY SOLUTIONS FACILITY  
PHILADELPHIA, PENNSYLVANIA

INDOOR AIR AND AMBIENT AIR SAMPLING LOCATIONS


11109614-01

Nov 24, 2016

FIGURE 18

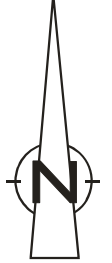






GHD Limited  
651 Colby Drive  
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T 519 884 0510 F 519 884 0525 W www.ghd.com

Source: Aerial: USDA NAIP August 2015



0 150 300 450  
Feet

Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet

**Legend**

- 2016 RI Groundwater Sample (Exceeded MSC)
- 2016 RI Groundwater Sample (Did not exceed MSC)
- 2016 RI Soil Sample
- Water Table Monitoring Well
- Recovery Well
- Deep Monitoring Well
- Damaged Monitoring Well
- Destroyed Monitoring Well
- Monitoring Well (Unable to Locate)
- Historical Soil Sample
- Bulkhead
- 3 Separator Remediation System
- 3 Separator Remediation System
- Solid Waste Management Unit
- Area Of Interest

Original Size

**ANSI D**

Bar is one inch on original size drawing

0 1"

Project : 11109614

Date: Jan 3, 2017

**EVERGREEN RESOURCES MANAGEMENT**

**AOI-7 PHILADELPHIA REFINERY OPERATIONS**

**WATER TABLE GROUNDWATER RESULTS**

Figure No.











**FIGURE 19**

Fraction	Parameter	PADEP Act2 Used Aquifer NR MSC (ug/L)
VOCs	1,2,4-Trimethylbenzene	62
VOCs	1,2-Dibromoethane (Ethylene dibromide)	0.05
VOCs	Benzene	5
VOCs	Isopropyl benzene	3500
VOCs	Toluene	1000
SVOCs	Benzo(a)anthracene	4.9
SVOCs	Benzo(a)pyrene	0.2
SVOCs	Benzo(b)fluoranthene	1.2
SVOCs	Benzo(g,h,i)perylene	0.26
SVOCs	Chrysene	1.9
SVOCs	Naphthalene	100
Metals	Lead (dissolved)	5





Coordinate System:  
NAD 1983 StatePlane Pennsylvania South FIPS  
3702 Feet

- Legend**
-  2016 RI Groundwater Sample (Exceeded MSC)
  -  2016 RI Groundwater Sample (Did not exceed MSC)
  -  2016 RI Soil Sample
  -  Water Table Monitoring Well
  -  Recovery Well
  -  Deep Monitoring Well
  -  Damaged Monitoring Well
  -  Destroyed Monitoring Well
  -  Monitoring Well (Unable to Locate)
  -  Historical Soil Sample
  -  Bulkhead
  -  3 Separator Remediation System
  -  3 Separator Remediation System
  -  Solid Waste Management Unit
  -  Area Of Interest

Original Size

ANSI D

Bar is one inch on original size drawing

0 ————— 1

Project : 11109614

Date: Dec 19, 2016

**EVERGREEN RESOURCES  
MANAGEMENT  
AOI-7 PHILADELPHIA  
REFINERY OPERATIONS  
DEEP  
GROUNDWATER RESULTS**

Figure No.

## FIGURE 20



Table 1

**Constituents of Concern**  
**Evergreen Act 2/One Cleanup Program Petroleum Short List**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC**

<b>Volatile Organic Compounds</b>	<b>CAS No.</b>
Benzene	71-43-2
Cumene	98-82-8
Dichloroethane, 1,2-	107-06-2
Ethylbenzene	100-41-4
Ethylene Dibromide	106-93-4
Methyl tert butyl ether	1634-04-4
Toluene	108-88-3
Trimethylbenzene, 1,2,4-	95-63-6
Trimethylbenzene, 1,3,5-	108-67-8
Xylenes	1330-20-7
<b>Semi Volatile Organic Compounds</b>	<b>CAS No.</b>
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
<b>Metals</b>	<b>CAS No.</b>
Lead	7439-92-1

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

**Characterization Activities**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, A Series of Evergreen Resources Group, LLC**

Location ID	Location Rationale	Product Type	Media	Surface Soil Sample Collected (0-2 ft. bgs)	Subsurface Soil Sample Collected (>2 ft. bgs)	Groundwater Sample Collection	Analyte List	Used for Evaluation of Regulated Tank Incident
C-104	Dowgradient of GP-1002		GW			X	Evergreen Petr Short List COCs	YES
C-105	SWMU 87 area and side gradient delineation NAPL		GW			X	Evergreen Petr Short List COCs	NO
C-106	SWMU 88 area and groundwater sample under LNAPL	Lube Oil	GW			X	Evergreen Petr Short List COCs	NO
C-108	Downgradient of GP-1108		GW			X	Evergreen Petr Short List COCs	YES - secondary
C-112	Downgradient of AST 277		GW			X	Evergreen Petr Short List COCs	YES
C-113	Downgradient of AST-277		GW			X	Evergreen Petr Short List COCs	YES - secondary
C-127	Side gradient delineation NAPL		GW			X	Evergreen Petr Short List COCs	NO
C-128*	Groundwater sample under LNAPL (WELL DESTROYED)		GW			X	Evergreen Petr Short List COCs	NO
C-129	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		GW			X	Evergreen Petr Short List COCs	NO
C-130	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		GW			X	Evergreen Petr Short List COCs	NO
C-131	Downgradient of AST 275		GW			X	Evergreen Petr Short List COCs	YES
C-132	Downgradient of GP-273 and 277		GW			X	Evergreen Petr Short List COCs	YES
C-136	9th and L Ave between Unit 433 and Tank 1232		GW			X	Evergreen Petr Short List COCs	NO
C-138	Downgradient of former UST M004 and M005		GW			X	Evergreen Petr Short List COCs	YES
C-140	Western AOI 7 Boundary		GW			X	Evergreen Petr Short List COCs	NO
C-142	Side gradient delineation NAPL		GW			X	Evergreen Petr Short List COCs	NO
C-145	Downgradient of NAPL at C-128		GW			X	Evergreen Petr Short List COCs	NO
C-146	Groundwater sample under LNAPL		GW			X	Evergreen Petr Short List COCs	NO
C-150	Groundwater sample under LNAPL	Light Crude Oil	GW			X	Evergreen Petr Short List COCs	NO
C-151	Groundwater sample under LNAPL (WELL DAMAGED)	Light Crude Oil	GW			X	Evergreen Petr Short List COCs	NO
C-158	(WELL DAMAGED, sampled C-157 instead)		GW			X	Evergreen Petr Short List COCs	NO
C-161	Groundwater sample under LNAPL	Light Crude Oil	GW			X	Evergreen Petr Short List COCs	NO
C-162	Delineate C-143	Light Crude Oil	GW			X	Evergreen Petr Short List COCs	NO
C-163	Downgradient of GP-1100		GW			X	Evergreen Petr Short List COCs	YES
C-168	Groundwater sample under LNAPL	Very Light Crude Oil	GW			X	Evergreen Petr Short List COCs	NO
C-49	Downgradient of GP-277		GW			X	Evergreen Petr Short List COCs	YES
C-50	Downgradient of GP-281		GW			X	Evergreen Petr Short List COCs	YES
C-51	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		GW			X	Evergreen Petr Short List COCs	NO
C-52	Site Boundary Well		GW			X	Evergreen Petr Short List COCs	NO
C-54	Characterize downgradient of GP-1100		GW			X	Evergreen Petr Short List COCs	YES
C-57	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		GW			X	Evergreen Petr Short List COCs	NO
C-58	Complete characterization for ASTs 271, 272, 275		GW			X	Evergreen Petr Short List COCs	YES
C-59	Complete characterization for AST 271 (WELL DESTROYED)		GW			X	Evergreen Petr Short List COCs	YES
C-62	Side gradient delineation NAPL		GW			X	Evergreen Petr Short List COCs	NO
C-96	Complete characterization for AST 281		GW			X	Evergreen Petr Short List COCs	YES
C-134D	AOI-11 Characterization		GW			X	Evergreen Petr Short List COCs	NO
C-129D	AOI-11 Characterization		GW			X	Evergreen Petr Short List COCs	NO
C-144D	AOI-11 Characterization; Site Boundary Well		GW			X	Evergreen Petr Short List COCs	NO
C-50D	AOI-11 Characterization		GW			X	Evergreen Petr Short List COCs	NO
C-170	Delineate NAPL southwest of C-168		GW	X	X	X <sup>10</sup>	Evergreen Petr Short List COCs	NO
C-171	Delineate NAPL southeast of C-106		GW	X	X	X <sup>10</sup>	Evergreen Petr Short List COCs	NO
C-172	Investigate potential impacts from M-004 and M-005 USTs; subsurface soil characterization		GW	X	X	X <sup>10</sup>	Evergreen Petr Short List COCs	YES
AOI7-BH-16-001	Delineate by Tank 1108		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-002	Delineate by Tank 1108		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-003	Delineate by Tank 1108		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-005	Delineate by Tank 281		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-006	Delineate by Tank 281		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-007	Delineate by Tank 281		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-008	Delineate by Tank 281		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-009	Delineate by Tank 272		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-010	Delineate by Tank 272		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-011	Delineate by Tank 272		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-012	Delineate by Tank 272		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-013	Delineate by Tank 273		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-014	Delineate by Tank 273		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-015	Delineate by Tank 273		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-016	Delineate by Tank 273		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-017	Delineate to NE at Tank 1100 for direct contact BaP exceedance		Soil	BaP only <sup>6</sup>	BaP only <sup>6</sup>		BAP only	YES
AOI7-BH-16-018	Delineate subsurface soil conditions at GP-1100-1100-CV2 for benzo(a)pyrene		Soil		BaP only <sup>6</sup>		BAP only	YES
AOI7-BH-16-019	Historic Release Charge Line from Tank 284 to Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-020	Historic Release Charge Line from Tank 284 to Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO



Table 2  
Characterization Activities  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, A Series of Evergreen Resources Group, LLC

Location ID	Location Rationale	Product Type	Media	Surface Soil Sample Collected (0-2 ft. bgs)	Subsurface Soil Sample Collected (>2 ft. bgs)	Groundwater Sample Collection	Analyte List	Used for Evaluation of Regulated Tank Incident
AOI7-BH-16-021	Historic Release Charge Line from Tank 284 to Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-022	Historic Release Charge Line from Tank 284 to Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-023	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-024	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-025	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-026	Historic Release - 9th and L Ave between Unit 43 and Tank 1232		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-027	Historic Release in M Avenue north of 1132 unit		Soil	X	X (could not collect)		Evergreen Petr Short List COCs	NO
AOI7-BH-16-028	Historic Release sewer backup north of 1332 at bulkhead		Soil	X	X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-029	Delineate subsurface soil conditions at C-143		Soil		X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-030	Delineate subsurface soil conditions at C-169		Soil		X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-031	Delineate subsurface soil conditions at AOI7-BH-10-20		Soil		X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-032	Delineate subsurface soil conditions at AOI7-BH-12-56		Soil		X		Evergreen Petr Short List COCs	NO
AOI7-BH-16-033	Verify Lead concentration at BNA-10 2-4 ft		Soil		Pb <sup>7</sup>		Lead	NO
AOI7-BH-16-034	Investigate conditions at former tank GP-274		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-035	Investigate conditions at former tank GP-279		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-036	Investigate conditions at former tank GP-287		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-037	Investigate conditions at former tank GP-288		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-038	Investigate conditions at former tank GP-1102		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-039	Investigate conditions at former tank GP-1103		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-040	Investigate conditions at former tank GP-1123		Soil	X <sup>9</sup>	X <sup>9</sup>		Evergreen Petr Short List COCs	YES
AOI7-BH-16-041	Investigate conditions at former tank GP-1132		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-042	Investigate conditions at former tank GP-1135		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-043	Investigate conditions at former tank GP-1202		Soil	X <sup>9</sup>	X <sup>9</sup>		Evergreen Petr Short List COCs	YES
AOI7-BH-16-044	Investigate conditions at former historical tank farm		Soil	X	X		Evergreen Petr Short List COCs	YES
AOI7-BH-16-045	Investigate unpaved area adjacent to former incinerator (SW)		Soil	X <sup>8</sup>	X <sup>8</sup>		Evergreen Petr Short List COCs	
AOI7-BH-16-046	Investigate unpaved area adjacent to former sludge basins (W)		Soil	X <sup>8</sup>	X <sup>8</sup> (Could not collect)		Evergreen Petr Short List COCs	
AOI7-BH-16-047	Investigate unpaved area adjacent to former haz waste tanks 1004-1007 (N)		Soil	X <sup>8</sup>	X <sup>8</sup>		Evergreen Petr Short List COCs	
AOI7-AA-16-001	Investigate outdoor air quality in location over NAPL plume - light crude oil plume		Outdoor Air			Note 5	TO-15	NO
AOI7-AA-16-002	Investigate outdoor air quality in location over NAPL plume - light crude oil plume		Outdoor Air			Note 5	TO-15	NO
AOI7-AA-16-003	duplicate sample		Outdoor Air			Note 5	TO-15	NO
AOI7-AI-16-001	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-002	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-003	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-004	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-005	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-006	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-007	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-008	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-009	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-010	Investigate outdoor air quality		Indoor Air				TO-15	NO
AOI7-AI-16-011	Investigate outdoor air quality		Indoor Air				TO-15	NO

Notes:

- Investigation Area #1
- Investigation Area #2
- Investigation Area #3
- Investigation Area #4
- Outdoor air samples to be collected for volatile organics by TO-15 analytical method
- Soil sample analyzed only for benzo(a)pyrene to complete delineation of impact observed in sample GP-1100-1100-CV2
- Soil sample analyzed only for lead at location to verify concentrations at BNA-10
- Site specific constituents -hexavalent chromium and mercury
- Sulfur tank
- Newly installed wells C-170, C-171, and C-172 were also sampled a second time.
- ft bgs - feet below ground surface



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-001 AOI7-BH-16-001-0-2-070116 07/01/2016 0.0-2.0 ft	AOI7-BH-16-002 AOI7-BH-16-002-0-2-071216 07/12/2016 0.0-2.0 ft	AOI7-BH-16-003 AOI7-BH-16-003-0-2-071216 07/12/2016 0.0-2.0 ft	AOI7-BH-16-005 AOI7-BH-16-005-0-2-062816 06/28/2016 0.0-2.0 ft	AOI7-BH-16-006 AOI7-BH-16-006-0-2-062816 06/28/2016 0.0-2.0 ft	AOI7-BH-16-007 AOI7-BH-16-007-0-2-062816 06/28/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	0.62	ND(0.005)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006) <sup>b</sup>	ND(0.24) <sup>b</sup>	ND(0.005)
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	0.13 J	ND(0.005)
Benzene	mg/kg	290	0.5	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
Ethylbenzene	mg/kg	890	70	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
Isopropyl benzene	mg/kg	10000	2500	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
Toluene	mg/kg	10000	100	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	ND(0.24)	ND(0.005)
Xylenes (total)	mg/kg	8000	1000	ND(0.004)	ND(0.005)	ND(0.004)	ND(0.006)	0.20 J	ND(0.005)
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	0.005 J	0.020	ND(0.018)	0.59	0.60	0.067
Benzo(a)anthracene	mg/kg	130	130	0.017 J	0.088	ND(0.018)	0.77	0.83	0.078
Benzo(a)pyrene	mg/kg	12	12	0.017 J	0.062	ND(0.018)	0.66	1.0	0.053
Benzo(b)fluoranthene	mg/kg	76	76	0.026	0.085	ND(0.018)	0.79	1.3	0.094
Benzo(g,h,i)perylene	mg/kg	190000	180	0.019	0.051	0.008 J	0.60	0.42	0.11
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	0.018 J	0.200	ND(0.018)	0.89	4.7	0.086
Fluorene	mg/kg	130000	3800	ND(0.018)	0.015 J	ND(0.018)	0.22	3.1	0.023
Naphthalene	mg/kg	760	25	0.009 J	0.019 J	ND(0.018)	5.2	0.30	0.28
Phenanthrene	mg/kg	190000	10000	0.015 J	0.15	0.005 J	1.7	8.7	0.15
Pyrene	mg/kg	96000	2200	0.025	0.11	0.006 J	0.87	2.8	0.098



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				AOI7-BH-16-001	AOI7-BH-16-002	AOI7-BH-16-003	AOI7-BH-16-005	AOI7-BH-16-006	AOI7-BH-16-007
Sample ID:				AOI7-BH-16-001-0-2-070116	AOI7-BH-16-002-0-2-071216	AOI7-BH-16-003-0-2-071216	AOI7-BH-16-005-0-2-062816	AOI7-BH-16-006-0-2-062816	AOI7-BH-16-007-0-2-062816
Sample Date:				07/01/2016	07/12/2016	07/12/2016	06/28/2016	06/28/2016	06/28/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	10.2	98.3	ND(13.4)	130	63.6	241
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	7.2	10.4	6.6	26.6	12.4	19.0

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-008 AOI7-BH-16-008-0-2-062816 06/28/2016 0.0-2.0 ft	AOI7-BH-16-009 AOI7-BH-16-009-062816-0-2 06/28/2016 0.0-2.0 ft	AOI7-BH-16-010 AOI7-BH-16-010-062816-0-2 06/28/2016 0.0-2.0 ft	AOI7-BH-16-011 AOI7-BH-16-011-062816-0-2 06/28/2016 0.0-2.0 ft	AOI7-BH-16-012 AOI7-BH-16-012-062816-0-2 06/28/2016 0.0-2.0 ft	AOI7-BH-16-013 AOI7-BH-16-013-0-2-062916 06/29/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640)	ND(0.660)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.005)	ND(0.005)	ND(0.007) <sup>b</sup>	ND(0.006) <sup>b</sup>	ND(0.640) <sup>b</sup>	ND(0.660) <sup>b</sup>
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640) <sup>b</sup>	ND(0.660) <sup>b</sup>
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640)	ND(0.660)
Benzene	mg/kg	290	0.5	0.0008 J	0.002 J	ND(0.007)	ND(0.006)	0.079 J	ND(0.660) <sup>b</sup>
Ethylbenzene	mg/kg	890	70	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640)	ND(0.660)
Isopropyl benzene	mg/kg	10000	2500	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640)	ND(0.660)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	ND(0.640)	ND(0.660)
Toluene	mg/kg	10000	100	0.002 J	0.002 J	0.001 J	ND(0.006)	0.810	0.280 J
Xylenes (total)	mg/kg	8000	1000	ND(0.005)	ND(0.005)	ND(0.007)	ND(0.006)	0.220 J	ND(0.660)
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	0.10	0.11	1.1	0.91	2.4	2.5
Benzo(a)anthracene	mg/kg	130	130	0.13	0.24	2.7	0.96	2	2.2
Benzo(a)pyrene	mg/kg	12	12	0.20	0.26	2.1	0.81	1.5	1.3
Benzo(b)fluoranthene	mg/kg	76	76	0.17	0.52	2.7	1.2	1.8	1.8
Benzo(g,h,i)perylene	mg/kg	190000	180	0.14	0.51	1.4	0.72	1.1	0.75
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	0.45	0.40	2.9	1.2	2.4	2.8
Fluorene	mg/kg	130000	3800	0.043	0.035	0.54	0.43	2	2.2
Naphthalene	mg/kg	760	25	0.34	0.48	10	9.5	11	8
Phenanthrene	mg/kg	190000	10000	0.25	0.27	3.9	3.0	4.3	5.9
Pyrene	mg/kg	96000	2200	0.23	0.40	3.6	1.2	4.2	6.3



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				AOI7-BH-16-008	AOI7-BH-16-009	AOI7-BH-16-010	AOI7-BH-16-011	AOI7-BH-16-012	AOI7-BH-16-013
Sample ID:				AOI7-BH-16-008-0-2-062816	AOI7-BH-16-009-062816-0-2	AOI7-BH-16-010-062816-0-2	AOI7-BH-16-011-062816-0-2	AOI7-BH-16-012-062816-0-2	AOI7-BH-16-013-0-2-062916
Sample Date:				06/28/2016	06/28/2016	06/28/2016	06/28/2016	06/28/2016	06/29/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	85.4	526	399	321	295	418
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	15.8	20.6	30.9	29.5	44.3	44.1

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-014 AOI7-BH-16-014-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-015 AOI7-BH-16-015-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-016 AOI7-BH-16-016-062816-0-2 06/28/2016 0.0-2.0 ft	AOI7-BH-16-017 AOI7-BH-16-017-0-2-071116 07/11/2016 0.0-2.0 ft	AOI7-BH-16-019 AOI7-BH-16-019-0-2-070616 07/06/2016 0.0-2.0 ft	AOI7-BH-16-020 AOI7-BH-16-020-0-2-062816 06/28/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.007)	ND(0.008)	ND(0.004)	-	0.002 J	ND(0.009)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.007) <sup>b</sup>	ND(0.008) <sup>b</sup>	ND(0.004)	-	ND(0.004)	ND(0.009) <sup>b</sup>
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.007)	ND(0.008)	ND(0.004)	-	ND(0.004)	ND(0.009)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.007)	ND(0.008)	ND(0.004)	-	0.002 J	ND(0.009)
Benzene	mg/kg	290	0.5	ND(0.007)	ND(0.008)	ND(0.004)	-	0.0006 J	ND(0.009)
Ethylbenzene	mg/kg	890	70	ND(0.007)	ND(0.008)	ND(0.004)	-	ND(0.004)	ND(0.009)
Isopropyl benzene	mg/kg	10000	2500	ND(0.007)	ND(0.008)	ND(0.004)	-	0.002 J	ND(0.009)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.007)	ND(0.008)	ND(0.004)	-	ND(0.004)	ND(0.009)
Toluene	mg/kg	10000	100	ND(0.007)	ND(0.008)	ND(0.004)	-	0.0009 J	ND(0.009)
Xylenes (total)	mg/kg	8000	1000	ND(0.007)	ND(0.008)	ND(0.004)	-	0.002 J	ND(0.009)
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	1.6	1.2	0.012 J	-	0.18	0.024
Benzo(a)anthracene	mg/kg	130	130	1.3	1.4	0.025	-	0.27	0.11
Benzo(a)pyrene	mg/kg	12	12	1.2	1.3	0.021	3.2	0.22	0.085
Benzo(b)fluoranthene	mg/kg	76	76	1.9	1.8	0.035	-	0.26	0.13
Benzo(g,h,i)perylene	mg/kg	190000	180	1.2	1.3	0.023	-	0.29	0.076
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	1.7	1.8	0.032	-	0.57	0.14
Fluorene	mg/kg	130000	3800	0.88	0.47	0.006 J	-	0.25	0.008 J
Naphthalene	mg/kg	760	25	22	12	0.017 J	-	0.68	0.025
Phenanthrene	mg/kg	190000	10000	5	3.4	0.028	-	0.83	0.078
Pyrene	mg/kg	96000	2200	1.9	1.6	0.039	-	0.45	0.18



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				AOI7-BH-16-014	AOI7-BH-16-015	AOI7-BH-16-016	AOI7-BH-16-017	AOI7-BH-16-019	AOI7-BH-16-020
Sample ID:				AOI7-BH-16-014-0-2-062916	AOI7-BH-16-015-0-2-062916	AOI7-BH-16-016-062816-0-2	AOI7-BH-16-017-0-2-071116	AOI7-BH-16-019-0-2-070616	AOI7-BH-16-020-0-2-062816
Sample Date:				06/29/2016	06/29/2016	06/28/2016	07/11/2016	07/06/2016	06/28/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	566	386	21.4	-	117	13.9
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	35.5	36.3	8.1	32.5	16.0	20.9

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-020 AOI7-BH-16-020-0-2-070116 07/01/2016 0.0-2.0 ft	AOI7-BH-16-021 AOI7-BH-16-021-0-2-063016 06/30/2016 0.0-2.0 ft	AOI7-BH-16-022 AOI7-BH-16-022-0-2-070516 07/05/2016 0.0-2.0 ft	AOI7-BH-16-023 AOI7-BH-16-023-0-2-070116 07/01/2016 0.0-2.0 ft	AOI7-BH-16-024 AOI7-BH-16-024-0-2-070716 07/07/2016 0.0-2.0 ft	AOI7-BH-16-025 AOI7-BH-16-025-0-2-070116 07/01/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	1.0 J
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	ND(4.1) <sup>b</sup>
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	ND(4.1) <sup>b</sup>
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	ND(4.1)
Benzene	mg/kg	290	0.5	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	0.82 J <sup>b</sup>
Ethylbenzene	mg/kg	890	70	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	1.6 J
Isopropyl benzene	mg/kg	10000	2500	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	3.4 J
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	ND(4.1) <sup>b</sup>
Toluene	mg/kg	10000	100	ND(0.004)	ND(0.004)	ND(0.005)	0.002 J	ND(0.004)	1.1 J
Xylenes (total)	mg/kg	8000	1000	ND(0.004)	ND(0.004)	ND(0.005)	ND(0.005)	ND(0.004)	2.0 J
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	0.3	0.19	1.3	0.200 J	0.004 J	2.0
Benzo(a)anthracene	mg/kg	130	130	0.53	0.53	2.2	0.46	0.009 J	1.8
Benzo(a)pyrene	mg/kg	12	12	0.48	0.48	2.1	0.38	0.014 J	1.9
Benzo(b)fluoranthene	mg/kg	76	76	0.63	0.61	3.1	0.80	0.017 J	2.3
Benzo(g,h,i)perylene	mg/kg	190000	180	0.59	0.33	1.6	0.43	0.016 J	1.6
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	0.6	0.48	2.3	0.54	0.012 J	2.1
Fluorene	mg/kg	130000	3800	0.15	0.074	0.8	0.063 J	ND(0.018)	1.8
Naphthalene	mg/kg	760	25	1.0	0.15	5.5	1.1	0.009 J	64 <sup>b</sup>
Phenanthrene	mg/kg	190000	10000	0.9	0.74	3.5	0.72	0.008 J	5.1
Pyrene	mg/kg	96000	2200	0.84	0.95	3.5	0.67	0.016 J	3.4



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				AOI7-BH-16-020	AOI7-BH-16-021	AOI7-BH-16-022	AOI7-BH-16-023	AOI7-BH-16-024	AOI7-BH-16-025
Sample ID:				AOI7-BH-16-020-0-2-070116	AOI7-BH-16-021-0-2-063016	AOI7-BH-16-022-0-2-070516	AOI7-BH-16-023-0-2-070116	AOI7-BH-16-024-0-2-070716	AOI7-BH-16-025-0-2-070116
Sample Date:				07/01/2016	06/30/2016	07/05/2016	07/01/2016	07/07/2016	07/01/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	351	77.5	119	268	6.35	533
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	16.7	18.7	20.3	23.3	6.3	27.7

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
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Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-026 AOI7-BH-16-026-0-2-070116 07/01/2016 0.0-2.0 ft	AOI7-BH-16-027 AOI7-BH-16-027-0-2-070716 07/07/2016 0.0-2.0 ft	AOI7-BH-16-028 AOI7-BH-16-028-0-2-071216 07/12/2016 0.0-2.0 ft	AOI7-BH-16-032 AOI7-BH-16-032-0-2-071216 07/12/2016 0.0-2.0 ft	AOI7-BH-16-034 AOI7-BH-16-034-0-2-070816 07/08/2016 0.0-2.0 ft	AOI7-BH-16-035 AOI7-BH-16-035-0-2-070816 07/08/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	ND(0.006)	ND(0.004)	ND(0.006)	ND(0.004)	1.0	ND(0.004)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.006) <sup>b</sup>	ND(0.004)	ND(0.006) <sup>b</sup>	ND(0.004)	ND(0.41) <sup>b</sup>	ND(0.004)
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.006)	ND(0.004)	ND(0.006)	ND(0.004)	ND(0.41)	ND(0.004)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.006)	ND(0.004)	ND(0.006)	ND(0.004)	ND(0.41)	ND(0.004)
Benzene	mg/kg	290	0.5	0.001 J	ND(0.004)	0.010	ND(0.004)	0.390 J	0.002 J
Ethylbenzene	mg/kg	890	70	ND(0.006)	ND(0.004)	ND(0.006)	ND(0.004)	0.150 J	ND(0.004)
Isopropyl benzene	mg/kg	10000	2500	0.004 J	ND(0.004)	ND(0.006)	ND(0.004)	0.250 J	ND(0.004)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.006)	ND(0.004)	ND(0.006)	ND(0.004)	ND(0.41)	ND(0.004)
Toluene	mg/kg	10000	100	ND(0.006)	ND(0.004)	0.015	ND(0.004)	0.670	0.002 J
Xylenes (total)	mg/kg	8000	1000	0.002 J	ND(0.004)	0.004 J	ND(0.004)	1.500	ND(0.004)
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	0.053 J	0.014 J	1.0	0.010 J	1.0	0.34
Benzo(a)anthracene	mg/kg	130	130	0.26	0.025	2.0	0.03	1.8	0.72
Benzo(a)pyrene	mg/kg	12	12	0.37	0.034	1.7	0.038	1.8	0.55
Benzo(b)fluoranthene	mg/kg	76	76	0.57	0.053	2.2	0.069	2.5	0.69
Benzo(g,h,i)perylene	mg/kg	190000	180	0.39	0.046	1.6	0.046	1.6	0.56
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	0.40	0.034	2.2	0.049	2.8	0.73
Fluorene	mg/kg	130000	3800	ND(0.190)	0.004 J	0.22	ND(0.018)	0.83	0.11
Naphthalene	mg/kg	760	25	0.120 J	0.04	3.3	0.009 J	10	0.20
Phenanthrene	mg/kg	190000	10000	0.23	0.029	2.6	0.031	3.1	1.4
Pyrene	mg/kg	96000	2200	0.61	0.035	2.8	0.062	2.3	1.3



Table 3a

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Sample Location:				AOI7-BH-16-026	AOI7-BH-16-027	AOI7-BH-16-028	AOI7-BH-16-032	AOI7-BH-16-034	AOI7-BH-16-035
Sample ID:				AOI7-BH-16-026-0-2-070116	AOI7-BH-16-027-0-2-070716	AOI7-BH-16-028-0-2-071216	AOI7-BH-16-032-0-2-071216	AOI7-BH-16-034-0-2-070816	AOI7-BH-16-035-0-2-070816
Sample Date:				07/01/2016	07/07/2016	07/12/2016	07/12/2016	07/08/2016	07/08/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	50.3	5.12	499	8.24	424	59.9
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	12.8	4.0	24.5	7.1	27.9	12.3

- Notes:
- a PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
  - b PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
  - ND Not detected at the associated reporting limit.
  - J Estimated concentration.
  - ND(10)<sup>b</sup> Indicates reporting limit was above the applicable standard.
  - 1.4 J<sup>b</sup> Indicates detected value was above the applicable standard
  - <sup>SS</sup> Lead value is the site specific standard for lead accepted by the PADEP.
  - ft feet



Table 3a

Surface Soil Analytical Results Summary  
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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-036 AOI7-BH-16-036-0-2-063016 06/30/2016 0.0-2.0 ft	AOI7-BH-16-037 AOI7-BH-16-037-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-038 AOI7-BH-16-038-0-2-063016 06/30/2016 0.0-2.0 ft	AOI7-BH-16-039 AOI7-BH-16-039-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-040 AOI7-BH-16-040-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-041 AOI7-BH-16-041-0-2-070616 07/06/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	0.14 J	ND(2.3)	ND(0.005)	0.001 J	ND(0.004)	ND(0.005)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.49) <sup>b</sup>	ND(2.3) <sup>b</sup>	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.49)	ND(2.3) <sup>b</sup>	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.49)	ND(2.3)	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
Benzene	mg/kg	290	0.5	0.089 J	ND(2.3) <sup>b</sup>	ND(0.005)	0.004 J	0.001 J	0.002 J
Ethylbenzene	mg/kg	890	70	0.11 J	ND(2.3)	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
Isopropyl benzene	mg/kg	10000	2500	ND(0.49)	ND(2.3)	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.49)	ND(2.3) <sup>b</sup>	ND(0.005)	ND(0.004)	ND(0.004)	ND(0.005)
Toluene	mg/kg	10000	100	1.4	0.610 J	0.001 J	0.002 J	0.001 J	ND(0.005)
Xylenes (total)	mg/kg	8000	1000	0.26 J	ND(2.3)	ND(0.005)	0.002 J	0.0008 J	ND(0.005)
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	1.6	1.2	0.16 J	0.009 J	0.21	0.014 J
Benzo(a)anthracene	mg/kg	130	130	1.4	0.89	0.54	0.032	0.33	0.032
Benzo(a)pyrene	mg/kg	12	12	1.5	0.91	0.69	0.027	0.25	0.041
Benzo(b)fluoranthene	mg/kg	76	76	2.3	1.4	0.8	0.037	0.23	0.057
Benzo(g,h,i)perylene	mg/kg	190000	180	1.4	0.99	0.72	0.043	0.28	0.035
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	-	-	-
Chrysene	mg/kg	760	230	1.6	1.2	0.65	0.063	0.72	0.043
Fluorene	mg/kg	130000	3800	1.1	0.77	0.059 J	0.005 J	0.27	0.005 J
Naphthalene	mg/kg	760	25	21	10	1.4	0.02	0.087	0.039
Phenanthrene	mg/kg	190000	10000	4.7	3.9	0.65	0.05	1.1	0.032
Pyrene	mg/kg	96000	2200	2.2	1.5	0.64	0.04	0.78	0.057



Table 3a

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Sample Location:				AOI7-BH-16-036	AOI7-BH-16-037	AOI7-BH-16-038	AOI7-BH-16-039	AOI7-BH-16-040	AOI7-BH-16-041
Sample ID:				AOI7-BH-16-036-0-2-063016	AOI7-BH-16-037-0-2-062916	AOI7-BH-16-038-0-2-063016	AOI7-BH-16-039-0-2-062916	AOI7-BH-16-040-0-2-062916	AOI7-BH-16-041-0-2-070616
Sample Date:				06/30/2016	06/29/2016	06/30/2016	06/29/2016	06/29/2016	07/06/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	368	313	40.6	42.3	309	26.1
Mercury	mg/kg	510	10	-	-	-	-	-	-
<b>General Chemistry</b>									
Percent moisture	%	-	-	36.9	37.1	22.6	7.0	7.4	7.0

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a

Surface Soil Analytical Results Summary  
Statewide Health Standards  
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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:				AOI7-BH-16-042 AOI7-BH-16-042-0-2-070616 07/06/2016 0.0-2.0 ft	AOI7-BH-16-043 AOI7-BH-16-043-0-2-062916 06/29/2016 0.0-2.0 ft	AOI7-BH-16-044 AOI7-BH-16-044-0-2-071216 07/12/2016 0.0-2.0 ft	AOI7-BH-16-045 AOI7-BH-16-045-0-2-070116 07/01/2016 0.0-2.0 ft	AOI7-BH-16-046 AOI7-BH-16-046-0-2-070516 07/05/2016 0.0-2.0 ft	AOI7-BH-16-047 AOI7-BH-16-047-0-2-070816 07/08/2016 0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Volatile Organic Compounds</b>									
1,2,4-Trimethylbenzene	mg/kg	560	35	0.082 J	ND(0.005)	ND(0.005)	ND(0.004)	0.16 J	0.13 J
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.39) <sup>b</sup>	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.34) <sup>b</sup>	ND(0.38) <sup>b</sup>
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.39)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.34)	ND(0.38)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.39)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.34)	ND(0.38)
Benzene	mg/kg	290	0.5	0.11 J	0.002 J	ND(0.005)	ND(0.004)	0.37	0.12 J
Ethylbenzene	mg/kg	890	70	0.12 J	ND(0.005)	ND(0.005)	ND(0.004)	0.18 J	0.10 J
Isopropyl benzene	mg/kg	10000	2500	ND(0.39)	ND(0.005)	ND(0.005)	ND(0.004)	0.61	ND(0.38)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.39)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.340)	ND(0.38)
Toluene	mg/kg	10000	100	0.70	0.002 J	ND(0.005)	ND(0.004)	0.50	0.89
Xylenes (total)	mg/kg	8000	1000	0.30 J	ND(0.005)	ND(0.005)	ND(0.004)	0.88	0.21 J
<b>Semi-Volatile Organic Compounds</b>									
Anthracene	mg/kg	190000	350	2.0	1.4	0.006 J	ND(0.019)	3.5	1.9
Benzo(a)anthracene	mg/kg	130	130	2.7	3.4	0.024	0.016 J	5.0	2.1
Benzo(a)pyrene	mg/kg	12	12	3.3	2.4	0.022	0.020	5.1	2.4
Benzo(b)fluoranthene	mg/kg	76	76	4.1	3.1	0.039	0.030	6.4	2.7
Benzo(g,h,i)perylene	mg/kg	190000	180	2.7	1.7	0.024	0.024	3.4	2.1
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-	0.009 J	2.2	1.2
Chrysene	mg/kg	760	230	2.6	3.3	0.030	0.020	5.9	2.7
Fluorene	mg/kg	130000	3800	1.2	0.48	ND(0.018)	ND(0.019)	5.4	1.0
Naphthalene	mg/kg	760	25	8.7	2.5	0.004 J	0.007 J	11	10
Phenanthrene	mg/kg	190000	10000	4.2	3.5	0.018 J	0.012 J	5.7	3.7
Pyrene	mg/kg	96000	2200	3.6	4.5	0.038	0.024	9.0	3.9



Table 3a

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Sample Location:				AOI7-BH-16-042	AOI7-BH-16-043	AOI7-BH-16-044	AOI7-BH-16-045	AOI7-BH-16-046	AOI7-BH-16-047
Sample ID:				AOI7-BH-16-042-0-2-070616	AOI7-BH-16-043-0-2-062916	AOI7-BH-16-044-0-2-071216	AOI7-BH-16-045-0-2-070116	AOI7-BH-16-046-0-2-070516	AOI7-BH-16-047-0-2-070816
Sample Date:				07/06/2016	06/29/2016	07/12/2016	07/01/2016	07/05/2016	07/08/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b						
<b>Metals - Total</b>									
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-	ND(1.7)	ND(7.4)	ND(1.9)
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	256	432	ND(29.0)	4.14	509	238
Mercury	mg/kg	510	10	-	-	-	ND(0.105)	11 <sup>b</sup>	1.15
<b>General Chemistry</b>									
Percent moisture	%	-	-	23.3	15.7	7.6	10.7	18.5	20.8

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- <sup>SS</sup>Lead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3a  
Surface Soil Analytical Results Summary  
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Sample Location:				C-170	C-171	C-172
Sample ID:				AOI7-C-170-0-2-070716	AOI7-C-171-0-2-070516	AOI7-C-172-0-2-070616
Sample Date:				07/07/2016	07/05/2016	07/06/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b			
Volatile Organic Compounds						
1,2,4-Trimethylbenzene	mg/kg	560	35	1.5	0.11 J	ND(0.006)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	3.7	0.005	ND(0.38) <sup>b</sup>	ND(0.33) <sup>b</sup>	ND(0.006) <sup>b</sup>
1,2-Dichloroethane	mg/kg	86	0.5	ND(0.38)	ND(0.33)	ND(0.006)
1,3,5-Trimethylbenzene	mg/kg	10000	210	0.27 J	ND(0.33)	ND(0.006)
Benzene	mg/kg	290	0.5	0.090 J	0.15 J	ND(0.006)
Ethylbenzene	mg/kg	890	70	0.16 J	0.090 J	ND(0.006)
Isopropyl benzene	mg/kg	10000	2500	0.91	ND(0.33)	ND(0.006)
Methyl tert butyl ether (MTBE)	mg/kg	8600	2.0	ND(0.38)	ND(0.33)	ND(0.006)
Toluene	mg/kg	10000	100	0.41	0.39	ND(0.006)
Xylenes (total)	mg/kg	8000	1000	0.83	0.49	ND(0.006)
Semi-Volatile Organic Compounds						
Anthracene	mg/kg	190000	350	2.2	2.9	0.91
Benzo(a)anthracene	mg/kg	130	130	2.1 J	4.8	2.0
Benzo(a)pyrene	mg/kg	12	12	2.1 J	3.9	2.0
Benzo(b)fluoranthene	mg/kg	76	76	2.7	7.0	2.6
Benzo(g,h,i)perylene	mg/kg	190000	180	2.4	2.7	1.5
Benzo(k)fluoranthene	mg/kg	76	76	-	-	-
Chrysene	mg/kg	760	230	3.6	5.1	1.9
Fluorene	mg/kg	130000	3800	ND(2.1)	1.8	0.47
Naphthalene	mg/kg	760	25	6.2	5.0	3.1
Phenanthrene	mg/kg	190000	10000	6.3	6.6	2.7
Pyrene	mg/kg	96000	2200	5.4	8.5	2.8



Table 3a  
Surface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				C-170	C-171	C-172
Sample ID:				AOI7-C-170-0-2-070716	AOI7-C-171-0-2-070516	AOI7-C-172-0-2-070616
Sample Date:				07/07/2016	07/05/2016	07/06/2016
Sample Depth:				0.0-2.0 ft	0.0-2.0 ft	0.0-2.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b			
Metals - Total						
Chromium VI (hexavalent)	mg/kg	220	190	-	-	-
Lead	mg/kg	2240 <sup>SS</sup>	2240 <sup>SS</sup>	793	324	198
Mercury	mg/kg	510	10	-	-	-
General Chemistry						
Percent moisture	%	-	-	18.7	21.2	18.8

- Notes:
- a PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Surface Soil (0-2 feet), August 27, 2016.
  - b PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500, Non-residential, August 27, 2016.
  - ND Not detected at the associated reporting limit.
  - J Estimated concentration.
  - ND(10)<sup>b</sup> Indicates reporting limit was above the applicable standard.
  - 1.4 J<sup>b</sup> Indicates detected value was above the applicable standard
  - <sup>SS</sup> Lead value is the site specific standard for lead accepted by the PADEP.
  - ft feet



Table 3b

Subsurface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:				AOI7-BH-16-001	AOI7-BH-16-001	AOI7-BH-16-011	AOI7-BH-16-013	AOI7-BH-16-015	AOI7-BH-16-017	AOI7-BH-16-018
Sample ID:				AOI7-BH-16-001-2-4-070116	AOI7-BH-16-001D-2-4-070116	AOI7-BH-16-011-062816-2-4	AOI7-BH-16-013-2-4-062916	AOI7-BH-16-015-2-4-062916	AOI7-BH-16-017-2-4-071116	AOI7-BH-16-018-2-4-071116
Sample Date:				07/01/2016	07/01/2016	06/28/2016	06/29/2016	06/29/2016	07/11/2016	07/11/2016
Sample Depth:				2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft
		Act 2 Non-Residential Used	Act 2 Non-Residential Used							
		Aquifer Direct Contact MSC	Aquifer Minimum MSC							
Parameters	Units	a	b							
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	mg/kg	640	35	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(0.005)	ND(0.006) <sup>b</sup>	ND(0.006) <sup>b</sup>	ND(0.66) <sup>b</sup>	ND(0.66) <sup>b</sup>	-	-
1,2-Dichloroethane	mg/kg	98	0.5	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66) <sup>b</sup>	ND(0.66) <sup>b</sup>	-	-
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
Benzene	mg/kg	330	0.5	ND(0.005)	ND(0.006)	ND(0.006)	0.081 J	ND(0.66) <sup>b</sup>	-	-
Ethylbenzene	mg/kg	1000	70	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
Isopropyl benzene	mg/kg	10000	2500	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
Methyl tert butyl ether (MTBE)	mg/kg	9900	2.0	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
Toluene	mg/kg	10000	100	ND(0.005)	ND(0.006)	ND(0.006)	0.280 J	0.43 J	-	-
Xylenes (total)	mg/kg	9100	1000	ND(0.005)	ND(0.006)	ND(0.006)	ND(0.66)	ND(0.66)	-	-
Semi-Volatile Organic Compounds										
Anthracene	mg/kg	190000	350	ND(0.022)	ND(0.022)	2.0	4.300	2.6	-	-
Benzo(a)anthracene	mg/kg	190000	430	0.007 J	0.006 J	1.8	3.500	2.3	-	-
Benzo(a)pyrene	mg/kg	190000	46	0.009 J	0.007 J	1.5	1.800	1.8	2.8	1.2
Benzo(b)fluoranthene	mg/kg	190000	170	0.011 J	0.007 J	1.7	2.300	2.2	-	-
Benzo(g,h,i)perylene	mg/kg	190000	180	0.010 J	ND(0.022)	1.5	1.000	1.3	-	-
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	0.008 J	0.005 J	2.2	4.200	2.9	-	-
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	ND(0.022)	ND(0.022)	1.4	3.900	1.9	-	-
Naphthalene	mg/kg	190000	25	ND(0.022)	ND(0.022)	10	10.000	10	-	-
Phenanthrene	mg/kg	190000	10000	0.006 J	ND(0.022)	4.0	15.000	4.4	-	-
Pyrene	mg/kg	190000	2200	0.012 J	0.007 J	3.0	10.000	5.4	-	-
Metals - Total										
Chromium VI (hexavalent)	mg/kg	20000	190	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	2.19	2.23	439	425	452 <sup>b</sup>	-	-
Mercury	mg/kg	190000	10	-	-	-	-	-	-	-
General Chemistry										
Percent moisture	%	-	-	22.6	22.7	31.6	44.4	44.5	33.1	36.6

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- ssLead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3b

Subsurface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		AOI7-BH-16-020		AOI7-BH-16-021		AOI7-BH-16-021		AOI7-BH-16-022		AOI7-BH-16-023		AOI7-BH-16-024		AOI7-BH-16-025	
Sample ID:		AOI7-BH-16-020-2-4-070116		AOI7-BH-16-021-2-4-063016		AOI7-BH-16-021D-2-4-063016		AOI7-BH-16-022-2-4-070516		AOI7-BH-16-023-2-4-070116		AOI7-BH-16-024-2-4-070716		AOI7-BH-16-025-4.75-5.0-070116	
Sample Date:		07/01/2016		06/30/2016		06/30/2016		07/05/2016		07/01/2016		07/07/2016		07/01/2016	
Sample Depth:		2.0-4.0 ft		2.0-4.0 ft		2.0-4.0 ft		2.0-4.0 ft		2.0-4.0 ft		2.0-4.0 ft		4.8-5.0 ft	
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC	Act 2 Non-Residential Used Aquifer Minimum MSC												
		a	b												
<b>Volatile Organic Compounds</b>															
1,2,4-Trimethylbenzene	mg/kg	640	35	0.18 J	ND(0.007)	0.12 J	ND(0.006)	ND(0.008)	ND(0.004)	1.1 J					
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(0.66) <sup>b</sup>	ND(0.007) <sup>b</sup>	ND(0.47) <sup>b</sup>	ND(0.006) <sup>b</sup>	ND(0.008) <sup>b</sup>	ND(0.004)	ND(4.9) <sup>b</sup>					
1,2-Dichloroethane	mg/kg	98	0.5	ND(0.66) <sup>b</sup>	ND(0.007)	ND(0.47)	ND(0.006)	ND(0.008)	ND(0.004)	ND(4.9) <sup>b</sup>					
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.66)	ND(0.007)	ND(0.47)	ND(0.006)	ND(0.008)	ND(0.004)	ND(4.9)					
Benzene	mg/kg	330	0.5	0.15 J	ND(0.007)	0.079 J	ND(0.006)	0.0009 J	0.0007 J	1.4 J <sup>b</sup>					
Ethylbenzene	mg/kg	1000	70	0.23 J	ND(0.007)	ND(0.47)	ND(0.006)	ND(0.008)	ND(0.004)	2.0 J					
Isopropyl benzene	mg/kg	10000	2500	ND(0.66)	ND(0.007)	ND(0.47)	ND(0.006)	ND(0.008)	ND(0.004)	12					
Methyl tert butyl ether (MTBE)	mg/kg	9900	2.0	ND(0.66)	ND(0.007)	ND(0.47)	ND(0.006)	ND(0.008)	ND(0.004)	ND(4.9) <sup>b</sup>					
Toluene	mg/kg	10000	100	1.700	ND(0.007)	1.1	0.002 J	0.006 J	ND(0.004)	1.2 J					
Xylenes (total)	mg/kg	9100	1000	0.41 J	ND(0.007)	0.17 J	ND(0.006)	ND(0.008)	ND(0.004)	3.8 J					
<b>Semi-Volatile Organic Compounds</b>															
Anthracene	mg/kg	190000	350	1.2	1.1	1.9	2.6	1.1	ND(0.018)	2.9					
Benzo(a)anthracene	mg/kg	190000	430	1.5	1.9	3.0	3.6	1.2	0.010 J	2.6					
Benzo(a)pyrene	mg/kg	190000	46	1.8	1.9	2.7	3.2	1.6	0.012 J	2.5					
Benzo(b)fluoranthene	mg/kg	190000	170	2.1	2.3	3.2	4.4	2.2	0.015 J	3.0					
Benzo(g,h,i)perylene	mg/kg	190000	180	1.6	1.1	1.6	2.5	2.0	0.016 J	1.8					
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-					
Chrysene	mg/kg	190000	230	1.8	2.3	3.3	3.8	1.6	0.011 J	3.0					
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-					
Fluorene	mg/kg	190000	3800	0.55	1.2	2.4	1.4	0.36	ND(0.018)	2.2					
Naphthalene	mg/kg	190000	25	15	5.5	9.3	12	12	0.009 J	80 <sup>b</sup>					
Phenanthrene	mg/kg	190000	10000	3.3	2.4	3.9	7.5	3.1	0.008 J	8.4					
Pyrene	mg/kg	190000	2200	1.9	4.1	6.6	5.6	1.6	0.014 J	4.7					
<b>Metals - Total</b>															
Chromium VI (hexavalent)	mg/kg	20000	190	-	-	-	-	-	-	-					
Lead	mg/kg	190000	450	281	154	111	224	291	8.79	469 <sup>b</sup>					
Mercury	mg/kg	190000	10	-	-	-	-	-	-	-					
<b>General Chemistry</b>															
Percent moisture	%	-	-	36.1	39.1	31.2	28.7	40.9	7.0	34.5					

Notes:

- a

PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016
- b

PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016
- ND

Not detected at the associated reporting limit.
- J

Estimated concentration.
- ND(10)<sup>b</sup>

Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>

Indicates detected value was above the applicable standard
- ss

Lead value is the site specific standard for lead accepted by the PADEP.
- ft

feet



Table 3b

Subsurface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:		AOI7-BH-16-025 AOI7-BH-16-025D-4.75-5.0-070116 07/01/2016 4.8-5.0 ft Duplicate		AOI7-BH-16-026 AOI7-BH-16-026-2-4-070116 07/01/2016 2.0-4.0 ft		AOI7-BH-16-028 AOI7-BH-16-028-2-4-071116 07/11/2016 2.0-4.0 ft		AOI7-BH-16-029 AOI7-BH-16-029-2-4-070816 07/08/2016 2.0-4.0 ft		AOI7-BH-16-029 AOI7-BH-16-029D-2-4-070816 07/08/2016 2.0-4.0 ft Duplicate		AOI7-BH-16-030 AOI7-BH-16-030-2-4-071116 07/11/2016 2.0-4.0 ft		AOI7-BH-16-031 AOI7-BH-16-031-2-4-071216 07/12/2016 2.0-4.0 ft	
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC a	Act 2 Non-Residential Used Aquifer Minimum MSC b												
<b>Volatile Organic Compounds</b>															
1,2,4-Trimethylbenzene	mg/kg	640	35	1.2 J	0.35 J	0.001 J	15	9.6	0.42 J	ND(0.40)					
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(5.2) <sup>b</sup>	ND(0.43) <sup>b</sup>	ND(0.006) <sup>b</sup>	ND(0.65) <sup>b</sup>	ND(0.58) <sup>b</sup>	ND(1.3) <sup>b</sup>	ND(0.40) <sup>b</sup>					
1,2-Dichloroethane	mg/kg	98	0.5	ND(5.2) <sup>b</sup>	ND(0.43)	ND(0.006)	ND(0.65) <sup>b</sup>	ND(0.58) <sup>b</sup>	ND(1.3) <sup>b</sup>	ND(0.40)					
1,3,5-Trimethylbenzene	mg/kg	10000	210	0.11 J	0.11 J	ND(0.006)	13	7.7	ND(1.3)	ND(0.40)					
Benzene	mg/kg	330	0.5	0.93 J <sup>b</sup>	0.17 J	0.014	6.6 <sup>b</sup>	7.4 <sup>b</sup>	1.2 J <sup>b</sup>	ND(0.40)					
Ethylbenzene	mg/kg	1000	70	1.3 J	0.21 J	ND(0.006)	4.8	3.9	0.30 J	ND(0.40)					
Isopropyl benzene	mg/kg	10000	2500	12	0.36 J	ND(0.006)	9.3	5.2	11	ND(0.40)					
Methyl tert butyl ether (MTBE)	mg/kg	9900	2.0	ND(5.2) <sup>b</sup>	ND(0.43)	ND(0.006)	ND(0.65)	ND(0.58)	ND(1.3)	ND(0.40)					
Toluene	mg/kg	10000	100	ND(5.2)	0.20 J	0.015	2	2	0.51 J	ND(0.40)					
Xylenes (total)	mg/kg	9100	1000	3.1 J	0.37 J	0.007	22	17	0.90 J	ND(0.40)					
<b>Semi-Volatile Organic Compounds</b>															
Anthracene	mg/kg	190000	350	1.9	0.83	1.6	0.75	0.59	1.6	0.015 J					
Benzo(a)anthracene	mg/kg	190000	430	1.4	0.68	7.4	1.2	0.84	2.2	0.008 J					
Benzo(a)pyrene	mg/kg	190000	46	1.4	0.55	3.5	0.87	0.65	1.4	0.008 J					
Benzo(b)fluoranthene	mg/kg	190000	170	1.7	0.67	5.1	1.4	1.0	1.8	0.012 J					
Benzo(g,h,i)perylene	mg/kg	190000	180	1.1	0.41	1.7	0.74	0.56	0.77	0.005 J					
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-					
Chrysene	mg/kg	190000	230	1.6	0.8	7.4	1.8	1.4	2.7	0.017 J					
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-					
Fluorene	mg/kg	190000	3800	1.6	1.0	0.43	1.3	1.1	2.4	0.015 J					
Naphthalene	mg/kg	190000	25	47 <sup>b</sup>	6.5	3.4	4.8	2.8	0.68	0.027					
Phenanthrene	mg/kg	190000	10000	6.4	3.5	5.0	4.1	3.4	8.6	0.034					
Pyrene	mg/kg	190000	2200	2.8	1.8	12	2.1	1.4	4.0	0.029					
<b>Metals - Total</b>															
Chromium VI (hexavalent)	mg/kg	20000	190	-	-	-	-	-	-	-					
Lead	mg/kg	190000	450	306	62.4	276	192	201	140	3.36					
Mercury	mg/kg	190000	10	-	-	-	-	-	-	-					
<b>General Chemistry</b>															
Percent moisture	%	-	-	36.6	21.8	28.3	7.4	9.7	14.0	28.5					

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- ssLead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3b

Subsurface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date: Sample Depth:		Act 2 Non-Residential Used Aquifer Direct Contact MSC		Act 2 Non-Residential Used Aquifer Minimum MSC	AOI7-BH-16-033 AOI7-BH-16-033-2-4-071116 07/11/2016 2.0-4.0 ft	AOI7-BH-16-034 AOI7-BH-16-034-2-4-070816 07/08/2016 2.0-4.0 ft	AOI7-BH-16-036 AOI7-BH-16-036-2-4-063016 06/30/2016 2.0-4.0 ft	AOI7-BH-16-037 AOI7-BH-16-037-2-4-062916 06/29/2016 2.0-4.0 ft	AOI7-BH-16-038 AOI7-BH-16-038-2-4-063016 06/30/2016 2.0-4.0 ft	AOI7-BH-16-038 AOI7-BH-16-038D-2-4-063016 06/30/2016 2.0-4.0 ft Duplicate	AOI7-BH-16-041 AOI7-BH-16-041-2-4-070616 07/06/2016 2.0-4.0 ft
Parameters	Units	a	b								
Volatile Organic Compounds											
1,2,4-Trimethylbenzene	mg/kg	640	35	-	-	2.0	0.20 J	ND(2.3)	0.013	0.007	ND(0.007)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	-	-	ND(0.54) <sup>b</sup>	ND(0.58) <sup>b</sup>	ND(2.3) <sup>b</sup>	ND(0.008) <sup>b</sup>	ND(0.007) <sup>b</sup>	ND(0.007) <sup>b</sup>
1,2-Dichloroethane	mg/kg	98	0.5	-	-	ND(0.54) <sup>b</sup>	ND(0.58) <sup>b</sup>	ND(2.3) <sup>b</sup>	ND(0.008)	ND(0.007)	ND(0.007)
1,3,5-Trimethylbenzene	mg/kg	10000	210	-	-	0.340 J	ND(0.58)	ND(2.3)	0.013	0.006 J	ND(0.007)
Benzene	mg/kg	330	0.5	-	-	0.120 J	0.11 J	0.41 J	ND(0.008)	ND(0.007)	0.012
Ethylbenzene	mg/kg	1000	70	-	-	0.130 J	0.13 J	ND(2.3)	ND(0.008)	0.002 J	ND(0.007)
Isopropyl benzene	mg/kg	10000	2500	-	-	0.470 J	ND(0.58)	ND(2.3)	0.024	0.011	ND(0.007)
Methyl tert butyl ether (MTBE)	mg/kg	9900	2.0	-	-	ND(0.54)	ND(0.58)	ND(2.3) <sup>b</sup>	ND(0.008)	ND(0.007)	ND(0.007)
Toluene	mg/kg	10000	100	-	-	1.3	1.5	1.0 J	0.004 J	0.002 J	0.007 J
Xylenes (total)	mg/kg	9100	1000	-	-	2.8	0.29 J	0.85 J	0.01	0.007	0.003 J
Semi-Volatile Organic Compounds											
Anthracene	mg/kg	190000	350	-	-	2.1	3.6	0.63	2.1	1.8	3.5
Benzo(a)anthracene	mg/kg	190000	430	-	-	1.1	2.3	0.73	1.7	1.8	4.1
Benzo(a)pyrene	mg/kg	190000	46	-	-	0.84	1.8	0.9	1.7	1.9	3.3
Benzo(b)fluoranthene	mg/kg	190000	170	-	-	1.2	2.3	1.2	2.1	2.3	4.7
Benzo(g,h,i)perylene	mg/kg	190000	180	-	-	0.81	1.1	0.87	2.3	2.1	1.9
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	-	-	-	-	-	-
Chrysene	mg/kg	190000	230	-	-	1.5	2.7	0.93	2.3	2.6	4.3
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	-	-	-	-	-	-
Fluorene	mg/kg	190000	3800	-	-	1.5	4.1	0.45	1.5	1.4	2.4
Naphthalene	mg/kg	190000	25	-	-	25	17	6.7	17	15	15
Phenanthrene	mg/kg	190000	10000	-	-	6.4	6.3	2.1	5.8	5.1	6.5
Pyrene	mg/kg	190000	2200	-	-	1.9	6.9	1.1	3.1	2.9	9.6
Metals - Total											
Chromium VI (hexavalent)	mg/kg	20000	190	-	-	-	-	-	-	-	-
Lead	mg/kg	190000	450	ND(7.37)	-	375	272	227	329	360	269
Mercury	mg/kg	190000	10	-	-	-	-	-	-	-	-
General Chemistry											
Percent moisture	%	-	-	-	9.9	36.6	42.4	38.9	33.7	34.9	30.8

Notes:

- aPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016
- bPADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016
- NDNot detected at the associated reporting limit.
- JEstimated concentration.
- ND(10)<sup>b</sup>Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>Indicates detected value was above the applicable standard
- ssLead value is the site specific standard for lead accepted by the PADEP.
- ftfeet



Table 3b

Subsurface Soil Analytical Results Summary  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		AOI7-BH-16-042		AOI7-BH-16-043	AOI7-BH-16-046	AOI7-BH-16-047	C-170	C-171	C-172
Sample ID:		AOI7-BH-16-042-2-4-070616		AOI7-BH-16-043-2-4-062916	AOI7-BH-16-046-2-4-070816	AOI7-BH-16-047-2-4-070816	AOI7-C-170-2-4-070716	AOI7-C-171-2-4-070516	AOI7-C-172-2-4-070616
Sample Date:		07/06/2016		06/29/2016	07/08/2016	07/08/2016	07/07/2016	07/05/2016	07/06/2016
Sample Depth:		2.0-4.0 ft		2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft	2.0-4.0 ft
Parameters	Units	Act 2 Non-Residential Used Aquifer Direct Contact MSC	Act 2 Non-Residential Used Aquifer Minimum MSC						
		a	b						
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	mg/kg	640	35	ND(0.54)	ND(0.006)	0.11 J	0.470 J	0.003 J	ND(0.003)
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	4.3	0.005	ND(0.54) <sup>b</sup>	ND(0.006) <sup>b</sup>	ND(0.38) <sup>b</sup>	ND(1.200) <sup>b</sup>	ND(0.008) <sup>b</sup>	ND(0.003)
1,2-Dichloroethane	mg/kg	98	0.5	ND(0.54) <sup>b</sup>	ND(0.006)	ND(0.38)	ND(1.200) <sup>b</sup>	ND(0.008)	ND(0.003)
1,3,5-Trimethylbenzene	mg/kg	10000	210	ND(0.54)	0.001 J	ND(0.38)	ND(1.200)	ND(0.008)	ND(0.003)
Benzene	mg/kg	330	0.5	ND(0.54) <sup>b</sup>	0.005 J	0.14 J	ND(1.200) <sup>b</sup>	ND(0.008)	ND(0.003)
Ethylbenzene	mg/kg	1000	70	ND(0.54)	0.001 J	0.11 J	ND(1.200)	ND(0.008)	ND(0.003)
Isopropyl benzene	mg/kg	10000	2500	ND(0.54)	ND(0.006)	0.48	2.3	ND(0.008)	ND(0.003)
Methyl tert butyl ether (MTBE)	mg/kg	9900	2.0	ND(0.54)	ND(0.006)	ND(0.38)	ND(1.200)	ND(0.008)	ND(0.003)
Toluene	mg/kg	10000	100	0.22 J	0.005 J	0.40	ND(1.200)	0.003 J	ND(0.003)
Xylenes (total)	mg/kg	9100	1000	ND(0.54)	0.001 J	0.45	ND(1.200)	0.002 J	ND(0.003)
Semi-Volatile Organic Compounds									
Anthracene	mg/kg	190000	350	1.3	1.1	4.1	2.0	0.94 J	2.5
Benzo(a)anthracene	mg/kg	190000	430	1.8	2.6	7.1	1.8	1.4	3.7
Benzo(a)pyrene	mg/kg	190000	46	2.0	1.8	5.3	1.0	1.9	4.0
Benzo(b)fluoranthene	mg/kg	190000	170	2.4	2.2	5.9	1.2	2.4	4.5
Benzo(g,h,i)perylene	mg/kg	190000	180	1.4	1.1	3.5	0.77	2.0	2.7
Benzo(k)fluoranthene	mg/kg	190000	610	-	-	3.3	0.49	-	-
Chrysene	mg/kg	190000	230	2.0	2.6	7.4	2.7	1.6	3.6
Dibenz(a,h)anthracene	mg/kg	190000	270	-	-	1.2	0.23 J	-	-
Fluorene	mg/kg	190000	3800	0.76 J	0.47	4.3	2.8	0.49 J	2.0
Naphthalene	mg/kg	190000	25	3.8	2.4	7.4	ND(0.48)	9.7	7.3
Phenanthrene	mg/kg	190000	10000	3.2	2.2	8.4	9.1	2.8	7.5
Pyrene	mg/kg	190000	2200	3.4	3.9	10	3.9	1.9	6.1
Metals - Total									
Chromium VI (hexavalent)	mg/kg	20000	190	-	-	ND(7.8)	ND(1.7)	-	-
Lead	mg/kg	190000	450	181	2590 <sup>b</sup>	408	34.1	343	151
Mercury	mg/kg	190000	10	-	-	4.14	0.145	-	-
General Chemistry									
Percent moisture	%	-	-	31.6	21.9	23.4	12.5	36.0	21.0

Notes:

- a

PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Direct Contact, Non-Residential, Subsurface Soil (2-15 feet), August 27, 2016
- b

PADEP Act 2 Medium-Specific Concentration (MSCs) for Organic/Inorganic Regulated Substances in Soil, Minimum of Direct Contact and Soil to Groundwater Max(Generic vs x100), Used Aquifers TDS <= 2500,Non-residential, August 27, 2016
- ND

Not detected at the associated reporting limit.
- J

Estimated concentration.
- ND(10)<sup>b</sup>

Indicates reporting limit was above the applicable standard.
- 1.4 J<sup>b</sup>

Indicates detected value was above the applicable standard
- ss

Lead value is the site specific standard for lead accepted by the PADEP.
- ft

feet



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-46	AOI7 BH-12-47	AOI7 BH-12-55	AOI7 BH-12-56	AOI7 BH-12-67	AOI7 BH-12-68	AOI7 BH-12-69	AOI7 BH-12-70	AOI7 BH-12-74	AOI7 BH-12-75		AOI7 BH-12-76
Sample Date				29-Nov-12	29-Nov-12	30-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	29-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12
Sample ID				BH-12-46_0.5'	BH-12-47_1.5'	BH-12-55_1.5'	BH-12-56_2'	BH-12-67_2'	BH-12-68_1.5'	BH-12-69_2'	BH-12-70_2'	BH-12-74_1'	BH-12-75_1'	BH-12-75_2'	BH-12-76_1'
Sample Depth				0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL
Laboratory Work Order				JB22561	JB22561	JB22549	1352569	JB22561	JB22561	JB22561	1352569	1352569	1352569	1352569	1352569
Laboratory Sample ID	Units	A	B	JB22561-8	JB22561-9	JB22549-3	6876917	JB22561-4	JB22561-6	JB22561-1	6876924	6876913	6876926	6876914	6876910
Volatile Organic Compounds															
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.00082) (0.00082)	ND (0.092) (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.0005)	ND (0.0014) (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.0005)	0.027 (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.00082) (0.00082)	ND (0.092) (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.001)	ND (0.0014) (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.00082) (0.00082)	ND (0.092) (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.001)	ND (0.0014) (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.00082) (0.00082)	ND (0.092) (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.001)	ND (0.0014) (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.0041) (0.0041)	ND (0.46) (0.46)	ND (0.0042) (0.0042)	ND (0.005) (0.001)	ND (0.0070) (0.0070)	ND (0.0050) (0.0050)	ND (0.0040) (0.0040)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.00082) (0.00082)	ND (0.092) (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.0005)	0.0023 (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.0005)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	ND (0.0041) (0.0041)	ND (0.46) (0.46)	ND (0.0042) (0.0042)	-	ND (0.0070) (0.0070)	ND (0.0050) (0.0050)	ND (0.0040) (0.0040)	-	-	-	-	-
BUTYLBENZENE, SEC-STYRENE	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-1,1,1,2-TETRACHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.00082) (0.00082)	0.288 (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.001)	ND (0.0014) (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.0041) (0.0041)	ND (0.46) (0.46)	ND (0.0042) (0.0042)	ND (0.005) (0.001)	ND (0.0070) (0.0070)	ND (0.0050) (0.0050)	ND (0.0040) (0.0040)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.0041) (0.0041)	ND (0.46) (0.46)	ND (0.0042) (0.0042)	ND (0.005) (0.001)	ND (0.0070) (0.0070)	ND (0.0050) (0.0050)	ND (0.0040) (0.0040)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.00082) (0.00082)	0.111 (0.092)	ND (0.00085) (0.00085)	ND (0.005) (0.001)	0.0025 (0.0014)	ND (0.00099) (0.00099)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)															
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds															
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.032) (0.032)	ND (0.39) (0.39)	0.0370 (0.037)	0.35 (0.003)	0.497 (0.071)	0.0890 (0.033)	5.04 (0.61)	ND (0.018) (0.003)	0.081 (0.003)	0.079 (0.003)	0.88 (0.003)	0.035 (0.003)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.139 (0.032)	3.38 (0.39)	0.118 (0.037)	0.85 (0.003)	0.908 (0.071)	0.214 (0.033)	6.21 (0.61)	0.032 (0.003)	0.27 (0.003)	0.29 (0.003)	2.6 (0.003)	0.11 (0.003)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.129 (0.032)	0.731 (0.39)	0.120 (0.037)	1.0 (0.003)	1.06 (0.071)	0.203 (0.033)	4.06 (0.61)	0.039 (0.003)	0.36 (0.003)	0.32 (0.003)	2.8 (0.003)	0.099 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.177 (0.032)	ND (0.39) (0.39)	0.125 (0.037)	1.3 (0.003)	0.943 (0.071)	0.185 (0.033)	3.28 (0.61)	0.057 (0.003)	0.47 (0.003)	0.44 (0.003)	3.5 (0.003)	0.13 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.166 (0.032)	ND (0.39) (0.39)	0.116 (0.037)	0.88 (0.003)	0.641 (0.071)	0.279 (0.033)	1.69 (0.61)	0.039 (0.003)	0.41 (0.003)	0.29 (0.003)	1.9 (0.003)	0.059 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID				AOI7 BH-12-46 29-Nov-12	AOI7 BH-12-47 29-Nov-12	AOI7 BH-12-55 30-Nov-12	AOI7 BH-12-56 28-Nov-12	AOI7 BH-12-67 29-Nov-12	AOI7 BH-12-68 29-Nov-12	AOI7 BH-12-69 29-Nov-12	AOI7 BH-12-70 28-Nov-12	AOI7 BH-12-74 28-Nov-12	AOI7 BH-12-75		AOI7 BH-12-76 28-Nov-12
				BH-12-46_0.5'	BH-12-47_1.5'	BH-12-55_1.5'	BH-12-56_2'	BH-12-67_2'	BH-12-68_1.5'	BH-12-69_2'	BH-12-70_2'	BH-12-74_1'	BH-12-75_1'	BH-12-75_2'	BH-12-76_1'
				0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft
				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
				ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL
				JB22561	JB22561	JB22549	1352569	JB22561	JB22561	JB22561	1352569	1352569	1352569	1352569	1352569
				JB22561-8	JB22561-9	JB22549-3	6876917	JB22561-4	JB22561-6	JB22561-1	6876924	6876913	6876926	6876914	6876910
				Units	A	B									
				MSC-PA	SHS-PA										
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	0.199 (0.032)	1.82 (0.39)	0.124 (0.037)	0.89 (0.003)	1.61 (0.071)	0.201 (0.033)	5.53 (0.61)	0.032 (0.003)	0.45 (0.003)	0.39 (0.003)	2.9 (0.003)	0.14 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.032) (0.032)	0.418 (0.39)	ND (0.037) (0.037)	0.076 (0.003)	0.510 (0.071)	ND (0.033) (0.033)	1.74 (0.030)	ND (0.018) (0.003)	ND (0.020) (0.003)	ND (0.019) (0.003)	0.33 (0.003)	ND (0.019) (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>s2</sub> <sup>A</sup>	58 <sub>s2</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	1.0 (0.003)	-	-	-	0.025 (0.003)	0.13 (0.003)	0.19 (0.003)	0.43 (0.003)	0.027 (0.003)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.183 (0.032)	2.95 (0.39)	0.0855 (0.037)	0.64 (0.003)	1.02 (0.071)	0.197 (0.033)	17.9 (0.61)	0.026 (0.003)	0.41 (0.003)	0.32 (0.003)	2.7 (0.003)	0.16 (0.003)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	0.237 (0.032)	ND (0.39) (0.39)	0.185 (0.037)	0.93 (0.003)	1.99 (0.071)	0.339 (0.033)	14.4 (0.61)	0.039 (0.003)	0.46 (0.003)	0.43 (0.003)	4.3 (0.003)	0.18 (0.003)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID				AOI7 BH-12-46	AOI7 BH-12-47	AOI7 BH-12-55	AOI7 BH-12-56	AOI7 BH-12-67	AOI7 BH-12-68	AOI7 BH-12-69	AOI7 BH-12-70	AOI7 BH-12-74	AOI7 BH-12-75		AOI7 BH-12-76	
				29-Nov-12	29-Nov-12	30-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12	28-Nov-12
				BH-12-46_0.5'	BH-12-47_1.5'	BH-12-55_1.5'	BH-12-56_2'	BH-12-67_2'	BH-12-68_1.5'	BH-12-69_2'	BH-12-70_2'	BH-12-74_1'	BH-12-75_1'	BH-12-75_2'	BH-12-76_1'	
				0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	1 - 1.5 ft	1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft	
UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	
ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	
JB22561	JB22561	JB22549	1352569	JB22561	JB22561	JB22549-3	6876917	JB22561-4	JB22561-6	JB22561-1	1352569	1352569	1352569	1352569	1352569	
JB22561-8	JB22561-9	JB22549-3	6876917	JB22561-4	JB22561-6	JB22549-3	6876917	JB22561-4	JB22561-6	JB22561-1	6876924	6876913	6876926	6876914	6876910	
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	121 (7.0)	2060 <sup>B</sup> (2.8)	112 (2.2)	743 <sup>B</sup> (0.0044)	583 <sup>B</sup> (2.4)	240 (2.2)	14.7 (2.2)	13.8 (0.0044)	254 (0.0044)	335 (0.0044)	551 <sup>B</sup> (0.0044)	143 (0.0044)	
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	16.0 (0.50)	-	-	-	6.5 (0.50)	14.7 (0.50)	12.5 (0.50)	13.8 (0.50)	9.5 (0.50)	
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
SOLIDS, PERCENT	%	n/v	n/v	86.9 ()	72.6 ()	85.7 ()	-	79.6 ()	86.8 ()	94.0 ()	-	-	-	-	-	
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-78		AOI7 BH-12-79	AOI7 BH-12-82	AOI7 BH-12-83	AOI7 BH-12-85	AOI7 BH-12-87	AOI7 BH-12-91	AOI7 BH-12-92	AOI7 BH-12-94	AOI7 BH-12-98	AOI7 BH-12-99
Sample Date				27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	28-Nov-12	28-Nov-12
Sample ID				BH-12-78_1.0'	BH-12-78_2.0'	BH-12-79_1.0'	BH-12-82_1.0'	BH-12-83_1.0'	BH-12-85_1.5'	BH-12-87_1.0'	BH-12-91_0.5'	BH-12-92_0.5'	BH-12-94_1.0'	BH-12-98_1'	BH-12-99_0.5'
Sample Depth				0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order		A	B	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	1352569	1352569
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22267-15	JB22267-16	JB22267-13	JB22267-14	JB22267-9	JB22267-7	JB22267-4	JB22267-1	JB22267-2	JB22267-3	6876922	6876923
Volatile Organic Compounds															
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	0.53 <sup>B</sup> (0.0005)	ND (0.006) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	ND (0.076) (0.001)	ND (0.006) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	ND (0.076) (0.001)	ND (0.006) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	0.18 J (0.001)	ND (0.006) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.0044) (0.0044)	ND (0.0052) (0.0052)	ND (0.0055) (0.0055)	ND (0.0049) (0.0049)	ND (0.0056) (0.0056)	ND (0.0078) (0.0078)	ND (0.0062) (0.0062)	ND (0.0044) (0.0044)	ND (0.0041) (0.0041)	ND (0.0058) (0.0058)	7.6 (0.001)	ND (0.006) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	ND (0.038) (0.0005)	ND (0.006) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	ND (0.0044) (0.0044)	ND (0.0052) (0.0052)	ND (0.0055) (0.0055)	ND (0.0049) (0.0049)	ND (0.0056) (0.0056)	ND (0.0078) (0.0078)	ND (0.0062) (0.0062)	ND (0.0044) (0.0044)	ND (0.0041) (0.0041)	ND (0.0058) (0.0058)	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	2.0 (0.001)	ND (0.006) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.0044) (0.0044)	ND (0.0052) (0.0052)	ND (0.0055) (0.0055)	ND (0.0049) (0.0049)	ND (0.0056) (0.0056)	ND (0.0078) (0.0078)	ND (0.0062) (0.0062)	ND (0.0044) (0.0044)	ND (0.0041) (0.0041)	ND (0.0058) (0.0058)	7.3 (0.001)	ND (0.006) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.0044) (0.0044)	ND (0.0052) (0.0052)	ND (0.0055) (0.0055)	ND (0.0049) (0.0049)	ND (0.0056) (0.0056)	ND (0.0078) (0.0078)	ND (0.0062) (0.0062)	ND (0.0044) (0.0044)	ND (0.0041) (0.0041)	ND (0.0058) (0.0058)	ND (0.076) (0.001)	ND (0.006) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.00088) (0.00088)	ND (0.0010) (0.0010)	ND (0.0011) (0.0011)	ND (0.00097) (0.00097)	ND (0.0011) (0.0011)	ND (0.0016) (0.0016)	ND (0.0012) (0.0012)	ND (0.00088) (0.00088)	ND (0.00083) (0.00083)	ND (0.0012) (0.0012)	0.57 (0.001)	ND (0.006) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)															
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds															
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.119 (0.033)	0.0605 (0.039)	0.0638 (0.037)	ND (0.036) (0.036)	ND (0.031) (0.031)	0.0562 (0.043)	0.223 (0.041)	0.0677 (0.038)	ND (0.034) (0.034)	0.162 (0.036)	0.17 J (0.003)	ND (15) (0.003)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.200 (0.033)	0.180 (0.039)	0.265 (0.037)	0.0384 (0.036)	ND (0.031) (0.031)	0.128 (0.043)	0.670 (0.041)	0.401 (0.038)	ND (0.034) (0.034)	0.816 (0.036)	0.34 (0.003)	ND (15) (0.003)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.150 (0.033)	0.207 (0.039)	0.244 (0.037)	ND (0.036) (0.036)	ND (0.031) (0.031)	0.183 (0.043)	0.775 (0.041)	0.403 (0.038)	ND (0.034) (0.034)	0.782 (0.036)	0.32 (0.003)	ND (15) (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.176 (0.033)	0.235 (0.039)	0.282 (0.037)	ND (0.036) (0.036)	ND (0.031) (0.031)	0.259 (0.043)	0.815 (0.041)	0.760 (0.038)	ND (0.034) (0.034)	0.952 (0.036)	0.59 (0.003)	ND (15) (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.0889 (0.033)	0.222 (0.039)	0.179 (0.037)	0.106 (0.036)	ND (0.031) (0.031)	0.197 (0.043)	0.617 (0.041)	0.463 (0.038)	ND (0.034) (0.034)	0.538 (0.036)	0.32 (0.003)	ND (15) (0.003)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-78		AOI7 BH-12-79	AOI7 BH-12-82	AOI7 BH-12-83	AOI7 BH-12-85	AOI7 BH-12-87	AOI7 BH-12-91	AOI7 BH-12-92	AOI7 BH-12-94	AOI7 BH-12-98	AOI7 BH-12-99
Sample Date				27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	28-Nov-12	28-Nov-12
Sample ID				BH-12-78_1.0'	BH-12-78_2.0'	BH-12-79_1.0'	BH-12-82_1.0'	BH-12-83_1.0'	BH-12-85_1.5'	BH-12-87_1.0'	BH-12-91_0.5'	BH-12-92_0.5'	BH-12-94_1.0'	BH-12-98_1'	BH-12-99_0.5'
Sample Depth				0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order				JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	1352569	1352569
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22267-15	JB22267-16	JB22267-13	JB22267-14	JB22267-9	JB22267-7	JB22267-4	JB22267-1	JB22267-2	JB22267-3	6876922	6876923
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	0.205 (0.033)	0.202 (0.039)	0.253 (0.037)	0.0408 (0.036)	ND (0.031) (0.031)	0.159 (0.043)	0.718 (0.041)	0.622 (0.038)	ND (0.034) (0.034)	0.904 (0.036)	0.42 (0.003)	16 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.0695 (0.033)	ND (0.039) (0.039)	ND (0.037) (0.037)	ND (0.036) (0.036)	ND (0.031) (0.031)	ND (0.043) (0.043)	0.0663 (0.041)	ND (0.038) (0.038)	ND (0.034) (0.034)	ND (0.036) (0.036)	0.077 J (0.003)	400 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>92</sub> <sup>A</sup>	58 <sub>82</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	0.79 (0.003)	ND (15) (0.003)
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.584 (0.033)	0.115 (0.039)	0.243 (0.037)	ND (0.036) (0.036)	ND (0.031) (0.031)	0.0803 (0.043)	0.737 (0.041)	0.122 (0.038)	ND (0.034) (0.034)	1.03 (0.036)	0.70 (0.003)	180 (0.003)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	0.350 (0.033)	0.212 (0.039)	0.390 (0.037)	0.0396 (0.036)	ND (0.031) (0.031)	0.111 (0.043)	0.884 (0.041)	0.910 (0.038)	ND (0.034) (0.034)	1.54 (0.036)	0.53 (0.003)	ND (15) (0.003)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-78		AOI7 BH-12-79	AOI7 BH-12-82	AOI7 BH-12-83	AOI7 BH-12-85	AOI7 BH-12-87	AOI7 BH-12-91	AOI7 BH-12-92	AOI7 BH-12-94	AOI7 BH-12-98	AOI7 BH-12-99
Sample Date				27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	28-Nov-12	28-Nov-12
Sample ID				BH-12-78_1.0'	BH-12-78_2.0'	BH-12-79_1.0'	BH-12-82_1.0'	BH-12-83_1.0'	BH-12-85_1.5'	BH-12-87_1.0'	BH-12-91_0.5'	BH-12-92_0.5'	BH-12-94_1.0'	BH-12-98_1'	BH-12-99_0.5'
Sample Depth				0.5 - 1 ft	1.5 - 2 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	1 - 1.5 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order		A	B	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	JB22267	1352569	1352569
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22267-15	JB22267-16	JB22267-13	JB22267-14	JB22267-9	JB22267-7	JB22267-4	JB22267-1	JB22267-2	JB22267-3	6876922	6876923
Metals															
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	237 (2.2)	128 (2.4)	498 <sup>B</sup> (2.3)	116 (13)	16.2 (2.2)	145 (2.8)	870 <sup>B</sup> (2.8)	291 (24)	30.2 (2.1)	1340 <sup>B</sup> (2.6)	955 <sup>B</sup> (0.0044)	341 (0.0044)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry															
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	22.2 (0.50)	30.9 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	88.9 ()	79.5 ()	83.5 ()	75.8 ()	92.2 ()	68.3 ()	75.1 ()	81.6 ()	86.3 ()	78.7 ()	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-13-45	AOI7-BH-13-46	AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-13-50	AOI7-BH-16-001	AOI7-BH-16-002	AOI7-BH-16-003	AOI7-BH-16-005	AOI7-BH-16-006	AOI7-BH-16-007	AOI7-BH-16-008	AOI7-BH-16-009
Sample Date				13-Mar-13	13-Mar-13	13-Mar-13	13-Mar-13	19-Mar-13	1-Jul-16	12-Jul-16	12-Jul-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16
Sample ID				AOI7-BH-13-45_1.5-2_031313	AOI7-BH-13-46_1.5-2_031313	AOI7-BH-13-47_1.5-2_031313	AOI7-BH-13-48_1.5-2_031313	AOI7-BH-13-50_0.5_031913	AOI7-BH-16-001-0-2-070116	AOI7-BH-16-002-0-2-071216	AOI7-BH-16-003-0-2-071216	AOI7-BH-16-005-0-2-062816	AOI7-BH-16-006-0-2-062816	AOI7-BH-16-007-0-2-062816	AOI7-BH-16-008-0-2-062816	AOI7-BH-16-009-062816-0-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB31265	JB31265	JB31265	JB31265	JB31794	1679350	1682473	1682473	1678008	1678008	1678008	1678008	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB31265-3	JB31265-7	JB31265-5	JB31265-1	JB31794-2	8460987	8473663	8473664	8455730	8455727	8455729	8455728	8455725
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.14) (0.14)	ND (0.00086) (0.00086)	ND (0.12) (0.12)	2.66 <sup>B</sup> (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.006) (0.0005)	ND (0.240) (0.0005)	ND (0.005) (0.0005)	0.0008 J (0.0005)	0.002 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.14) (0.14)	ND (0.00086) (0.00086)	ND (0.12) (0.12)	ND (0.088) (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.240) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.14) (0.14)	ND (0.00086) (0.00086)	ND (0.12) (0.12)	ND (0.088) (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.240) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.14) (0.14)	ND (0.00086) (0.00086)	ND (0.12) (0.12)	0.643 (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.240) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.69) (0.69)	ND (0.0043) (0.0043)	ND (0.58) (0.58)	ND (0.44) (0.44)	ND (0.019) (0.019)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.240) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.14) (0.14)	ND (0.00086) (0.00086)	ND (0.12) (0.12)	ND (0.088) (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.006) (0.0005)	ND (0.240) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-STYRENE	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-1,1,1,2-TETRACHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.140 (0.14)	ND (0.00086) (0.00086)	0.252 (0.12)	3.45 (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.240) (0.001)	ND (0.005) (0.001)	0.002 J (0.001)	0.002 J (0.001)
1,1,1-TRICHLOROETHANE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.69) (0.69)	ND (0.0043) (0.0043)	ND (0.58) (0.58)	0.499 (0.44)	ND (0.019) (0.019)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	0.620 (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.69) (0.69)	ND (0.0043) (0.0043)	ND (0.58) (0.58)	ND (0.44) (0.44)	ND (0.019) (0.019)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	0.130 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	0.474 (0.14)	ND (0.00086) (0.00086)	0.255 (0.12)	4.53 (0.088)	ND (0.0039) (0.0039)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	0.200 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)
Ethylene oxide	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.21) (0.21)	0.0831 (0.037)	0.459 (0.042)	0.332 (0.034)	0.110 (0.038)	0.005 J (0.003)	0.020 (0.003)	ND (0.018) (0.003)	0.590 (0.003)	0.600 (0.003)	0.067 (0.003)	0.100 (0.003)	0.110 (0.003)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.482 (0.21)	0.335 (0.037)	1.23 (0.042)	0.797 (0.034)	0.188 (0.038)	0.017 J (0.003)	0.088 (0.003)	ND (0.018) (0.003)	0.770 (0.003)	0.830 (0.003)	0.078 (0.003)	0.130 (0.003)	0.240 (0.003)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.395 (0.21)	0.347 (0.037)	1.25 (0.042)	0.934 (0.034)	0.197 (0.038)	0.017 J (0.003)	0.062 (0.003)	ND (0.018) (0.003)	0.660 (0.003)	1.000 (0.003)	0.053 (0.003)	0.200 (0.003)	0.260 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.425 (0.21)	0.535 (0.037)	1.14 (0.042)	1.10 (0.034)	0.184 (0.038)	0.026 (0.003)	0.085 (0.003)	ND (0.018) (0.003)	0.790 (0.003)	1.300 (0.003)	0.094 (0.003)	0.170 (0.003)	0.520 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.485 (0.21)	0.309 (0.037)	0.818 (0.042)	0.590 (0.034)	0.516 (0.038)	0.019 (0.003)	0.051 (0.003)	0.008 J (0.003)	0.600 (0.003)	0.420 (0.003)	0.110 (0.003)	0.140 (0.003)	0.510 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-13-45	AOI7-BH-13-46	AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-13-50	AOI7-BH-16-001	AOI7-BH-16-002	AOI7-BH-16-003	AOI7-BH-16-005	AOI7-BH-16-006	AOI7-BH-16-007	AOI7-BH-16-008	AOI7-BH-16-009
Sample Date				13-Mar-13	13-Mar-13	13-Mar-13	13-Mar-13	19-Mar-13	1-Jul-16	12-Jul-16	12-Jul-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16
Sample ID				AOI7-BH-13-45_1.5-2_031313	AOI7-BH-13-46_1.5-2_031313	AOI7-BH-13-47_1.5-2_031313	AOI7-BH-13-48_1.5-2_031313	AOI7-BH-13-50_0.5_031913	AOI7-BH-16-001-0-2-070116	AOI7-BH-16-002-0-2-071216	AOI7-BH-16-003-0-2-071216	AOI7-BH-16-005-0-2-062816	AOI7-BH-16-006-0-2-062816	AOI7-BH-16-007-0-2-062816	AOI7-BH-16-008-0-2-062816	AOI7-BH-16-009-062816-0-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB31265	JB31265	JB31265	JB31265	JB31794	1679350	1682473	1682473	1678008	1678008	1678008	1678008	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB31265-3	JB31265-7	JB31265-5	JB31265-1	JB31794-2	8460987	8473663	8473664	8455730	8455727	8455729	8455728	8455725
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	1.26 (0.21)	0.546 (0.037)	1.40 (0.042)	1.00 (0.034)	0.219 (0.038)	0.018 J (0.003)	0.200 (0.003)	ND (0.018) (0.003)	0.890 (0.003)	4.700 (0.003)	0.086 (0.003)	0.450 (0.003)	0.400 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.21) (0.21)	ND (0.037) (0.037)	0.211 (0.042)	0.428 (0.034)	0.0427 (0.038)	ND (0.018) (0.003)	0.015 J (0.003)	ND (0.018) (0.003)	0.220 (0.003)	3.100 (0.003)	0.023 (0.003)	0.043 (0.003)	0.035 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>s2</sub> <sup>A</sup>	58 <sub>s2</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	ND (0.21) (0.21)	ND (0.037) (0.037)	0.190 (0.042)	0.120 (0.034)	0.0880 (0.038)	0.009 J (0.003)	0.019 J (0.003)	ND (0.018) (0.003)	5.200 (0.003)	0.300 (0.003)	0.280 (0.003)	0.340 (0.003)	0.480 (0.003)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.246 (0.21)	0.266 (0.037)	1.07 (0.042)	0.214 (0.034)	0.269 (0.038)	0.015 J (0.003)	0.150 (0.003)	0.005 J (0.003)	1.700 (0.003)	8.700 (0.003)	0.150 (0.003)	0.250 (0.003)	0.270 (0.003)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	1.39 (0.21)	0.585 (0.037)	1.46 (0.042)	1.51 (0.034)	0.243 (0.038)	0.025 (0.003)	0.110 (0.003)	0.006 J (0.003)	0.870 (0.003)	2.800 (0.003)	0.098 (0.003)	0.230 (0.003)	0.400 (0.003)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-13-45	AOI7-BH-13-46	AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-13-50	AOI7-BH-16-001	AOI7-BH-16-002	AOI7-BH-16-003	AOI7-BH-16-005	AOI7-BH-16-006	AOI7-BH-16-007	AOI7-BH-16-008	AOI7-BH-16-009
Sample Date				13-Mar-13	13-Mar-13	13-Mar-13	13-Mar-13	19-Mar-13	1-Jul-16	12-Jul-16	12-Jul-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16	28-Jun-16
Sample ID				AOI7-BH-13-45_1.5-2_031313	AOI7-BH-13-46_1.5-2_031313	AOI7-BH-13-47_1.5-2_031313	AOI7-BH-13-48_1.5-2_031313	AOI7-BH-13-50_0.5_031913	AOI7-BH-16-001-0-2-070116	AOI7-BH-16-002-0-2-071216	AOI7-BH-16-003-0-2-071216	AOI7-BH-16-005-0-2-062816	AOI7-BH-16-006-0-2-062816	AOI7-BH-16-007-0-2-062816	AOI7-BH-16-008-0-2-062816	AOI7-BH-16-009-062816-0-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	JB31265	JB31265	JB31265	JB31265	JB31794	1679350	1682473	1682473	1678008	1678008	1678008	1678008	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB31265-3	JB31265-7	JB31265-5	JB31265-1	JB31794-2	8460987	8473663	8473664	8455730	8455727	8455729	8455728	8455725
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	498 <sup>B</sup> (2.0)	237 (2.2)	866 <sup>B</sup> (2.0)	275 (2.2)	281 (2.0)	10.2 (0.550)	98.3 (0.550)	ND (13.4) (0.550)	130 (0.550)	63.6 (0.550)	241 (0.550)	85.4 (0.550)	526 <sup>B</sup> (0.550)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	7.2 (0.50)	10.4 (0.50)	6.6 (0.50)	26.6 (0.50)	12.4 (0.50)	19.0 (0.50)	15.8 (0.50)	20.6 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	78.4 ()	85.8 ()	79.4 ()	91.1 ()	80.4 ()	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-010	AOI7-BH-16-011	AOI7-BH-16-012	AOI7-BH-16-013	AOI7-BH-16-014	AOI7-BH-16-015	AOI7-BH-16-016	AOI7-BH-16-017	AOI7-BH-16-019	AOI7-BH-16-020		AOI7-BH-16-021	AOI7-BH-16-022
Sample Date				28-Jun-16	28-Jun-16	28-Jun-16	29-Jun-16	29-Jun-16	29-Jun-16	28-Jun-16	11-Jul-16	6-Jul-16	28-Jun-16	1-Jul-16	30-Jun-16	5-Jul-16
Sample ID				AOI7-BH-16-010-062816-0-2	AOI7-BH-16-011-062816-0-2	AOI7-BH-16-012-062816-0-2	AOI7-BH-16-013-0-2-062916	AOI7-BH-16-014-0-2-062916	AOI7-BH-16-015-0-2-062916	AOI7-BH-16-016-062816-0-2	AOI7-BH-16-017-0-2-071116	AOI7-BH-16-019-0-2-070616	AOI7-BH-16-020-0-2-062816	AOI7-BH-16-020-0-2-070116	AOI7-BH-16-021-0-2-063016	AOI7-BH-16-022-0-2-070516
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1678008	1678008	1678008	1678008	1682473	1680744	1678008	1679350	1679350	1680744
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455721	8455723	8455722	8455736	8455739	8455734	8455726	8473658	8466410	8455731	8460999	8460978	8466399
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.007) (0.0005)	ND (0.006) (0.0005)	0.079 J (0.0005)	ND (0.660) (0.0005)	ND (0.007) (0.0005)	ND (0.008) (0.0005)	ND (0.004) (0.0005)	-	0.0006 J (0.0005)	ND (0.009) (0.0005)	ND (0.004) (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	ND (0.004) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	ND (0.004) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	ND (0.004) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	0.002 J (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.007) (0.0005)	ND (0.006) (0.0005)	ND (0.640) (0.0005)	ND (0.660) (0.0005)	ND (0.007) (0.0005)	ND (0.008) (0.0005)	ND (0.004) (0.0005)	-	ND (0.004) (0.0005)	ND (0.009) (0.0005)	ND (0.004) (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-STYRENE	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-1,1,1,2-TETRACHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.001 J (0.001)	ND (0.006) (0.001)	0.810 (0.001)	0.280 J (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	0.0009 J (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	0.002 J (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	ND (0.640) (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	0.002 J (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.007) (0.001)	ND (0.006) (0.001)	0.220 J (0.001)	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	-	0.002 J (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.100 (0.003)	0.910 (0.003)	2.400 (0.003)	2.500 (0.003)	1.600 (0.003)	1.200 (0.003)	0.012 J (0.003)	-	0.180 (0.003)	0.024 (0.003)	0.300 (0.003)	0.190 (0.003)	1.300 (0.003)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	2.700 (0.003)	0.960 (0.003)	2.000 (0.003)	2.200 (0.003)	1.300 (0.003)	1.400 (0.003)	0.025 (0.003)	-	0.270 (0.003)	0.110 (0.003)	0.530 (0.003)	0.530 (0.003)	2.200 (0.003)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	2.100 (0.003)	0.810 (0.003)	1.500 (0.003)	1.300 (0.003)	1.200 (0.003)	1.300 (0.003)	0.021 (0.003)	3.200 (0.003)	0.220 (0.003)	0.085 (0.003)	0.480 (0.003)	0.480 (0.003)	2.100 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	2.700 (0.003)	1.200 (0.003)	1.800 (0.003)	1.800 (0.003)	1.900 (0.003)	1.800 (0.003)	0.035 (0.003)	-	0.260 (0.003)	0.130 (0.003)	0.630 (0.003)	0.610 (0.003)	3.100 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.400 (0.003)	0.720 (0.003)	1.100 (0.003)	0.750 (0.003)	1.200 (0.003)	1.300 (0.003)	0.023 (0.003)	-	0.290 (0.003)	0.076 (0.003)	0.590 (0.003)	0.330 (0.003)	1.600 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-010	AOI7-BH-16-011	AOI7-BH-16-012	AOI7-BH-16-013	AOI7-BH-16-014	AOI7-BH-16-015	AOI7-BH-16-016	AOI7-BH-16-017	AOI7-BH-16-019	AOI7-BH-16-020		AOI7-BH-16-021	AOI7-BH-16-022
Sample Date				28-Jun-16	28-Jun-16	28-Jun-16	29-Jun-16	29-Jun-16	29-Jun-16	28-Jun-16	11-Jul-16	6-Jul-16	28-Jun-16	1-Jul-16	30-Jun-16	5-Jul-16
Sample ID				AOI7-BH-16-010-062816-0-2	AOI7-BH-16-011-062816-0-2	AOI7-BH-16-012-062816-0-2	AOI7-BH-16-013-0-2-062916	AOI7-BH-16-014-0-2-062916	AOI7-BH-16-015-0-2-062916	AOI7-BH-16-016-062816-0-2	AOI7-BH-16-017-0-2-071116	AOI7-BH-16-019-0-2-070616	AOI7-BH-16-020-0-2-062816	AOI7-BH-16-020-0-2-070116	AOI7-BH-16-021-0-2-063016	AOI7-BH-16-022-0-2-070516
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1678008	1678008	1678008	1678008	1682473	1680744	1678008	1679350	1679350	1680744
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455721	8455723	8455722	8455736	8455739	8455734	8455726	8473658	8466410	8455731	8460999	8460978	8466399
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	2.900 (0.003)	1.200 (0.003)	2.400 (0.003)	2.800 (0.003)	1.700 (0.003)	1.800 (0.003)	0.032 (0.003)	-	0.570 (0.003)	0.140 (0.003)	0.600 (0.003)	0.480 (0.003)	2.300 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.540 (0.003)	0.430 (0.003)	2.000 (0.003)	2.200 (0.003)	0.880 (0.003)	0.470 (0.003)	0.006 J (0.003)	-	0.250 (0.003)	0.008 J (0.003)	0.150 (0.003)	0.074 (0.003)	0.800 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup> <sub>32</sub>	58 <sup>B</sup> <sub>32</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	10.000 (0.003)	9.500 (0.003)	11.000 (0.003)	8.000 (0.003)	22.000 (0.003)	12.000 (0.003)	0.017 J (0.003)	-	0.680 (0.003)	0.025 (0.003)	1.000 (0.003)	0.150 (0.003)	5.500 (0.003)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	3.900 (0.003)	3.000 (0.003)	4.300 (0.003)	5.900 (0.003)	5.000 (0.003)	3.400 (0.003)	0.028 (0.003)	-	0.830 (0.003)	0.078 (0.003)	0.900 (0.003)	0.740 (0.003)	3.500 (0.003)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	3.600 (0.003)	1.200 (0.003)	4.200 (0.003)	6.300 (0.003)	1.900 (0.003)	1.600 (0.003)	0.039 (0.003)	-	0.450 (0.003)	0.180 (0.003)	0.840 (0.003)	0.950 (0.003)	3.500 (0.003)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-010	AOI7-BH-16-011	AOI7-BH-16-012	AOI7-BH-16-013	AOI7-BH-16-014	AOI7-BH-16-015	AOI7-BH-16-016	AOI7-BH-16-017	AOI7-BH-16-019	AOI7-BH-16-020		AOI7-BH-16-021	AOI7-BH-16-022
Sample Date				28-Jun-16	28-Jun-16	28-Jun-16	29-Jun-16	29-Jun-16	29-Jun-16	28-Jun-16	11-Jul-16	6-Jul-16	28-Jun-16	1-Jul-16	30-Jun-16	5-Jul-16
Sample ID				AOI7-BH-16-010-062816-0-2	AOI7-BH-16-011-062816-0-2	AOI7-BH-16-012-062816-0-2	AOI7-BH-16-013-0-2-062916	AOI7-BH-16-014-0-2-062916	AOI7-BH-16-015-0-2-062916	AOI7-BH-16-016-062816-0-2	AOI7-BH-16-017-0-2-071116	AOI7-BH-16-019-0-2-070616	AOI7-BH-16-020-0-2-062816	AOI7-BH-16-020-0-2-070116	AOI7-BH-16-021-0-2-063016	AOI7-BH-16-022-0-2-070516
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1678008	1678008	1678008	1678008	1682473	1680744	1678008	1679350	1679350	1680744
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455721	8455723	8455722	8455736	8455739	8455734	8455726	8473658	8466410	8455731	8460999	8460978	8466399
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	399 (0.550)	321 (0.550)	295 (0.550)	418 (0.550)	566 <sup>B</sup> (0.550)	386 (0.550)	21.4 (0.550)	-	117 (0.550)	13.9 (0.550)	351 (0.550)	77.5 (0.550)	119 (0.550)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	30.9 (0.50)	29.5 (0.50)	44.3 (0.50)	44.1 (0.50)	35.5 (0.50)	36.3 (0.50)	8.1 (0.50)	32.5 (0.50)	16.0 (0.50)	20.9 (0.50)	16.7 (0.50)	18.7 (0.50)	20.3 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-023	AOI7-BH-16-024	AOI7-BH-16-025	AOI7-BH-16-026	AOI7-BH-16-027	AOI7-BH-16-028	AOI7-BH-16-032	AOI7-BH-16-034	AOI7-BH-16-035	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-BH-16-038	AOI7-BH-16-039
Sample Date				1-Jul-16	7-Jul-16	1-Jul-16	1-Jul-16	7-Jul-16	12-Jul-16	12-Jul-16	8-Jul-16	8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16	29-Jun-16
Sample ID				AOI7-BH-16-023-0-2-	AOI7-BH-16-024-0-2-	AOI7-BH-16-025-0-2-	AOI7-BH-16-026-0-2-	AOI7-BH-16-027-0-2-	AOI7-BH-16-028-0-2-	AOI7-BH-16-032-0-2-	AOI7-BH-16-034-0-2-	AOI7-BH-16-035-0-2-	AOI7-BH-16-036-0-2-	AOI7-BH-16-037-0-2-	AOI7-BH-16-038-0-2-	AOI7-BH-16-039-0-2-
Sample Depth				070116	070716	070116	070116	070716	071216	071216	070816	070816	063016	062916	063016	062916
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1679350	1679350	1680744	1682473	1682473	1681418	1681418	1679350	1678008	1679350	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460992	8466411	8460993	8460990	8466408	8473666	8473667	8469170	8469168	8460984	8455741	8460981	8455740
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.005) (0.0005)	ND (0.004) (0.0005)	0.820 J <sup>B</sup> (0.0005)	0.001 J (0.0005)	ND (0.004) (0.0005)	0.010 (0.0005)	ND (0.004) (0.0005)	0.390 J (0.0005)	0.002 J (0.0005)	0.089 J (0.0005)	ND (2.300) (0.0005)	ND (0.005) (0.0005)	0.004 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (4.100) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.410) (0.001)	ND (0.004) (0.001)	ND (0.490) (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (4.100) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.410) (0.001)	ND (0.004) (0.001)	ND (0.490) (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	1.600 J (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	0.150 J (0.001)	ND (0.004) (0.001)	0.110 J (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	3.400 J (0.001)	0.004 J (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	0.250 J (0.001)	ND (0.004) (0.001)	ND (0.490) (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (4.100) (0.0005)	ND (0.006) (0.0005)	ND (0.004) (0.0005)	ND (0.006) (0.0005)	ND (0.004) (0.0005)	ND (0.410) (0.0005)	ND (0.004) (0.0005)	ND (0.490) (0.0005)	ND (2.300) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.002 J (0.001)	ND (0.004) (0.001)	1.100 J (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	0.015 (0.001)	ND (0.004) (0.001)	0.670 (0.001)	0.002 J (0.001)	1.400 (0.001)	0.610 J (0.001)	0.001 J (0.001)	0.002 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	1.000 J (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	1.000 (0.001)	ND (0.004) (0.001)	0.140 J (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	0.001 J (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (4.100) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.006) (0.001)	ND (0.004) (0.001)	ND (0.410) (0.001)	ND (0.004) (0.001)	ND (0.490) (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.005) (0.001)	ND (0.004) (0.001)	2.000 J (0.001)	0.002 J (0.001)	ND (0.004) (0.001)	0.004 J (0.001)	ND (0.004) (0.001)	1.500 (0.001)	ND (0.004) (0.001)	0.260 J (0.001)	ND (2.300) (0.001)	ND (0.005) (0.001)	0.002 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.200 J (0.003)	0.004 J (0.003)	2.000 (0.003)	0.053 J (0.003)	0.014 J (0.003)	1.000 (0.003)	0.010 J (0.003)	1.000 (0.003)	0.340 (0.003)	1.600 (0.003)	1.200 (0.003)	0.160 J (0.003)	0.009 J (0.003)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.460 (0.003)	0.009 J (0.003)	1.800 (0.003)	0.260 (0.003)	0.025 (0.003)	2.000 (0.003)	0.030 (0.003)	1.800 (0.003)	0.720 (0.003)	1.400 (0.003)	0.890 (0.003)	0.540 (0.003)	0.032 (0.003)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.380 (0.003)	0.014 J (0.003)	1.900 (0.003)	0.370 (0.003)	0.034 (0.003)	1.700 (0.003)	0.038 (0.003)	1.800 (0.003)	0.550 (0.003)	1.500 (0.003)	0.910 (0.003)	0.690 (0.003)	0.027 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.800 (0.003)	0.017 J (0.003)	2.300 (0.003)	0.570 (0.003)	0.053 (0.003)	2.200 (0.003)	0.069 (0.003)	2.500 (0.003)	0.690 (0.003)	2.300 (0.003)	1.400 (0.003)	0.800 (0.003)	0.037 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.430 (0.003)	0.016 J (0.003)	1.600 (0.003)	0.390 (0.003)	0.046 (0.003)	1.600 (0.003)	0.046 (0.003)	1.600 (0.003)	0.560 (0.003)	1.400 (0.003)	0.990 (0.003)	0.720 (0.003)	0.043 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-023	AOI7-BH-16-024	AOI7-BH-16-025	AOI7-BH-16-026	AOI7-BH-16-027	AOI7-BH-16-028	AOI7-BH-16-032	AOI7-BH-16-034	AOI7-BH-16-035	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-BH-16-038	AOI7-BH-16-039
Sample Date				1-Jul-16	7-Jul-16	1-Jul-16	1-Jul-16	7-Jul-16	12-Jul-16	12-Jul-16	8-Jul-16	8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16	29-Jun-16
Sample ID				AOI7-BH-16-023-0-2-	AOI7-BH-16-024-0-2-	AOI7-BH-16-025-0-2-	AOI7-BH-16-026-0-2-	AOI7-BH-16-027-0-2-	AOI7-BH-16-028-0-2-	AOI7-BH-16-032-0-2-	AOI7-BH-16-034-0-2-	AOI7-BH-16-035-0-2-	AOI7-BH-16-036-0-2-	AOI7-BH-16-037-0-2-	AOI7-BH-16-038-0-2-	AOI7-BH-16-039-0-2-
Sample Depth				070116	070716	070116	070116	070716	071216	071216	070816	070816	063016	062916	063016	062916
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1679350	1679350	1680744	1682473	1682473	1681418	1681418	1679350	1678008	1679350	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460992	8466411	8460993	8460990	8466408	8473666	8473667	8469170	8469168	8460984	8455741	8460981	8455740
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	0.540 (0.003)	0.012 J (0.003)	2.100 (0.003)	0.400 (0.003)	0.034 (0.003)	2.200 (0.003)	0.049 (0.003)	2.800 (0.003)	0.730 (0.003)	1.600 (0.003)	1.200 (0.003)	0.650 (0.003)	0.063 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.063 J (0.003)	ND (0.018) (0.003)	1.800 (0.003)	ND (0.190) (0.003)	0.004 J (0.003)	0.220 (0.003)	ND (0.018) (0.003)	0.830 (0.003)	0.110 (0.003)	1.100 (0.003)	0.770 (0.003)	0.059 J (0.003)	0.005 J (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>s2</sub> <sup>A</sup>	58 <sub>s2</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	1.100 (0.003)	0.009 J (0.003)	64.000 <sup>B</sup> (0.003)	0.120 J (0.003)	0.040 (0.003)	3.300 (0.003)	0.009 J (0.003)	10.000 (0.003)	0.200 (0.003)	21.000 (0.003)	10.000 (0.003)	1.400 (0.003)	0.020 (0.003)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.720 (0.003)	0.008 J (0.003)	5.100 (0.003)	0.230 (0.003)	0.029 (0.003)	2.600 (0.003)	0.031 (0.003)	3.100 (0.003)	1.400 (0.003)	4.700 (0.003)	3.900 (0.003)	0.650 (0.003)	0.050 (0.003)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	0.670 (0.003)	0.016 J (0.003)	3.400 (0.003)	0.610 (0.003)	0.035 (0.003)	2.800 (0.003)	0.062 (0.003)	2.300 (0.003)	1.300 (0.003)	2.200 (0.003)	1.500 (0.003)	0.640 (0.003)	0.040 (0.003)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-023	AOI7-BH-16-024	AOI7-BH-16-025	AOI7-BH-16-026	AOI7-BH-16-027	AOI7-BH-16-028	AOI7-BH-16-032	AOI7-BH-16-034	AOI7-BH-16-035	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-BH-16-038	AOI7-BH-16-039
Sample Date				1-Jul-16	7-Jul-16	1-Jul-16	1-Jul-16	7-Jul-16	12-Jul-16	12-Jul-16	8-Jul-16	8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16	29-Jun-16
Sample ID				AOI7-BH-16-023-0-2-	AOI7-BH-16-024-0-2-	AOI7-BH-16-025-0-2-	AOI7-BH-16-026-0-2-	AOI7-BH-16-027-0-2-	AOI7-BH-16-028-0-2-	AOI7-BH-16-032-0-2-	AOI7-BH-16-034-0-2-	AOI7-BH-16-035-0-2-	AOI7-BH-16-036-0-2-	AOI7-BH-16-037-0-2-	AOI7-BH-16-038-0-2-	AOI7-BH-16-039-0-2-
Sample Depth				070116	070716	070116	070116	070716	071216	071216	070816	070816	063016	062916	063016	062916
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1679350	1679350	1680744	1682473	1682473	1681418	1681418	1679350	1678008	1679350	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460992	8466411	8460993	8460990	8466408	8473666	8473667	8469170	8469168	8460984	8455741	8460981	8455740
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	268 (0.550)	6.35 (0.550)	533 <sup>B</sup> (0.550)	50.3 (0.550)	5.12 (0.550)	499 <sup>B</sup> (0.550)	8.24 (0.550)	424 (0.550)	59.9 (0.550)	368 (0.550)	313 (0.550)	40.6 (0.550)	42.3 (0.550)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	23.3 (0.50)	6.3 (0.50)	27.7 (0.50)	12.8 (0.50)	4.0 (0.50)	24.5 (0.50)	7.1 (0.50)	27.9 (0.50)	12.3 (0.50)	36.9 (0.50)	37.1 (0.50)	22.6 (0.50)	7.0 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-040	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043	AOI7-BH-16-044	AOI7-BH-16-045	AOI7-BH-16-046	AOI7-BH-16-047	AST 283-CV-1	AST 283-SB-1	AST 283-SB-2	AST 283-SB-3	AST 283-SB-4
Sample Date				29-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16	12-Jul-16	1-Jul-16	5-Jul-16	8-Jul-16	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05
Sample ID				AOI7-BH-16-040-0-2-	AOI7-BH-16-041-0-2-	AOI7-BH-16-042-0-2-	AOI7-BH-16-043-0-2-	AOI7-BH-16-044-0-2-	AOI7-BH-16-045-0-2-	AOI7-BH-16-046-0-2-	AOI7-BH-16-047-0-2-	CV-1	SB-1	SB-2	SB-3	SB-4
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1680744	1680744	1678008	1682473	1679350	1680744	1681418	950598	950598	950598	950598	950598
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455738	8466406	8466404	8455732	8473665	8460994	8466398	8469172	4559623	4559618	4559619	4559620	4559621
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	0.001 J (0.0005)	0.002 J (0.0005)	0.110 J (0.0005)	0.002 J (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	0.370 (0.0005)	0.120 J (0.0005)	ND (0.027) (0.0005)	ND (0.030) (0.0005)	ND (0.5) (0.5)	0.059 J (0.0005)	0.033 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.390) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.340) (0.001)	ND (0.380) (0.001)	ND (0.054) (0.001)	ND (0.059) (0.001)	-	ND (0.051) (0.001)	ND (0.059) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.390) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.340) (0.001)	ND (0.380) (0.001)	ND (0.054) (0.001)	ND (0.059) (0.001)	ND (1) (1)	ND (0.051) (0.001)	ND (0.059) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	0.120 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.180 J (0.001)	0.100 J (0.001)	ND (0.054) (0.001)	ND (0.059) (0.001)	ND (0.8) (0.8)	ND (0.051) (0.001)	0.064 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.390) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.610 (0.001)	ND (0.380) (0.001)	ND (0.054) (0.001)	ND (0.059) (0.001)	ND (1) (1)	ND (0.051) (0.001)	ND (0.059) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.390) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.004) (0.0005)	ND (0.340) (0.0005)	ND (0.380) (0.0005)	ND (0.027) (0.0005)	ND (0.030) (0.0005)	ND (0.5) (0.5)	ND (0.026) (0.0005)	ND (0.029) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	ND (0.054) (0.001)	ND (0.059) (0.001)	ND (1) (1)	ND (0.051) (0.001)	0.260 J (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.001 J (0.001)	ND (0.005) (0.001)	0.700 (0.001)	0.002 J (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.500 (0.001)	0.890 (0.001)	ND (0.054) (0.001)	0.073 J (0.001)	ND (0.7) (0.7)	0.074 J (0.001)	0.200 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	0.082 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.160 J (0.001)	0.130 J (0.001)	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.390) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	ND (0.340) (0.001)	ND (0.380) (0.001)	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	0.0008 J (0.001)	ND (0.005) (0.001)	0.300 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.004) (0.001)	0.880 (0.001)	0.210 J (0.001)	ND (0.054) (0.001)	ND (0.059) (0.001)	ND (0.8) (0.8)	ND (0.051) (0.001)	0.170 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	ND (0.0096) (0.010)	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.210 (0.003)	0.014 J (0.003)	2.000 (0.003)	1.400 (0.003)	0.006 J (0.003)	ND (0.019) (0.003)	3.500 (0.003)	1.900 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.00072 (0.040)	ND (0.190) (0.033)	0.460 J (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.330 (0.003)	0.032 (0.003)	2.700 (0.003)	3.400 (0.003)	0.024 (0.003)	0.016 J (0.003)	5.000 (0.003)	2.100 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0030 (0.020)	0.260 J (0.033)	0.920 J (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.250 (0.003)	0.041 (0.003)	3.300 (0.003)	2.400 (0.003)	0.022 (0.003)	0.020 (0.003)	5.100 (0.003)	2.400 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0046 (0.020)	0.260 J (0.033)	0.900 J (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.230 (0.003)	0.057 (0.003)	4.100 (0.003)	3.100 (0.003)	0.039 (0.003)	0.030 (0.003)	6.400 (0.003)	2.700 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0024 (0.040)	0.320 J (0.033)	0.850 J (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.280 (0.003)	0.035 (0.003)	2.700 (0.003)	1.700 (0.003)	0.024 (0.003)	0.024 (0.003)	3.400 (0.003)	2.100 (0.003)	0.260 J (0.033)	ND (0.960) (0.033)	0.0037 (0.10)	ND (0.190) (0.033)	0.620 J (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	0.009 J (0.003)	2.200 (0.003)	1.200 (0.003)	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-040	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043	AOI7-BH-16-044	AOI7-BH-16-045	AOI7-BH-16-046	AOI7-BH-16-047	AST 283-CV-1	AST 283-SB-1	AST 283-SB-2	AST 283-SB-3	AST 283-SB-4
Sample Date				29-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16	12-Jul-16	1-Jul-16	5-Jul-16	8-Jul-16	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05
Sample ID				AOI7-BH-16-040-0-2-	AOI7-BH-16-041-0-2-	AOI7-BH-16-042-0-2-	AOI7-BH-16-043-0-2-	AOI7-BH-16-044-0-2-	AOI7-BH-16-045-0-2-	AOI7-BH-16-046-0-2-	AOI7-BH-16-047-0-2-	CV-1	SB-1	SB-2	SB-3	SB-4
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1680744	1680744	1678008	1682473	1679350	1680744	1681418	950598	950598	950598	950598	950598
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455738	8466406	8466404	8455732	8473665	8460994	8466398	8469172	4559623	4559618	4559619	4559620	4559621
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	0.720 (0.003)	0.043 (0.003)	2.600 (0.003)	3.300 (0.003)	0.030 (0.003)	0.020 (0.003)	5.900 (0.003)	2.700 (0.003)	ND (0.190) (0.033)	1.6 J (0.033)	0.0044 (0.080)	0.220 J (0.033)	1.1 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	0.006 J (0.003)	0.970 J (0.003)	0.570 (0.003)	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.270 (0.003)	0.005 J (0.003)	1.200 (0.003)	0.480 (0.003)	ND (0.018) (0.003)	ND (0.019) (0.003)	5.400 (0.003)	1.000 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0013 (0.50)	ND (0.190) (0.033)	0.210 J (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0027 (0.080)	ND (0.190) (0.033)	0.510 J (0.033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>s2</sup> <sup>A</sup>	58 <sup>s2</sup> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	0.087 (0.003)	0.039 (0.003)	8.700 (0.003)	2.500 (0.003)	0.004 J (0.003)	0.007 J (0.003)	11.000 (0.003)	10.000 (0.003)	-	-	-	-	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	1.100 (0.003)	0.032 (0.003)	4.200 (0.003)	3.500 (0.003)	0.018 J (0.003)	0.012 J (0.003)	5.700 (0.003)	3.700 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.0035 (0.080)	0.370 J (0.033)	0.790 J (0.033)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	0.780 (0.003)	0.057 (0.003)	3.600 (0.003)	4.500 (0.003)	0.038 (0.003)	0.024 (0.003)	9.000 (0.003)	3.900 (0.003)	ND (0.190) (0.033)	ND (0.960) (0.033)	0.010 (0.18)	0.480 J (0.033)	1.0 (0.033)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-040	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043	AOI7-BH-16-044	AOI7-BH-16-045	AOI7-BH-16-046	AOI7-BH-16-047	AST 283-CV-1	AST 283-SB-1	AST 283-SB-2	AST 283-SB-3	AST 283-SB-4
Sample Date				29-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16	12-Jul-16	1-Jul-16	5-Jul-16	8-Jul-16	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05	28-Jun-05
Sample ID				AOI7-BH-16-040-0-2-	AOI7-BH-16-041-0-2-	AOI7-BH-16-042-0-2-	AOI7-BH-16-043-0-2-	AOI7-BH-16-044-0-2-	AOI7-BH-16-045-0-2-	AOI7-BH-16-046-0-2-	AOI7-BH-16-047-0-2-	CV-1	SB-1	SB-2	SB-3	SB-4
Sample Depth				0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 0.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft	1 - 1.5 ft
Sampling Company				GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1680744	1680744	1678008	1682473	1679350	1680744	1681418	950598	950598	950598	950598	950598
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455738	8466406	8466404	8455732	8473665	8460994	8466398	8469172	4559623	4559618	4559619	4559620	4559621
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	ND (1.7) (0.50)	ND (7.4) (0.50)	ND (1.9) (0.50)	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	309 (0.550)	26.1 (0.550)	256 (0.550)	432 (0.550)	ND (29.0) (0.550)	4.14 (0.550)	509 <sup>B</sup> (0.550)	238 (0.550)	121 (0.780)	317 (0.780)	-	97.9 (0.780)	113 (0.780)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	ND (0.105) (0.0100)	11.0 <sup>B</sup> (0.0100)	1.15 (0.0100)	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	7.4 (0.50)	7.0 (0.50)	23.3 (0.50)	15.7 (0.50)	7.6 (0.50)	10.7 (0.50)	18.5 (0.50)	20.8 (0.50)	12.1 (0.50)	13.3 (0.50)	-	12.5 (0.50)	13.7 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AST 283-SB-5	B90-1	B90-2	B90-4	B90-7	B90-8	B90-9	B90-13	B90-13DL	B90-16	B91-3	B91-7	B91-8	B91-9	B91-19	BH-10-05
Sample Date				28-Jun-05	24-Aug-92	24-Aug-92	24-Aug-92	26-Aug-92	25-Aug-92	24-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	26-Aug-92	26-Aug-92	28-Aug-92	28-Aug-92	9-Jun-10
Sample ID				SB-5	B090A4	B090A1	B090A6	B090B7	B090A9	B090A8	B090B2	B090B2DL	B090C1	B091A5	B091A3	B091A1	B091B2	B091B5	BH-10-05_1.5-2.0
Sample Depth				1 - 1.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 4 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN															UNKNOWN
Laboratory		A	B	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LL
Laboratory Work Order				950598	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4559622	P209605	P209602	P209610	P209930	P209880	P209612	P209882	P209882DL	P209933	P210009	P209937	P209935	P210085	P210088	6007722
Volatile Organic Compounds																			
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	ND (7.4) R ()	ND (7.3) R ()	-	-	-	-	ND (0.056) ()	-	ND (0.057) ()	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	ND (15) ()	ND (15) ()	-	-	-	-	ND (0.11) ()	-	ND (0.11) ()	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	ND (15) ()	ND (15) ()	-	-	-	-	ND (0.11) ()	-	ND (0.11) ()	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.027) (0.0005)	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	0.008 ()	-	ND (0.006) ()	-	-	0.003 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	ND (1.5) ()	ND (1.5) ()	-	-	-	-	ND (0.011) ()	-	ND (0.011) ()	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	ND (1.5) ()	ND (1.5) ()	-	-	-	-	ND (0.011) ()	-	ND (0.011) ()	-	-	ND (0.002) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	ND (0.002) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	ND (22) R ()	ND (22) R ()	-	-	-	-	ND (0.17) R ()	-	ND (0.17) R ()	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	ND (1.5) ()	ND (1.5) ()	-	-	-	-	0.072 ()	-	ND (0.011) ()	-	-	0.004 J (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (1.5) ()	ND (1.5) ()	-	-	-	-	ND (0.011) ()	-	ND (0.011) ()	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	0.005 B ()	-	ND (0.006) ()	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.027) (0.0005)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.0008) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	ND (1.5) ()	ND (1.5) ()	-	-	-	-	ND (0.011) ()	-	ND (0.011) ()	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	1.1 ()	4.8 ()	-	-	-	-	0.007 ()	-	ND (0.006) ()	-	-	0.005 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	ND (0.74) ()	ND (0.73) ()	-	-	-	-	ND (0.006) ()	-	ND (0.006) ()	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007 J (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006 J (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.055) (0.001)	-	-	-	30 ()	14 ()	-	-	-	-	0.11 ()	-	0.011 ()	-	-	0.017 (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	ND (7.4) R ()	ND (7.3) R ()	-	-	-	-	ND (0.056) R ()	-	ND (0.057) R ()	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	ND (1.10) L ()	ND (0.94) L ()	-	-	-	-	ND (0.91) L ()	-	ND (1.10) L ()	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (1.500) ()	0.500 J ()	-	-	-	-	0.036 ()	-	ND (0.011) ()	-	-	-
Volatile Organic Compounds (SW8011)																			
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																			
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	0.540 (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	ND (0.390) ()	ND (0.370) ()	-	-	-	-	ND (0.370) ()	-	ND (0.380) ()	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	ND (1.9) ()	ND (1.8) ()	-	-	-	-	ND (1.8) ()	-	ND (1.8) ()	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.2 J ()	0.13 J ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	1.1 (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.22 J ()	0.16 J ()	-	-	-	-	0.12 J ()	-	ND (0.38) ()	-	-	1.0 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.960 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AST 283-SB-5	B90-1	B90-2	B90-4	B90-7	B90-8	B90-9	B90-13	B90-13DL	B90-16	B91-3	B91-7	B91-8	B91-9	B91-19	BH-10-05
Sample Date				28-Jun-05	24-Aug-92	24-Aug-92	24-Aug-92	26-Aug-92	25-Aug-92	24-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	26-Aug-92	26-Aug-92	28-Aug-92	28-Aug-92	9-Jun-10
Sample ID				SB-5	B090A4	B090A1	B090A6	B090B7	B090A9	B090A8	B090B2	B090B2DL	B090C1	B091A5	B091A3	B091A1	B091B2	B091B5	BH-10-05_1.5-2.0
Sample Depth				1 - 1.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 4 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	LL
Laboratory Work Order		MSC-PA	SHS-PA	950598	P209605	P209602	P209610	P209930	P209880	P209612	P209882	P209882DL	P209933	P210009	P209937	P209935	P210085	P210088	1198982
Laboratory Sample ID	Units			4559622															6007722
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	0.3 B ()	0.34 J ()	-	-	-	-	0.82 B ()	-	0.57 B ()	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.260 ()	0.200 J ()	-	-	-	-	0.130 J ()	-	0.290 ()	-	-	1.1 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	ND (0.390) ()	ND (0.370) ()	-	-	-	-	ND (0.370) ()	-	ND (0.380) ()	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	ND (0.350) ()	ND (0.340) ()	-	-	-	-	ND (0.340) ()	-	ND (0.340) ()	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	ND (1.900) ()	ND (1.800) ()	-	-	-	-	ND (1.800) ()	-	ND (1.800) ()	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	ND (1.9) ()	ND (1.8) ()	-	-	-	-	ND (1.8) ()	-	ND (1.8) ()	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	0.26 J ()	0.2 J ()	-	-	-	-	0.16 J ()	-	0.15 J ()	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.340 (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	ND (0.790) ()	ND (0.760) ()	-	-	-	-	ND (0.750) ()	-	ND (0.770) ()	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.26 J ()	0.24 J ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	0.780 J ()	1.300 ()	-	-	-	-	ND (0.750) ()	-	ND (0.770) ()	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup> <sub>32</sub>	58 <sup>B</sup> <sub>32</sub>	-	-	-	-	ND (0.390) ()	ND (0.370) ()	-	-	-	-	ND (0.370) ()	-	ND (0.380) ()	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	ND (1.2) ()	ND (1.1) ()	-	-	-	-	ND (1.1) ()	-	ND (1.1) ()	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	0.33 J ()	0.31 J ()	3.2 ()	1.4 ()	2.6 ()	0.32 J ()	13 J ()	12 ()	2.9 ()	0.2 J ()	1.4 ()	ND (0.38) ()	ND (0.36) ()	2.3 ()	1.0 (0.033)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	ND (1.9) ()	ND (1.8) ()	-	-	-	-	ND (1.8) ()	-	ND (1.8) ()	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	ND (1.9) ()	ND (1.8) ()	-	-	-	-	ND (1.8) ()	-	ND (1.8) ()	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	ND (1.9) ()	ND (1.8) ()	-	-	-	-	ND (1.8) ()	-	ND (1.8) ()	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.2 J ()	0.14 J ()	-	-	-	-	0.17 J ()	-	ND (0.38) ()	-	-	1.2 (0.033)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	ND (0.990) (0.033)	-	-	-	0.23 J ()	0.19 J ()	-	-	-	-	0.15 J ()	-	ND (0.38) ()	-	-	1.7 (0.033)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	ND (0.79) ()	ND (0.76) ()	-	-	-	-	ND (0.75) ()	-	ND (0.77) ()	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	ND (0.79) ()	ND (0.76) ()	-	-	-	-	ND (0.75) ()	-	ND (0.77) ()	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	ND (0.240) ()	ND (0.230) ()	-	-	-	-	ND (0.220) ()	-	ND (0.230) ()	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	ND (0.390) ()	ND (0.370) ()	-	-	-	-	ND (0.370) ()	-	ND (0.380) ()	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	0.42 J ()	0.26 J ()	-	-	-	-	0.23 J ()	-	0.32 J ()	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	ND (0.39) ()	ND (0.37) ()	-	-	-	-	ND (0.37) ()	-	ND (0.38) ()	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	ND (0.780) ()	ND (0.750) ()	-	-	-	-	ND (0.740) ()	-	ND (0.760) ()	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	ND (0) ()	ND (0) ()	-	-	-	-	ND (0) ()	-	ND (0) ()	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	ND (2) ()	ND (1.9) ()	-	-	-	-	ND (1.9) ()	-	ND (2) ()	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AST 283-SB-5	B90-1	B90-2	B90-4	B90-7	B90-8	B90-9	B90-13	B90-13DL	B90-16	B91-3	B91-7	B91-8	B91-9	B91-19	BH-10-05
Sample Date				28-Jun-05	24-Aug-92	24-Aug-92	24-Aug-92	26-Aug-92	25-Aug-92	24-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	26-Aug-92	26-Aug-92	28-Aug-92	28-Aug-92	9-Jun-10
Sample ID				SB-5	B090A4	B090A1	B090A6	B090B7	B090A9	B090A8	B090B2	B090B2DL	B090C1	B091A5	B091A3	B091A1	B091B2	B091B5	BH-10-05_1.5-2.0
Sample Depth				1 - 1.5 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 4 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN															UNKNOWN
Laboratory		A	B	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LL
Laboratory Work Order				950598	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4559622	P209605	P209602	P209610	P209930	P209880	P209612	P209882	P209882DL	P209933	P210009	P209937	P209935	P210085	P210088	6007722
Metals																			
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	ND (1.20) L ()	ND (1.10) L ()	-	-	-	-	1.3 L ()	-	2.5 L ()	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	5.8 H ()	2.0 H ()	1.3 H ()	3.3 H ()	2.9 H ()	11.5 H ()	6.8 H ()	-	6.9 H ()	1.4 H ()	1.7 H ()	3.2 H ()	1.9 H ()	6.5 H ()	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	88.6 ()	59.5 ()	-	-	-	-	33.9 ()	-	160 ()	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	0.82 ()	ND (0.57) ()	-	-	-	-	ND (0.56) ()	-	0.69 ()	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	ND (0.59) ()	ND (0.57) ()	-	-	-	-	ND (0.56) ()	-	ND (0.57) ()	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	62.9 L ()	16.3 L ()	27.5 L ()	22.4 ()	16.3 ()	43.1 L ()	8.5 L ()	-	49.4 L ()	15.4 ()	20.7 L ()	1730 <sup>AB</sup> ()	23.6 J ()	30.6 J ()	-
CHROMIUM, HEXVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	11.4 ()	5.1 ()	-	-	-	-	13.3 ()	-	4.8 ()	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	81.1 (0.780)	93.8 H ()	16.0 L ()	78.5 H ()	148 ()	233 ()	236 H ()	80.3 H ()	-	310 H ()	19.8 ()	8.1 H ()	306 ()	117 ()	1110 <sup>B</sup> ()	411 (0.0050)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	0.22 J ()	0.62 J ()	-	-	-	-	0.13 J ()	-	0.11 J ()	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	17.3 ()	12.6 ()	-	-	-	-	15.0 ()	-	17.9 ()	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	ND (0.47) ()	ND (0.45) ()	-	-	-	-	ND (0.45) ()	-	ND (0.46) ()	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	15.2 ()	15.7 ()	-	-	-	-	15.2 ()	-	195 ()	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																			
Cation Exchange Capacity	meq/100g	n/v	n/v	-	8.3 ()	6.4 ()	7.2 ()	13.2 ()	15.9 ()	15.4 ()	14.0 ()	-	12.1 ()	9.7 ()	0.56 ()	14.1 ()	11.7 J ()	7.7 J ()	-
CHROMIUM, HEXVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	ND (0.08) ()	ND (0.08) ()	ND (0.08) ()	ND (0.12) ()	ND (0.11) ()	ND (0.11) ()	ND (0.11) ()	-	ND (0.09) ()	ND (0.11) ()	ND (0.08) ()	ND (0.11) ()	ND (0.11) L ()	ND (0.14) L ()	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	92.9 J ()	ND (21.50) J ()	179 J ()	664 J ()	3720 J ()	1040 J ()	1630 J ()	-	983 J ()	ND (32.10) J ()	1580 J ()	1030 J ()	ND (22.10) L ()	945 L ()	-
MOISTURE, PERCENT	%	n/v	n/v	15.6 (0.50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.6 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	ND (0.51) ()	ND (0.54) ()	ND (0.48) ()	ND (0.48) ()	ND (0.54) ()	ND (0.62) ()	1.4 ()	-	1.0 ()	ND (0.48) ()	ND (0.51) ()	ND (0.51) ()	ND (0.55) L ()	0.95 L ()	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	ND (4.40) ()	13.2 H ()	ND (4.40) ()	23.7 J ()	ND (4.50) J ()	ND (6.10) ()	29.7 H ()	-	53.1 ()	8.9 J ()	52.9 ()	18.6 J ()	48.1 ()	ND (5.80) L ()	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	ND (0.28) ()	ND (0.28) ()	ND (0.28) ()	0.54 ()	1.6 ()	2.7 ()	0.97 ()	-	0.80 ()	ND (0.28) ()	ND (0.27) ()	0.39 ()	ND (0.27) ()	0.92 ()	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	4090 J ()	1260 J ()	3560 J ()	7570 L ()	9170 L ()	33500 J ()	24100 J ()	-	43000 J ()	3620 L ()	2440 J ()	5720 L ()	5270 ()	29500 ()	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	ND (21.40) ()	ND (20.40) ()	ND (18.20) ()	ND (20.30) ()	38.5 ()	ND (27.70) ()	ND (24.10) ()	-	ND (24.2) ()	ND (20.70) ()	ND (20.70) ()	ND (20.10) ()	ND (21.30) ()	ND (26.40) ()	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-06 9-Jun-10	BH-10-07 10-Jun-10	BH-10-08 10-Jun-10	BH-10-09		BH-10-10 10-Jun-10	BH-10-11 10-Jun-10	BH-10-12 10-Jun-10	BH-10-13 9-Jun-10	BH-10-14 9-Jun-10	BH-10-15 9-Jun-10	BH-10-16 9-Jun-10	BH-10-17 9-Jun-10
Sample Date				9-Jun-10	10-Jun-10	10-Jun-10	6-Apr-09	10-Jun-10	10-Jun-10	10-Jun-10	10-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10
Sample ID				BH-10-06_1.2-1.7	BH-10-07_1.0-1.5	BH-10-08_1.5-2.0	BH-10-09	BH-10-09_1.2-1.7	BH-10-10_1.5-2.0	BH-10-11_1.5-2.0	BH-10-12_1.5-2.0	BH-10-13_1.5-2.0	BH-10-14_1.5-2.0	BH-10-15_1.4-1.9	BH-10-16_1.5-2.0	BH-10-17_1.5-2.0
Sample Depth				1.2 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 2 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.4 - 1.9 ft	1.5 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	UNKNOWN	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007721	6007732	6007730	5640517	6007731	6007729	6007728	6007727	6007723	6007724	6007725	6007726	6007720
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	0.0007 J (0.0005)	ND (0.005) (0.0005)	0.370 J (0.0005)	-	0.002 J (0.0005)	0.160 J (0.0005)	0.056 J (0.0005)	0.004 J (0.0005)	0.002 J (0.0005)	0.260 J (0.0005)	0.004 J (0.0005)	0.850 J <sup>B</sup> (0.0005)	0.460 (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.092) (0.001)	-	ND (0.001) (0.001)	ND (0.093) (0.001)	ND (0.053) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.081) (0.001)	ND (0.001) (0.001)	ND (0.180) (0.001)	ND (0.057) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.092) (0.001)	-	ND (0.001) (0.001)	ND (0.093) (0.001)	ND (0.053) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.081) (0.001)	ND (0.001) (0.001)	ND (0.180) (0.001)	ND (0.057) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	0.150 J (0.001)	-	ND (0.001) (0.001)	0.180 J (0.001)	0.090 J (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.220 J (0.001)	ND (0.001) (0.001)	ND (0.180) (0.001)	0.800 (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	27 (0.001)	-	ND (0.001) (0.001)	0.180 J (0.001)	ND (0.053) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.081) (0.001)	ND (0.001) (0.001)	9.1 (0.001)	0.300 (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.0006) (0.0005)	ND (0.005) (0.0005)	ND (0.046) (0.0005)	-	ND (0.0007) (0.0005)	ND (0.047) (0.0005)	ND (0.026) (0.0005)	ND (0.0007) (0.0005)	ND (0.0006) (0.0005)	ND (0.040) (0.0005)	ND (0.0006) (0.0005)	ND (0.088) (0.0005)	ND (0.029) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-STYRENE	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-1,1,1,2-TETRACHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.002 J (0.001)	ND (0.005) (0.001)	0.120 J (0.001)	-	0.003 J (0.001)	0.700 (0.001)	0.190 J (0.001)	0.007 J (0.001)	0.003 J (0.001)	0.950 (0.001)	0.002 J (0.001)	0.340 J (0.001)	2.3 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	0.002 J (0.001)	ND (0.005) (0.001)	0.210 J (0.001)	-	ND (0.001) (0.001)	0.890 (0.001)	0.430 (0.001)	0.006 J (0.001)	ND (0.001) (0.001)	0.290 J (0.001)	ND (0.001) (0.001)	0.240 J (0.001)	4.4 (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.092) (0.001)	-	ND (0.001) (0.001)	0.099 J (0.001)	0.085 J (0.001)	0.003 J (0.001)	ND (0.001) (0.001)	0.120 J (0.001)	ND (0.001) (0.001)	ND (0.180) (0.001)	2.4 (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	0.690 (0.001)	-	0.002 J (0.001)	0.570 (0.001)	0.300 (0.001)	0.007 (0.001)	ND (0.001) (0.001)	1.1 (0.001)	ND (0.001) (0.001)	0.690 J (0.001)	7.5 (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.870 (0.033)	ND (1.9) (0.033)	2.5 (0.033)	-	1.5 (0.033)	1.2 (0.033)	1.3 (0.033)	1.7 (0.033)	1.6 (0.033)	1.0 (0.033)	0.570 (0.033)	1.9 J (0.033)	0.570 (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	1.9 (0.033)	ND (1.9) (0.033)	2.6 (0.033)	-	2.6 (0.033)	1.4 (0.033)	3.3 (0.033)	2.4 (0.033)	5.0 (0.033)	1.3 (0.033)	1.7 (0.033)	3.5 (0.033)	0.580 (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	1.9 (0.033)	ND (1.9) (0.033)	2.2 J (0.033)	-	2.7 (0.033)	1.4 (0.033)	2.7 (0.033)	2.1 (0.033)	4.2 (0.033)	1.2 (0.033)	1.4 (0.033)	2.8 (0.033)	0.510 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	2.5 (0.033)	ND (1.9) (0.033)	2.1 J (0.033)	-	3.4 (0.033)	1.7 (0.033)	3.6 (0.033)	2.7 (0.033)	5.7 (0.033)	1.6 (0.033)	2.0 (0.033)	3.5 (0.033)	0.540 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.6 (0.033)	ND (1.9) (0.033)	1.6 J (0.033)	-	1.9 (0.033)	1.0 (0.033)	1.4 (0.033)	1.5 (0.033)	2.9 (0.033)	1.1 (0.033)	0.970 (0.033)	2.2 J (0.033)	0.320 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID				BH-10-06	BH-10-07	BH-10-08	BH-10-09		BH-10-10	BH-10-11	BH-10-12	BH-10-13	BH-10-14	BH-10-15	BH-10-16	BH-10-17	
				9-Jun-10	10-Jun-10	10-Jun-10	6-Apr-09	10-Jun-10	10-Jun-10	10-Jun-10	10-Jun-10	10-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10
				BH-10-06_1.2-1.7	BH-10-07_1.0-1.5	BH-10-08_1.5-2.0	BH-10-09	BH-10-09_1.2-1.7	BH-10-10_1.5-2.0	BH-10-11_1.5-2.0	BH-10-12_1.5-2.0	BH-10-13_1.5-2.0	BH-10-14_1.5-2.0	BH-10-15_1.4-1.9	BH-10-16_1.5-2.0	BH-10-17_1.5-2.0	
				1.2 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 2 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.4 - 1.9 ft	1.5 - 2 ft	1.5 - 2 ft	
				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	
				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	
				1198982	1198982	1198982	UNKNOWN	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
				Units	MSC-PA	SHS-PA	6007721	6007732	6007730	5640517	6007731	6007729	6007728	6007727	6007723	6007724	6007725
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	2.0 (0.033)	ND (1.9) (0.033)	8.3 (0.033)	-	2.6 (0.033)	1.8 (0.033)	3.4 (0.033)	2.5 (0.033)	4.6 (0.033)	1.4 (0.033)	1.6 (0.033)	4.7 (0.033)	0.930 (0.033)	
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.360 (0.033)	ND (1.9) (0.033)	35 (0.033)	-	0.570 (0.033)	0.930 (0.033)	0.640 (0.033)	1.3 (0.033)	0.530 (0.033)	0.410 (0.033)	0.230 (0.033)	ND (0.440) (0.033)	0.900 (0.033)	
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup> <sub>s2</sub>	58 <sup>B</sup> <sub>s2</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	3.3 (0.033)	ND (1.9) (0.033)	ND (0.460) (0.033)	-	4.6 (0.033)	3.3 (0.033)	1.5 (0.033)	3.8 (0.033)	1.0 (0.033)	4.9 (0.033)	0.310 (0.033)	ND (0.440) (0.033)	1.4 (0.033)	
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	2.3 (0.033)	ND (1.9) (0.033)	20 (0.033)	-	3.4 (0.033)	2.0 (0.033)	2.9 (0.033)	3.8 (0.033)	4.5 (0.033)	2.6 (0.033)	2.4 (0.033)	11 (0.033)	2.3 (0.033)	
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	2.8 (0.033)	ND (1.9) (0.033)	8.9 (0.033)	-	3.2 (0.033)	3.0 (0.033)	6.6 (0.033)	4.5 (0.033)	7.3 (0.033)	1.8 (0.033)	2.7 (0.033)	8.0 (0.033)	1.4 (0.033)	
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-06	BH-10-07	BH-10-08	BH-10-09		BH-10-10	BH-10-11	BH-10-12	BH-10-13	BH-10-14	BH-10-15	BH-10-16	BH-10-17
Sample Date				9-Jun-10	10-Jun-10	10-Jun-10	6-Apr-09	10-Jun-10	10-Jun-10	10-Jun-10	10-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10	9-Jun-10
Sample ID				BH-10-06_1.2-1.7	BH-10-07_1.0-1.5	BH-10-08_1.5-2.0	BH-10-09	BH-10-09_1.2-1.7	BH-10-10_1.5-2.0	BH-10-11_1.5-2.0	BH-10-12_1.5-2.0	BH-10-13_1.5-2.0	BH-10-14_1.5-2.0	BH-10-15_1.4-1.9	BH-10-16_1.5-2.0	BH-10-17_1.5-2.0
Sample Depth				1.2 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 2 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.4 - 1.9 ft	1.5 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order				1198982	1198982	1198982	UNKNOWN	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
Laboratory Sample ID	Units	A	B	6007721	6007732	6007730	5640517	6007731	6007729	6007728	6007727	6007723	6007724	6007725	6007726	6007720

Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	266 (0.0050)	305 (0.0050)	444 (0.0050)	441 (0.015)	1230 <sup>B</sup> (0.0050)	725 <sup>B</sup> (0.0050)	184 (0.0050)	414 (0.0050)	320 (0.0050)	531 <sup>B</sup> (0.0050)	280 (0.0050)	616 <sup>B</sup> (0.0050)	47.8 (0.0050)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-

General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	20.4 (0.50)	13.0 (0.50)	27.3 (0.50)	14.7 (0.5)	20.9 (0.50)	15.7 (0.50)	12.6 (0.50)	15.9 (0.50)	11.8 (0.50)	14.3 (0.50)	11.3 (0.50)	23.9 (0.50)	8.3 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-18	BH-10-19	BH-10-20	BH-10-21	BH-10-22	BH-10-23	BH-10-24	BH-10-25	BH-10-26	BH-10-27	BH-10-28	BH-10-29
Sample Date				9-Jun-10	9-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10
Sample ID				BH-10-18_1.5-2.0	BH-10-19_0.5-1.0	BH-10-20_1.3-1.8	BH-10-21_1.0-1.5	BH-10-22_1.5-2.0	BH-10-23_1.0-1.5	BH-10-24_1.0-1.5	BH-10-25_1.2-1.7	BH-10-26_1.5-2.0	BH-10-27_1.5-2.0	BH-10-28_1.5-2.0	BH-10-29_0.7-1.2
Sample Depth				1.5 - 2 ft	0.5 - 1 ft	1.3 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0.7 - 1.2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007719	6007718	6007717	6007716	6007715	6007703	6007702	6007704	6007705	6007709	6007708	6007706
Volatile Organic Compounds															
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	0.0008 J (0.0005)	ND (0.005) (0.0005)	0.003 J (0.0005)	ND (0.0007) (0.0005)	0.005 J (0.0005)	0.019 (0.0005)	0.094 J (0.0005)	31 <sup>B</sup> (0.0005)	0.003 J (0.0005)	ND (0.460) (0.0005)	1.6 <sup>B</sup> (0.0005)	0.010 (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.073) (0.001)	ND (0.097) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.920) (0.001)	ND (0.075) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.073) (0.001)	ND (0.097) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.920) (0.001)	ND (0.075) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	0.780 (0.001)	0.510 (0.001)	ND (0.001) (0.001)	2.4 J (0.001)	27 (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	0.280 J (0.001)	ND (0.097) (0.001)	ND (0.001) (0.001)	6.5 (0.001)	2.1 (0.001)	ND (0.005) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.0007) (0.0005)	ND (0.005) (0.0005)	ND (0.0006) (0.0005)	ND (0.0007) (0.0005)	ND (0.0007) (0.0005)	ND (0.0008) (0.0005)	ND (0.036) (0.0005)	ND (0.049) (0.0005)	ND (0.0006) (0.0005)	ND (0.460) (0.0005)	ND (0.037) (0.0005)	ND (0.005) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.002 J (0.001)	ND (0.005) (0.001)	0.001 J (0.001)	ND (0.001) (0.001)	0.014 (0.001)	0.010 (0.001)	0.180 J (0.001)	2.8 (0.001)	0.002 J (0.001)	1.7 J (0.001)	6.5 (0.001)	0.028 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	0.830 (0.001)	0.200 J (0.001)	ND (0.001) (0.001)	16 (0.001)	280 <sup>B</sup> (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	0.340 J (0.001)	ND (0.097) (0.001)	ND (0.001) (0.001)	8.0 (0.001)	130 (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	0.001 J (0.001)	0.002 J (0.001)	0.003 J (0.001)	0.890 (0.001)	1.3 (0.001)	ND (0.001) (0.001)	9.0 (0.001)	250 (0.001)	0.006 (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)															
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds															
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.0 (0.033)	0.670 (0.033)	0.880 (0.033)	2.9 (0.033)	0.790 (0.033)	0.052 J (0.033)	0.083 J (0.033)	0.450 (0.033)	3.6 (0.033)	2.6 (0.033)	ND (0.410) (0.033)	ND (0.180) (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	1.4 (0.033)	2.1 (0.033)	1.8 (0.033)	4.4 (0.033)	1.1 (0.033)	0.200 (0.033)	0.270 (0.033)	0.360 (0.033)	5.8 (0.033)	3.4 (0.033)	0.610 J (0.033)	0.210 (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	1.5 (0.033)	2.3 (0.033)	1.7 (0.033)	3.8 (0.033)	1.1 (0.033)	0.240 (0.033)	0.310 (0.033)	0.380 (0.033)	4.3 (0.033)	3.8 (0.033)	0.600 J (0.033)	0.230 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	1.7 (0.033)	3.1 (0.033)	2.3 (0.033)	4.5 (0.033)	1.6 (0.033)	0.320 (0.033)	0.430 (0.033)	0.770 (0.033)	6.1 (0.033)	5.5 (0.033)	1.3 J (0.033)	0.360 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.2 (0.033)	2.5 (0.033)	1.4 (0.033)	2.9 (0.033)	1.2 (0.033)	0.140 J (0.033)	0.180 (0.033)	0.270 (0.033)	1.2 (0.033)	3.4 (0.033)	0.640 J (0.033)	ND (0.180) (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-18	BH-10-19	BH-10-20	BH-10-21	BH-10-22	BH-10-23	BH-10-24	BH-10-25	BH-10-26	BH-10-27	BH-10-28	BH-10-29
Sample Date				9-Jun-10	9-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10
Sample ID				BH-10-18_1.5-2.0	BH-10-19_0.5-1.0	BH-10-20_1.3-1.8	BH-10-21_1.0-1.5	BH-10-22_1.5-2.0	BH-10-23_1.0-1.5	BH-10-24_1.0-1.5	BH-10-25_1.2-1.7	BH-10-26_1.5-2.0	BH-10-27_1.5-2.0	BH-10-28_1.5-2.0	BH-10-29_0.7-1.2
Sample Depth				1.5 - 2 ft	0.5 - 1 ft	1.3 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0.7 - 1.2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007719	6007718	6007717	6007716	6007715	6007703	6007702	6007704	6007705	6007709	6007708	6007706
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	1.6 (0.033)	2.2 (0.033)	1.7 (0.033)	4.7 (0.033)	1.3 (0.033)	0.210 (0.033)	0.280 (0.033)	0.440 (0.033)	5.4 (0.033)	4.4 (0.033)	0.680 J (0.033)	0.240 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.530 (0.033)	0.190 (0.033)	0.320 (0.033)	0.970 (0.033)	0.250 (0.033)	ND (0.037) (0.033)	0.080 J (0.033)	0.170 J (0.033)	1.1 (0.033)	1.7 J (0.033)	0.590 J (0.033)	ND (0.180) (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>sz</sub> <sup>A</sup>	58 <sub>sz</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	3.1 (0.033)	ND (0.180) (0.033)	1.2 (0.033)	9.2 (0.033)	3.7 (0.033)	0.110 J (0.033)	1.4 (0.033)	5.5 (0.033)	3.3 (0.033)	21 (0.033)	30 <sup>B</sup> (0.033)	0.200 (0.033)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	2.4 (0.033)	2.5 (0.033)	2.6 (0.033)	4.2 (0.033)	2.0 (0.033)	0.170 J (0.033)	0.480 (0.033)	1.6 (0.033)	2.8 (0.033)	8.9 (0.033)	1.8 J (0.033)	0.210 (0.033)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	2.4 (0.033)	3.5 (0.033)	2.8 (0.033)	7.7 (0.033)	1.5 (0.033)	0.310 (0.033)	0.440 (0.033)	0.540 (0.033)	8.2 (0.033)	6.5 (0.033)	1.3 J (0.033)	0.290 (0.033)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-18	BH-10-19	BH-10-20	BH-10-21	BH-10-22	BH-10-23	BH-10-24	BH-10-25	BH-10-26	BH-10-27	BH-10-28	BH-10-29
Sample Date				9-Jun-10	9-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	7-Jun-10	8-Jun-10	7-Jun-10	7-Jun-10
Sample ID				BH-10-18_1.5-2.0	BH-10-19_0.5-1.0	BH-10-20_1.3-1.8	BH-10-21_1.0-1.5	BH-10-22_1.5-2.0	BH-10-23_1.0-1.5	BH-10-24_1.0-1.5	BH-10-25_1.2-1.7	BH-10-26_1.5-2.0	BH-10-27_1.5-2.0	BH-10-28_1.5-2.0	BH-10-29_0.7-1.2
Sample Depth				1.5 - 2 ft	0.5 - 1 ft	1.3 - 1.7 ft	1 - 1.5 ft	1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.2 - 1.7 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0.7 - 1.2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982	1198982
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007719	6007718	6007717	6007716	6007715	6007703	6007702	6007704	6007705	6007709	6007708	6007706
Metals															
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	478 <sup>B</sup> (0.0050)	365 (0.0050)	179 (0.0050)	869 <sup>B</sup> (0.0050)	304 (0.0050)	623 <sup>B</sup> (0.0050)	411 (0.0050)	79.4 (0.0050)	2040 <sup>B</sup> (0.0050)	393 (0.0050)	155 (0.0050)	395 (0.0050)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry															
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	23.4 (0.50)	9.3 (0.50)	10.7 (0.50)	24.7 (0.50)	12.2 (0.50)	8.8 (0.50)	8.0 (0.50)	32.1 (0.50)	19.3 (0.50)	21.6 (0.50)	19.4 (0.50)	9.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-30	BH-10-31	BH-10-32	BH-10-33	BH-10-34	BH-10-35	BNA-3	BNA-11	BNA-12	BNA-14	C-129	C-130	C-131	C-136
Sample Date				7-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	21-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	2-Jun-10	2-Jun-10	3-Jun-10	28-May-10
Sample ID				BH-10-30_1.5-2.0	BH-10-31_1.5-2.0	BH-10-32_0.5-1.0	BH-10-33_1.5-2.0	BH-10-34_1.0-1.5	BH-10-35_1.3-1.7	B087A9	B088A5	B089A2	B089A1	C-129_1-2	C-130_1-2	C-131_1-2	C-136_1-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	1.5 - 2 ft	1 - 1.5 ft	1.3 - 1.7 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN					UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	1198982	1198982	1198982	CCR Historical	CCR Historical	CCR Historical	CCR Historical	1197775	1197775	1197775	1196722
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007707	6007714	6007713	6007710	6007712	6007711	P209531	P208791	P208744	P208743	6000420	6000419	6000424	5994015
Volatile Organic Compounds																	
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	0.380 J (0.0005)	0.470 J (0.0005)	0.004 J (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	-	-	-	-	0.003 J (0.0005)	ND (0.005) (0.0005)	ND (0.0006) (0.0005)	0.007 (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	<i>ND (0.088)</i> (0.001)	<i>ND (0.098)</i> (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.088) (0.001)	ND (0.098) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	0.290 J (0.001)	0.630 (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.088) (0.001)	0.170 J (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.044) (0.0005)	ND (0.049) (0.0005)	ND (0.0006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	-	-	-	-	ND (0.0006) (0.0005)	ND (0.005) (0.0005)	0.017 (0.0005)	ND (0.005) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	1.7 (0.001)	1.7 (0.001)	0.007 (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	0.012 (0.001)	ND (0.005) (0.001)	0.003 J (0.001)	0.008 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	0.240 J (0.001)	1.1 (0.001)	0.002 J (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.088) (0.001)	0.450 J (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	0.810 (0.001)	3.8 (0.001)	0.009 (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-	-	ND (0.001) (0.001)	ND (0.005) (0.001)	ND (0.001) (0.001)	ND (0.005) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																	
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																	
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.0 (0.033)	0.820 (0.033)	0.130 J (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.290 (0.033)	-	-	-	-	0.830 (0.033)	2.7 (0.033)	0.940 J (0.033)	ND (0.180) (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	1.3 (0.033)	0.610 (0.033)	0.180 J (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.790 (0.033)	-	-	-	-	1.9 (0.033)	9.6 (0.033)	1.3 (0.033)	0.370 (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	1.5 (0.033)	0.610 (0.033)	0.210 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.820 (0.033)	-	-	-	-	2.3 (0.033)	8.4 (0.033)	1.5 (0.033)	0.380 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	2.3 (0.033)	0.910 (0.033)	0.270 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.840 (0.033)	-	-	-	-	3.1 (0.033)	11 (0.033)	2.2 (0.033)	0.550 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.740 (0.033)	0.660 (0.033)	0.250 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.610 (0.033)	-	-	-	-	0.870 (0.033)	4.9 (0.033)	0.640 J (0.033)	0.390 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-30	BH-10-31	BH-10-32	BH-10-33	BH-10-34	BH-10-35	BNA-3	BNA-11	BNA-12	BNA-14	C-129	C-130	C-131	C-136
Sample Date				7-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	21-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	2-Jun-10	2-Jun-10	3-Jun-10	28-May-10
Sample ID				BH-10-30_1.5-2.0	BH-10-31_1.5-2.0	BH-10-32_0.5-1.0	BH-10-33_1.5-2.0	BH-10-34_1.0-1.5	BH-10-35_1.3-1.7	B087A9	B088A5	B089A2	B089A1	C-129_1-2	C-130_1-2	C-131_1-2	C-136_1-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	1.5 - 2 ft	1 - 1.5 ft	1.3 - 1.7 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN					UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LL	LL	LL	LL
Laboratory Work Order		A	B	1198982	1198982	1198982	1198982	1198982	1198982	CCR Historical	CCR Historical	CCR Historical	CCR Historical	1197775	1197775	1197775	1196722
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6007707	6007714	6007713	6007710	6007712	6007711	P209531	P208791	P208744	P208743	6000420	6000419	6000424	5994015
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	1.6 (0.033)	0.800 (0.033)	0.270 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.850 (0.033)	-	-	-	-	1.8 (0.033)	8.7 (0.033)	1.6 (0.033)	0.410 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.500 (0.033)	0.320 (0.033)	ND (0.040) (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	-	-	-	-	0.280 (0.033)	ND (1.9) (0.033)	0.350 J (0.033)	ND (0.180) (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>s2</sub> <sup>A</sup>	58 <sub>s2</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	11 (0.033)	7.3 (0.033)	0.640 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.17 J ()	ND (0.35) ()	ND (0.37) ()	0.31 J ()	4.2 (0.033)	ND (1.9) (0.033)	6.5 (0.033)	0.550 (0.033)
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	2.9 (0.033)	2.5 (0.033)	0.300 (0.033)	ND (0.180) (0.033)	ND (0.180) (0.033)	0.840 (0.033)	-	-	-	-	2.6 (0.033)	7.3 (0.033)	2.9 (0.033)	0.360 (0.033)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	1.7 (0.033)	0.770 (0.033)	0.290 (0.033)	ND (0.180) (0.033)	0.190 (0.033)	1.7 (0.033)	-	-	-	-	3.6 (0.033)	13 (0.033)	1.9 (0.033)	0.440 (0.033)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				BH-10-30	BH-10-31	BH-10-32	BH-10-33	BH-10-34	BH-10-35	BNA-3	BNA-11	BNA-12	BNA-14	C-129	C-130	C-131	C-136
Sample Date				7-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	8-Jun-10	21-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	2-Jun-10	2-Jun-10	3-Jun-10	28-May-10
Sample ID				BH-10-30_1.5-2.0	BH-10-31_1.5-2.0	BH-10-32_0.5-1.0	BH-10-33_1.5-2.0	BH-10-34_1.0-1.5	BH-10-35_1.3-1.7	B087A9	B088A5	B089A2	B089A1	C-129_1-2	C-130_1-2	C-131_1-2	C-136_1-2
Sample Depth				1.5 - 2 ft	1.5 - 2 ft	0.5 - 1 ft	1.5 - 2 ft	1 - 1.5 ft	1.3 - 1.7 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN					UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LL	LL	LL	LL
Laboratory Work Order				1198982	1198982	1198982	1198982	1198982	1198982	CCR Historical	CCR Historical	CCR Historical	CCR Historical	1197775	1197775	1197775	1196722
Laboratory Sample ID	Units	A	B	6007707	6007714	6007713	6007710	6007712	6007711	P209531	P208791	P208744	P208743	6000420	6000419	6000424	5994015
Metals																	
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	13.4 ( )	4.9 ( )	5.5 ( )	10.6 ( )	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	150 H ( )	30.2 H ( )	264 <i>H<sup>AB</sup></i> ( )	972 <i>H<sup>AB</sup></i> ( )	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	250 (0.0050)	610 <sup>B</sup> (0.0050)	298 (0.0050)	43.1 (0.0050)	84.2 (0.0050)	92.5 (0.0050)	650 <sup>B</sup> ( )	32.3 ( )	88.7 ( )	228 ( )	252 (0.005)	814 <sup>B</sup> (0.005)	396 (0.005)	218 (0.02)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																	
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	14.2 J ( )	4.9 J ( )	10.6 J ( )	7.9 J ( )	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	ND (0.11) L ( )	0.21 L ( )	ND (0.08) L ( )	ND (0.09) L ( )	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	651 ( )	ND (10.60) ( )	ND (11.00) ( )	305 ( )	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	21.2 (0.50)	30.6 (0.50)	17.6 (0.50)	9.1 (0.50)	9.4 (0.50)	9.7 (0.50)	-	-	-	-	21.4 (0.5)	14.3 (0.5)	24.2 (0.5)	9.7 (0.5)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	6.2 ( )	ND (0.52) ( )	ND (0.52) ( )	ND (0.53) ( )	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (5.80) ( )	17.6 ( )	27.9 ( )	24.6 ( )	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	0.44 ( )	ND (0.27) ( )	0.35 ( )	2.2 ( )	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	17700 J ( )	2440 J ( )	2720 J ( )	9220 J ( )	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (28.60) ( )	ND (16.80) ( )	ND (23.40) ( )	94.6 ( )	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				C-137	C-138	C-139	C-140	C-142	C-143	C-165	C-168	C-169	C-170	C-171	C-172	GP-270-S-6
Sample Date				27-May-10	27-May-10	2-Jun-10	26-May-10	3-Jun-10	3-Jun-10	5-Dec-12	5-Dec-12	5-Dec-12	7-Jul-16	5-Jul-16	6-Jul-16	29-Sep-09
Sample ID				C-137_1-2	C-138_1-2	C-139_1-2	C-140_1-2	C-142_1-2	C-143_1-2	C-165_1.5-2'	C-168_1.5-2'	C-169_1.5-2'	AOI7-C-170-0-2-070716	AOI7-C-171-0-2-070516	AOI7-C-172-0-2-070616	S-6 (1.5-2.0)
Sample Depth				1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL
Laboratory Work Order		A	B	1196722	1196722	1197775	1196722	1197775	1197775	JB23100	JB23100	JB23100	1680744	1680744	1680744	1163948
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5994014	5994013	6000421	5994012	6000423	6000422	JB23100-13	JB23100-14	JB23100-15	8466413	8466396	8466402	5790786
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.005) (0.0005)	0.012 J (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	0.100 J (0.0005)	2.0 <sup>A</sup> (0.0005)	ND (0.25) (0.030)	ND (0.0013) (0.00015)	ND (0.0016) (0.00019)	0.090 J (0.0005)	0.150 J (0.0005)	ND (0.006) (0.0005)	ND (0.053) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.005) (0.001)	ND (0.002) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.061) (0.001)	ND (0.067) (0.001)	ND (0.25) (0.032)	ND (0.0013) (0.00016)	ND (0.0016) (0.00020)	ND (0.380) (0.001)	ND (0.330) (0.001)	ND (0.006) (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.005) (0.001)	ND (0.002) (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	ND (0.061) (0.001)	ND (0.067) (0.001)	ND (0.25) (0.034)	ND (0.0013) (0.00017)	ND (0.0016) (0.00022)	ND (0.380) (0.001)	ND (0.330) (0.001)	ND (0.006) (0.001)	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.005) (0.001)	0.014 (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.072 J (0.001)	0.150 J (0.001)	ND (0.25) (0.066)	ND (0.0013) (0.00034)	ND (0.0016) (0.00042)	0.160 J (0.001)	0.090 J (0.001)	ND (0.006) (0.001)	ND (0.110) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.009 (0.001)	0.003 J (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.078 J (0.001)	5.6 (0.001)	0.918 J (0.019)	ND (0.0064) (0.000095)	ND (0.0080) (0.00012)	0.910 (0.001)	ND (0.330) (0.001)	ND (0.006) (0.001)	ND (0.110) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	ND (0.005) (0.0005)	ND (0.001) (0.0005)	ND (0.004) (0.0005)	ND (0.005) (0.0005)	ND (0.031) (0.0005)	ND (0.033) (0.0005)	ND (0.25) (0.059)	ND (0.0013) (0.00030)	ND (0.0016) (0.00038)	ND (0.380) (0.0005)	ND (0.330) (0.0005)	ND (0.006) (0.0005)	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	0.410 J (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.005) (0.001)	0.054 (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.630 (0.001)	0.220 J (0.001)	0.347 (0.026)	ND (0.0013) (0.00013)	0.00052 J (0.00017)	0.410 (0.001)	0.390 (0.001)	ND (0.006) (0.001)	0.360 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.005) (0.001)	0.014 (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.180 J (0.001)	0.250 J (0.001)	0.147 J (0.052)	ND (0.0064) (0.00027)	ND (0.0080) (0.00033)	1.500 (0.001)	0.110 J (0.001)	ND (0.006) (0.001)	ND (0.110) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.005) (0.001)	0.007 J (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.090 J (0.001)	0.240 J (0.001)	ND (1.2) (0.040)	ND (0.0064) (0.00020)	ND (0.0080) (0.00026)	0.270 J (0.001)	ND (0.330) (0.001)	ND (0.006) (0.001)	ND (0.110) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	ND (0.005) (0.001)	0.072 (0.001)	ND (0.004) (0.001)	ND (0.005) (0.001)	0.220 J (0.001)	0.570 (0.001)	0.445 (0.035)	ND (0.0013) (0.00018)	ND (0.0016) (0.00022)	0.830 (0.001)	0.490 (0.001)	ND (0.006) (0.001)	ND (0.110) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.9 (0.033)	0.094 J (0.033)	ND (0.180) (0.033)	0.380 (0.033)	2.0 (0.033)	0.170 J (0.033)	2.64 (0.090)	0.206 (0.013)	0.0691 (0.016)	2.200 (0.003)	2.900 (0.003)	0.910 (0.003)	7.5 (0.033)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	2.3 (0.033)	0.240 J (0.033)	ND (0.180) (0.033)	1.2 (0.033)	3.1 (0.033)	0.420 (0.033)	0.790 (0.084)	0.240 (0.013)	0.0673 (0.015)	2.100 J (0.003)	4.800 (0.003)	2.000 (0.003)	8.8 (0.033)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	1.9 (0.033)	0.200 J (0.033)	ND (0.180) (0.033)	1.2 (0.033)	3.4 (0.033)	0.520 (0.033)	0.576 (0.078)	0.223 (0.012)	0.0624 (0.014)	2.100 J (0.003)	3.900 (0.003)	2.000 (0.003)	7.1 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	2.2 (0.033)	0.320 (0.033)	ND (0.180) (0.033)	1.4 (0.033)	4.8 (0.033)	0.620 (0.033)	0.445 (0.086)	0.206 (0.013)	0.0670 (0.015)	2.700 (0.003)	7.000 (0.003)	2.600 (0.003)	8.6 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.3 (0.033)	0.150 J (0.033)	ND (0.180) (0.033)	1.0 (0.033)	1.3 (0.033)	0.430 (0.033)	0.912 (0.096)	0.612 (0.014)	0.0751 (0.017)	2.400 (0.003)	2.700 (0.003)	1.500 (0.003)	3.7 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				C-137	C-138	C-139	C-140	C-142	C-143	C-165	C-168	C-169	C-170	C-171	C-172	GP-270-S-6
Sample Date				27-May-10	27-May-10	2-Jun-10	26-May-10	3-Jun-10	3-Jun-10	5-Dec-12	5-Dec-12	5-Dec-12	7-Jul-16	5-Jul-16	6-Jul-16	29-Sep-09
Sample ID				C-137_1-2	C-138_1-2	C-139_1-2	C-140_1-2	C-142_1-2	C-143_1-2	C-165_1.5-2'	C-168_1.5-2'	C-169_1.5-2'	AOI7-C-170-0-2-070716	AOI7-C-171-0-2-070516	AOI7-C-172-0-2-070616	S-6 (1.5-2.0)
Sample Depth				1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL
Laboratory Work Order		A	B	1196722	1196722	1197775	1196722	1197775	1197775	JB23100	JB23100	JB23100	1680744	1680744	1680744	1163948
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5994014	5994013	6000421	5994012	6000423	6000422	JB23100-13	JB23100-14	JB23100-15	8466413	8466396	8466402	5790786
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	2.3 (0.033)	0.300 (0.033)	ND (0.180) (0.033)	1.3 (0.033)	2.9 (0.033)	0.600 (0.033)	1.05 (0.087)	0.276 (0.013)	0.0565 (0.015)	3.600 (0.003)	5.100 (0.003)	1.900 (0.003)	11 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	1.8 (0.033)	ND (0.051) (0.033)	ND (0.180) (0.033)	ND (0.190) (0.033)	1.6 (0.033)	0.062 J (0.033)	7.93 (0.084)	ND (0.038) (0.013)	ND (0.045) (0.015)	ND (2.100) (0.003)	1.800 (0.003)	0.470 (0.003)	7.3 (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	3.1 (0.033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sub>s2</sub> <sup>A</sup>	58 <sub>s2</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	5.4 (0.033)	0.110 J (0.033)	ND (0.180) (0.033)	0.470 (0.033)	2.0 (0.033)	0.270 (0.033)	ND (0.26) (0.070)	0.0225 J (0.010)	ND (0.045) (0.012)	6.200 (0.003)	5.000 (0.003)	3.100 (0.003)	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	4.4 (0.033)	0.240 J (0.033)	ND (0.180) (0.033)	0.990 (0.033)	7.1 (0.033)	0.490 (0.033)	10.6 (0.12)	0.165 (0.017)	0.0423 J (0.021)	6.300 (0.003)	6.600 (0.003)	2.700 (0.003)	17 (0.033)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	ND (0.210) (0.033)	0.360 (0.033)	0.250 (0.033)	1.9 (0.033)	5.9 (0.033)	0.930 (0.033)	2.05 (0.099)	0.284 (0.015)	0.0751 (0.017)	5.400 (0.003)	8.500 (0.003)	2.800 (0.003)	23 (0.033)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				C-137	C-138	C-139	C-140	C-142	C-143	C-165	C-168	C-169	C-170	C-171	C-172	GP-270-S-6
Sample Date				27-May-10	27-May-10	2-Jun-10	26-May-10	3-Jun-10	3-Jun-10	5-Dec-12	5-Dec-12	5-Dec-12	7-Jul-16	5-Jul-16	6-Jul-16	29-Sep-09
Sample ID				C-137_1-2	C-138_1-2	C-139_1-2	C-140_1-2	C-142_1-2	C-143_1-2	C-165_1.5-2'	C-168_1.5-2'	C-169_1.5-2'	AOI7-C-170-0-2-070716	AOI7-C-171-0-2-070516	AOI7-C-172-0-2-070616	S-6 (1.5-2.0)
Sample Depth				1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	GHD	GHD	GHD	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL
Laboratory Work Order		A	B	1196722	1196722	1197775	1196722	1197775	1197775	JB23100	JB23100	JB23100	1680744	1680744	1680744	1163948
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5994014	5994013	6000421	5994012	6000423	6000422	JB23100-13	JB23100-14	JB23100-15	8466413	8466396	8466402	5790786
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	251 (0.02)	103 (0.02)	98.7 (0.02)	98.6 (0.02)	1370 <sup>B</sup> (0.005)	164 (0.005)	286 (0.17)	273 (0.14)	127 (0.17)	793 <sup>B</sup> (0.550)	324 (0.550)	198 (0.550)	450 (0.591)
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	20.5 (0.5)	35.1 (0.5)	9.5 (0.5)	12.9 (0.5)	10.9 (0.5)	6.2 (0.5)	-	-	-	18.7 (0.50)	21.2 (0.50)	18.8 (0.50)	44.9 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	64.4 ()	81.5 ()	69.4 ()	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-270-S-11	GP-270-S-13	GP-270-S-14	GP-270-S-15	GP-271-GP-1	GP-271-GP-2	GP-271-GP-3	GP-271-GP-4		GP-271-GP-5		GP-271-GP-6	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Date				6-Oct-09	6-Oct-09	6-Oct-09	6-Oct-09	4-Jun-02	4-Jun-02	4-Jun-02	4-Jun-02	17-Sep-02	4-Jun-02	17-Sep-02	4-Jun-02	25-May-07	25-May-07	25-May-07	25-May-07
Sample ID				S-11 (1.5-2.0)	S-13 (1.0-1.5)	S-14 (1.0-1.5)	S-15 (1.5-2.0)	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Depth				1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 0.5 ft	0.5 - 1 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	WGI	WGI	WGI	WGI	WGI	WGI	WGI	WGI	PIP	PIP	PIP	PIP
Laboratory Work Order				1165331	1165331	1165331	1165331	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	074100	074100	074100	074100
Laboratory Sample ID	Units	A	B	5799593	5799595	5799596	5799597	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	0705-4569	0705-4570	0705-4571	0705-4572
Volatile Organic Compounds																			
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	0.120 J (0.0005)	ND (0.058) (0.0005)	ND (0.057) (0.0005)	0.110 J (0.0005)	ND (0.27) ()	ND (0.22) ()	0.15 J ()	2.2 <sup>B</sup> ()	38 ()	1.2 <sup>B</sup> ()	ND (5) ()	0.076 J ()	ND (0.240) D ()	ND (0.210) D ()	ND (0.230) D ()	ND (0.160) D ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	ND (0.064) (0.001)	ND (0.120) (0.001)	ND (0.110) (0.001)	0.190 J (0.001)	-	-	-	-	-	-	-	-	ND (0.240) D ()	ND (0.210) D ()	ND (0.230) D ()	ND (0.160) D ()
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.064) (0.001)	ND (0.120) (0.001)	ND (0.110) (0.001)	ND (0.110) (0.001)	-	-	-	-	-	-	-	-	ND (0.240) D ()	ND (0.210) D ()	ND (0.230) D ()	ND (0.160) D ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	0.290 J (0.001)	0.670 (0.001)	0.800 (0.001)	0.430 J (0.001)	-	-	-	-	-	-	-	-	0.230 J D ()	ND (0.210) D ()	ND (0.230) D ()	ND (0.160) D ()
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.400 (0.001)	0.400 J (0.001)	0.280 J (0.001)	0.630 (0.001)	-	-	-	-	-	-	-	-	ND (0.240) D ()	ND (0.210) D ()	ND (0.230) D ()	ND (0.160) D ()
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	ND (0.064) (0.001)	ND (0.120) (0.001)	0.130 J (0.001)	0.160 J (0.001)	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.064) (0.001)	ND (0.120) (0.001)	ND (0.110) (0.001)	ND (0.110) (0.001)	-	-	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	0.083 J (0.001)	0.140 J (0.001)	0.190 J (0.001)	0.640 (0.001)	-	-	-	-	-	-	-	-	-	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																			
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																			
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.890 J (0.033)	1.1 J (0.033)	1.1 J (0.033)	4.4 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	ND (0.44) ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	1.6 J (0.033)	1.8 J (0.033)	1.9 J (0.033)	5.8 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	0.25 J ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	1.6 J (0.033)	2.4 J (0.033)	2.5 J (0.033)	6.5 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	0.33 J ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	2.0 (0.033)	2.8 (0.033)	3.0 (0.033)	7.5 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	0.44 ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.1 J (0.033)	1.9 J (0.033)	2.3 J (0.033)	4.6 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	ND (0.44) ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-270-S-11	GP-270-S-13	GP-270-S-14	GP-270-S-15	GP-271-GP-1	GP-271-GP-2	GP-271-GP-3	GP-271-GP-4		GP-271-GP-5		GP-271-GP-6	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Date				6-Oct-09	6-Oct-09	6-Oct-09	6-Oct-09	4-Jun-02	4-Jun-02	4-Jun-02	4-Jun-02	17-Sep-02	4-Jun-02	17-Sep-02	4-Jun-02	25-May-07	25-May-07	25-May-07	25-May-07
Sample ID				S-11 (1.5-2.0)	S-13 (1.0-1.5)	S-14 (1.0-1.5)	S-15 (1.5-2.0)	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Depth				1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 0.5 ft	0.5 - 1 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	LL	LL	LL	WGI	WGI	WGI	WGI	WGI	WGI	WGI	WGI	PIP	PIP	PIP	PIP
Laboratory Work Order				1165331	1165331	1165331	1165331	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	074100	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799593	5799595	5799596	5799597	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	0705-4569	0705-4570	0705-4571	0705-4572
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	1.9 J (0.033)	1.9 J (0.033)	1.9 J (0.033)	7.3 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	ND (16) ()	-	0.41 J ()	0.230 J ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLORO BENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLORO BENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLORO BENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	0.650 J (0.033)	ND (0.520) (0.033)	ND (0.500) (0.033)	3.2 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	0.75 ()	-	120 ()	-	ND (0.44) ()	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.960 J (0.033)	1.6 J (0.033)	1.9 J (0.033)	3.6 (0.033)	-	-	-	-	-	-	-	-	ND (0.340) ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	ND (0.27) ()	ND (0.22) ()	1.2 ()	1.5 ()	-	ND (0.54) ()	-	0.19 J ()	-	-	-	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	1.7 J (0.033)	3.0 (0.033)	2.5 J (0.033)	4.9 (0.033)	ND (0.37) ()	ND (0.37) ()	0.29 J ()	0.84 ()	-	110 ()	-	0.39 J ()	0.560 ()	0.210 J ()	ND (0.370) ()	ND (0.350) ()
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	3.5 (0.033)	2.0 J (0.033)	2.3 J (0.033)	15 (0.033)	ND (0.37) ()	ND (0.37) ()	ND (0.53) ()	ND (0.65) ()	-	11 J ()	-	0.44 ()	0.330 J ()	ND (0.360) ()	ND (0.370) ()	ND (0.350) ()
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLORO BENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-270-S-11	GP-270-S-13	GP-270-S-14	GP-270-S-15	GP-271-GP-1	GP-271-GP-2	GP-271-GP-3	GP-271-GP-4		GP-271-GP-5		GP-271-GP-6	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Date				6-Oct-09	6-Oct-09	6-Oct-09	6-Oct-09	4-Jun-02	4-Jun-02	4-Jun-02	4-Jun-02	17-Sep-02	4-Jun-02	17-Sep-02	4-Jun-02	25-May-07	25-May-07	25-May-07	25-May-07
Sample ID				S-11 (1.5-2.0)	S-13 (1.0-1.5)	S-14 (1.0-1.5)	S-15 (1.5-2.0)	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	GP-275-LINE1	GP-275-LINE2	GP-275-LINE3	GP-275-LINE4
Sample Depth				1.5 - 2 ft	1 - 1.5 ft	1 - 1.5 ft	1.5 - 2 ft	0 - 0.5 ft	0.5 - 1 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	LL	LL	LL	WGI	WGI	WGI	WGI	WGI	WGI	WGI	WGI	PIP	PIP	PIP	PIP
Laboratory Work Order				1165331	1165331	1165331	1165331	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	074100	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799593	5799595	5799596	5799597	GP-1(0-0.5)	GP-2 (0.5-1.0)	GP-3 (1.5-2.0)	GP-4 (1.5-2.0)	GP-4 (1.5-2)	GP-5 (1.5-2.0)	GP-5 (1.5-2)	GP-6 (0-0.5)	0705-4569	0705-4570	0705-4571	0705-4572
Metals																			
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	99.9 (0.591)	330 (0.591)	366 (0.591)	386 (0.591)	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																			
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	15.0 (0.50)	35.9 (0.50)	33.8 (0.50)	35.5 (0.50)	-	-	-	-	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	GP-1002-1002	GP 1002-1002 PIPE-1	GP 1002-1002 PIPE-2	GP 1002-1002-1	GP 1002-1002-2	GP 1002-1002-3	GP 1100-1100-1	GP 1100-1100-2	GP 1100-1100-3	GP 1100-1100-CV-1	
Sample Date				25-May-07	25-May-07	25-May-07	11-May-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	11-May-06	11-May-06	11-May-06	11-May-06	19-Jun-06
Sample ID				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	1002	1002 PIPE-1	1002 PIPE-2	1002-1	1002-2	1002-3	1100-1	1100-2	1100-3	1100-CV-1	1100CV-1
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft											
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	074097	074097	074097	989527	985190	985190	985190	985190	985190	989526	989526	989526	989526	994824
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4554	0705-4555	0705-4556	4771679	4748119	4748120	4748121	4748122	4748123	4771671	4771672	4771673	4771674	4800867
Volatile Organic Compounds																	
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	2.3 D <sup>B</sup> ()	ND (0.140) D ()	ND (0.160) D ()	U	U	0.16 (0.025)	U	1.4 <sup>B</sup> (0.12)	U	1 <sup>B</sup> (0.017)	0.097 J (0.017)	0.25 (0.021)	0.017 J (0.015)	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	0.680 D ()	ND (0.140) D ()	ND (0.160) D ()	U	U	0.047 J (0.025)	0.63 (0.12)	1.9 (0.12)	0.56 (0.052)	0.59 (0.035)	0.28 (0.034)	0.33 (0.042)	U	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.120 J D ()	ND (0.140) D ()	ND (0.160) D ()	0.52 (0.034)	U	0.064 J (0.063)	5.8 (0.3)	12 (0.31)	6.2 (0.13)	0.18 (0.035)	0.09 J (0.034)	0.076 J (0.042)	U	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	0.580 D ()	0.130 J D ()	0.130 J D ()	0.043 J (0.034)	4 J (2.6)	2.5 (0.13)	14 (0.59)	30 <sup>B</sup> (0.62)	4.5 (0.26)	0.099 J (0.035)	0.35 (0.034)	1.2 (0.042)	0.18 (0.03)	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	1.7 D ()	0.098 J D ()	ND (0.160) D ()	U	U	0.12 (0.025)	0.6 (0.12)	1.2 (0.12)	0.23 (0.052)	U	U	U	U	-
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	-	-	-	U	U	0.27 (0.063)	2.2 (0.3)	6.8 (0.31)	1.9 (0.13)	0.042 J (0.035)	0.13 J (0.034)	0.11 J (0.042)	U	-
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																	
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																	
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.360) ()	ND (0.360) ()	ND (0.380) ()	4.8 (0.21)	U	0.076 J (0.015)	9.1 (0.17)	5.5 (0.18)	8.9 (0.16)	82 (5.3)	21 (0.26)	32 (0.55)	-	5.6 (0.2)
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	0.730 D ()	ND (0.360) ()	ND (0.380) ()	2.9 (0.21)	0.17 (0.032)	0.31 (0.033)	6.1 (0.39)	3 (0.39)	5.4 (0.36)	16 (0.53)	3.8 (0.26)	8.2 (0.55)	-	10 (0.2)
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	0.760 D ()	ND (0.360) ()	ND (0.380) ()	2.3 (0.21)	1.2 (0.048)	1.2 (0.05)	5.8 (0.58)	2.8 J (0.59)	4.9 (0.54)	9.7 (0.53)	2.6 (0.26)	3.8 (0.55)	-	6.8 (0.2)
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.830 D ()	ND (0.360) ()	0.260 J ()	2.6 (0.21)	0.83 (0.064)	1 (0.067)	4.8 (0.77)	2.5 J (0.79)	5.5 (0.72)	9.3 (0.53)	2.6 (0.26)	4 (0.55)	-	7.9 (0.2)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.630 J D ()	ND (0.360) ()	ND (0.380) ()	1.6 (0.21)	13 (0.064)	5.7 (0.067)	6 (0.77)	-	5.5 (0.72)	4.2 (0.53)	1.9 (0.26)	2.4 J (0.55)	-	3.8 (0.2)
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	GP-1002-1002	GP 1002-1002 PIPE-1	GP 1002-1002 PIPE-2	GP 1002-1002-1	GP 1002-1002-2	GP 1002-1002-3	GP 1100-1100-1	GP 1100-1100-2	GP 1100-1100-3	GP 1100-1100-CV-1	
Sample Date				25-May-07	25-May-07	25-May-07	11-May-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	11-May-06	11-May-06	11-May-06	11-May-06	19-Jun-06
Sample ID				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	1002	1002 PIPE-1	1002 PIPE-2	1002-1	1002-2	1002-3	1100-1	1100-2	1100-3	1100-CV-1	1100CV-1
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft											
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	074097	074097	074097	989527	985190	985190	985190	985190	985190	989526	989526	989526	989526	994824
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4554	0705-4555	0705-4556	4771679	4748119	4748120	4748121	4748122	4748123	4771671	4771672	4771673	4771674	4800867
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	1.7 D ()	ND (0.360) ()	ND (0.380) ()	3.6 (0.21)	0.65 (0.048)	0.33 J (0.05)	11 (0.58)	6.6 (0.59)	11 (0.54)	29 (0.53)	7.1 (0.26)	22 (0.55)	-	16 (0.2)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.720) D ()	ND (0.360) ()	ND (0.380) ()	6.3 (0.21)	2 (0.096)	0.47 J (0.1)	22 (1.2)	20 (1.2)	20 (1.1)	210 (5.3)	64 (2.6)	160 (5.5)	-	11 (0.2)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	0.460 J D ()	ND (0.360) ()	ND (0.380) ()	-	-	-	-	-	-	3.2 (0.53)	1.5 (0.26)	1.8 J (0.55)	-	2.7 (0.2)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.860 D ()	ND (0.360) ()	ND (0.380) ()	13 (0.21)	0.16 J (0.048)	0.85 (0.05)	41 (0.58)	26 (0.59)	36 (0.54)	620 (5.3)	180 (2.6)	440 (5.5)	-	22 (0.2)
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	2.5 D ()	ND (0.360) ()	0.300 J ()	7.3 (0.21)	0.53 J (0.11)	1.3 (0.12)	14 (1.4)	34 (1.4)	16 (1.3)	60 (0.53)	17 (0.26)	41 (0.55)	-	31 (0.41)
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	GP-1002-1002	GP 1002-1002 PIPE-1	GP 1002-1002 PIPE-2	GP 1002-1002-1	GP 1002-1002-2	GP 1002-1002-3	GP 1100-1100-1	GP 1100-1100-2	GP 1100-1100-3	GP 1100-1100-CV-1	
Sample Date				25-May-07	25-May-07	25-May-07	11-May-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	7-Apr-06	11-May-06	11-May-06	11-May-06	11-May-06	19-Jun-06
Sample ID				GP-277-LINE1	GP-277-LINE2	GP-277-LINE3	1002	1002 PIPE-1	1002 PIPE-2	1002-1	1002-2	1002-3	1100-1	1100-2	1100-3	1100-CV-1	1100CV-1
Sample Depth				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft											
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	074097	074097	074097	989527	985190	985190	985190	985190	985190	989526	989526	989526	989526	994824
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4554	0705-4555	0705-4556	4771679	4748119	4748120	4748121	4748122	4748123	4771671	4771672	4771673	4771674	4800867
Metals																	
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CADIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																	
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	22 (0.5)	16.8 (0.5)	20.3 (0.5)	31.1 (0.5)	32.1 (0.5)	26.2 (0.5)	36.9 (0.5)	35.3 (0.5)	39.3 (0.5)	19.3 (0.5)	18.1 (0.0005)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP 1100-1100-CV-2	GP 1100-1100-CV-3	GP 1100-1100-ELBOW	GP 1100-1100-JOINTS	GP280-08	GP280-09	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Date				11-May-06	11-May-06	11-May-06	11-May-06	29-Aug-16	29-Aug-16	24-Feb-16	24-Feb-16	24-Feb-16	24-Feb-16	30-May-07	30-May-07	30-May-07
Sample ID				1100-CV-2	1100-CV-3	1100-Elbow	1100-Joints	GP280-08-20160829-1.0	GP280-09-20160829-1.0	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Depth								1 ft	1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	PIP	PIP	PIP
Laboratory Work Order				989526	989526	989526	989526	1701349	1701349	1634471/1629086	1634471/1629086	1634471/1629086	1634471/1629086	074145	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4771675	4771676	4771677	4771678	8557113	8557114	8256671/8231752	8256672/8231753	8256673/8231754	8256674/8231755	0706-0474	0706-0475	0706-0476
Volatile Organic Compounds																
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	µg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	U	U	0.16 J (0.017)	0.33 (0.019)	ND (0.0008) (0.0005)	ND (0.064) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	-	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	0.013 (0.001)	ND (0.13) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	0.003 J (0.001)	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	ND (0.002) (0.001)	ND (0.13) (0.001)	-	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	U	U	U	1.3 (0.038)	0.004 J (0.001)	ND (0.13) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	U	U	U	2.6 (0.038)	0.004 J (0.001)	ND (0.13) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	ND (0.0008) (0.0005)	ND (0.064) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.005) (0.0005)	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	0.003 J (0.001)	ND (0.13) (0.001)	ND (0.001) (0.001)	0.002 J (0.001)	ND (0.001) (0.001)	0.044 (0.001)	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	0.18 (0.031)	0.054 J (0.03)	0.048 J (0.033)	5.6 (0.038)	0.005 J (0.001)	0.50 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	0.008 (0.001)	ND (0.13) (0.001)	ND (0.001) (0.001)	0.005 J (0.001)	ND (0.001) (0.001)	0.002 J (0.001)	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	ND (0.002) (0.001)	ND (0.13) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.0008) (0.001)	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	U	U	0.25 (0.033)	5.6 (0.038)	0.003 J (0.001)	ND (0.13) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.005) (0.001)	-	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	0.16 (0.001)	0.22 J (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	0.006 (0.001)	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	0.026 (0.001)	ND (0.13) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)	ND (0.005) (0.001)	0.013 (0.001)	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	0.18 (0.031)	0.031 J (0.03)	0.12 J (0.033)	86 (0.38)	0.011 (0.001)	ND (0.13) (0.001)	0.002 J (0.001)	0.022 (0.001)	ND (0.001) (0.001)	0.004 J (0.001)	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (SW8011)																
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	ND (0.0026) (0.00020)	ND (0.0024) (0.00020)	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds																
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	0.83 J (0.0033)	0.85 (0.0033)	0.22 J (0.0033)	0.27 (0.0033)	ND (0.021) (0.0033)	ND (0.10) (0.0033)	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	41 (0.42)	0.84 J (0.41)	1.6 J (0.43)	7.4 (0.44)	2.7 (0.0033)	1.4 (0.0033)	0.31 J (0.0033)	0.35 (0.0033)	0.11 (0.0033)	0.11 J (0.0033)	-	-	-
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	26 (0.42)	0.63 J (0.41)	0.89 J (0.43)	5 (0.44)	1.9 (0.0033)	0.99 (0.0033)	0.42 J (0.0033)	0.53 (0.0033)	0.20 (0.0033)	0.32 J (0.0033)	-	-	-
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	13 <sup>AB</sup> (0.42)	0.79 J (0.41)	1.2 J (0.43)	2.3 (0.44)	1.2 (0.0033)	0.58 (0.0033)	0.44 J (0.0033)	0.46 (0.0033)	0.19 (0.0033)	0.28 J (0.0033)	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	8.5 (0.42)	0.81 J (0.41)	0.87 J (0.43)	1.8 J (0.44)	2.8 (0.0033)	0.88 (0.0033)	0.51 J (0.0033)	0.59 (0.0033)	0.25 (0.0033)	0.42 J (0.0033)	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	6.2 (0.42)	3.4 (0.41)	1.8 J (0.43)	3.3 (0.44)	1.4 (0.0033)	0.67 (0.0033)	0.47 J (0.0033)	0.42 (0.0033)	0.25 (0.0033)	ND (0.10) (0.0033)	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-	-	-	-	1.1 J (0.0033)	0.41 J (0.0033)	0.19 J (0.0033)	0.20 (0.0033)	0.077 J (0.0033)	0.12 J (0.0033)	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	ND (1.1) (0.017)	0.96 (0.017)	ND (0.53) (0.017)	0.47 (0.017)	0.13 J (0.017)	ND (0.52) (0.017)	-	-	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP 1100-1100-CV-2	GP 1100-1100-CV-3	GP 1100-1100-ELBOW	GP 1100-1100-JOINTS	GP280-08	GP280-09	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Date				11-May-06	11-May-06	11-May-06	11-May-06	29-Aug-16	29-Aug-16	24-Feb-16	24-Feb-16	24-Feb-16	24-Feb-16	30-May-07	30-May-07	30-May-07
Sample ID				1100-CV-2	1100-CV-3	1100-Elbow	1100-Joints	GP280-08-20160829-1.0	GP280-09-20160829-1.0	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Depth								1 ft	1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	PIP	PIP	PIP
Laboratory Work Order				989526	989526	989526	989526	1701349	1701349	1634471/1629086	1634471/1629086	1634471/1629086	1634471/1629086	074145	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4771675	4771676	4771677	4771678	8557113	8557114	8256671/8231752	8256672/8231753	8256673/8231754	8256674/8231755	0706-0474	0706-0475	0706-0476
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	ND (4.3) (0.067)	ND (1.7) (0.067)	ND (2.1) (0.067)	ND (0.43) (0.067)	ND (0.43) (0.067)	ND (2.1) (0.067)	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	ND (4.3) (0.067)	ND (1.7) (0.067)	ND (2.1) (0.067)	ND (0.43) (0.067)	ND (0.43) (0.067)	ND (2.1) (0.067)	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	41 (0.42)	2.3 (0.41)	3 (0.43)	8.2 (0.44)	8.0 (0.0033)	4.0 (0.0033)	1.9 (0.0033)	1.8 (0.0033)	0.32 (0.0033)	1.5 (0.0033)	-	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-	-	-	-	0.50 J (0.0033)	0.31 J (0.0033)	0.17 J (0.0033)	0.10 J (0.0033)	0.071 J (0.0033)	ND (0.10) (0.0033)	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	ND (4.3) (0.067)	ND (1.7) (0.067)	ND (2.1) (0.067)	ND (0.43) (0.067)	ND (0.43) (0.067)	ND (2.1) (0.067)	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	ND (1.1) (0.017)	ND (0.42) (0.017)	ND (0.53) (0.017)	ND (0.11) (0.017)	ND (0.11) (0.017)	ND (0.52) (0.017)	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	ND (20) (0.30)	ND (7.6) (0.30)	ND (9.5) (0.30)	ND (1.9) (0.30)	ND (1.9) (0.30)	ND (9.3) (0.30)	-	-	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	5.2 (0.0033)	1.6 (0.0033)	0.66 (0.0033)	0.57 (0.0033)	0.28 (0.0033)	0.42 J (0.0033)	-	-	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	59 (2.1)	U	1.1 (0.43)	16 (0.44)	2.0 (0.0033)	2.7 (0.0033)	0.34 J (0.0033)	0.41 (0.0033)	0.069 J (0.0033)	0.16 J (0.0033)	-	-	-
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	4 (0.42)	1.5 J (0.41)	1.2 J (0.43)	1.6 J (0.44)	0.88 J (0.0033)	0.45 (0.0033)	0.39 J (0.0033)	0.31 (0.0033)	0.14 (0.0033)	ND (0.10) (0.0033)	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	2.5 (0.0033)	8.1 (0.0033)	1.1 (0.0033)	2.1 (0.0033)	0.60 (0.0033)	0.12 J (0.0033)	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup> <sub>32</sub>	58 <sup>B</sup> <sub>32</sub>	-	-	-	-	ND (1.1) (0.017)	ND (0.42) (0.017)	ND (0.53) (0.017)	ND (0.11) (0.017)	ND (0.11) (0.017)	ND (0.52) (0.017)	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	ND (1.1) (0.017)	ND (0.42) (0.017)	ND (0.53) (0.017)	ND (0.11) (0.017)	ND (0.11) (0.017)	ND (0.52) (0.017)	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	0.71 (0.0033)	1.8 (0.0033)	0.54 (0.0033)	0.10 J (0.0033)	-	-	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	ND (11) (0.17)	ND (4.2) (0.17)	ND (5.3) (0.17)	ND (1.1) (0.17)	ND (1.1) (0.17)	ND (5.2) (0.17)	-	-	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	160 (2.1)	0.63 J (0.41)	2.6 (0.43)	31 (0.44)	7.4 (0.0033)	8.5 (0.0033)	0.88 (0.0033)	0.95 (0.0033)	0.37 (0.0033)	0.22 J (0.0033)	-	-	-
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	ND (1.1) (0.017)	ND (0.42) (0.017)	ND (0.53) (0.017)	ND (0.11) (0.017)	ND (0.11) (0.017)	ND (0.52) (0.017)	-	-	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	78 (2.1)	1 J (0.41)	2.9 (0.43)	13 (0.44)	5.6 (0.0033)	2.3 (0.0033)	1.4 (0.0033)	0.98 (0.0033)	0.28 (0.0033)	1.0 (0.0033)	-	-	-
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	ND (4.3) (0.067)	ND (1.7) (0.067)	ND (2.1) (0.067)	ND (0.43) (0.067)	ND (0.43) (0.067)	ND (2.1) (0.067)	-	-	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	ND (2.2) (0.033)	ND (0.85) (0.033)	ND (1.1) (0.033)	ND (0.21) (0.033)	ND (0.21) (0.033)	ND (1.0) (0.033)	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP 1100-1100-CV-2	GP 1100-1100-CV-3	GP 1100-1100-ELBOW	GP 1100-1100-JOINTS	GP280-08	GP280-09	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Date				11-May-06	11-May-06	11-May-06	11-May-06	29-Aug-16	29-Aug-16	24-Feb-16	24-Feb-16	24-Feb-16	24-Feb-16	30-May-07	30-May-07	30-May-07
Sample ID				1100-CV-2	1100-CV-3	1100-Elbow	1100-Joints	GP280-08-20160829-1.0	GP280-09-20160829-1.0	GP284-01	GP284-02	GP284-03	GP284-04	LO-1000-LINE-1	LO-1000-LINE-2	LO-1000-LINE-3
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	1 ft	1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0.5 - 1 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		A	B	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	PIP	PIP	PIP
Laboratory Work Order				989526	989526	989526	989526	1701349	1701349	1634471/1629086	1634471/1629086	1634471/1629086	1634471/1629086	074145	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	4771675	4771676	4771677	4771678	8557113	8557114	8256671/8231752	8256672/8231753	8256673/8231754	8256674/8231755	0706-0474	0706-0475	0706-0476
Metals																
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	10.9 (0.120)	11.9 (0.120)	7.70 (0.0810)	6.50 (0.0810)	5.39 (0.0810)	7.79 (0.0810)	-	-	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	-	-	-	-	98.5 (0.550)	50.3 (0.550)	-	-	-	-	-	-	-
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	32.9 (0.300)	21.6 (0.300)	34.3 (0.230)	17.9 (0.230)	22.1 (0.230)	53.1 (0.230)	-	-	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	65 J ( )	820 ( )	110 J ( )
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-	-	-	-	85.0 (0.140)	60.1 (0.140)	119 (0.230)	29.3 (0.230)	28.6 (0.230)	633 <sup>AB</sup> (0.230)	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	185 (0.680)	86.7 (0.680)	538 (0.770)	149 (0.770)	94.6 (0.770)	886 (0.770)	-	-	-
General Chemistry																
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	20.8 (0.5)	17.9 (0.5)	23.3 (0.5)	24.7 (0.5)	23.2 (0.50)	21.3 (0.50)	20.9 (0.50)	22.3 (0.50)	23.5 (0.50)	20.2 (0.50)	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-	-	-	6.33 ( )	11.39 ( )	5.45 ( )
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 4a  
Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				LO-1000-LINE-4
Sample Date				30-May-07
Sample ID				LO-1000-LINE-4
Sample Depth				0 - 0.5 ft
Sampling Company				UNKNOWN
Laboratory				PIP
Laboratory Work Order		A	B	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0477
Volatile Organic Compounds				
ACETONITRILE	mg/kg	4800 <sup>A</sup>	n/v	-
ACROLEIN	mg/kg	1.6 <sup>A</sup>	n/v	-
ACRYLONITRILE	mg/kg	33 <sup>A</sup>	n/v	-
BENZENE	µg/L	n/v	n/v	-
BENZENE	mg/kg	290 <sup>A</sup>	0.5 <sup>B</sup>	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-
CHLOROBENZENE	mg/kg	4000 <sup>A</sup>	n/v	-
CHLOROFORM	mg/kg	97 <sup>A</sup>	n/v	-
CHLOROMETHANE	mg/kg	1200 <sup>A</sup>	n/v	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-
1,2-DICHLOROETHANE (EDC)	mg/kg	86 <sup>A</sup>	0.5 <sup>B</sup>	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-
1,2-DICHLOROPROPANE	mg/kg	220 <sup>A</sup>	n/v	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	290 <sup>A</sup>	n/v	-
ETHYLBENZENE	mg/kg	890 <sup>A</sup>	70 <sup>B</sup>	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-
METHYL TERTIARY BUTYL ETHER	mg/kg	8600 <sup>A</sup>	2 <sup>B</sup>	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	300 <sup>A</sup>	n/v	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	38 <sup>A</sup>	n/v	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3200 <sup>A</sup>	n/v	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-
TRANS-1,2-DICHLOROETHENE	mg/kg	4800 <sup>A</sup>	n/v	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-
1,1,2-TRICHLOROETHANE	mg/kg	16 <sup>A</sup>	n/v	-
TRICHLOROETHYLENE (TCE)	mg/kg	160 <sup>A</sup>	n/v	-
1,2,4-TRIMETHYLBENZENE	mg/kg	560 <sup>A</sup>	35 <sup>B</sup>	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	8000 <sup>A</sup>	1000 <sup>B</sup>	-
Crotonaldehyde (2-Butenal)	mg/kg	48 <sup>A</sup>	n/v	-
Ethylene oxide	mg/kg	n/v	n/v	-
Ethyleneimine	mg/kg	n/v	n/v	-
Formaldehyde	mg/kg	170 <sup>A</sup>	n/v	-
Methanethiol	mg/kg	n/v	n/v	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-
Volatile Organic Compounds (SW8011)				
1,2-DIBROMOETHANE (EDB)	mg/kg	3.7 <sup>A</sup>	0.005 <sup>B</sup>	-
Semi-Volatile Organic Compounds				
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-
BENZENETHIOL	mg/kg	3200 <sup>A</sup>	n/v	-
BENZIDINE	mg/kg	0.4 <sup>A</sup>	n/v	-
BENZO(A)ANTHRACENE	mg/kg	130 <sup>A</sup>	130 <sup>B</sup>	-
BENZO(A)PYRENE	mg/kg	12 <sup>A</sup>	12 <sup>B</sup>	-
BENZO(B)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-
BENZO(K)FLUORANTHENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-
1,1'-BIPHENYL	mg/kg	11000 <sup>A</sup>	190 <sup>B</sup>	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				LO-1000-LINE-4
Sample Date				30-May-07
Sample ID				LO-1000-LINE-4
Sample Depth				0 - 0.5 ft
Sampling Company				UNKNOWN
Laboratory				PIP
Laboratory Work Order		A	B	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0477
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	6.7 <sup>A</sup>	n/v	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	6500 <sup>A</sup>	130 <sup>B</sup>	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-
CHRYSENE	mg/kg	760 <sup>A</sup>	230 <sup>B</sup>	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-
DIBENZ(A,H)ANTHRACENE	mg/kg	22 <sup>A</sup>	22 <sup>B</sup>	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-
1,4-DICHLOROBENZENE	mg/kg	200 <sup>A</sup>	n/v	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	260 <sup>A</sup>	n/v	-
2,4-DINITROPHENOL	mg/kg	6400 <sup>A</sup>	23 <sup>B</sup>	-
2,4-DINITROTOLUENE	mg/kg	290 <sup>A</sup>	n/v	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-
1,2-DIPHENYLHYDRAZINE	mg/kg	110 <sup>A</sup>	n/v	-
FLUORANTHENE	mg/kg	130000 <sup>A</sup>	3200 <sup>B</sup>	-
FLUORENE	mg/kg	130000 <sup>A</sup>	3800 <sup>B</sup>	-
INDENE	mg/kg	n/v	n/v	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	76 <sup>A</sup>	76 <sup>B</sup>	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-
2-METHYLNAPHTHALENE	mg/kg	13000 <sup>A</sup>	1900 <sup>B</sup>	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup> <sub>s2</sub>	58 <sup>B</sup> <sub>s2</sub>	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	160000 <sup>A</sup>	580 <sup>B</sup>	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	16000 <sup>A</sup>	58 <sup>B</sup>	-
NAPHTHALENE	mg/kg	760 <sup>A</sup>	25 <sup>B</sup>	-
4-NITROANILINE	mg/kg	4600 <sup>A</sup>	n/v	-
NITROBENZENE	mg/kg	6400 <sup>A</sup>	n/v	-
4-NITROPHENOL	mg/kg	26000 <sup>A</sup>	6 <sup>B</sup>	-
PENTACHLOROPHENOL	mg/kg	230 <sup>A</sup>	n/v	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-
PHENOL	mg/kg	16000 <sup>A</sup>	200 <sup>B</sup>	-
PYRENE	mg/kg	96000 <sup>A</sup>	2200 <sup>B</sup>	-
PYRIDINE	mg/kg	3200 <sup>A</sup>	12 <sup>B</sup>	-
QUINOLINE	mg/kg	30 <sup>A</sup>	0.37 <sup>B</sup>	-
1,2,4-TRICHLOROBENZENE	mg/kg	3100 <sup>A</sup>	n/v	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-
2,4,6-TRICHLOROPHENOL	mg/kg	3200 <sup>A</sup>	n/v	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-
Aniline	mg/kg	79 <sup>A</sup>	n/v	-
Benz(c)acridine	mg/kg	n/v	n/v	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-
BENZYL CHLORIDE	mg/kg	45 <sup>A</sup>	n/v	-
Bis(2-chloromethyl)ether	mg/kg	0.036 <sup>A</sup>	n/v	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-
Hydroquinone	mg/kg	1500 <sup>A</sup>	n/v	-



Table 4a

Historical Soil Analytical Results Summary – AOI 7 (0-2 feet)  
AOI 7 Remedial Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				LO-1000-LINE-4
Sample Date				30-May-07
Sample ID				LO-1000-LINE-4
Sample Depth				0 - 0.5 ft
Sampling Company				UNKNOWN
Laboratory				PIP
Laboratory Work Order		A	B	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0477
Metals				
ANTIMONY	mg/kg	1300 <sup>A</sup>	n/v	-
ARSENIC	mg/kg	61 <sup>A</sup>	29 <sup>B</sup>	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-
BERYLLIUM	mg/kg	11 <sup>A</sup>	n/v	-
CADMIUM	mg/kg	6.1 <sup>A</sup>	6.1 <sup>B</sup>	-
CHROMIUM	mg/kg	220 <sub>s1</sub> <sup>A</sup>	190 <sub>s1</sub> <sup>B</sup>	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-
COBALT	mg/kg	960 <sup>A</sup>	160 <sup>B</sup>	-
LEAD	mg/kg	2240 <sup>A</sup>	450 <sup>B</sup>	-
MERCURY	mg/kg	510 <sup>A</sup>	10 <sup>B</sup>	-
NICKEL	mg/kg	64000 <sup>A</sup>	650 <sup>B</sup>	-
SELENIUM	mg/kg	16000 <sup>A</sup>	26 <sup>B</sup>	-
SODIUM	mg/kg	n/v	n/v	46 J ( )
VANADIUM	mg/kg	220 <sup>A</sup>	220 <sup>B</sup>	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-
General Chemistry				
Cation Exchange Capacity	meq/100g	n/v	n/v	-
CHROMIUM, HEXAVALENT	mg/kg	220 <sup>A</sup>	190 <sup>B</sup>	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-
MOISTURE, PERCENT	%	n/v	n/v	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	11.44 ( )
Phenols (Phenolics)	mg/kg	n/v	n/v	-
SOLIDS, PERCENT	%	n/v	n/v	-
SULFIDE	mg/kg	n/v	n/v	-
TOTAL CYANIDE (WATER)	mg/kg	1900 <sup>A</sup>	n/v	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-43	AOI7 BH-12-45	AOI7 BH-12-48	AOI7 BH-12-49	AOI7 BH-12-53	AOI7 BH-12-54
Sample Date				28-Nov-12	29-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12
Sample ID				BH-12-43_2.5'	BH-12-45_3.5'	BH-12-48_3'	BH-12-49_2.5'	BH-12-53_2.5'	BH-12-54_3'
Sample Depth				2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	JB22561	JB22549	JB22549	JB22549	JB22549
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876921	JB22561-11	JB22549-5	JB22549-6	JB22549-4	JB22549-1
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.004) (0.0005)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	ND (0.066) (0.066)	0.340 (0.066)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	ND (0.066) (0.066)	ND (0.066) (0.066)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	ND (0.066) (0.066)	ND (0.066) (0.066)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	0.164 (0.066)	5.98 (0.066)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0063) (0.0063)	ND (0.0062) (0.0062)	ND (0.0042) (0.0042)	ND (0.33) (0.33)	2.24 (0.33)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.004) (0.0005)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	ND (0.066) (0.066)	ND (0.066) (0.066)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	ND (0.0063) (0.0063)	ND (0.0062) (0.0062)	ND (0.0042) (0.0042)	0.989 (0.33)	4.58 (0.33)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0013) (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	0.148 (0.066)	0.569 (0.066)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0063) (0.0063)	ND (0.0062) (0.0062)	ND (0.0042) (0.0042)	1.86 (0.33)	34.9 (3.3)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.004) (0.001)	ND (0.0063) (0.0063)	ND (0.0062) (0.0062)	ND (0.0042) (0.0042)	0.474 (0.33)	9.72 (0.33)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.004) (0.001)	0.0021 (0.0013)	ND (0.0012) (0.0012)	ND (0.00083) (0.00083)	0.942 (0.066)	17.2 (0.066)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-43	AOI7 BH-12-45	AOI7 BH-12-48	AOI7 BH-12-49	AOI7 BH-12-53	AOI7 BH-12-54
Sample Date				28-Nov-12	29-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12
Sample ID				BH-12-43_2.5'	BH-12-45_3.5'	BH-12-48_3'	BH-12-49_2.5'	BH-12-53_2.5'	BH-12-54_3'
Sample Depth				2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	JB22561	JB22549	JB22549	JB22549	JB22549
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876921	JB22561-11	JB22549-5	JB22549-6	JB22549-4	JB22549-1
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.59 (0.003)	1.04 (0.040)	0.820 (0.084)	0.0698 (0.036)	0.409 (0.080)	0.932 (0.038)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.8 (0.003)	2.16 (0.040)	0.800 (0.084)	0.260 (0.036)	0.914 (0.080)	1.35 (0.038)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	2.0 (0.003)	2.89 (0.040)	1.02 (0.084)	0.278 (0.036)	0.921 (0.080)	1.04 (0.038)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.6 (0.003)	2.82 (0.040)	0.717 (0.084)	0.263 (0.036)	0.895 (0.080)	1.32 (0.038)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.4 (0.003)	1.93 (0.040)	1.14 (0.084)	0.226 (0.036)	0.839 (0.080)	0.709 (0.038)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	2.0 (0.003)	2.35 (0.040)	1.60 (0.084)	0.305 (0.036)	1.31 (0.080)	1.43 (0.038)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-43	AOI7 BH-12-45	AOI7 BH-12-48	AOI7 BH-12-49	AOI7 BH-12-53	AOI7 BH-12-54
Sample Date				28-Nov-12	29-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12
Sample ID				BH-12-43_2.5'	BH-12-45_3.5'	BH-12-48_3'	BH-12-49_2.5'	BH-12-53_2.5'	BH-12-54_3'
Sample Depth				2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	JB22561	JB22549	JB22549	JB22549	JB22549
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876921	JB22561-11	JB22549-5	JB22549-6	JB22549-4	JB22549-1
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.26 (0.003)	1.14 (0.040)	0.217 (0.084)	ND (0.036) (0.036)	0.297 (0.080)	0.890 (0.038)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.54 (0.003)	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	1.7 (0.003)	1.42 (0.040)	1.25 (0.084)	0.201 (0.036)	1.25 (0.080)	2.73 (0.038)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	3.0 (0.003)	3.39 (0.040)	2.10 (0.084)	0.410 (0.036)	1.81 (0.080)	3.35 (0.038)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-43	AOI7 BH-12-45	AOI7 BH-12-48	AOI7 BH-12-49	AOI7 BH-12-53	AOI7 BH-12-54
Sample Date				28-Nov-12	29-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12	30-Nov-12
Sample ID				BH-12-43_2.5'	BH-12-45_3.5'	BH-12-48_3'	BH-12-49_2.5'	BH-12-53_2.5'	BH-12-54_3'
Sample Depth				2 - 2.5 ft	3 - 3.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	JB22561	JB22549	JB22549	JB22549	JB22549
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876921	JB22561-11	JB22549-5	JB22549-6	JB22549-4	JB22549-1
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	119 (0.0044)	758 <sup>B</sup> (2.7)	1530 <sup>B</sup> (2.9)	107 (4.3)	510 <sup>B</sup> (2.3)	190 (4.9)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	9.4 (0.50)	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	71.6 ( )	74.1 ( )	89.9 ( )	82.9 ( )	79.1 ( )
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-55	AOI7 BH-12-58		AOI7 BH-12-62	AOI7 BH-12-64	
Sample Date				30-Nov-12	28-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	29-Nov-12
Sample ID				BH-12-55_2.5'	BH-12-58_3'	BH-12-58_4'	BH-12-62_3'	BH-12-64_2.5'	BH-12-64_3'
Sample Depth				2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22549	1352569	1352569	JB22561	JB22561	JB22561
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22549-2	6876918	6876919	JB22561-10	JB22561-3	JB22561-12
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.0005)	ND (0.036) (0.0005)	ND (0.00087) (0.00087)	0.135 (0.070)	ND (0.00099) (0.00099)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.00087) (0.00087)	ND (0.070) (0.070)	ND (0.00099) (0.00099)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.00087) (0.00087)	ND (0.070) (0.070)	ND (0.00099) (0.00099)
1,1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.00087) (0.00087)	0.143 (0.070)	ND (0.00099) (0.00099)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.0053) (0.0053)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.0043) (0.0043)	ND (0.35) (0.35)	ND (0.0049) (0.0049)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.0005)	ND (0.036) (0.0005)	ND (0.00087) (0.00087)	ND (0.070) (0.070)	ND (0.00099) (0.00099)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.0053) (0.0053)	-	-	ND (0.0043) (0.0043)	0.816 (0.35)	ND (0.0049) (0.0049)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.001)	0.21 J (0.001)	ND (0.00087) (0.00087)	0.421 (0.070)	ND (0.00099) (0.00099)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.0053) (0.0053)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.0043) (0.0043)	ND (0.35) (0.35)	ND (0.0049) (0.0049)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.0053) (0.0053)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.0043) (0.0043)	ND (0.35) (0.35)	ND (0.0049) (0.0049)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.0011) (0.0011)	ND (0.005) (0.001)	ND (0.073) (0.001)	ND (0.00087) (0.00087)	0.300 (0.070)	ND (0.00099) (0.00099)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-55	AOI7 BH-12-58		AOI7 BH-12-62	AOI7 BH-12-64	
Sample Date				30-Nov-12	28-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	29-Nov-12
Sample ID				BH-12-55_2.5'	BH-12-58_3'	BH-12-58_4'	BH-12-62_3'	BH-12-64_2.5'	BH-12-64_3'
Sample Depth				2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22549	1352569	1352569	JB22561	JB22561	JB22561
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22549-2	6876918	6876919	JB22561-10	JB22561-3	JB22561-12
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.265 (0.073)	0.13 (0.003)	3.3 (0.003)	0.0828 (0.029)	1.88 (0.072)	0.382 (0.034)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.612 (0.073)	0.27 (0.003)	5.2 (0.003)	0.276 (0.029)	2.13 (0.072)	0.969 (0.034)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.599 (0.073)	0.30 (0.003)	5.3 (0.003)	0.329 (0.029)	2.26 (0.072)	0.916 (0.034)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	0.701 (0.073)	0.35 (0.003)	6.2 (0.003)	0.415 (0.029)	1.95 (0.072)	0.771 (0.034)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.557 (0.073)	0.28 (0.003)	3.7 (0.003)	0.281 (0.029)	1.52 (0.072)	0.678 (0.034)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.718 (0.073)	0.27 (0.003)	6.3 (0.003)	0.325 (0.029)	2.89 (0.072)	0.987 (0.034)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-55	AOI7 BH-12-58		AOI7 BH-12-62	AOI7 BH-12-64	
Sample Date				30-Nov-12	28-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	29-Nov-12
Sample ID				BH-12-55_2.5'	BH-12-58_3'	BH-12-58_4'	BH-12-62_3'	BH-12-64_2.5'	BH-12-64_3'
Sample Depth				2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22549	1352569	1352569	JB22561	JB22561	JB22561
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22549-2	6876918	6876919	JB22561-10	JB22561-3	JB22561-12
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.100 (0.073)	0.040 (0.003)	2.4 (0.003)	0.0428 (0.029)	1.73 (0.072)	0.141 (0.034)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sub>2</sub> <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	0.52 (0.003)	12 (0.003)	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.792 (0.073)	0.34 (0.003)	4.1 (0.003)	0.527 (0.029)	4.08 (0.072)	0.932 (0.034)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.928 (0.073)	0.34 (0.003)	10 (0.003)	0.664 (0.029)	4.06 (0.072)	1.69 (0.034)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-55	AOI7 BH-12-58		AOI7 BH-12-62	AOI7 BH-12-64	
Sample Date				30-Nov-12	28-Nov-12	28-Nov-12	29-Nov-12	29-Nov-12	29-Nov-12
Sample ID				BH-12-55_2.5'	BH-12-58_3'	BH-12-58_4'	BH-12-62_3'	BH-12-64_2.5'	BH-12-64_3'
Sample Depth				2 - 2.5 ft	2.5 - 3 ft	3.5 - 4 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22549	1352569	1352569	JB22561	JB22561	JB22561
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22549-2	6876918	6876919	JB22561-10	JB22561-3	JB22561-12
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	313 (2.5)	350 (0.0044)	467 <sup>B</sup> (0.0044)	26.1 (2.0)	594 <sup>B</sup> (2.5)	360 (2.5)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	13.0 (0.50)	26.5 (0.50)	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	82.9 ( )	-	-	99.2 ( )	79.3 ( )	81.7 ( )
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-67 29-Nov-12	AOI7 BH-12-68 29-Nov-12	AOI7 BH-12-69 29-Nov-12	AOI7 BH-12-70 28-Nov-12	AOI7 BH-12-72 28-Nov-12	AOI7 BH-12-73 28-Nov-12
Sample Date				BH-12-67_3'	BH-12-68_3'	BH-12-69_2.5'	BH-12-70_4'	BH-12-72_3.5'	BH-12-73_5'
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	3.5 - 4 ft	3 - 3.5 ft	4.5 - 5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory				JB22561	JB22561	JB22561	1352569	1352569	1352569
Laboratory Work Order		A	B	JB22561-5	JB22561-7	JB22561-2	6876925	6876916	6876915
Laboratory Sample ID	Units	MSC-PA	SHS-PA						
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0013) (0.0013)	0.00097 (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.0013) (0.0013)	ND (0.00089) (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0013) (0.0013)	ND (0.00089) (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.0013) (0.0013)	ND (0.00089) (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.0064) (0.0064)	ND (0.0045) (0.0045)	ND (0.0039) (0.0039)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.0013) (0.0013)	ND (0.00089) (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.0005)	ND (0.005) (0.0005)	ND (0.006) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.0064) (0.0064)	ND (0.0045) (0.0045)	ND (0.0039) (0.0039)	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.0013) (0.0013)	ND (0.00089) (0.00089)	ND (0.00079) (0.00079)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.0064) (0.0064)	ND (0.0045) (0.0045)	ND (0.0039) (0.0039)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.0064) (0.0064)	ND (0.0045) (0.0045)	ND (0.0039) (0.0039)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.0024 (0.0013)	ND (0.00089) (0.00089)	0.0020 (0.00079)	ND (0.006) (0.001)	ND (0.005) (0.001)	ND (0.006) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-67 29-Nov-12	AOI7 BH-12-68 29-Nov-12	AOI7 BH-12-69 29-Nov-12	AOI7 BH-12-70 28-Nov-12	AOI7 BH-12-72 28-Nov-12	AOI7 BH-12-73 28-Nov-12
Sample Date				BH-12-67_3'	BH-12-68_3'	BH-12-69_2.5'	BH-12-70_4'	BH-12-72_3.5'	BH-12-73_5'
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	3.5 - 4 ft	3 - 3.5 ft	4.5 - 5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory				JB22561	JB22561	JB22561	1352569	1352569	1352569
Laboratory Work Order				JB22561-5	JB22561-7	JB22561-2	6876925	6876916	6876915
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA						
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.791 (0.039)	0.158 (0.064)	1.54 (0.031)	ND (0.019) (0.003)	0.31 (0.003)	0.12 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.52 (0.039)	0.390 (0.064)	2.77 (0.031)	ND (0.019) (0.003)	0.76 (0.003)	0.24 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.57 (0.039)	0.392 (0.064)	2.38 (0.031)	ND (0.019) (0.003)	0.93 (0.003)	0.22 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.55 (0.039)	0.337 (0.064)	2.64 (0.031)	ND (0.019) (0.003)	1.1 (0.003)	0.32 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.01 (0.039)	0.305 (0.064)	1.71 (0.031)	ND (0.019) (0.003)	0.70 (0.003)	0.21 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.65 (0.039)	0.449 (0.064)	2.67 (0.031)	ND (0.019) (0.003)	0.90 (0.003)	0.25 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-67 29-Nov-12	AOI7 BH-12-68 29-Nov-12	AOI7 BH-12-69 29-Nov-12	AOI7 BH-12-70 28-Nov-12	AOI7 BH-12-72 28-Nov-12	AOI7 BH-12-73 28-Nov-12
Sample Date				BH-12-67_3'	BH-12-68_3'	BH-12-69_2.5'	BH-12-70_4'	BH-12-72_3.5'	BH-12-73_5'
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	3.5 - 4 ft	3 - 3.5 ft	4.5 - 5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory				JB22561	JB22561	JB22561	1352569	1352569	1352569
Laboratory Work Order		A	B	JB22561-5	JB22561-7	JB22561-2	6876925	6876916	6876915
Laboratory Sample ID	Units	MSC-PA	SHS-PA						
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.426 (0.039)	ND (0.064) (0.064)	0.459 (0.031)	ND (0.019) (0.003)	0.090 (0.003)	0.045 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	ND (0.019) (0.003)	1.0 (0.003)	0.11 (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	1.66 (0.039)	0.433 (0.064)	5.63 (0.15)	ND (0.019) (0.003)	0.88 (0.003)	0.26 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	2.31 (0.039)	0.565 (0.064)	5.68 (0.15)	ND (0.019) (0.003)	1.0 (0.003)	0.36 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7 BH-12-67 29-Nov-12	AOI7 BH-12-68 29-Nov-12	AOI7 BH-12-69 29-Nov-12	AOI7 BH-12-70 28-Nov-12	AOI7 BH-12-72 28-Nov-12	AOI7 BH-12-73 28-Nov-12
Sample Date				BH-12-67_3'	BH-12-68_3'	BH-12-69_2.5'	BH-12-70_4'	BH-12-72_3.5'	BH-12-73_5'
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	3.5 - 4 ft	3 - 3.5 ft	4.5 - 5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory				JB22561	JB22561	JB22561	1352569	1352569	1352569
Laboratory Work Order		A	B	JB22561-5	JB22561-7	JB22561-2	6876925	6876916	6876915
Laboratory Sample ID	Units	MSC-PA	SHS-PA						
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	672 <sup>B</sup> (2.6)	210 (2.4)	43.5 (2.2)	7.46 (0.0044)	185 (0.0044)	27.3 (0.0044)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	8.3 (0.50)	11.6 (0.50)	28.6 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	72.8 ( )	87.4 ( )	92.2 ( )	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-74	AOI7 BH-12-76	AOI7 BH-12-77	AOI7 BH-12-80	AOI7 BH-12-83	AOI7 BH-12-84
Sample Date				28-Nov-12	28-Nov-12	28-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12
Sample ID				BH-12-74_4'	BH-12-76_3'	BH-12-77_3'	BH-12-80_3.0'	BH-12-83_3.0'	BH-12-84_3.0'
Sample Depth				3.5 - 4 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	1352569	1352569	JB22267	JB22267	JB22267
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876912	6876911	6876920	JB22267-17	JB22267-10	JB22267-11
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.0005)	ND (0.009) (0.0005)	ND (0.004) (0.0005)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	ND (0.00086) (0.00086)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	ND (0.00086) (0.00086)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	ND (0.00086) (0.00086)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	ND (0.00086) (0.00086)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0054) (0.0054)	ND (0.0085) (0.0085)	ND (0.0043) (0.0043)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.006) (0.0005)	ND (0.009) (0.0005)	ND (0.004) (0.0005)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	ND (0.00086) (0.00086)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	ND (0.0054) (0.0054)	ND (0.0085) (0.0085)	ND (0.0043) (0.0043)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	0.0011 (0.00086)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0054) (0.0054)	ND (0.0085) (0.0085)	ND (0.0043) (0.0043)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0054) (0.0054)	ND (0.0085) (0.0085)	ND (0.0043) (0.0043)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.006) (0.001)	ND (0.009) (0.001)	ND (0.004) (0.001)	ND (0.0011) (0.0011)	ND (0.0017) (0.0017)	0.0012 (0.00086)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-74	AOI7 BH-12-76	AOI7 BH-12-77	AOI7 BH-12-80	AOI7 BH-12-83	AOI7 BH-12-84
Sample Date				28-Nov-12	28-Nov-12	28-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12
Sample ID				BH-12-74_4'	BH-12-76_3'	BH-12-77_3'	BH-12-80_3.0'	BH-12-83_3.0'	BH-12-84_3.0'
Sample Depth				3.5 - 4 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	1352569	1352569	JB22267	JB22267	JB22267
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876912	6876911	6876920	JB22267-17	JB22267-10	JB22267-11
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.85 (0.003)	1.5 (0.003)	ND (0.018) (0.003)	0.0448 (0.030)	0.362 (0.047)	ND (0.033) (0.033)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.9 (0.003)	0.87 (0.003)	0.026 (0.003)	0.152 (0.030)	0.845 (0.047)	0.0454 (0.033)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.6 (0.003)	0.66 (0.003)	0.028 (0.003)	0.161 (0.030)	0.870 (0.047)	0.0430 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.9 (0.003)	1.1 (0.003)	0.032 (0.003)	0.158 (0.030)	0.973 (0.047)	0.0646 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.1 (0.003)	0.56 (0.003)	0.020 (0.003)	0.106 (0.030)	0.693 (0.047)	0.0338 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	2.2 (0.003)	1.1 (0.003)	0.032 (0.003)	0.151 (0.030)	0.887 (0.047)	0.0657 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-74	AOI7 BH-12-76	AOI7 BH-12-77	AOI7 BH-12-80	AOI7 BH-12-83	AOI7 BH-12-84
Sample Date				28-Nov-12	28-Nov-12	28-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12
Sample ID				BH-12-74_4'	BH-12-76_3'	BH-12-77_3'	BH-12-80_3.0'	BH-12-83_3.0'	BH-12-84_3.0'
Sample Depth				3.5 - 4 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	1352569	1352569	JB22267	JB22267	JB22267
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876912	6876911	6876920	JB22267-17	JB22267-10	JB22267-11
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.18 (0.003)	0.78 (0.003)	ND (0.018) (0.003)	ND (0.030) (0.030)	0.122 (0.047)	ND (0.033) (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.19 (0.003)	18 (0.003)	ND (0.018) (0.003)	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	3.7 (0.003)	5.2 (0.003)	ND (0.018) (0.003)	0.217 (0.030)	1.01 (0.047)	0.0508 (0.033)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	4.5 (0.003)	1.8 (0.003)	0.035 (0.003)	0.276 (0.030)	1.03 (0.047)	0.0768 (0.033)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-74	AOI7 BH-12-76	AOI7 BH-12-77	AOI7 BH-12-80	AOI7 BH-12-83	AOI7 BH-12-84
Sample Date				28-Nov-12	28-Nov-12	28-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12
Sample ID				BH-12-74_4'	BH-12-76_3'	BH-12-77_3'	BH-12-80_3.0'	BH-12-83_3.0'	BH-12-84_3.0'
Sample Depth				3.5 - 4 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft	2.5 - 3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	1352569	1352569	1352569	JB22267	JB22267	JB22267
Laboratory Sample ID	Units	MSC-PA	SHS-PA	6876912	6876911	6876920	JB22267-17	JB22267-10	JB22267-11
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A1</sup>	190 <sup>B1</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	538 <sup>B</sup> (0.0044)	380 (0.0044)	4.40 (0.0044)	104 (2.3)	264 (3.2)	58.0 (2.3)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	15.0 (0.50)	34.7 (0.50)	7.2 (0.50)	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	92.4 ( )	64.0 ( )	87.8 ( )
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-85 27-Nov-12	AOI7 BH-12-87 27-Nov-12	AOI7 BH-12-88 27-Nov-12	AOI7 BH-12-100 27-Nov-12	AOI7-BH-13-45 13-Mar-13
Sample Date				BH-12-85_3.0'	BH-12-87_3.0'	BH-12-88_2.5'	BH-12-100_3.0'	AOI7-BH-13-45_2-2.5_031313
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory				JB22267	JB22267	JB22267	JB22267	JB31265
Laboratory Work Order				JB22267-8	JB22267-5	JB22267-12	JB22267-6	JB31265-4
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA					
<b>Volatile Organic Compounds</b>								
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	2.35 <sup>B</sup> (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.099) (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.099) (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	0.382 (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.49) (0.49)	ND (0.0095) (0.0095)	ND (0.0051) (0.0051)	ND (0.0046) (0.0046)	ND (0.64) (0.64)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.099) (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	1.04 (0.49)	ND (0.0095) (0.0095)	ND (0.0051) (0.0051)	ND (0.0046) (0.0046)	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	1.16 (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	ND (0.13) (0.13)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	1.03 (0.49)	ND (0.0095) (0.0095)	ND (0.0051) (0.0051)	ND (0.0046) (0.0046)	ND (0.64) (0.64)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.49) (0.49)	ND (0.0095) (0.0095)	ND (0.0051) (0.0051)	ND (0.0046) (0.0046)	ND (0.64) (0.64)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	1.64 (0.099)	ND (0.0019) (0.0019)	ND (0.0010) (0.0010)	ND (0.00091) (0.00091)	0.394 (0.13)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-85	AOI7 BH-12-87	AOI7 BH-12-88	AOI7 BH-12-100	AOI7-BH-13-45
Sample Date				27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	13-Mar-13
Sample ID				BH-12-85_3.0'	BH-12-87_3.0'	BH-12-88_2.5'	BH-12-100_3.0'	AOI7-BH-13-45_2-2.5_031313
Sample Depth				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order				JB22267	JB22267	JB22267	JB22267	JB31265
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA	JB22267-8	JB22267-5	JB22267-12	JB22267-6	JB31265-4
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>								
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>								
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.256 (0.045)	0.204 (0.047)	ND (0.037) (0.037)	0.159 (0.033)	0.256 (0.21)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.455 (0.045)	0.662 (0.047)	0.0591 (0.037)	0.818 (0.033)	0.550 (0.21)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.524 (0.045)	0.695 (0.047)	0.0748 (0.037)	0.796 (0.033)	0.600 (0.21)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	0.460 (0.045)	0.593 (0.047)	0.129 (0.037)	0.821 (0.033)	0.643 (0.21)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.494 (0.045)	0.560 (0.047)	0.0754 (0.037)	0.489 (0.033)	0.601 (0.21)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.518 (0.045)	0.687 (0.047)	0.0824 (0.037)	0.768 (0.033)	1.29 (0.21)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-85 27-Nov-12	AOI7 BH-12-87 27-Nov-12	AOI7 BH-12-88 27-Nov-12	AOI7 BH-12-100 27-Nov-12	AOI7-BH-13-45 13-Mar-13
Sample Date				BH-12-85_3.0'	BH-12-87_3.0'	BH-12-88_2.5'	BH-12-100_3.0'	AOI7-BH-13-45_2-2.5_031313
Sample ID				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sample Depth				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sampling Company				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory				JB22267	JB22267	JB22267	JB22267	JB31265
Laboratory Work Order				JB22267-8	JB22267-5	JB22267-12	JB22267-6	JB31265-4
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA					
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.139 (0.045)	0.0573 (0.047)	ND (0.037) (0.037)	0.0385 (0.033)	ND (0.21) (0.21)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	ND (0.21) (0.21)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.613 (0.045)	0.611 (0.047)	ND (0.037) (0.037)	0.469 (0.033)	0.217 (0.21)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.540 (0.045)	0.896 (0.047)	0.0767 (0.037)	0.835 (0.033)	1.95 (0.21)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7 BH-12-85	AOI7 BH-12-87	AOI7 BH-12-88	AOI7 BH-12-100	AOI7-BH-13-45
Sample Date				27-Nov-12	27-Nov-12	27-Nov-12	27-Nov-12	13-Mar-13
Sample ID				BH-12-85_3.0'	BH-12-87_3.0'	BH-12-88_2.5'	BH-12-100_3.0'	AOI7-BH-13-45_2-2.5_031313
Sample Depth				2.5 - 3 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order		A	B	JB22267	JB22267	JB22267	JB22267	JB31265
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB22267-8	JB22267-5	JB22267-12	JB22267-6	JB31265-4
<b>Metals</b>								
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup>	190 <sup>s1</sup>	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	344 (2.8)	1110 <sup>B</sup> (2.9)	198 (2.4)	135 (2.3)	753 <sup>B</sup> (2.0)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-
<b>General Chemistry</b>								
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	71.7 ( )	64.2 ( )	80.6 ( )	85.6 ( )	79.9 ( )
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-16-001	
Sample Date				13-Mar-13	13-Mar-13	1-Jul-16	1-Jul-16
Sample ID				AOI7-BH-13-47_2.5-3_031313	AOI7-BH-13-48_2.5-3_031313	AOI7-BH-16-001-2-4-070116	AOI7-BH-16-001D-2-4-070116
Sample Depth				2.5 - 3 ft	2.5 - 3 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order		A	B	JB31265	JB31265	1679350	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB31265-6	JB31265-2	8460988	8460989
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.16) (0.16)	0.845 <sup>B</sup> (0.11)	ND (0.005) (0.0005)	ND (0.006) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.16) (0.16)	ND (0.11) (0.11)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.16) (0.16)	ND (0.11) (0.11)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.16) (0.16)	0.401 (0.11)	ND (0.005) (0.001)	ND (0.006) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.870 (0.79)	1.96 (0.56)	ND (0.005) (0.001)	ND (0.006) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.16) (0.16)	ND (0.11) (0.11)	ND (0.005) (0.0005)	ND (0.006) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.475 (0.16)	1.08 (0.11)	ND (0.005) (0.001)	ND (0.006) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.79) (0.79)	ND (0.56) (0.56)	ND (0.005) (0.001)	ND (0.006) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.79) (0.79)	ND (0.56) (0.56)	ND (0.005) (0.001)	ND (0.006) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.364 (0.16)	1.58 (0.11)	ND (0.005) (0.001)	ND (0.006) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-16-001	
Sample Date				13-Mar-13	13-Mar-13	1-Jul-16	1-Jul-16
Sample ID				AOI7-BH-13-47_2.5-3_031313	AOI7-BH-13-48_2.5-3_031313	AOI7-BH-16-001-2-4-070116	AOI7-BH-16-001D-2-4-070116
Sample Depth				2.5 - 3 ft	2.5 - 3 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	GHD	GHD
Laboratory				ACCUTEST	ACCUTEST	LL	LL
Laboratory Work Order		A	B	JB31265	JB31265	1679350	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	JB31265-6	JB31265-2	8460988	8460989
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	2.03 (0.24)	1.12 (0.077)	ND (0.022) (0.003)	ND (0.022) (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	3.13 (0.24)	1.56 (0.077)	0.007 J (0.003)	0.006 J (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	2.50 (0.24)	1.50 (0.077)	0.009 J (0.003)	0.007 J (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.40 (0.24)	1.44 (0.077)	0.011 J (0.003)	0.007 J (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.37 (0.24)	0.986 (0.077)	0.010 J (0.003)	ND (0.022) (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	4.13 (0.24)	2.07 (0.077)	0.008 J (0.003)	0.005 J (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID				AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-16-001	
				13-Mar-13 AOI7-BH-13-47_2.5-3_031313 2.5 - 3 ft UNKNOWN ACCUTEST JB31265 JB31265-6	13-Mar-13 AOI7-BH-13-48_2.5-3_031313 2.5 - 3 ft UNKNOWN ACCUTEST JB31265 JB31265-2	1-Jul-16 AOI7-BH-16-001-2-4-070116 2 - 4 ft GHD LL 1679350 8460988	1-Jul-16 AOI7-BH-16-001D-2-4-070116 2 - 4 ft GHD LL 1679350 8460989
	Units	A MSC-PA	B SHS-PA				
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	3.36 (0.24)	1.58 (0.077)	ND (0.022) (0.003)	ND (0.022) (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.24) (0.24)	ND (0.077) (0.077)	ND (0.022) (0.003)	ND (0.022) (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	7.92 (0.24)	2.27 (0.077)	0.006 J (0.003)	ND (0.022) (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	5.58 (0.24)	3.34 (0.077)	0.012 J (0.003)	0.007 J (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenapthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID	Units	A MSC-PA	B SHS-PA	AOI7-BH-13-47	AOI7-BH-13-48	AOI7-BH-16-001	
				13-Mar-13	13-Mar-13	1-Jul-16	1-Jul-16
				AOI7-BH-13-47_2.5-3_031313	AOI7-BH-13-48_2.5-3_031313	AOI7-BH-16-001-2-4-070116	AOI7-BH-16-001D-2-4-070116
				2.5 - 3 ft	2.5 - 3 ft	2 - 4 ft	2 - 4 ft
				UNKNOWN	UNKNOWN	GHD	GHD
				ACCUTEST	ACCUTEST	LL	LL
				JB31265	JB31265	1679350	1679350
				JB31265-6	JB31265-2	8460988	8460989
Metals							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup> <sub>st</sub>	190 <sup>B</sup> <sub>st</sub>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	567 <sup>B</sup> (2.0)	348 (2.5)	2.19 (0.550)	2.23 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
General Chemistry							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	22.6 (0.50)	22.7 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	65.3 ( )	81.9 ( )	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-011	AOI7-BH-16-013	AOI7-BH-16-015	AOI7-BH-16-017
Sample Date				28-Jun-16	29-Jun-16	29-Jun-16	11-Jul-16
Sample ID				AOI7-BH-16-011-062816-2-4	AOI7-BH-16-013-2-4-062916	AOI7-BH-16-015-2-4-062916	AOI7-BH-16-017-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455724	8455737	8455735	8473659
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.0005)	0.081 J (0.0005)	ND (0.660) (0.0005)	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.006) (0.0005)	ND (0.660) (0.0005)	ND (0.660) (0.0005)	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.006) (0.001)	0.280 J (0.001)	0.430 J (0.001)	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.006) (0.001)	ND (0.660) (0.001)	ND (0.660) (0.001)	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-011	AOI7-BH-16-013	AOI7-BH-16-015	AOI7-BH-16-017
Sample Date				28-Jun-16	29-Jun-16	29-Jun-16	11-Jul-16
Sample ID				AOI7-BH-16-011-062816-2-4	AOI7-BH-16-013-2-4-062916	AOI7-BH-16-015-2-4-062916	AOI7-BH-16-017-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455724	8455737	8455735	8473659
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	2.000 (0.003)	4.300 (0.003)	2.600 (0.003)	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.800 (0.003)	3.500 (0.003)	2.300 (0.003)	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.500 (0.003)	1.800 (0.003)	1.800 (0.003)	2.800 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.700 (0.003)	2.300 (0.003)	2.200 (0.003)	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.500 (0.003)	1.000 (0.003)	1.300 (0.003)	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	2.200 (0.003)	4.200 (0.003)	2.900 (0.003)	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-011	AOI7-BH-16-013	AOI7-BH-16-015	AOI7-BH-16-017
Sample Date				28-Jun-16	29-Jun-16	29-Jun-16	11-Jul-16
Sample ID				AOI7-BH-16-011-062816-2-4	AOI7-BH-16-013-2-4-062916	AOI7-BH-16-015-2-4-062916	AOI7-BH-16-017-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455724	8455737	8455735	8473659
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.400 (0.003)	3.900 (0.003)	1.900 (0.003)	-
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	10.000 (0.003)	10.000 (0.003)	10.000 (0.003)	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	4.000 (0.003)	15.000 (0.003)	4.400 (0.003)	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	3.000 (0.003)	10.000 (0.003)	5.400 (0.003)	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROGENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-011	AOI7-BH-16-013	AOI7-BH-16-015	AOI7-BH-16-017
Sample Date				28-Jun-16	29-Jun-16	29-Jun-16	11-Jul-16
Sample ID				AOI7-BH-16-011-062816-2-4	AOI7-BH-16-013-2-4-062916	AOI7-BH-16-015-2-4-062916	AOI7-BH-16-017-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1678008	1678008	1678008	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8455724	8455737	8455735	8473659
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	439 (0.550)	425 (0.550)	452 <sup>B</sup> (0.550)	-
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	31.6 (0.50)	44.4 (0.50)	44.5 (0.50)	33.1 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-018	AOI7-BH-16-020	AOI7-BH-16-021	
Sample Date				11-Jul-16	1-Jul-16	30-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-018-2-4-071116	AOI7-BH-16-020-2-4-070116	AOI7-BH-16-021-2-4-063016	AOI7-BH-16-021D-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1682473	1679350	1679350	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8473660	8461000	8460979	8460980
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	0.150 J (0.0005)	ND (0.007) (0.0005)	0.079 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.470) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.470) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	0.230 J (0.001)	ND (0.007) (0.001)	ND (0.470) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.470) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	ND (0.660) (0.0005)	ND (0.007) (0.0005)	ND (0.470) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	1.700 (0.001)	ND (0.007) (0.001)	1.100 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	0.180 J (0.001)	ND (0.007) (0.001)	0.120 J (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	ND (0.660) (0.001)	ND (0.007) (0.001)	ND (0.470) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	0.410 J (0.001)	ND (0.007) (0.001)	0.170 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-018	AOI7-BH-16-020	AOI7-BH-16-021	
Sample Date				11-Jul-16	1-Jul-16	30-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-018-2-4-071116	AOI7-BH-16-020-2-4-070116	AOI7-BH-16-021-2-4-063016	AOI7-BH-16-021D-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1682473	1679350	1679350	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8473660	8461000	8460979	8460980
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	1.200 (0.003)	1.100 (0.003)	1.900 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	1.500 (0.003)	1.900 (0.003)	3.000 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.200 (0.003)	1.800 (0.003)	1.900 (0.003)	2.700 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	2.100 (0.003)	2.300 (0.003)	3.200 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	1.600 (0.003)	1.100 (0.003)	1.600 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	1.800 (0.003)	2.300 (0.003)	3.300 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location Sample Date Sample ID Sample Depth Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID				AOI7-BH-16-018	AOI7-BH-16-020	AOI7-BH-16-021	
				11-Jul-16 AOI7-BH-16-018-2-4-071116 2 - 4 ft GHD LL 1682473 8473660	1-Jul-16 AOI7-BH-16-020-2-4-070116 2 - 4 ft GHD LL 1679350 8461000	30-Jun-16 AOI7-BH-16-021-2-4-063016 2 - 4 ft GHD LL 1679350 8460979	30-Jun-16 AOI7-BH-16-021D-2-4-063016 2 - 4 ft GHD LL 1679350 8460980
		<b>A</b>	<b>B</b>				
	<b>Units</b>	<b>MSC-PA</b>	<b>SHS-PA</b>				
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	0.550 (0.003)	1.200 (0.003)	2.400 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	15.000 (0.003)	5.500 (0.003)	9.300 (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	3.300 (0.003)	2.400 (0.003)	3.900 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	1.900 (0.003)	4.100 (0.003)	6.600 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0,041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-018	AOI7-BH-16-020	AOI7-BH-16-021	
Sample Date				11-Jul-16	1-Jul-16	30-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-018-2-4-071116	AOI7-BH-16-020-2-4-070116	AOI7-BH-16-021-2-4-063016	AOI7-BH-16-021D-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1682473	1679350	1679350	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8473660	8461000	8460979	8460980
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup>	190 <sup>s1</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	281 (0.550)	154 (0.550)	111 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	36.6 (0.50)	36.1 (0.50)	39.1 (0.50)	31.2 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-022	AOI7-BH-16-023	AOI7-BH-16-024	AOI7-B
Sample Date				5-Jul-16	1-Jul-16	7-Jul-16	1-Jul-16
Sample ID				AOI7-BH-16-022-2-4-070516	AOI7-BH-16-023-2-4-070116	AOI7-BH-16-024-2-4-070716	AOI7-BH-16-025-4.75-5.0-070116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4.75 - 5 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1679350	1680744	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466400	8460995	8466412	8460996
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.0005)	0.0009 J (0.0005)	0.0007 J (0.0005)	1.400 J <sup>B</sup> (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	ND (4.900) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	ND (4.900) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	2.000 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	12.000 (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.006) (0.0005)	ND (0.008) (0.0005)	ND (0.004) (0.0005)	ND (4.900) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.002 J (0.001)	0.006 J (0.001)	ND (0.004) (0.001)	1.200 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	1.100 J (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	ND (4.900) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.006) (0.001)	ND (0.008) (0.001)	ND (0.004) (0.001)	3.800 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-022	AOI7-BH-16-023	AOI7-BH-16-024	AOI7-B
Sample Date				5-Jul-16	1-Jul-16	7-Jul-16	1-Jul-16
Sample ID				AOI7-BH-16-022-2-4-070516	AOI7-BH-16-023-2-4-070116	AOI7-BH-16-024-2-4-070716	AOI7-BH-16-025-4.75-5.0-070116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4.75 - 5 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1679350	1680744	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466400	8460995	8466412	8460996
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	2.600 (0.003)	1.100 (0.003)	ND (0.018) (0.003)	2.900 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	3.600 (0.003)	1.200 (0.003)	0.010 J (0.003)	2.600 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	3.200 (0.003)	1.600 (0.003)	0.012 J (0.003)	2.500 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	4.400 (0.003)	2.200 (0.003)	0.015 J (0.003)	3.000 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	2.500 (0.003)	2.000 (0.003)	0.016 J (0.003)	1.800 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	3.800 (0.003)	1.600 (0.003)	0.011 J (0.003)	3.000 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				AOI7-BH-16-022	AOI7-BH-16-023	AOI7-BH-16-024	AOI7-B
Sample Date				5-Jul-16	1-Jul-16	7-Jul-16	1-Jul-16
Sample ID				AOI7-BH-16-022-2-4-070516	AOI7-BH-16-023-2-4-070116	AOI7-BH-16-024-2-4-070716	AOI7-BH-16-025-4.75-5.0-070116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4.75 - 5 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1679350	1680744	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466400	8460995	8466412	8460996
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.400 (0.003)	0.360 (0.003)	ND (0.018) (0.003)	2.200 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	12.000 (0.003)	12.000 (0.003)	0.009 J (0.003)	80.000 <sup>B</sup> (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	7.500 (0.003)	3.100 (0.003)	0.008 J (0.003)	8.400 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	5.600 (0.003)	1.600 (0.003)	0.014 J (0.003)	4.700 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-022	AOI7-BH-16-023	AOI7-BH-16-024	AOI7-B
Sample Date				5-Jul-16	1-Jul-16	7-Jul-16	1-Jul-16
Sample ID				AOI7-BH-16-022-2-4-070516	AOI7-BH-16-023-2-4-070116	AOI7-BH-16-024-2-4-070716	AOI7-BH-16-025-4.75-5.0-070116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4.75 - 5 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1679350	1680744	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466400	8460995	8466412	8460996
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup>	190 <sup>s1</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	224 (0.550)	291 (0.550)	8.79 (0.550)	469 <sup>B</sup> (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	28.7 (0.50)	40.9 (0.50)	7.0 (0.50)	34.5 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				H-16-025	AOI7-BH-16-026	AOI7-BH-16-028	AOI7-B
Sample Date				1-Jul-16	1-Jul-16	11-Jul-16	8-Jul-16
Sample ID				AOI7-BH-16-025D-4.75-5.0-070116	AOI7-BH-16-026-2-4-070116	AOI7-BH-16-028-2-4-071116	AOI7-BH-16-029-2-4-070816
Sample Depth				4.75 - 5 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1679350	1682473	1681418
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460997	8460991	8473657	8469166
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	0.930 J <sup>B</sup> (0.0005)	0.170 J (0.0005)	0.014 (0.0005)	6.600 <sup>B</sup> (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (5.200) (0.001)	ND (0.430) (0.001)	ND (0.006) (0.001)	ND (0.650) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (5.200) (0.001)	ND (0.430) (0.001)	ND (0.006) (0.001)	ND (0.650) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	1.300 J (0.001)	0.210 J (0.001)	ND (0.006) (0.001)	4.800 (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	12.000 (0.001)	0.360 J (0.001)	ND (0.006) (0.001)	9.300 (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (5.200) (0.0005)	ND (0.430) (0.0005)	ND (0.006) (0.0005)	ND (0.650) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (5.200) (0.001)	0.200 J (0.001)	0.015 (0.001)	2.000 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	1.200 J (0.001)	0.350 J (0.001)	0.001 J (0.001)	15.000 (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (5.200) (0.001)	0.110 J (0.001)	ND (0.006) (0.001)	13.000 (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	3.100 J (0.001)	0.370 J (0.001)	0.007 (0.001)	22.000 (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-025	AOI7-BH-16-026	AOI7-BH-16-028	AOI7-B
Sample Date				1-Jul-16	1-Jul-16	11-Jul-16	8-Jul-16
Sample ID				AOI7-BH-16-025D-4.75-5.0-070116	AOI7-BH-16-026-2-4-070116	AOI7-BH-16-028-2-4-071116	AOI7-BH-16-029-2-4-070816
Sample Depth				4.75 - 5 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1679350	1682473	1681418
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460997	8460991	8473657	8469166
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.900 (0.003)	0.830 (0.003)	1.600 (0.003)	0.750 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.400 (0.003)	0.680 (0.003)	7.400 (0.003)	1.200 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.400 (0.003)	0.550 (0.003)	3.500 (0.003)	0.870 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.700 (0.003)	0.670 (0.003)	5.100 (0.003)	1.400 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.100 (0.003)	0.410 (0.003)	1.700 (0.003)	0.740 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.600 (0.003)	0.800 (0.003)	7.400 (0.003)	1.800 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-025	AOI7-BH-16-026	AOI7-BH-16-028	AOI7-B
Sample Date				1-Jul-16	1-Jul-16	11-Jul-16	8-Jul-16
Sample ID				AOI7-BH-16-025D-4.75-5.0-070116	AOI7-BH-16-026-2-4-070116	AOI7-BH-16-028-2-4-071116	AOI7-BH-16-029-2-4-070816
Sample Depth				4.75 - 5 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1679350	1682473	1681418
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460997	8460991	8473657	8469166
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.600 (0.003)	1.000 (0.003)	0.430 (0.003)	1.300 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sub>32</sub> <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	47.000 <sup>B</sup> (0.003)	6.500 (0.003)	3.400 (0.003)	4.800 (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	6.400 (0.003)	3.500 (0.003)	5.000 (0.003)	4.100 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	2.800 (0.003)	1.800 (0.003)	12.000 (0.003)	2.100 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5- TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-025	AOI7-BH-16-026	AOI7-BH-16-028	AOI7-B
Sample Date				1-Jul-16	1-Jul-16	11-Jul-16	8-Jul-16
Sample ID				AOI7-BH-16-025D-4.75-5.0-070116	AOI7-BH-16-026-2-4-070116	AOI7-BH-16-028-2-4-071116	AOI7-BH-16-029-2-4-070816
Sample Depth				4.75 - 5 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1679350	1682473	1681418
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460997	8460991	8473657	8469166
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sub>st</sub> <sup>A</sup>	190 <sub>st</sub> <sup>B</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	306 (0.550)	62.4 (0.550)	276 (0.550)	192 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	36.6 (0.50)	21.8 (0.50)	28.3 (0.50)	7.4 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-029	AOI7-BH-16-030	AOI7-BH-16-031	AOI7-BH-16-033
Sample Date				8-Jul-16	11-Jul-16	12-Jul-16	11-Jul-16
Sample ID				AOI7-BH-16-029D-2-4-070816	AOI7-BH-16-030-2-4-071116	AOI7-BH-16-031-2-4-071216	AOI7-BH-16-033-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1682473	1682473	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469167	8473656	8473668	8473661
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	7.400 <sup>B</sup> (0.0005)	1.200 J <sup>B</sup> (0.0005)	ND (0.400) (0.0005)	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.580) (0.001)	ND (1.300) (0.001)	ND (0.400) (0.001)	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.580) (0.001)	ND (1.300) (0.001)	ND (0.400) (0.001)	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	3.900 (0.001)	0.300 J (0.001)	ND (0.400) (0.001)	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	5.200 (0.001)	11.000 (0.001)	ND (0.400) (0.001)	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.580) (0.0005)	ND (1.300) (0.0005)	ND (0.400) (0.0005)	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	2.000 (0.001)	0.510 J (0.001)	ND (0.400) (0.001)	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	9.600 (0.001)	0.420 J (0.001)	ND (0.400) (0.001)	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	7.700 (0.001)	ND (1.300) (0.001)	ND (0.400) (0.001)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	17.000 (0.001)	0.900 J (0.001)	ND (0.400) (0.001)	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-029	AOI7-BH-16-030	AOI7-BH-16-031	AOI7-BH-16-033
Sample Date				8-Jul-16	11-Jul-16	12-Jul-16	11-Jul-16
Sample ID				AOI7-BH-16-029D-2-4-070816	AOI7-BH-16-030-2-4-071116	AOI7-BH-16-031-2-4-071216	AOI7-BH-16-033-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1682473	1682473	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469167	8473656	8473668	8473661
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.590 (0.003)	1.600 (0.003)	0.015 J (0.003)	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.840 (0.003)	2.200 (0.003)	0.008 J (0.003)	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.650 (0.003)	1.400 (0.003)	0.008 J (0.003)	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.000 (0.003)	1.800 (0.003)	0.012 J (0.003)	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.560 (0.003)	0.770 (0.003)	0.005 J (0.003)	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.400 (0.003)	2.700 (0.003)	0.017 J (0.003)	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-029	AOI7-BH-16-030	AOI7-BH-16-031	AOI7-BH-16-033
Sample Date				8-Jul-16	11-Jul-16	12-Jul-16	11-Jul-16
Sample ID				AOI7-BH-16-029D-2-4-070816	AOI7-BH-16-030-2-4-071116	AOI7-BH-16-031-2-4-071216	AOI7-BH-16-033-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1682473	1682473	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469167	8473656	8473668	8473661
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.100 (0.003)	2.400 (0.003)	0.015 J (0.003)	-
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	2.800 (0.003)	0.680 (0.003)	0.027 (0.003)	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	3.400 (0.003)	8.600 (0.003)	0.034 (0.003)	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	1.400 (0.003)	4.000 (0.003)	0.029 (0.003)	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0,041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-029	AOI7-BH-16-030	AOI7-BH-16-031	AOI7-BH-16-033
Sample Date				8-Jul-16	11-Jul-16	12-Jul-16	11-Jul-16
Sample ID				AOI7-BH-16-029D-2-4-070816	AOI7-BH-16-030-2-4-071116	AOI7-BH-16-031-2-4-071216	AOI7-BH-16-033-2-4-071116
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1682473	1682473	1682473
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469167	8473656	8473668	8473661
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup>	190 <sup>s1</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	201 (0.550)	140 (0.550)	3.36 (0.550)	ND (7.37) (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	9.7 (0.50)	14.0 (0.50)	28.5 (0.50)	9.9 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-034	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-B
Sample Date				8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-034-2-4-070816	AOI7-BH-16-036-2-4-063016	AOI7-BH-16-037-2-4-062916	AOI7-BH-16-038-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1679350	1678008	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469171	8460985	8455742	8460982
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	0.120 J (0.0005)	0.110 J (0.0005)	0.410 J (0.0005)	ND (0.008) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.540) (0.001)	ND (0.580) (0.001)	ND (2.300) (0.001)	ND (0.008) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.540) (0.001)	ND (0.580) (0.001)	ND (2.300) (0.001)	ND (0.008) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	0.130 J (0.001)	0.130 J (0.001)	ND (2.300) (0.001)	ND (0.008) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.470 J (0.001)	ND (0.580) (0.001)	ND (2.300) (0.001)	0.024 (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.540) (0.0005)	ND (0.580) (0.0005)	ND (2.300) (0.0005)	ND (0.008) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	1.300 (0.001)	1.500 (0.001)	1.000 J (0.001)	0.004 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	2.000 (0.001)	0.200 J (0.001)	ND (2.300) (0.001)	0.013 (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	0.340 J (0.001)	ND (0.580) (0.001)	ND (2.300) (0.001)	0.013 (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	2.800 (0.001)	0.290 J (0.001)	0.850 J (0.001)	0.010 (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-034	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-B
Sample Date				8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-034-2-4-070816	AOI7-BH-16-036-2-4-063016	AOI7-BH-16-037-2-4-062916	AOI7-BH-16-038-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1679350	1678008	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469171	8460985	8455742	8460982
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	2.100 (0.003)	3.600 (0.003)	0.630 (0.003)	2.100 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.100 (0.003)	2.300 (0.003)	0.730 (0.003)	1.700 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.840 (0.003)	1.800 (0.003)	0.900 (0.003)	1.700 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.200 (0.003)	2.300 (0.003)	1.200 (0.003)	2.100 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.810 (0.003)	1.100 (0.003)	0.870 (0.003)	2.300 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.500 (0.003)	2.700 (0.003)	0.930 (0.003)	2.300 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-034	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-B
Sample Date				8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-034-2-4-070816	AOI7-BH-16-036-2-4-063016	AOI7-BH-16-037-2-4-062916	AOI7-BH-16-038-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1679350	1678008	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469171	8460985	8455742	8460982
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.500 (0.003)	4.100 (0.003)	0.450 (0.003)	1.500 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	25.000 (0.003)	17.000 (0.003)	6.700 (0.003)	17.000 (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	6.400 (0.003)	6.300 (0.003)	2.100 (0.003)	5.800 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	1.900 (0.003)	6.900 (0.003)	1.100 (0.003)	3.100 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-034	AOI7-BH-16-036	AOI7-BH-16-037	AOI7-B
Sample Date				8-Jul-16	30-Jun-16	29-Jun-16	30-Jun-16
Sample ID				AOI7-BH-16-034-2-4-070816	AOI7-BH-16-036-2-4-063016	AOI7-BH-16-037-2-4-062916	AOI7-BH-16-038-2-4-063016
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1681418	1679350	1678008	1679350
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469171	8460985	8455742	8460982
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	375 (0.550)	272 (0.550)	227 (0.550)	329 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	36.6 (0.50)	42.4 (0.50)	38.9 (0.50)	33.7 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-038	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043
Sample Date				30-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16
Sample ID				AOI7-BH-16-038D-2-4-063016	AOI7-BH-16-041-2-4-070616	AOI7-BH-16-042-2-4-070616	AOI7-BH-16-043-2-4-062916
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1680744	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460983	8466407	8466405	8455733
<b>Volatile Organic Compounds</b>							
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.007) (0.0005)	0.012 (0.0005)	ND (0.540) (0.0005)	0.005 J (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.007) (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	ND (0.006) (0.001)
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.007) (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	ND (0.006) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	0.002 J (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	0.001 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.011 (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	ND (0.006) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.007) (0.0005)	ND (0.007) (0.0005)	ND (0.540) (0.0005)	ND (0.006) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.002 J (0.001)	0.007 J (0.001)	0.220 J (0.001)	0.005 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	0.007 (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	ND (0.006) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	0.006 J (0.001)	ND (0.007) (0.001)	ND (0.540) (0.001)	0.001 J (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.007 (0.001)	0.003 J (0.001)	ND (0.540) (0.001)	0.001 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-038	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043
Sample Date				30-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16
Sample ID				AOI7-BH-16-038D-2-4-063016	AOI7-BH-16-041-2-4-070616	AOI7-BH-16-042-2-4-070616	AOI7-BH-16-043-2-4-062916
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1680744	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460983	8466407	8466405	8455733
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>							
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>							
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	1.800 (0.003)	3.500 (0.003)	1.300 (0.003)	1.100 (0.003)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.800 (0.003)	4.100 (0.003)	1.800 (0.003)	2.600 (0.003)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.900 (0.003)	3.300 (0.003)	2.000 (0.003)	1.800 (0.003)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.300 (0.003)	4.700 (0.003)	2.400 (0.003)	2.200 (0.003)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	2.100 (0.003)	1.900 (0.003)	1.400 (0.003)	1.100 (0.003)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	2.600 (0.003)	4.300 (0.003)	2.000 (0.003)	2.600 (0.003)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-038	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043
Sample Date				30-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16
Sample ID				AOI7-BH-16-038D-2-4-063016	AOI7-BH-16-041-2-4-070616	AOI7-BH-16-042-2-4-070616	AOI7-BH-16-043-2-4-062916
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1680744	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460983	8466407	8466405	8455733
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.400 (0.003)	2.400 (0.003)	0.760 J (0.003)	0.470 (0.003)
INDENE	mg/kg	n/v	n/v	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	15.000 (0.003)	15.000 (0.003)	3.800 (0.003)	2.400 (0.003)
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	5.100 (0.003)	6.500 (0.003)	3.200 (0.003)	2.200 (0.003)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	2.900 (0.003)	9.600 (0.003)	3.400 (0.003)	3.900 (0.003)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0,041 <sup>A</sup>	n/v	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				H-16-038	AOI7-BH-16-041	AOI7-BH-16-042	AOI7-BH-16-043
Sample Date				30-Jun-16	6-Jul-16	6-Jul-16	29-Jun-16
Sample ID				AOI7-BH-16-038D-2-4-063016	AOI7-BH-16-041-2-4-070616	AOI7-BH-16-042-2-4-070616	AOI7-BH-16-043-2-4-062916
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD	GHD	GHD
Laboratory				LL	LL	LL	LL
Laboratory Work Order		A	B	1679350	1680744	1680744	1678008
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8460983	8466407	8466405	8455733
<b>Metals</b>							
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1A</sup>	190 <sup>s1B</sup>	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	360 (0.550)	269 (0.550)	181 (0.550)	2590 <sup>B</sup> (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-
<b>General Chemistry</b>							
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	34.9 (0.50)	30.8 (0.50)	31.6 (0.50)	21.9 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-046	AOI7-BH-16-047	B90-1	B90-2	B90-3	B90-5
Sample Date				8-Jul-16	8-Jul-16	24-Aug-92	24-Aug-92	24-Aug-92	24-Aug-92
Sample ID				AOI7-BH-16-046-2-4-070816	AOI7-BH-16-047-2-4-070816	B090A5	B090A2	B090A3	B090A7
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD				
Laboratory				LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	1681418	1681418	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469174	8469173	P209609	P209603	P209604	P209611
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	ND (9.6) R ()
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	ND (19) ()
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	ND (19) ()
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	0.140 J (0.0005)	ND (1.200) (0.0005)	-	-	-	ND (0.96) ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	ND (1.9) ()
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.380) (0.001)	ND (1.200) (0.001)	-	-	-	ND (1.9) ()
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.380) (0.001)	ND (1.200) (0.001)	-	-	-	ND (0.96) ()
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	ND (29) R ()
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	0.110 J (0.001)	ND (1.200) (0.001)	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	0.480 (0.001)	2.300 (0.001)	-	-	-	ND (1.9) ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (1.9) ()
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.380) (0.0005)	ND (1.200) (0.0005)	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	ND (1.9) ()
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.400 (0.001)	ND (1.200) (0.001)	-	-	-	ND (0.96) ()
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.96) ()
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	0.110 J (0.001)	0.470 J (0.001)	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.380) (0.001)	ND (1.200) (0.001)	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.450 (0.001)	ND (1.200) (0.001)	-	-	-	ND (0.96) ()
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (9.6) R ()
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-046	AOI7-BH-16-047	B90-1	B90-2	B90-3	B90-5
Sample Date				8-Jul-16	8-Jul-16	24-Aug-92	24-Aug-92	24-Aug-92	24-Aug-92
Sample ID				AOI7-BH-16-046-2-4-070816	AOI7-BH-16-047-2-4-070816	B090A5	B090A2	B090A3	B090A7
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD				
Laboratory				LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	1681418	1681418	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469174	8469173	P209609	P209603	P209604	P209611
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	ND (1.50) L ()
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (1.900) ()
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	4.100 (0.003)	2.000 (0.003)	-	-	-	ND (0.51) ()
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.510) ()
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (2.5) ()
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	7.100 (0.003)	1.800 (0.003)	-	-	-	ND (0.51) ()
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	5.300 (0.003)	1.000 (0.003)	-	-	-	ND (0.51) ()
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	5.900 (0.003)	1.200 (0.003)	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	3.500 (0.003)	0.770 (0.003)	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	3.300 (0.003)	0.490 (0.003)	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.51) ()
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	0.55 ()
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	7.400 (0.003)	2.700 (0.003)	-	-	-	ND (0.310) ()
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.510) ()
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	1.200 (0.003)	0.230 J (0.003)	-	-	-	ND (0.51) ()
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.51) ()
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.460) ()
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (2.500) ()
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	ND (2.5) ()
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-046	AOI7-BH-16-047	B90-1	B90-2	B90-3	B90-5
Sample Date				8-Jul-16	8-Jul-16	24-Aug-92	24-Aug-92	24-Aug-92	24-Aug-92
Sample ID				AOI7-BH-16-046-2-4-070816	AOI7-BH-16-047-2-4-070816	B090A5	B090A2	B090A3	B090A7
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD				
Laboratory				LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	1681418	1681418	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469174	8469173	P209609	P209603	P209604	P209611
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	4.300 (0.003)	2.800 (0.003)	-	-	-	-
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	ND (1.000) ()
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	ND (1.000) ()
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	ND (0.510) ()
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	ND (1.5) ()
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	7.400 (0.003)	ND (0.480) (0.003)	67 <sup>B</sup> ()	0.31 J ()	0.31 J ()	ND (0.51) ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (2.5) ()
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	ND (2.5) ()
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (2.5) ()
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	8.400 (0.003)	9.100 (0.003)	-	-	-	ND (0.51) ()
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	ND (0.51) ()
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	10.000 (0.003)	3.900 (0.003)	-	-	-	ND (0.51) ()
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	ND (1) ()
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	ND (1) ()
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.51) ()
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.310) ()
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	ND (0.510) ()
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	ND (1.8) ()
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	ND (0.51) ()
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	ND (0) ()
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	ND (1.000) ()
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	ND (0) ()
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	ND (2.6) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				AOI7-BH-16-046	AOI7-BH-16-047	B90-1	B90-2	B90-3	B90-5
Sample Date				8-Jul-16	8-Jul-16	24-Aug-92	24-Aug-92	24-Aug-92	24-Aug-92
Sample ID				AOI7-BH-16-046-2-4-070816	AOI7-BH-16-047-2-4-070816	B090A5	B090A2	B090A3	B090A7
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				GHD	GHD				
Laboratory				LL	LL	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	1681418	1681418	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8469174	8469173	P209609	P209603	P209604	P209611
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	1.9 L ()
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	10.0 H ()	17.9 H ()	31.1 H <sup>B</sup> ()	5.8 H ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	159 ()
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	1.2 ()
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	0.93 ()
CHROMIUM	mg/kg	20000 <sup>s1A</sup>	190 <sup>s1B</sup>	-	-	19.5 L ()	77.1 L ()	63.7 L ()	37.3 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	ND (7.8) (0.50)	ND (1.7) (0.50)	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	16.4 ()
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	408 (0.550)	34.1 (0.550)	138 H ()	464 H <sup>B</sup> ()	313 H ()	188 ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	4.14 (0.0100)	0.145 (0.0100)	-	-	-	0.78 J ()
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	27.5 ()
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	ND (0.62) ()
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	19.3 ()
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	10.4 ()	12.0 ()	11.1 ()	15.3 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	ND (0.10) ()	ND (0.13) ()	ND (0.12) ()	ND (0.15) ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	3330 J ()	2360 J ()	3830 J ()	3120 J ()
MOISTURE, PERCENT	%	n/v	n/v	23.4 (0.50)	12.5 (0.50)	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	3.0 ()	ND (0.85) ()	ND (0.69) ()	ND (0.80) ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	ND (5.30) ()	ND (6.7) ()	30.5 H ()	ND (6.20) J ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	1.1 ()	3.8 ()	3.7 ()	2.1 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	16000 J ()	45600 J ()	37000 J ()	43400 L ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	ND (25.90) ()	ND (32.40) ()	38.6 ()	ND (29.70) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-6	B90-10	B90-10DL	B90-11	B90-12	B90-12DL	B90-13	B90-14
Sample Date				26-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92
Sample ID				B090B9	B090B4	B090B4DL	B090B8	B090B1	B090B1DL	B090B3	B090B6
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209932	P209884	P209884DL	P209931	P209881	P209881DL	P209883	P209886
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (83) R ()	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (170) ()	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (170) ()	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	ND (8.3) ()	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (17) ()	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	ND (17) ()	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	ND (8.3) ()	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (250) R ()	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	-	-	-	-	-	13 J ()	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (17) ()	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (17) ()	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	-	-	-	-	-	64 ()	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (8.3) ()	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	-	-	-	-	24 ()	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (83) R ()	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-6	B90-10	B90-10DL	B90-11	B90-12	B90-12DL	B90-13	B90-14
Sample Date				26-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92
Sample ID				B090B9	B090B4	B090B4DL	B090B8	B090B1	B090B1DL	B090B3	B090B6
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209932	P209884	P209884DL	P209931	P209881	P209881DL	P209883	P209886
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (1.20) L ()	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	18.000 ()	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.880) ()	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (4.3) ()	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	-	-	-	-	-	1.1 ()	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	-	-	-	-	-	-	0.81 J ()	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.88) ()	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	0.73 J ()	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	0.910 ()	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.880) ()	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.88) ()	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.800) ()	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (4.300) ()	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	ND (4.3) ()	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				B90-6	B90-10	B90-10DL	B90-11	B90-12	B90-12DL	B90-13	B90-14
Sample Date				26-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92
Sample ID				B090B9	B090B4	B090B4DL	B090B8	B090B1	B090B1DL	B090B3	B090B6
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209932	P209884	P209884DL	P209931	P209881	P209881DL	P209883	P209886
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	1.3 ()	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (1.800) ()	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-	0.67 J ()	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	5.000 ()	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	ND (0.880) ()	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	ND (2.7) ()	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.75 ()	8 J ()	6.9 ()	1 ()	13 J ()	11 ()	11 ()	34 J <sup>B</sup> ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (4.3) ()	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	ND (4.3) ()	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (4.3) ()	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	-	-	-	-	-	0.79 J ()	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	ND (0.88) ()	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	1.1 ()	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	ND (1.8) ()	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	ND (1.8) ()	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.88) ()	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.530) ()	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0.880) ()	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	1.3 J ()	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.88) ()	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0) ()	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (1.800) ()	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	ND (0) ()	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (4.5) ()	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-6	B90-10	B90-10DL	B90-11	B90-12	B90-12DL	B90-13	B90-14
Sample Date				26-Aug-92	25-Aug-92	25-Aug-92	26-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92	25-Aug-92
Sample ID				B090B9	B090B4	B090B4DL	B090B8	B090B1	B090B1DL	B090B3	B090B6
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209932	P209884	P209884DL	P209931	P209881	P209881DL	P209883	P209886
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (1.30) L ()	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	20.9 H ()	1.5 H ()	-	15.9 H ()	4.4 H ()	-	5.3 H ()	3.0 H ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	88.9 ()	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	ND (0.66) ()	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-	ND (0.66) ()	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	64.9 L ()	4.7 L ()	-	66.3 L ()	29.4 L ()	-	24.1 ()	25.8 L ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	10.2 ()	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	388 H ()	243 H ()	-	381 H ()	115 H ()	-	148 ()	110 H ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	0.43 J ()	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	18.7 ()	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	1.0 ()	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-	13.8 ()	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	17.6 ()	0.10 ()	-	11.4 ()	11.5 ()	-	14.1 ()	11.1 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	ND (0.13) ()	ND (0.08) ()	-	ND (0.12) ()	ND (0.09) ()	-	ND (0.13) ()	ND (0.09) ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	562 J ()	1610 J ()	-	3230 J ()	1810 J ()	-	1820 J ()	507 J ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	1.0 ()	ND (0.34) ()	-	ND (0.66) ()	ND (0.58) ()	-	ND (0.52) ()	ND (0.37) ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	80.2 ()	29.0 ()	-	52.1 ()	14.7 H ()	-	34.4 H ()	20.2 ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	5.6 ()	0.59 ()	-	2.1 ()	0.88 ()	-	1.4 ()	0.60 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	49500 J ()	1870 J ()	-	45200 J ()	5270 J ()	-	14600 L ()	16400 J ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	ND (29.80) ()	ND (18.20) ()	-	ND (28.80) ()	ND (23.70) ()	-	ND (24.70) ()	ND (25.3) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-14DL	B90-15	B90-16	B91-1	B91-2	B91-4	B91-5	B91-6
Sample Date				25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	27-Aug-92	27-Aug-92	26-Aug-92	27-Aug-92
Sample ID				B090B6DL	B090B5	B090C2	B091A6	B091A8	B091A9	B091A2	B091A4
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209886DL	P209885	P209934	P210010	P210012	P210013	P209936	P210008
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (6.6) R ()
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (13) ()
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (13) ()
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.66) ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.3) ()
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.3) ()
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.66) ()
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (20) R ()
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	-	-	-	-	-	-	1.5 ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.3) ()
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.3) ()
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.66) ()
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.66) ()
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	-	-	-	-	-	9 ()
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (6.6) R ()
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-14DL	B90-15	B90-16	B91-1	B91-2	B91-4	B91-5	B91-6
Sample Date				25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	27-Aug-92	27-Aug-92	26-Aug-92	27-Aug-92
Sample ID				B090B6DL	B090B5	B090C2	B091A6	B091A8	B091A9	B091A2	B091A4
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209886DL	P209885	P209934	P210010	P210012	P210013	P209936	P210008
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ( )
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.90) L ( )
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ( )
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	1.600 ( )
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.350) ( )
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.7) ( )
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	0.58 B ( )
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.210) ( )
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.350) ( )
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.320) ( )
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ( )
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.700) ( )
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.7) ( )
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ( )



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-14DL	B90-15	B90-16	B91-1	B91-2	B91-4	B91-5	B91-6
Sample Date				25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	27-Aug-92	27-Aug-92	26-Aug-92	27-Aug-92
Sample ID				B090B6DL	B090B5	B090C2	B091A6	B091A8	B091A9	B091A2	B091A4
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209886DL	P209885	P209934	P210010	P210012	P210013	P209936	P210008
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	0.16 J ()
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.710) ()
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	0.560 J ()
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.350) ()
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ()
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.1) ()
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	35 <sup>B</sup> ()	0.67 ()	2.3 ()	0.53 ()	3.5 ()	1.5 ()	0.45 J ()	0.81 ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.7) ()
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.7) ()
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.7) ()
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	-	-	-	-	-	-	0.14 J ()
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.35) ()
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	0.14 J ()
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.71) ()
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.71) ()
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.35) ()
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.210) ()
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.350) ()
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	0.15 J ()
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0.35) ()
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (0) ()
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0.690) ()
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	ND (0) ()
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	ND (1.8) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B90-14DL	B90-15	B90-16	B91-1	B91-2	B91-4	B91-5	B91-6
Sample Date				25-Aug-92	25-Aug-92	26-Aug-92	27-Aug-92	27-Aug-92	27-Aug-92	26-Aug-92	27-Aug-92
Sample ID				B090B6DL	B090B5	B090C2	B091A6	B091A8	B091A9	B091A2	B091A4
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209886DL	P209885	P209934	P210010	P210012	P210013	P209936	P210008
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	1.7 L ()
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	17.5 H ()	7.5 H ()	13.8 H ()	6.3 H ()	9.6 H ()	4.8 H ()	11.8 H ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	151 ()
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	0.53 ()
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.53) ()
CHROMIUM	mg/kg	20000 <sup>A1</sup>	190 <sup>B</sup>	-	31.1 L ()	56.7 L ()	588 L <sup>B</sup> ()	167 J ()	49.9 J ()	83.5 L ()	163 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	5.8 ()
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	198 H ()	321 H ()	257 H ()	195 ()	258 ()	305 H ()	369 ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.08) J ()
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	16.0 ()
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.42) ()
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-	-	66.6 ()
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	-	17.1 ()	11.3 ()	0.55 ()	10.5 J ()	8.9 J ()	13.2 ()	8.2 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	ND (0.12) ()	ND (0.11) ()	ND (0.10) ()	ND (0.13) L ()	ND (0.15) L ()	ND (0.12) ()	ND (0.11) ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	4740 J ()	2720 J ()	1410 J ()	4300 L ()	839 L ()	1760 J ()	ND (20.70) J ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	1.0 ()	1.0 ()	ND (0.60) ()	ND (0.58) L ()	ND (0.69) L ()	ND (0.74) ()	0.72 ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	55.4 ()	ND (5.70) ()	41.2 ()	26.7 ()	18.0 ()	43.2 ()	46.8 J ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	2.1 ()	2.7 ()	2.3 ()	1.9 ()	1.3 ()	0.04 ()	0.48 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	44700 J ()	34200 J ()	19100 J ()	40000 ()	39300 ()	40100 J ()	5030 L ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	35.2 ()	ND (26.50) ()	ND (19.20) ()	ND (23.30) ()	ND (26.60) ()	ND (29.90) ()	ND (20.70) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-9	B91-10	B91-11	B91-12	B91-13	B91-14	B91-15	B91-16
Sample Date				28-Aug-92	28-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	28-Aug-92	28-Aug-92
Sample ID				B091B3	B091B1	B091C4	B091C3	B091C6	B091C5	B091C2	B091B9
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P210086	P210084	P210153	P210152	P210158	P210157	P210094	P210092
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	ND (0.075) ()	-	-	-	-	ND (0.071) ()
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	ND (0.15) ()	-	-	-	-	ND (0.14) ()
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	ND (0.15) ()	-	-	-	-	ND (0.14) ()
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	ND (0.015) ()	-	-	-	-	ND (0.014) ()
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	ND (0.015) ()	-	-	-	-	ND (0.014) ()
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	ND (0.22) R ()	-	-	-	-	ND (0.12) R ()
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	-	ND (0.015) ()	-	-	-	-	ND (0.014) ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	0.033 ()	-	-	-	-	ND (0.014) ()
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	0.01 B ()	-	-	-	-	ND (0.007) ()
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	ND (0.015) ()	-	-	-	-	ND (0.014) ()
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	ND (0.007) ()	-	-	-	-	ND (0.007) ()
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	0.006 J ()	-	-	-	-	ND (0.007) ()
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.075) R ()	-	-	-	-	ND (0.071) R ()
Ethylene oxide	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-9	B91-10	B91-11	B91-12	B91-13	B91-14	B91-15	B91-16
Sample Date				28-Aug-92	28-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	28-Aug-92	28-Aug-92
Sample ID				B091B3	B091B1	B091C4	B091C3	B091C6	B091C5	B091C2	B091B9
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P210086	P210084	P210153	P210152	P210158	P210157	P210094	P210092
Ethyleneimine	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) ()
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	1.9 L ()	-	-	-	-	2.2 L ()
Methanethiol	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) ()
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.015) ()	-	-	-	-	ND (0.014) ()
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.490) ()	-	-	-	-	ND (0.470) R ()
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (2.4) ()	-	-	-	-	ND (2.3) R ()
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	-	0.35 J ()	-	-	-	-	0.17 L ()
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	-	-	0.38 J ()	-	-	-	-	0.18 L ()
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	0.63 B ()	-	-	-	-	0.34 B ()
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	-	0.370 ()	-	-	-	-	0.190 L ()
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	ND (0.490) ()	-	-	-	-	ND (0.470) R ()
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	ND (0.450) ()	-	-	-	-	ND (0.430) R ()
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (2.400) ()	-	-	-	-	ND (2.300) R ()
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	ND (2.4) ()	-	-	-	-	ND (2.3) R ()
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-9	B91-10	B91-11	B91-12	B91-13	B91-14	B91-15	B91-16
Sample Date				28-Aug-92	28-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	28-Aug-92	28-Aug-92
Sample ID				B091B3	B091B1	B091C4	B091C3	B091C6	B091C5	B091C2	B091B9
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P210086	P210084	P210153	P210152	P210158	P210157	P210094	P210092
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	0.44 J ()	-	-	-	-	0.21 L ()
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	-	-	ND (1.000) ()	-	-	-	-	ND (0.960) R ()
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	0.21 J ()	-	-	-	-	ND (0.47) R ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	ND (1.000) ()	-	-	-	-	ND (0.960) R ()
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>A2B</sup>	-	-	ND (0.490) ()	-	-	-	-	ND (0.470) R ()
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	ND (1.5) ()	-	-	-	-	ND (1.4) R ()
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.78 ()	2.1 ()	0.31 J ()	ND (0.52) ()	0.33 J ()	0.61 ()	0.77 J ()	ND (0.47) R ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (2.4) ()	-	-	-	-	ND (2.3) R ()
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	ND (2.4) ()	-	-	-	-	ND (2.3) R ()
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (2.4) ()	-	-	-	-	ND (2.3) R ()
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	-	0.32 J ()	-	-	-	-	0.19 L ()
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-	0.37 J ()	-	-	-	-	0.2 L ()
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	ND (1) ()	-	-	-	-	ND (0.96) R ()
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	ND (1) ()	-	-	-	-	ND (0.96) R ()
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	ND (0.300) ()	-	-	-	-	ND (0.290) R ()
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	ND (0.490) ()	-	-	-	-	ND (0.470) R ()
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) R ()
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
Benz(c)acridine	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) R ()
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	0.69 J ()	-	-	-	-	0.32 L ()
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	ND (0.49) ()	-	-	-	-	ND (0.47) R ()
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) ()
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) R ()
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	ND (0.990) ()	-	-	-	-	ND (0.940) R ()
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) R ()
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	ND (0) R ()
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (2.5) ()	-	-	-	-	ND (2.4) R ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-9	B91-10	B91-11	B91-12	B91-13	B91-14	B91-15	B91-16
Sample Date				28-Aug-92	28-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	31-Aug-92	28-Aug-92	28-Aug-92
Sample ID				B091B3	B091B1	B091C4	B091C3	B091C6	B091C5	B091C2	B091B9
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA	P210086	P210084	P210153	P210152	P210158	P210157	P210094	P210092
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (1.50) L ()	-	-	-	-	ND (1.40) L ()
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	3.0 H ()	10.9 H ()	5.7 H ()	6.4 H ()	5.9 H ()	23.3 H ()	12.2 H ()	8.8 H ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	208 ()	-	-	-	-	178 ()
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	1.9 ()	-	-	-	-	1.7 ()
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	1.5 ()	-	-	-	-	ND (0.72) ()
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	16.8 J ()	45.9 J ()	55.2 ()	35.2 J ()	73.6 J ()	68.4 J ()	54.6 J ()	43.0 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	26.6 ()	-	-	-	-	20.5 ()
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	110 ()	299 ()	307 ()	121 ()	304 ()	354 ()	300 ()	222 ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	1.8 J ()	-	-	-	-	2.1 J ()
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	48.4 ()	-	-	-	-	45.5 ()
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	3.8 ()	-	-	-	-	3.3 ()
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	28.8 ()	-	-	-	-	23.8 ()
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	9.3 J ()	12.8 J ()	9.9 ()	14.4 J ()	12.5 J ()	9.2 J ()	17.6 J ()	11.5 ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	ND (0.11) L ()	ND (0.14) L ()	ND (0.15) ()	ND (0.16) L ()	0.17 L ()	0.16 L ()	ND (0.18) L ()	ND (0.14) ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	2740 L ()	806 L ()	363 J ()	ND (31.40) L ()	ND (29.20) L ()	ND (27.00) L ()	15100 L ()	ND (36.40) J ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	ND (0.54) L ()	ND (0.70) L ()	ND (0.73) ()	ND (0.79) L ()	ND (0.74) L ()	ND (0.70) L ()	ND (0.88) L ()	ND (0.67) ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	97.2 ()	109 ()	ND (6.00) L ()	ND (6.20) L ()	6.0 L ()	28.0 L ()	ND (7.10) L ()	ND (5.70) L ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	0.49 ()	1.8 ()	1.4 ()	ND (0.39) ()	1.8 ()	1.5 ()	5.2 ()	1.3 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	15300 ()	44800 ()	47000 L ()	18400 ()	52000 ()	48500 ()	65400 ()	28600 L ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	ND (20.70) ()	ND (25.20) ()	ND (25.80) ()	ND (29.40) ()	ND (43.4) ()	ND (26.80) ()	ND (33.50) ()	40.1 ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-16RE	B91-17	B91-18	B91-20	B91-21	B91-22	BNA-1	BNA-2
Sample Date				26-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	18-Aug-92	18-Aug-92
Sample ID				B091B9RE	B091C1	B091B6	B091B4	B091B8	B091B7	B087A6	B087A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	4 - 6 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P210092RE	P210093	P210089	P210087	P210091	P210090	P208882	P208881
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	ND (8.7) R ()	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	ND (17) ()	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	ND (17) ()	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	-	ND (0.87) ()	-	-	-	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	ND (1.7) ()	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	ND (1.7) ()	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	ND (0.87) ()	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	ND (26) R ()	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	-	7.3 ()	-	-	-	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (1.7) ()	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	0.85 J ()	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	ND (1.7) ()	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	-	0.71 J ()	-	-	-	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	ND (0.87) ()	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	18 ()	-	-	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	ND (8.7) R ()	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-16RE	B91-17	B91-18	B91-20	B91-21	B91-22	BNA-1	BNA-2
Sample Date				26-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	18-Aug-92	18-Aug-92
Sample ID				B091B9RE	B091C1	B091B6	B091B4	B091B8	B091B7	B087A6	B087A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	4 - 6 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P210092RE	P210093	P210089	P210087	P210091	P210090	P208882	P208881
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
Ethyleneimine	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	ND (1.10) L ()	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	ND (0) ()	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	7.300 ()	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.18 L ()	-	0.65 ()	-	-	-	-	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	ND (0.470) R ()	-	ND (0.460) ()	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	ND (2.3) R ()	-	ND (2.2) ()	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.65 L ()	-	1.6 ()	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.45 L ()	-	1.7 ()	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	0.32 L ()	-	1.1 B ()	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.620 L ()	-	1.700 ()	-	-	-	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	ND (0.470) R ()	-	ND (0.460) ()	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	ND (0.430) R ()	-	ND (0.420) ()	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (2.300) R ()	-	ND (2.200) ()	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	ND (2.3) R ()	-	ND (2.2) ()	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-16RE	B91-17	B91-18	B91-20	B91-21	B91-22	BNA-1	BNA-2
Sample Date				26-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	18-Aug-92	18-Aug-92
Sample ID				B091B9RE	B091C1	B091B6	B091B4	B091B8	B091B7	B087A6	B087A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	4 - 6 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P210092RE	P210093	P210089	P210087	P210091	P210090	P208882	P208881
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	0.79 L ()	-	3.7 ()	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	ND (0.960) R ()	-	ND (0.930) ()	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	ND (0.47) R ()	-	0.74 ()	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	0.370 L ()	-	2.000 ()	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	ND (0.470) R ()	-	ND (0.460) ()	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	ND (1.4) R ()	-	0.2 J ()	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.56 L ()	1.1 ()	3.7 ()	2.4 ()	0.37 J ()	1.8 ()	ND (0.46) J ()	0.19 J ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	ND (2.3) R ()	-	ND (2.2) ()	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	ND (2.3) R ()	-	ND (2.2) ()	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (2.3) R ()	-	ND (2.2) ()	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.98 L ()	-	2.3 ()	-	-	-	-	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.71 L ()	-	2.7 ()	-	-	-	-	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	ND (0.96) R ()	-	ND (0.93) ()	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	ND (0.96) R ()	-	ND (0.93) ()	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	ND (0.290) R ()	-	ND (0.280) ()	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	ND (0.470) R ()	-	ND (0.460) ()	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	ND (0) R ()	-	ND (0) ()	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	ND (0) R ()	-	ND (0) ()	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	0.42 L ()	-	3.4 J ()	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	ND (0.47) R ()	-	ND (0.46) ()	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	ND (0) ()	-	ND (0) ()	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	ND (0) R ()	-	ND (0) ()	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	ND (0.940) R ()	-	ND (0.920) ()	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	ND (0) R ()	-	ND (0) ()	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	ND (0) R ()	-	ND (0) ()	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	ND (2.4) R ()	-	ND (2.4) ()	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				B91-16RE	B91-17	B91-18	B91-20	B91-21	B91-22	BNA-1	BNA-2
Sample Date				26-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	28-Aug-92	18-Aug-92	18-Aug-92
Sample ID				B091B9RE	B091C1	B091B6	B091B4	B091B8	B091B7	B087A6	B087A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	4 - 6 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P210092RE	P210093	P210089	P210087	P210091	P210090	P208882	P208881
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	ND (1.40) L ()	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	5.1 H ()	8.0 H ()	6.8 H ()	3.1 H ()	8.5 H ()	2.7 ()	12.7 ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	141 ()	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	1.2 ()	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	ND (0.69) ()	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1A</sup>	190 <sup>s1B</sup>	-	31.5 J ()	46.6 ()	25.4 J ()	71.7 J ()	56.9 J ()	869 H <sup>B</sup> ()	227 H <sup>B</sup> ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	18.3 ()	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	197 ()	182 ()	189 ()	191 ()	270 ()	115 ()	973 <sup>B</sup> ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	0.95 J ()	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	33.7 ()	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	2.8 ()	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	22.3 ()	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	-	17.1 J ()	20.4 ()	15.2 J ()	14.1 J ()	17.3 J ()	10.8 J ()	23.0 J ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	ND (0.14) L ()	ND (0.14) ()	ND (0.14) L ()	ND (0.12) L ()	ND (0.16) L ()	ND (0.11) L ()	ND (0.09) L ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	ND (54.10) L ()	2290 J ()	3660 L ()	ND (25.60) L ()	6970 L ()	681 ()	26900 ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	ND (0.67) L ()	ND (0.72) ()	ND (0.61) L ()	ND (0.61) L ()	ND (0.81) L ()	6.8 ()	0.75 ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	ND (5.50) L ()	16.8 L ()	87.2 ()	ND (5.00) L ()	73.1 L ()	58.1 ()	25.0 ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	0.54 ()	1.3 ()	1.0 ()	0.34 ()	6.8 ()	0.42 ()	0.46 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	25300 ()	37400 L ()	38100 ()	11200 ()	45900 ()	15500 J ()	55700 J ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	ND (26.30) ()	ND (26.40) ()	ND (27.60) ()	ND (23.80) ()	ND (28.50) ()	ND (24.20) ()	89.0 ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-3	BNA-4	BNA-5	BNA-6		BNA-7	BNA-8	BNA-9
Sample Date				21-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92
Sample ID				B087B1	B087A4	B087A3	B087A1	B087A2	B088A3	B088A4	B088A2
Sample Depth				4 - 6 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209532	P208880	P208879	P208877	P208878	P208789	P208790	P208788
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	ND (0.058) ()	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	ND (0.12) ()	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	ND (0.12) ()	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	0.004 J ()	-	-	-	-	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	0.004 J ()	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	ND (0.12) ()	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	ND (0.012) ()	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	ND (0.006) ()	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	ND (0.17) R ()	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	ND (0.012) ()	-	-	-	-	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	0.055 ()	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	0.013 B ()	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	ND (0.012) ()	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	0.004 J ()	-	-	-	-	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	ND (0.006) ()	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	0.012 ()	-	-	-	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.058) R ()	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	ND (0) ()	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-3	BNA-4	BNA-5	BNA-6		BNA-7	BNA-8	BNA-9
Sample Date				21-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92
Sample ID				B087B1	B087A4	B087A3	B087A1	B087A2	B088A3	B088A4	B088A2
Sample Depth				4 - 6 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209532	P208880	P208879	P208877	P208878	P208789	P208790	P208788
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
Ethyleneimine	mg/kg	n/v	n/v	-	ND (0) ()	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	ND (1.00) L ()	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	ND (0) ()	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.012) ()	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	0.27 J ()	-	-	-	-	-	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.380) J ()	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	ND (1.9) J ()	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	1.4 J ()	-	-	-	-	-	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	-	1.5 J ()	-	-	-	-	-	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	ND (0.38) J ()	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	0.69 B ()	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	1.400 J ()	-	-	-	-	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	ND (0.380) J ()	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	ND (0.38) J ()	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	ND (0.38) J ()	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	ND (0.350) J ()	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	ND (0.38) J ()	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	ND (1.900) J ()	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	ND (1.9) J ()	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-3	BNA-4	BNA-5	BNA-6		BNA-7	BNA-8	BNA-9
Sample Date				21-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92
Sample ID				B087B1	B087A4	B087A3	B087A1	B087A2	B088A3	B088A4	B088A2
Sample Depth				4 - 6 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company											
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P209532	P208880	P208879	P208877	P208878	P208789	P208790	P208788
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	1.4 J ()	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	-	ND (0.780) J ()	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	0.72 J ()	-	-	-	-	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	ND (0.780) J ()	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	ND (0.380) J ()	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	ND (0.38) J ()	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	ND (1.2) J ()	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.42) ()	0.25 J ()	2.9 J ()	0.48 ()	0.18 J ()	0.69 ()	0.78 ()	ND (2.4) J ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	ND (1.9) J ()	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	ND (1.9) J ()	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	ND (1.9) J ()	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	0.75 J ()	-	-	-	-	-	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	ND (0.230) J ()	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	ND (0.380) J ()	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	ND (0) J ()	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	ND (0) J ()	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	0.89 J ()	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	ND (0.38) J ()	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	ND (0) J ()	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	ND (0) J ()	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	ND (0.770) J ()	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	ND (0) J ()	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	ND (0) J ()	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	ND (2) J ()	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-3	BNA-4	BNA-5	BNA-6		BNA-7	BNA-8	BNA-9
Sample Date				21-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	18-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92
Sample ID				B087B1	B087A4	B087A3	B087A1	B087A2	B088A3	B088A4	B088A2
Sample Depth				4 - 6 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft	2 - 4 ft	2 - 4 ft	2 - 4 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order		A	B	P209532	P208880	P208879	P208877	P208878	P208789	P208790	P208788
Laboratory Sample ID	Units	MSC-PA	SHS-PA								
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	ND (1.20) L ()	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	12.0 ()	11.2 H ()	7.9 ()	17.3 ()	27.8 ()	18.1 ()	25.4 ()	11.9 ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	162 ()	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	0.58 ()	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	0.58 ()	-	-	-	-	-	-
CHROMIUM	mg/kg	200000 <sup>A1</sup>	190 <sup>B</sup>	62.5 H ()	32.2 ()	52.5 H ()	62.4 H ()	30.3 H ()	68.9 H ()	75.8 H ()	157 H ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	11.4 ()	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	528 <sup>B</sup> ()	291 ()	450 ()	204 ()	62.0 ()	513 <sup>B</sup> ()	540 <sup>B</sup> ()	887 <sup>B</sup> ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	3.1 J ()	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	21.1 ()	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	0.70 ()	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	43.6 ()	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	7.5 J ()	9.2 ()	14.3 J ()	11.8 J ()	10.2 J ()	9.9 J ()	10.7 J ()	14.5 J ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	ND (0.10) L ()	ND (0.12) ()	ND (0.09) L ()	ND (0.10) L ()	ND (0.12) L ()	ND (0.10) L ()	ND (0.10) L ()	0.23 L ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	14500 ()	372 J ()	8020 ()	4530 ()	7460 ()	1240 ()	1540 ()	96800 ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	ND (0.64) ()	ND (0.58) ()	ND (0.62) ()	ND (0.66) ()	ND (0.85) ()	ND (0.69) ()	ND (0.63) ()	1.1 ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	ND (5.20) ()	ND (4.60) J ()	ND (5.00) ()	121 ()	40.7 ()	ND (5.50) ()	22.1 ()	25.4 ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	0.36 ()	0.41 ()	0.62 ()	2.5 ()	2.1 ()	4.8 ()	1.9 ()	0.74 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	17200 J ()	14100 L ()	37800 J ()	35100 J ()	40700 J ()	41100 J ()	44700 J ()	93200 J ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	ND (25.70) ()	ND (20.70) ()	ND (22.70) ()	ND (24.20) ()	33.5 ()	32.0 ()	ND (26.30) ()	144 ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-10	BNA-10DL	BNA-10RE	BNA-11	BNA-12	BNA-13	
Sample Date				17-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	14-Aug-92
Sample ID				B088A1	B088A1DL	B088A1RE	B088A6	B089A3	B089A4	B089A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft
Sampling Company										
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P208787	P208787DL	P208787RE	P208792	P208745	P208746	P208747
<b>Volatile Organic Compounds</b>										
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	ND (0.062) J ()	-	ND (0.062) ()	ND (9.5) ()	ND (0.071) ()	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	ND (0.12) J ()	-	ND (0.12) ()	ND (19) ()	ND (0.14) ()	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	ND (0.12) J ()	-	ND (0.12) ()	ND (19) ()	ND (0.14) ()	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	0.005 J ()	-	0.006 J ()	ND (0.95) ()	ND (0.007) ()	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	0.005 J ()	-	0.01 J ()	ND (0.95) ()	ND (0.007) ()	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	ND (0.012) J ()	-	ND (0.012) ()	ND (1.9) ()	ND (0.014) ()	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.012) J ()	-	ND (0.012) ()	ND (1.9) ()	ND (0.014) ()	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	ND (0.19) R ()	-	ND (0.19) J ()	ND (28) R ()	ND (0.21) R ()	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-	-	-	-	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.012) J ()	-	0.005 J ()	3 ()	0.014 J ()	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	0.048 J ()	-	0.041 ()	ND (1.9) ()	0.17 ()	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	0.012 B ()	-	0.015 B ()	0.9 J ()	0.011 B ()	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	ND (0.012) J ()	-	ND (0.012) ()	ND (1.9) ()	ND (0.014) ()	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	ND (0.006) ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.006) ()	-	0.009 ()	ND (0.95) ()	ND (0.007) ()	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	ND (0.006) J ()	-	ND (0.006) ()	ND (0.95) ()	ND (0.007) ()	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.018 J ()	-	0.045 ()	ND (0.95) ()	ND (0.007) ()	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	ND (0.062) R ()	-	ND (0.062) J ()	ND (9.5) R ()	ND (0.071) R ()	-	-
Ethylene oxide	mg/kg	n/v	n/v	ND (0) J ()	-	ND (0) ()	ND (0) ()	ND (0) ()	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-10	BNA-10DL	BNA-10RE	BNA-11	BNA-12	BNA-13	
Sample Date				17-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	14-Aug-92
Sample ID				B088A1	B088A1DL	B088A1RE	B088A6	B089A3	B089A4	B089A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order				P208787	P208787DL	P208787RE	P208792	P208745	P208746	P208747
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA							
Ethyleneimine	mg/kg	n/v	n/v	ND (0) J ()	-	ND (0) ()	ND (0) ()	ND (0) ()	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	ND (1.20) L ()	-	NT	1.5 L ()	ND (1.40) L ()	-	-
Methanethiol	mg/kg	n/v	n/v	ND (0) J ()	-	ND (0) ()	ND (0) ()	ND (0) ()	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.012) J ()	-	ND (0.012) ()	1.000 J ()	ND (0.014) J ()	-	-
<b>Volatile Organic Compounds (SW8011)</b>										
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>										
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	3.6 ()	3.6 J ()	-	1 ()	0.38 J ()	-	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	ND (0.410) ()	ND (1.400) J ()	-	ND (1.000) ()	ND (0.470) ()	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	ND (2) ()	ND (6.7) J ()	-	ND (4.8) ()	ND (2.3) ()	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	4.9 ()	5.1 J ()	-	ND (1) ()	0.53 ()	-	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	3.8 ()	4.8 J ()	-	ND (1) ()	0.59 ()	-	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-	-	-	-	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-	-	-	-	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	1.1 B ()	1.1 B ()	-	ND (1) ()	1.1 B ()	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	4.800 ()	5.300 J ()	-	0.720 ()	0.630 ()	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	ND (0.410) ()	ND (1.400) J ()	-	ND (1.000) ()	ND (0.470) ()	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	0.13 J ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	ND (0.380) ()	ND (1.200) J ()	-	ND (0.910) ()	ND (0.430) ()	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (2.000) ()	ND (6.700) J ()	-	ND (4.800) ()	ND (2.300) ()	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	ND (2) ()	ND (6.7) J ()	-	ND (4.8) ()	ND (2.3) ()	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-10	BNA-10DL	BNA-10RE	BNA-11	BNA-12	BNA-13	
Sample Date				17-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	14-Aug-92
Sample ID				B088A1	B088A1DL	B088A1RE	B088A6	B089A3	B089A4	B089A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft
Sampling Company										
Laboratory				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory Work Order		A	B	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Sample ID	Units	MSC-PA	SHS-PA	P208787	P208787DL	P208787RE	P208792	P208745	P208746	P208747
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	12 J ()	11 J ()	-	0.64 J ()	0.82 ()	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-	-	-	-	-	-
INDENE	mg/kg	n/v	n/v	ND (0.840) ()	ND (2.800) J ()	-	ND (2.000) ()	ND (0.960) ()	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	1.6 ()	2.1 J ()	-	ND (1) ()	0.39 J ()	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	0.750 J ()	0.660 J ()	-	1.500 J ()	0.240 J ()	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	ND (0.410) ()	ND (1.400) J ()	-	ND (1.000) ()	ND (0.470) ()	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	ND (1.2) ()	ND (4.2) J ()	-	ND (3) ()	ND (1.4) ()	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.68 ()	0.69 J ()	-	ND (1) ()	0.63 ()	0.52 ()	1.7 ()
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	ND (2) ()	ND (6.7) J ()	-	ND (4.8) ()	ND (2.3) ()	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	ND (2) ()	ND (6.7) J ()	-	ND (4.8) ()	ND (2.3) ()	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	ND (2) ()	ND (6.7) J ()	-	ND (4.8) ()	ND (2.3) ()	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	9.2 J ()	9.4 J ()	-	1.5 ()	0.84 ()	-	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	ND (0.250) ()	ND (0.830) J ()	-	ND (0.610) ()	ND (0.290) ()	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	ND (0.410) ()	ND (1.400) J ()	-	ND (1.000) ()	ND (0.470) ()	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
Benz(c)acridine	mg/kg	n/v	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	7 J ()	3.3 J ()	-	ND (3.6) ()	1 J ()	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	ND (0.41) ()	ND (1.4) J ()	-	ND (1) ()	ND (0.47) ()	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	ND (0.820) ()	ND (2.700) J ()	-	ND (2.000) ()	ND (0.940) ()	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	ND (0) ()	ND (0) J ()	-	ND (0) ()	ND (0) ()	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	ND (2.1) ()	ND (7.1) J ()	-	ND (5.2) ()	ND (2.4) ()	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				BNA-10	BNA-10DL	BNA-10RE	BNA-11	BNA-12	BNA-13	
Sample Date				17-Aug-92	17-Aug-92	17-Aug-92	17-Aug-92	14-Aug-92	14-Aug-92	14-Aug-92
Sample ID				B088A1	B088A1DL	B088A1RE	B088A6	B089A3	B089A4	B089A5
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 6 ft	2 - 4 ft	2 - 4 ft	6 - 8 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical	CCR Historical
Laboratory Work Order				P208787	P208787DL	P208787RE	P208792	P208745	P208746	P208747
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA							
<b>Metals</b>										
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	104 L ()	-	-	ND (1.50) L ()	ND (1.40) L ()	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	22.0 H ()	-	-	23.7 H ()	22.7 H ()	15.2 ()	17.9 ()
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	830 ()	-	-	445 ()	370 ()	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	ND (0.69) ()	-	-	2.4 ()	1.9 ()	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	2.2 ()	-	-	ND (0.76) ()	1.6 ()	-	-
CHROMIUM	mg/kg	20000 <sup>A1</sup>	190 <sup>B1</sup>	77.8 ()	-	-	91.7 ()	97.9 ()	180 H ()	108 H ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	11.6 ()	-	-	24.7 ()	17.3 ()	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	5200 <sup>B</sup> ()	-	-	576 <sup>B</sup> ()	421 ()	388 ()	1140 <sup>B</sup> ()
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	3.7 J ()	-	-	25.2 J <sup>B</sup> ()	2.0 J ()	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	66.6 ()	-	-	58.1 ()	40.8 ()	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	1.1 ()	-	-	1.7 ()	2.6 ()	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	43.1 ()	-	-	41.0 ()	39.8 ()	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-
<b>General Chemistry</b>										
Cation Exchange Capacity	meq/100g	n/v	n/v	14.2 ()	-	-	12.9 ()	11.6 ()	10.4 J ()	12.5 J ()
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	ND (0.12) ()	-	-	ND (0.15) ()	ND (0.14) ()	ND (0.09) L ()	ND (0.10) L ()
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	3690 J ()	-	-	58800 J ()	3890 J ()	2340 ()	16800 ()
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	ND (0.60) ()	-	-	1.2 ()	ND (0.68) ()	ND (0.61) ()	0.93 ()
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	ND (51.2) ()	-	-	50.1 J ()	35.5 J ()	20.0 ()	57.1 ()
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	2.4 ()	-	-	1.9 ()	2.4 ()	1.0 ()	2.5 ()
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	32900 L ()	-	-	69100 L ()	61300 L ()	18300 J ()	62600 J ()
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	ND (23.90) ()	-	-	ND (28.70) ()	64.3 ()	76.7 ()	167 ()



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				C-170	C-171	C-172	GP-270-S-1	GP-270-S-2	GP-270-S-3
Sample Date				7-Jul-16	5-Jul-16	6-Jul-16	21-Sep-09	21-Sep-09	21-Sep-09
Sample ID				AOI7-C-170-2-4-070716	AOI7-C-171-2-4-070516	AOI7-C-172-2-4-070616	S-1 (4.0-4.5)	S-2 (4.0-4.5)	S-3 (3.0-3.5)
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 4.5 ft	4 - 4.5 ft	3 - 3.5 ft
Sampling Company				GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1680744	1680744	1163143	1163143	1163143
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466414	8466397	8466403	5784781	5784782	5784783
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.008) (0.0005)	ND (0.007) (0.0005)	ND (0.003) (0.0005)	ND (0.029) (0.0005)	ND (0.025) (0.0005)	ND (0.041) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.008) (0.001)	ND (0.007) (0.001)	ND (0.003) (0.001)	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.008) (0.001)	ND (0.007) (0.001)	ND (0.003) (0.001)	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.008) (0.001)	ND (0.007) (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	ND (0.082) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.008) (0.001)	ND (0.007) (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	ND (0.082) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.008) (0.0005)	ND (0.007) (0.0005)	ND (0.003) (0.0005)	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	0.180 J (0.001)	ND (0.051) (0.001)	0.410 J (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.003 J (0.001)	0.003 J (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	0.410 J (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	0.003 J (0.001)	0.003 J (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	ND (0.082) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.008) (0.001)	ND (0.007) (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	ND (0.082) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.002 J (0.001)	0.005 J (0.001)	ND (0.003) (0.001)	ND (0.059) (0.001)	ND (0.051) (0.001)	ND (0.082) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

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**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				C-170	C-171	C-172	GP-270-S-1	GP-270-S-2	GP-270-S-3
Sample Date				7-Jul-16	5-Jul-16	6-Jul-16	21-Sep-09	21-Sep-09	21-Sep-09
Sample ID				AOI7-C-170-2-4-070716	AOI7-C-171-2-4-070516	AOI7-C-172-2-4-070616	S-1 (4.0-4.5)	S-2 (4.0-4.5)	S-3 (3.0-3.5)
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 4.5 ft	4 - 4.5 ft	3 - 3.5 ft
Sampling Company				GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1680744	1680744	1163143	1163143	1163143
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466414	8466397	8466403	5784781	5784782	5784783
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.940 J (0.003)	2.500 (0.003)	2.500 (0.003)	0.430 (0.033)	0.110 J (0.033)	4.7 (0.033)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.400 (0.003)	4.400 (0.003)	3.700 (0.003)	1.4 (0.033)	0.320 (0.033)	6.4 (0.033)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.900 (0.003)	4.300 (0.003)	4.000 (0.003)	1.7 (0.033)	0.360 (0.033)	5.1 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.400 (0.003)	4.800 (0.003)	4.500 (0.003)	2.2 (0.033)	0.410 (0.033)	7.0 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	2.000 (0.003)	4.600 (0.003)	2.700 (0.003)	1.4 (0.033)	0.290 (0.033)	3.4 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.600 (0.003)	3.800 (0.003)	3.600 (0.003)	1.4 (0.033)	0.340 (0.033)	7.1 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
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**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				C-170	C-171	C-172	GP-270-S-1	GP-270-S-2	GP-270-S-3
Sample Date				7-Jul-16	5-Jul-16	6-Jul-16	21-Sep-09	21-Sep-09	21-Sep-09
Sample ID				AOI7-C-170-2-4-070716	AOI7-C-171-2-4-070516	AOI7-C-172-2-4-070616	S-1 (4.0-4.5)	S-2 (4.0-4.5)	S-3 (3.0-3.5)
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 4.5 ft	4 - 4.5 ft	3 - 3.5 ft
Sampling Company				GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1680744	1680744	1163143	1163143	1163143
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466414	8466397	8466403	5784781	5784782	5784783
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.490 J (0.003)	1.100 J (0.003)	2.000 (0.003)	0.210 J (0.033)	0.062 J (0.033)	4.1 (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-	-	1.2 (0.033)	0.250 (0.033)	2.8 (0.033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sub>32</sub> <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	9.700 (0.003)	15.000 (0.003)	7.300 (0.003)	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	2.800 (0.003)	4.800 (0.003)	7.500 (0.003)	1.1 (0.033)	0.270 (0.033)	11 (0.033)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	1.900 (0.003)	5.200 (0.003)	6.100 (0.003)	1.9 (0.033)	0.440 (0.033)	15 (0.033)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5- TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				C-170	C-171	C-172	GP-270-S-1	GP-270-S-2	GP-270-S-3
Sample Date				7-Jul-16	5-Jul-16	6-Jul-16	21-Sep-09	21-Sep-09	21-Sep-09
Sample ID				AOI7-C-170-2-4-070716	AOI7-C-171-2-4-070516	AOI7-C-172-2-4-070616	S-1 (4.0-4.5)	S-2 (4.0-4.5)	S-3 (3.0-3.5)
Sample Depth				2 - 4 ft	2 - 4 ft	2 - 4 ft	4 - 4.5 ft	4 - 4.5 ft	3 - 3.5 ft
Sampling Company				GHD	GHD	GHD	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1680744	1680744	1680744	1163143	1163143	1163143
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8466414	8466397	8466403	5784781	5784782	5784783
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	343 (0.550)	200 (0.550)	151 (0.550)	73.1 (0.591)	47.1 (0.591)	264 (0.591)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	36.0 (0.50)	34.6 (0.50)	21.0 (0.50)	30.1 (0.50)	26.4 (0.50)	34.7 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-4	GP-270-S-5	GP-270-S-7	GP-270-S-8	GP-270-S-9	GP-270-S-10
Sample Date				22-Sep-09	22-Sep-09	29-Sep-09	29-Sep-09	6-Oct-09	6-Oct-09
Sample ID				S-4 (4.0-4.5)	S-5 (4.0-4.5)	S-7 (2.5-3.0)	S-8 (2.0-2.5)	S-9 (2.5-3.0)	S-10 (2.0-2.5)
Sample Depth				4 - 4.5 ft	4 - 4.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1163143	1163143	1163948	1163948	1165331	1165331
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5784784	5784785	5790787	5790788	5799591	5799592
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.035) (0.0005)	ND (0.031) (0.0005)	ND (0.044) (0.0005)	ND (0.044) (0.0005)	ND (0.057) (0.0005)	ND (0.051) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.070) (0.001)	ND (0.061) (0.001)	ND (0.088) (0.001)	ND (0.088) (0.001)	ND (0.110) (0.001)	0.120 J (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.070) (0.001)	ND (0.061) (0.001)	0.100 J (0.001)	ND (0.088) (0.001)	ND (0.110) (0.001)	ND (0.100) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.070) (0.001)	0.130 J (0.001)	0.390 J (0.001)	0.710 (0.001)	0.660 (0.001)	0.870 (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.070) (0.001)	0.071 J (0.001)	0.280 J (0.001)	0.440 J (0.001)	0.990 (0.001)	0.700 (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.070) (0.001)	ND (0.061) (0.001)	ND (0.088) (0.001)	ND (0.088) (0.001)	0.120 J (0.001)	ND (0.100) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.070) (0.001)	ND (0.061) (0.001)	ND (0.088) (0.001)	ND (0.088) (0.001)	ND (0.110) (0.001)	ND (0.100) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.070) (0.001)	ND (0.061) (0.001)	ND (0.088) (0.001)	0.180 J (0.001)	0.170 J (0.001)	0.250 J (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-4	GP-270-S-5	GP-270-S-7	GP-270-S-8	GP-270-S-9	GP-270-S-10
Sample Date				22-Sep-09	22-Sep-09	29-Sep-09	29-Sep-09	6-Oct-09	6-Oct-09
Sample ID				S-4 (4.0-4.5)	S-5 (4.0-4.5)	S-7 (2.5-3.0)	S-8 (2.0-2.5)	S-9 (2.5-3.0)	S-10 (2.0-2.5)
Sample Depth				4 - 4.5 ft	4 - 4.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1163143	1163143	1163948	1163948	1165331	1165331
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5784784	5784785	5790787	5790788	5799591	5799592
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.230 J (0.033)	0.095 J (0.033)	4.1 (0.033)	2.1 J (0.033)	2.5 J (0.033)	2.0 J (0.033)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.520 (0.033)	0.230 (0.033)	4.9 (0.033)	2.2 J (0.033)	3.5 (0.033)	2.1 J (0.033)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.590 (0.033)	0.260 (0.033)	3.5 (0.033)	2.2 J (0.033)	2.9 (0.033)	3.6 (0.033)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	0.690 (0.033)	0.340 (0.033)	3.9 (0.033)	2.5 J (0.033)	3.1 (0.033)	3.5 (0.033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.470 (0.033)	0.230 (0.033)	1.6 J (0.033)	1.5 J (0.033)	1.7 J (0.033)	4.5 (0.033)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.610 (0.033)	0.260 (0.033)	5.6 (0.033)	2.6 J (0.033)	3.7 (0.033)	2.6 (0.033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-4	GP-270-S-5	GP-270-S-7	GP-270-S-8	GP-270-S-9	GP-270-S-10
Sample Date				22-Sep-09	22-Sep-09	29-Sep-09	29-Sep-09	6-Oct-09	6-Oct-09
Sample ID				S-4 (4.0-4.5)	S-5 (4.0-4.5)	S-7 (2.5-3.0)	S-8 (2.0-2.5)	S-9 (2.5-3.0)	S-10 (2.0-2.5)
Sample Depth				4 - 4.5 ft	4 - 4.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1163143	1163143	1163948	1163948	1165331	1165331
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5784784	5784785	5790787	5790788	5799591	5799592
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.160 J (0.033)	0.047 J (0.033)	4.3 (0.033)	1.7 J (0.033)	2.2 J (0.033)	0.960 J (0.033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	0.410 (0.033)	0.210 J (0.033)	1.4 J (0.033)	1.1 J (0.033)	1.3 J (0.033)	3.5 (0.033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	1.1 (0.033)	0.210 J (0.033)	18 (0.033)	5.5 (0.033)	8.9 (0.033)	3.1 (0.033)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.930 (0.033)	0.330 (0.033)	13 (0.033)	5.2 (0.033)	8.5 (0.033)	2.7 (0.033)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-4	GP-270-S-5	GP-270-S-7	GP-270-S-8	GP-270-S-9	GP-270-S-10
Sample Date				22-Sep-09	22-Sep-09	29-Sep-09	29-Sep-09	6-Oct-09	6-Oct-09
Sample ID				S-4 (4.0-4.5)	S-5 (4.0-4.5)	S-7 (2.5-3.0)	S-8 (2.0-2.5)	S-9 (2.5-3.0)	S-10 (2.0-2.5)
Sample Depth				4 - 4.5 ft	4 - 4.5 ft	2.5 - 3 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1163143	1163143	1163948	1163948	1165331	1165331
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5784784	5784785	5790787	5790788	5799591	5799592
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	20.7 (0.591)	28.9 (0.591)	387 (0.591)	443 (0.591)	328 (0.591)	447 (0.591)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	30.3 (0.50)	25.2 (0.50)	38.8 (0.50)	37.1 (0.50)	36.1 (0.50)	31.8 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-12	GP-271-GP-2	GP-271-GP-4	GP-271-GP-5		GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Date				6-Oct-09	4-Jun-02	4-Jun-02	17-Sep-02	17-Sep-02	24-May-07	24-May-07	24-May-07
Sample ID				S-12 (2.0-2.5)	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	GP-5(3.5-4)	GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Depth				2 - 2.5 ft	8.5 - 9 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	WGI	WGI	WGI	LL	PIP	PIP	PIP
Laboratory Work Order		A	B	1165331	UNKNOWN	UNKNOWN	UNKNOWN	823333	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799594	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	3901263	0705-4563	0705-4564	0705-4565
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	0.061 J (0.0005)	ND (0.41) ()	ND (0.35) ()	ND (0.39) ()	ND (0.390) (0.001)	ND (0.270) D ()	ND (0.270) D ()	ND (0.230) D ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.097) (0.001)	-	-	-	-	ND (0.270) D ()	ND (0.270) D ()	ND (0.230) D ()
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.097) (0.001)	-	-	-	-	ND (0.270) D ()	ND (0.270) D ()	ND (0.230) D ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.850 (0.001)	-	-	-	-	0.430 D ()	0.600 D ()	0.350 D ()
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE(PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.940 (0.001)	-	-	-	-	0.590 D ()	0.710 D ()	0.490 D ()
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	0.120 J (0.001)	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.097) (0.001)	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	0.190 J (0.001)	-	-	-	-	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-12	GP-271-GP-2	GP-271-GP-4	GP-271-GP-5		GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Date				6-Oct-09	4-Jun-02	4-Jun-02	17-Sep-02	17-Sep-02	24-May-07	24-May-07	24-May-07
Sample ID				S-12 (2.0-2.5)	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	GP-5(3.5-4)	GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Depth				2 - 2.5 ft	8.5 - 9 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	WGI	WGI	WGI	LL	PIP	PIP	PIP
Laboratory Work Order		A	B	1165331	UNKNOWN	UNKNOWN	UNKNOWN	823333	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799594	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	3901263	0705-4563	0705-4564	0705-4565
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.780 J (0.033)	ND (0.58) ()	0.39 J ()	-	-	ND (0.580) ()	ND (0.560) ()	ND (0.550) ()
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.0 J (0.033)	ND (0.58) ()	0.44 J ()	-	-	1.8 ()	0.380 J ()	0.810 ()
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.0 J (0.033)	ND (0.58) ()	0.41 J ()	-	-	2.0 ()	0.400 J ()	0.990 ()
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	1.4 J (0.033)	ND (0.58) ()	0.46 J ()	-	-	2.5 ()	0.560 ()	1.3 ()
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.760 J (0.033)	ND (0.58) ()	ND (0.56) ()	-	-	1.1 ()	ND (0.560) ()	0.390 J ()
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.1 J (0.033)	ND (0.58) ()	0.58 ()	-	-	2.0 ()	0.700 ()	0.890 ()
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-12	GP-271-GP-2	GP-271-GP-4	GP-271-GP-5		GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Date				6-Oct-09	4-Jun-02	4-Jun-02	17-Sep-02	17-Sep-02	24-May-07	24-May-07	24-May-07
Sample ID				S-12 (2.0-2.5)	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	GP-5(3.5-4)	GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Depth				2 - 2.5 ft	8.5 - 9 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	WGI	WGI	WGI	LL	PIP	PIP	PIP
Laboratory Work Order		A	B	1165331	UNKNOWN	UNKNOWN	UNKNOWN	823333	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799594	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	3901263	0705-4563	0705-4564	0705-4565
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.620 J (0.033)	ND (0.58) ()	0.4 J ()	-	-	ND (0.580) ()	ND (0.560) ()	ND (0.550) ()
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	0.620 J (0.033)	-	-	-	-	1.1 ()	ND (0.560) ()	0.360 J ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	0.92 ()	0.72 ()	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	2.1 J (0.033)	0.6 ()	1.5 ()	-	-	2.2 ()	0.590 ()	0.830 ()
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	1.9 J (0.033)	0.57 J ()	1.4 ()	-	-	2.9 ()	1.0 ()	1.8 ()
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-270-S-12	GP-271-GP-2	GP-271-GP-4	GP-271-GP-5		GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Date				6-Oct-09	4-Jun-02	4-Jun-02	17-Sep-02	17-Sep-02	24-May-07	24-May-07	24-May-07
Sample ID				S-12 (2.0-2.5)	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	GP-5(3.5-4)	GP-275-PER1	GP-275-PER2	GP-275-PER3
Sample Depth				2 - 2.5 ft	8.5 - 9 ft	3.5 - 4 ft	3.5 - 4 ft	3.5 - 4 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				LL	WGI	WGI	WGI	LL	PIP	PIP	PIP
Laboratory Work Order		A	B	1165331	UNKNOWN	UNKNOWN	UNKNOWN	823333	074100	074100	074100
Laboratory Sample ID	Units	MSC-PA	SHS-PA	5799594	GP-2 (8.5-9.0)	GP-4 (3.5-4.0)	GP-5 (3.5-4)	3901263	0705-4563	0705-4564	0705-4565
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup> <sup>A</sup>	190 <sup>s1</sup> <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	235 (0.591)	-	-	-	-	-	-	-
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	30.7 (0.50)	-	-	-	37.7 (0.50)	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
 AOI 7 Remedial Investigation Report  
 Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Date				24-May-07	24-May-07	24-May-07	4-Sep-07	4-Sep-07	4-Sep-07	24-May-07	24-May-07
Sample ID				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.5 ft	5 - 5.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	074100	074100	074100	076856	076856	076856	074097	074097
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4566	0705-4567	0705-4568	0709-0958	0709-0959	0709-0960	0705-4545	0705-4546
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.230) D ()	ND (0.200) D ()	ND (0.340) D ()	ND (0.0058) ()	ND (0.0054) ()	ND (0.0051) ()	1.1 D <sup>B</sup> ()	2.8 D <sup>B</sup> ()
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.230) D ()	ND (0.200) D ()	ND (0.340) D ()	ND (0.0058) ()	ND (0.0054) ()	ND (0.0051) ()	1.2 D ()	1.9 D ()
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.230) D ()	ND (0.200) D ()	ND (0.340) D ()	ND (0.0058) ()	ND (0.0054) ()	ND (0.0051) ()	1.7 D ()	2.4 D ()
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.370 D ()	0.200 J D ()	ND (0.340) D ()	0.0022 J ()	0.0020 J ()	0.0023 J ()	1.0 D ()	0.870 D ()
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	0.500 D ()	0.380 D ()	ND (0.340) D ()	ND (0.0058) ()	ND (0.0054) ()	ND (0.0051) ()	1.4 D ()	2.6 D ()
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	-	-	-	-	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Date				24-May-07	24-May-07	24-May-07	4-Sep-07	4-Sep-07	4-Sep-07	24-May-07	24-May-07
Sample ID				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.5 ft	5 - 5.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	074100	074100	074100	076856	076856	076856	074097	074097
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4566	0705-4567	0705-4568	0709-0958	0709-0959	0709-0960	0705-4545	0705-4546
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.510) ()	ND (0.500) ()	ND (0.480) ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	ND (0.400) ()	ND (0.380) ()
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.1 ()	1.0 ()	0.460 J ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.320 J ()	ND (0.380) ()
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	1.7 ()	1.4 ()	0.590 ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.310 J ()	ND (0.380) ()
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.6 ()	1.5 ()	0.600 ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.420 ()	ND (0.380) ()
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.570 ()	0.830 ()	ND (0.480) ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	ND (0.400) ()	ND (0.380) ()
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	1.2 ()	1.2 ()	0.510 ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.410 ()	ND (0.380) ()
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Date				24-May-07	24-May-07	24-May-07	4-Sep-07	4-Sep-07	4-Sep-07	24-May-07	24-May-07
Sample ID				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.5 ft	5 - 5.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	074100	074100	074100	076856	076856	076856	074097	074097
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4566	0705-4567	0705-4568	0709-0958	0709-0959	0709-0960	0705-4545	0705-4546
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.510) ()	ND (0.500) ()	ND (0.480) ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	ND (0.400) ()	ND (0.380) ()
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	0.540 ()	0.700 ()	0.430 J ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	ND (0.400) ()	ND (0.380) ()
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.850 ()	0.640 ()	0.470 J ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.510 ()	ND (0.380) ()
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	1.4 ()	1.4 ()	0.690 ()	ND (0.380) ()	ND (0.360) ()	ND (0.340) ()	0.820 ()	ND (0.380) ()
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Date				24-May-07	24-May-07	24-May-07	4-Sep-07	4-Sep-07	4-Sep-07	24-May-07	24-May-07
Sample ID				GP-275-PER4	GP-275-PER5	GP-275-PER6	GP-275-SUB-1	GP-275-SUB-2	GP-275-SUB-3	GP-277-PER1	GP-277-PER2
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.5 ft	5 - 5.5 ft	3 - 3.5 ft	3 - 3.5 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	PIP
Laboratory Work Order		A	B	074100	074100	074100	076856	076856	076856	074097	074097
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4566	0705-4567	0705-4568	0709-0958	0709-0959	0709-0960	0705-4545	0705-4546
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	-	-	-	-	-	-	-
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	-
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01
Sample Date				24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	29-Aug-16
Sample ID				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01-20160829-3.0
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.6 ft	5 - 5.5 ft	3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	LL
Laboratory Work Order		A	B	074097	074097	074097	074097	074097	074097	074097	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4547	0705-4548	0705-4549	0705-4550	0705-4551	0705-4552	0705-4553	8557103
<b>Volatile Organic Compounds</b>											
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	3.3 D <sup>B</sup> ()	3.0 D <sup>B</sup> ()	8.6 D <sup>B</sup> ()	3.8 D <sup>B</sup> ()	0.790 D <sup>B</sup> ()	1.3 D <sup>B</sup> ()	2.1 D <sup>B</sup> ()	ND (0.0008) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-	-	-	-	-	-	0.002 J (0.001)
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	1.8 D ()	4.1 D ()	1.1 D ()	12 D ()	0.250 D ()	0.530 D ()	0.520 D ()	ND (0.002) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	2.7 D ()	4.3 D ()	2.5 D ()	7.2 D ()	0.900 D ()	0.160 J D ()	0.920 D ()	ND (0.002) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.0008) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	0.480 D ()	1.5 D ()	0.570 D ()	8.2 D ()	0.440 D ()	0.450 D ()	0.550 D ()	0.003 J (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	2.7 D ()	4.0 D ()	3.1 D ()	4.3 D ()	0.370 D ()	0.790 D ()	1.0 D ()	ND (0.002) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-	-	-	-	-	-	0.002 J (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.002) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01
Sample Date				24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	29-Aug-16
Sample ID				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01-20160829-3.0
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.6 ft	5 - 5.5 ft	3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	LL
Laboratory Work Order		A	B	074097	074097	074097	074097	074097	074097	074097	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4547	0705-4548	0705-4549	0705-4550	0705-4551	0705-4552	0705-4553	8557103
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>											
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.00029) (0.00020)
<b>Semi-Volatile Organic Compounds</b>											
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-	-	-	-	-	-	0.96 (0.0033)
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	ND (0.550) ()	2.7 ()	ND (5.3) D ()	ND (5.6) D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	2.8 (0.0033)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.330 J ()	ND (0.540) ()	ND (5.3) D ()	ND (5.6) D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	1.9 (0.0033)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.350 J ()	ND (0.540) ()	ND (5.3) D ()	3.9 J D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	2.5 (0.0033)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	0.490 J ()	0.480 J ()	ND (5.3) D ()	3.5 J D ()	ND (5.5) D ()	0.550 ()	ND (0.540) ()	2.4 (0.0033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	ND (0.550) ()	ND (0.540) ()	ND (5.3) D ()	4.4 J D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	2.6 (0.0033)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-	-	-	-	-	-	1.2 (0.0033)
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	1.5 (0.017)
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.0) (0.067)
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.0) (0.067)
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.370 J ()	0.440 J ()	5.5 D ()	ND (5.6) D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	2.1 (0.0033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-	-	-	-	-	-	0.66 (0.0033)
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.0) (0.067)
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.25) (0.017)
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-	-	-	-	-	-	ND (4.5) (0.30)
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01
Sample Date				24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	29-Aug-16
Sample ID				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01-20160829-3.0
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.6 ft	5 - 5.5 ft	3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	LL
Laboratory Work Order		A	B	074097	074097	074097	074097	074097	074097	074097	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4547	0705-4548	0705-4549	0705-4550	0705-4551	0705-4552	0705-4553	8557103
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-	-	-	-	-	-	2.5 (0.0033)
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	ND (0.550) ()	1.1 ()	3.7 J D ()	ND (5.6) D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	1.5 (0.0033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	ND (0.550) ()	ND (0.540) ()	ND (5.3) D ()	3.1 J D ()	ND (5.5) D ()	ND (0.540) ()	ND (0.540) ()	1.8 (0.0033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-	-	-	-	-	-	8.4 (0.0033)
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	0.87 (0.017)
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.25) (0.017)
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-	-	-	-	-	-	ND (2.5) (0.17)
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	ND (0.550) ()	2.7 ()	11 D ()	ND (5.6) D ()	ND (5.5) D ()	0.620 ()	ND (0.540) ()	5.8 (0.0033)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.25) (0.017)
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.460 J ()	0.400 J ()	4.9 J D ()	ND (5.6) D ()	ND (5.5) D ()	0.530 J ()	ND (0.540) ()	2.6 (0.0033)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-	-	-	-	-	-	ND (1.0) (0.067)
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-	-	-	-	-	-	ND (0.50) (0.033)
1,2,4-TRICHLOROENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01
Sample Date				24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	24-May-07	29-Aug-16
Sample ID				GP-277-PER3	GP-277-PER4	GP-277-PER5	GP-277-PER6	GP-277-SUB1	GP-277-SUB2	GP-277-SUB3	GP280-01-20160829-3.0
Sample Depth				3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	3 - 3.5 ft	5 - 5.5 ft	5 - 5.6 ft	5 - 5.5 ft	3 ft
Sampling Company				UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	STANTEC
Laboratory				PIP	PIP	PIP	PIP	PIP	PIP	PIP	LL
Laboratory Work Order		A	B	074097	074097	074097	074097	074097	074097	074097	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0705-4547	0705-4548	0705-4549	0705-4550	0705-4551	0705-4552	0705-4553	8557103
<b>Metals</b>											
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-	-	-	-	-	-	20.5 (0.120)
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	-	-	-	-	-	-	286 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-	-	-	-	-	-	42.7 (0.300)
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-	-	-	-	-	-	51.4 (0.140)
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-	-	-	-	-	-	546 (0.680)
<b>General Chemistry</b>											
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	34.6 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-02 29-Aug-16	GP280-03 29-Aug-16	GP280-04 29-Aug-16	GP280-05 29-Aug-16	GP280-06 29-Aug-16
Sample Date				GP280-02-20160829-3.0	GP280-03-20160829-2.0	GP280-04-20160829-3.0	GP280-05-20160829-3.0	GP280-06-20160829-3.0
Sample ID								
Sample Depth				3 ft	2 ft	3 ft	3 ft	3 ft
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1701349	1701349	1701349	1701349	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8557105	8557106	8557107	8557109	8557110
<b>Volatile Organic Compounds</b>								
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0007) (0.0005)	0.002 J (0.0005)	0.085 J (0.0005)	ND (0.0009) (0.0005)	ND (0.001) (0.0005)
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	0.005 J (0.001)	ND (0.002) (0.001)
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	0.10 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.0007) (0.0005)	ND (0.0006) (0.0005)	ND (0.034) (0.0005)	ND (0.0009) (0.0005)	ND (0.001) (0.0005)
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	0.004 J (0.001)	0.002 J (0.001)	0.34 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	1.4 (0.001)	0.004 J (0.001)	ND (0.002) (0.001)
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.001) (0.001)	0.001 J (0.001)	1.4 (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	0.18 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.089) (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	0.24 J (0.001)	ND (0.002) (0.001)	ND (0.002) (0.001)
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-02 29-Aug-16	GP280-03 29-Aug-16	GP280-04 29-Aug-16	GP280-05 29-Aug-16	GP280-06 29-Aug-16
Sample Date				GP280-02-20160829-3.0	GP280-03-20160829-2.0	GP280-04-20160829-3.0	GP280-05-20160829-3.0	GP280-06-20160829-3.0
Sample ID								
Sample Depth				3 ft	2 ft	3 ft	3 ft	3 ft
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL
Laboratory Work Order				1701349	1701349	1701349	1701349	1701349
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA	8557105	8557106	8557107	8557109	8557110
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>								
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.00026) (0.00020)	ND (0.00024) (0.00020)	ND (0.00027) (0.00020)	ND (0.00029) (0.00020)	ND (0.00037) (0.00020)
<b>Semi-Volatile Organic Compounds</b>								
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	1.2 (0.0033)	0.088 J (0.0033)	2.1 (0.0033)	1.5 (0.0033)	0.65 (0.0033)
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	2.7 (0.0033)	0.24 (0.0033)	4.5 (0.0033)	2.1 (0.0033)	1.6 (0.0033)
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	1.9 (0.0033)	0.43 (0.0033)	2.9 (0.0033)	1.4 (0.0033)	1.5 (0.0033)
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	2.0 (0.0033)	0.52 (0.0033)	2.3 (0.0033)	1.1 (0.0033)	1.3 (0.0033)
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	2.4 (0.0033)	0.61 (0.0033)	2.9 (0.0033)	1.6 (0.0033)	1.8 (0.0033)
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	1.9 (0.0033)	0.47 (0.0033)	1.5 (0.0033)	1.2 (0.0033)	1.2 (0.0033)
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	1.0 (0.0033)	0.31 (0.0033)	1.1 (0.0033)	0.83 (0.0033)	0.90 (0.0033)
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	2.0 (0.017)	ND (0.20) (0.017)	2.0 (0.017)	2.5 (0.017)	1.8 (0.017)
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	ND (0.86) (0.067)	ND (0.81) (0.067)	ND (0.93) (0.067)	ND (1.0) (0.067)	ND (1.2) (0.067)
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	ND (0.86) (0.067)	ND (0.81) (0.067)	ND (0.93) (0.067)	ND (1.0) (0.067)	ND (1.2) (0.067)
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	2.1 (0.0033)	0.77 (0.0033)	3.6 (0.0033)	1.7 (0.0033)	1.9 (0.0033)
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	0.49 (0.0033)	0.11 J (0.0033)	0.44 (0.0033)	0.31 (0.0033)	0.37 (0.0033)
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	ND (0.86) (0.067)	ND (0.81) (0.067)	ND (0.93) (0.067)	ND (1.0) (0.067)	ND (1.2) (0.067)
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	ND (0.22) (0.017)	ND (0.20) (0.017)	1.1 (0.017)	ND (0.26) (0.017)	ND (0.31) (0.017)
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	ND (3.9) (0.30)	ND (3.6) (0.30)	ND (4.2) (0.30)	ND (4.6) (0.30)	ND (5.6) (0.30)
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-02 29-Aug-16	GP280-03 29-Aug-16	GP280-04 29-Aug-16	GP280-05 29-Aug-16	GP280-06 29-Aug-16
Sample Date				GP280-02-20160829-3.0	GP280-03-20160829-2.0	GP280-04-20160829-3.0	GP280-05-20160829-3.0	GP280-06-20160829-3.0
Sample ID								
Sample Depth				3 ft	2 ft	3 ft	3 ft	3 ft
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				LL	LL	LL	LL	LL
Laboratory Work Order		A	B	1701349	1701349	1701349	1701349	1701349
Laboratory Sample ID	Units	MSC-PA	SHS-PA	8557105	8557106	8557107	8557109	8557110
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	3.2 (0.0033)	0.66 (0.0033)	6.6 (0.0033)	2.6 (0.0033)	2.6 (0.0033)
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	1.8 (0.0033)	0.10 J (0.0033)	3.3 (0.0033)	1.3 (0.0033)	0.93 (0.0033)
INDENE	mg/kg	n/v	n/v	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	1.4 (0.0033)	0.38 (0.0033)	1.1 (0.0033)	0.94 (0.0033)	1.0 (0.0033)
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	14 (0.0033)	0.62 (0.0033)	20 (0.0033)	20 (0.0033)	14 (0.0033)
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	1.5 (0.017)	ND (0.20) (0.017)	4.2 (0.017)	1.1 (0.017)	2.3 (0.017)
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	ND (0.22) (0.017)	ND (0.20) (0.017)	ND (0.23) (0.017)	ND (0.26) (0.017)	ND (0.31) (0.017)
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	ND (2.2) (0.17)	ND (2.0) (0.17)	ND (2.3) (0.17)	ND (2.6) (0.17)	ND (3.1) (0.17)
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	6.9 (0.0033)	0.64 (0.0033)	11 (0.0033)	6.7 (0.0033)	5.2 (0.0033)
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	ND (0.22) (0.017)	ND (0.20) (0.017)	ND (0.23) (0.017)	ND (0.26) (0.017)	ND (0.31) (0.017)
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	3.3 (0.0033)	0.74 (0.0033)	7.5 (0.0033)	2.3 (0.0033)	2.4 (0.0033)
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	ND (0.86) (0.067)	ND (0.81) (0.067)	ND (0.93) (0.067)	ND (1.0) (0.067)	ND (1.2) (0.067)
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	ND (0.43) (0.033)	ND (0.40) (0.033)	ND (0.47) (0.033)	ND (0.51) (0.033)	ND (0.62) (0.033)
1,2,4-TRICHLOROENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-02 29-Aug-16	GP280-03 29-Aug-16	GP280-04 29-Aug-16	GP280-05 29-Aug-16	GP280-06 29-Aug-16
Sample Date				GP280-02-20160829-3.0	GP280-03-20160829-2.0	GP280-04-20160829-3.0	GP280-05-20160829-3.0	GP280-06-20160829-3.0
Sample ID				3 ft	2 ft	3 ft	3 ft	3 ft
Sample Depth				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Sampling Company				LL	LL	LL	LL	LL
Laboratory				1701349	1701349	1701349	1701349	1701349
Laboratory Work Order				8557105	8557106	8557107	8557109	8557110
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA					
<b>Metals</b>								
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>A1</sup>	190 <sup>B1</sup>	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	16.7 (0.120)	13.1 (0.120)	11.7 (0.120)	17.4 (0.120)	22.4 (0.120)
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	254 (0.550)	214 (0.550)	172 (0.550)	327 (0.550)	397 (0.550)
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	35.5 (0.300)	152 (0.300)	31.3 (0.300)	43.9 (0.300)	40.6 (0.300)
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	-
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	41.0 (0.140)	226 (0.140)	37.9 (0.140)	38.0 (0.140)	94.5 (0.140)
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	595 (0.680)	1180 (0.680)	440 (0.680)	637 (0.680)	381 (0.680)
<b>General Chemistry</b>								
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	22.9 (0.50)	18.3 (0.50)	29.1 (0.50)	35.0 (0.50)	46.8 (0.50)
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	-
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-07 29-Aug-16	GP280-10 29-Aug-16	GP280-11 29-Aug-16	GP280-12 29-Aug-16	LO-1000-PER-1 29-May-07	LO-1000-PER-2 29-May-07
Sample Date				GP280-07-20160829-3.0	GP280-10-20160829-2.0	GP280-11-20160829-5.0	GP280-12-20160829-2.0	LO-1000-PER-1	LO-1000-PER-2
Sample ID				3 ft	2 ft	5 ft	2 ft	3 - 3.5 ft	3 - 3.5 ft
Sample Depth				STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN
Sampling Company				LL	LL	LL	LL	PIP	PIP
Laboratory				1701349	1701349	1701349	1701349	074145	074145
Laboratory Work Order				8557112	8557104	8557108	8557111	0706-0470	0706-0471
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA						
<b>Volatile Organic Compounds</b>									
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-	-	-	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.0006) (0.0005)	ND (0.0006) (0.0005)	ND (0.0008) (0.0005)	ND (0.0006) (0.0005)	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-	-	-	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-	-	-	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	0.003 J (0.001)	ND (0.001) (0.001)	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-	-	-	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-	-	-	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	ND (0.0006) (0.0005)	ND (0.0006) (0.0005)	ND (0.0008) (0.0005)	ND (0.0006) (0.0005)	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	0.002 J (0.001)	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-	-	-	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-	-	-	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-	-	-	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	ND (0.001) (0.001)	ND (0.001) (0.001)	ND (0.002) (0.001)	ND (0.001) (0.001)	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-07 29-Aug-16	GP280-10 29-Aug-16	GP280-11 29-Aug-16	GP280-12 29-Aug-16	LO-1000-PER-1 29-May-07	LO-1000-PER-2 29-May-07
Sample Date				GP280-07-20160829-3.0	GP280-10-20160829-2.0	GP280-11-20160829-5.0	GP280-12-20160829-2.0	LO-1000-PER-1	LO-1000-PER-2
Sample ID				3 ft	2 ft	5 ft	2 ft	3 - 3.5 ft	3 - 3.5 ft
Sample Depth				STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN
Sampling Company				LL	LL	LL	LL	PIP	PIP
Laboratory				1701349	1701349	1701349	1701349	074145	074145
Laboratory Work Order				8557112	8557104	8557108	8557111	0706-0470	0706-0471
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA						
Ethyleneimine	mg/kg	n/v	n/v	-	-	-	-	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-	-	-	-	-
Methanethiol	mg/kg	n/v	n/v	-	-	-	-	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
<b>Volatile Organic Compounds (SW8011)</b>									
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	ND (0.00022) (0.00020)	ND (0.00029) (0.00020)	ND (0.00030) (0.00020)	ND (0.0024) (0.00020)	-	-
<b>Semi-Volatile Organic Compounds</b>									
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	0.0048 J (0.0033)	0.31 (0.0033)	1.1 (0.0033)	0.31 (0.0033)	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	0.021 (0.0033)	0.94 (0.0033)	2.1 (0.0033)	0.86 (0.0033)	-	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	0.020 (0.0033)	1.2 (0.0033)	1.4 (0.0033)	0.79 (0.0033)	-	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	0.021 (0.0033)	1.3 (0.0033)	1.1 (0.0033)	0.75 (0.0033)	-	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	0.030 (0.0033)	1.6 (0.0033)	1.5 (0.0033)	0.82 (0.0033)	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	0.022 (0.0033)	1.1 (0.0033)	1.1 (0.0033)	1.0 (0.0033)	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	0.012 J (0.0033)	0.73 (0.0033)	0.74 (0.0033)	0.35 (0.0033)	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	ND (0.019) (0.017)	0.80 (0.017)	2.1 (0.017)	0.75 (0.017)	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-	-	-	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-	-	-	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	ND (0.075) (0.067)	ND (0.96) (0.067)	ND (1.0) (0.067)	ND (0.82) (0.067)	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	ND (0.075) (0.067)	ND (0.96) (0.067)	ND (1.0) (0.067)	ND (0.82) (0.067)	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	0.046 (0.0033)	1.3 (0.0033)	1.6 (0.0033)	1.3 (0.0033)	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-	-	-	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	0.0057 J (0.0033)	0.33 (0.0033)	0.32 (0.0033)	0.28 (0.0033)	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-	-	-	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	ND (0.075) (0.067)	ND (0.96) (0.067)	ND (1.0) (0.067)	ND (0.82) (0.067)	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-	-	-	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	ND (0.019) (0.017)	ND (0.24) (0.017)	ND (0.25) (0.017)	ND (0.20) (0.017)	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	ND (0.34) (0.30)	ND (4.3) (0.30)	ND (4.6) (0.30)	ND (3.7) (0.30)	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-07 29-Aug-16	GP280-10 29-Aug-16	GP280-11 29-Aug-16	GP280-12 29-Aug-16	LO-1000-PER-1 29-May-07	LO-1000-PER-2 29-May-07
Sample Date				GP280-07-20160829-3.0	GP280-10-20160829-2.0	GP280-11-20160829-5.0	GP280-12-20160829-2.0	LO-1000-PER-1	LO-1000-PER-2
Sample ID				3 ft	2 ft	5 ft	2 ft	3 - 3.5 ft	3 - 3.5 ft
Sample Depth				STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN
Sampling Company				LL	LL	LL	LL	PIP	PIP
Laboratory				1701349	1701349	1701349	1701349	074145	074145
Laboratory Work Order				8557112	8557104	8557108	8557111	0706-0470	0706-0471
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA						
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	0.036 (0.0033)	1.6 (0.0033)	2.7 (0.0033)	0.96 (0.0033)	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	0.0077 J (0.0033)	0.45 (0.0033)	1.3 (0.0033)	0.40 (0.0033)	-	-
INDENE	mg/kg	n/v	n/v	-	-	-	-	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	0.015 J (0.0033)	0.96 (0.0033)	0.82 (0.0033)	0.63 (0.0033)	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-	-	-	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	0.053 (0.0033)	5.1 (0.0033)	17 (0.0033)	5.5 (0.0033)	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A</sup>	58 <sup>B</sup>	ND (0.019) (0.017)	0.40 J (0.017)	1.2 (0.017)	0.68 (0.017)	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	ND (0.019) (0.017)	ND (0.24) (0.017)	ND (0.25) (0.017)	ND (0.20) (0.017)	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-	-	-	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-	-	-	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	ND (0.19) (0.17)	ND (2.4) (0.17)	ND (2.5) (0.17)	ND (2.0) (0.17)	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	0.050 (0.0033)	2.8 (0.0033)	6.1 (0.0033)	2.6 (0.0033)	-	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	ND (0.019) (0.017)	ND (0.24) (0.017)	ND (0.25) (0.017)	ND (0.20) (0.017)	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	0.055 (0.0033)	1.7 (0.0033)	2.5 (0.0033)	1.1 (0.0033)	-	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	ND (0.075) (0.067)	ND (0.96) (0.067)	ND (1.0) (0.067)	ND (0.82) (0.067)	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	ND (0.038) (0.033)	ND (0.48) (0.033)	ND (0.51) (0.033)	ND (0.41) (0.033)	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-	-	-	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-	-	-	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-	-	-	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-	-	-	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-	-	-	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-	-	-	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-	-	-	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-	-	-	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-	-	-	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				GP280-07 29-Aug-16	GP280-10 29-Aug-16	GP280-11 29-Aug-16	GP280-12 29-Aug-16	LO-1000-PER-1 29-May-07	LO-1000-PER-2 29-May-07
Sample Date				GP280-07-20160829-3.0	GP280-10-20160829-2.0	GP280-11-20160829-5.0	GP280-12-20160829-2.0	LO-1000-PER-1	LO-1000-PER-2
Sample ID				3 ft	2 ft	5 ft	2 ft	3 - 3.5 ft	3 - 3.5 ft
Sample Depth				STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	UNKNOWN
Sampling Company				LL	LL	LL	LL	PIP	PIP
Laboratory				1701349	1701349	1701349	1701349	074145	074145
Laboratory Work Order				8557112	8557104	8557108	8557111	0706-0470	0706-0471
Laboratory Sample ID	Units	A MSC-PA	B SHS-PA						
<b>Metals</b>									
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-	-	-	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-	-	-	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-	-	-	-	-
CHROMIUM	mg/kg	20000 <sup>s1</sup> <sup>A</sup>	190 <sup>s1</sup> <sup>B</sup>	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	7.17 (0.120)	14.6 (0.120)	34.9 (0.120)	11.4 (0.120)	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	10.9 (0.550)	201 (0.550)	344 (0.550)	209 (0.550)	-	-
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-	-	-	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	12.4 (0.300)	35.8 (0.300)	70.1 (0.300)	30.1 (0.300)	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-	-	-	-	-
SODIUM	mg/kg	n/v	n/v	-	-	-	-	330 J ( )	210 J ( )
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	37.5 (0.140)	67.1 (0.140)	44.1 (0.140)	60.7 (0.140)	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	32.9 (0.680)	319 (0.680)	621 (0.680)	285 (0.680)	-	-
<b>General Chemistry</b>									
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-	-	-	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-	-	-	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-	-	-	-	-
MOISTURE, PERCENT	%	n/v	n/v	11.7 (0.50)	31.0 (0.50)	35.4 (0.50)	18.9 (0.50)	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	-	-	-	-	7.98 ( )	7.84 ( )
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-	-	-	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-	-	-	-	-
SULFIDE	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-	-	-	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-	-	-	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-	-	-	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				LO-1000-PER-3	LO-1000-SUB-1
Sample Date				29-May-07	29-May-07
Sample ID				LO-1000-PER-3	LO-1000-SUB-1
Sample Depth				3 - 3.5 ft	5 - 5.5 ft
Sampling Company				UNKNOWN	UNKNOWN
Laboratory				PIP	PIP
Laboratory Work Order		A	B	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0472	0706-0473
<b>Volatile Organic Compounds</b>					
ACETONITRILE	mg/kg	5500 <sup>A</sup>	n/v	-	-
ACROLEIN	mg/kg	1.8 <sup>A</sup>	n/v	-	-
ACRYLONITRILE	mg/kg	38 <sup>A</sup>	n/v	-	-
BENZENE	mg/kg	330 <sup>A</sup>	0.5 <sup>B</sup>	-	-
CARBON DISULFIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-
CHLOROBENZENE	mg/kg	4600 <sup>A</sup>	n/v	-	-
CHLOROFORM	mg/kg	110 <sup>A</sup>	n/v	-	-
CHLOROMETHANE	mg/kg	1400 <sup>A</sup>	n/v	-	-
CYCLOHEXANE	mg/kg	10000 <sup>A</sup>	6900 <sup>B</sup>	-	-
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-
1,2-DICHLOROETHANE (EDC)	mg/kg	98 <sup>A</sup>	0.5 <sup>B</sup>	-	-
1,1-DICHLOROETHENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
1,2-DICHLOROPROPANE	mg/kg	260 <sup>A</sup>	n/v	-	-
1,4-DIOXANE (P-DIOXANE)	mg/kg	330 <sup>A</sup>	n/v	-	-
ETHYLBENZENE	mg/kg	1000 <sup>A</sup>	70 <sup>B</sup>	-	-
ISOPROPYLBENZENE (CUMENE)	mg/kg	10000 <sup>A</sup>	2500 <sup>B</sup>	-	-
METHYL ETHYL KETONE (2-BUTANONE)	mg/kg	10000 <sup>A</sup>	n/v	-	-
METHYLENE CHLORIDE	mg/kg	10000 <sup>A</sup>	n/v	-	-
METHYL TERTIARY BUTYL ETHER	mg/kg	9900 <sup>A</sup>	2 <sup>B</sup>	-	-
HEXANE	mg/kg	10000 <sup>A</sup>	5600 <sup>B</sup>	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-
BUTYLBENZENE, SEC-	mg/kg	10000 <sup>A</sup>	2800 <sup>B</sup>	-	-
STYRENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
BUTYLBENZENE, TERT-	mg/kg	10000 <sup>A</sup>	2200 <sup>B</sup>	-	-
1,1,1,2-TETRACHLOROETHANE	mg/kg	340 <sup>A</sup>	n/v	-	-
1,1,2,2-TETRACHLOROETHANE	mg/kg	44 <sup>A</sup>	n/v	-	-
TETRACHLOROETHYLENE (PCE)	mg/kg	3600 <sup>A</sup>	n/v	-	-
TOLUENE	mg/kg	10000 <sup>A</sup>	100 <sup>B</sup>	-	-
TRANS-1,2-DICHLOROETHENE	mg/kg	5500 <sup>A</sup>	n/v	-	-
1,1,1-TRICHLOROETHANE	mg/kg	10000 <sup>A</sup>	n/v	-	-
1,1,2-TRICHLOROETHANE	mg/kg	18 <sup>A</sup>	n/v	-	-
TRICHLOROETHYLENE (TCE)	mg/kg	180 <sup>A</sup>	n/v	-	-
1,2,4-TRIMETHYLBENZENE	mg/kg	640 <sup>A</sup>	35 <sup>B</sup>	-	-
1,3,5-TRIMETHYLBENZENE	mg/kg	10000 <sup>A</sup>	210 <sup>B</sup>	-	-
XYLENES, TOTAL (DIMETHYLBENZENE)	mg/kg	9100 <sup>A</sup>	1000 <sup>B</sup>	-	-
Crotonaldehyde (2-Butenal)	mg/kg	10000 <sup>A</sup>	n/v	-	-
Ethylene oxide	mg/kg	n/v	n/v	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				LO-1000-PER-3	LO-1000-SUB-1
Sample Date				29-May-07	29-May-07
Sample ID				LO-1000-PER-3	LO-1000-SUB-1
Sample Depth				3 - 3.5 ft	5 - 5.5 ft
Sampling Company				UNKNOWN	UNKNOWN
Laboratory				PIP	PIP
Laboratory Work Order		A	B	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0472	0706-0473
Ethyleneimine	mg/kg	n/v	n/v	-	-
Formaldehyde	mg/kg	200 <sup>A</sup>	n/v	-	-
Methanethiol	mg/kg	n/v	n/v	-	-
N-PROPYLBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
<b>Volatile Organic Compounds (SW8011)</b>					
1,2-DIBROMOETHANE (EDB)	mg/kg	4.3 <sup>A</sup>	0.005 <sup>B</sup>	-	-
<b>Semi-Volatile Organic Compounds</b>					
ACENAPHTHENE	mg/kg	190000 <sup>A</sup>	4700 <sup>B</sup>	-	-
ANTHRACENE	mg/kg	190000 <sup>A</sup>	350 <sup>B</sup>	-	-
BENZENETHIOL	mg/kg	10000 <sup>A</sup>	n/v	-	-
BENZIDINE	mg/kg	190000 <sup>A</sup>	n/v	-	-
BENZO(A)ANTHRACENE	mg/kg	190000 <sup>A</sup>	430 <sup>B</sup>	-	-
BENZO(A)PYRENE	mg/kg	190000 <sup>A</sup>	46 <sup>B</sup>	-	-
BENZO(B)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	170 <sup>B</sup>	-	-
BENZO(G,H,I)PERYLENE	mg/kg	190000 <sup>A</sup>	180 <sup>B</sup>	-	-
BENZO(K)FLUORANTHENE	mg/kg	190000 <sup>A</sup>	610 <sup>B</sup>	-	-
BENZYL BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-
1,1'-BIPHENYL	mg/kg	190000 <sup>A</sup>	190 <sup>B</sup>	-	-
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	mg/kg	7.7 <sup>A</sup>	n/v	-	-
BIS(2-CHLOROISOPROPYL) ETHER	mg/kg	n/v	n/v	-	-
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	10000 <sup>A</sup>	130 <sup>B</sup>	-	-
DI-N-BUTYL PHTHALATE	mg/kg	10000 <sup>A</sup>	4900 <sup>B</sup>	-	-
2-CHLORONAPHTHALENE	mg/kg	190000 <sup>A</sup>	n/v	-	-
2-CHLOROPHENOL	mg/kg	10000 <sup>A</sup>	n/v	-	-
CHRYSENE	mg/kg	190000 <sup>A</sup>	230 <sup>B</sup>	-	-
DIBENZ(A,H)ACRIDINE	mg/kg	n/v	n/v	-	-
DIBENZ(A,H)ANTHRACENE	mg/kg	190000 <sup>A</sup>	270 <sup>B</sup>	-	-
1,2-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
1,3-DICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
1,4-DICHLOROBENZENE	mg/kg	230 <sup>A</sup>	n/v	-	-
DIETHYL PHTHALATE	mg/kg	10000 <sup>A</sup>	9300 <sup>B</sup>	-	-
DIMETHYL PHTHALATE	mg/kg	n/v	n/v	-	-
7,12-DIMETHYLBENZ(A)ANTHRACENE	mg/kg	n/v	n/v	-	-
2,4-DIMETHYLPHENOL	mg/kg	10000 <sup>A</sup>	230 <sup>B</sup>	-	-
4,6-DINITRO-2-METHYLPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-
2,4-DINITROPHENOL	mg/kg	190000 <sup>A</sup>	23 <sup>B</sup>	-	-
2,4-DINITROTOLUENE	mg/kg	190000 <sup>A</sup>	n/v	-	-
DI-N-OCTYLPHTHALATE	mg/kg	10000 <sup>A</sup>	n/v	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				LO-1000-PER-3	LO-1000-SUB-1
Sample Date				29-May-07	29-May-07
Sample ID				LO-1000-PER-3	LO-1000-SUB-1
Sample Depth				3 - 3.5 ft	5 - 5.5 ft
Sampling Company				UNKNOWN	UNKNOWN
Laboratory				PIP	PIP
Laboratory Work Order		A	B	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0472	0706-0473
1,2-DIPHENYLHYDRAZINE	mg/kg	190000 <sup>A</sup>	n/v	-	-
FLUORANTHENE	mg/kg	190000 <sup>A</sup>	3200 <sup>B</sup>	-	-
FLUORENE	mg/kg	190000 <sup>A</sup>	3800 <sup>B</sup>	-	-
INDENE	mg/kg	n/v	n/v	-	-
INDENO(1,2,3-C,D)PYRENE	mg/kg	190000 <sup>A</sup>	22000 <sup>B</sup>	-	-
1-METHYLNAPHTHALENE	mg/kg	n/v	n/v	-	-
2-METHYLNAPHTHALENE	mg/kg	190000 <sup>A</sup>	1900 <sup>B</sup>	-	-
CRESOL, M,P- (3&4-METHYLPHENOL)	mg/kg	10000 <sup>A2</sup>	58 <sup>B</sup>	-	-
CRESOL, O- (2-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	580 <sup>B</sup>	-	-
CRESOL, P- (4-METHYLPHENOL)	mg/kg	190000 <sup>A</sup>	58 <sup>B</sup>	-	-
NAPHTHALENE	mg/kg	190000 <sup>A</sup>	25 <sup>B</sup>	-	-
4-NITROANILINE	mg/kg	190000 <sup>A</sup>	n/v	-	-
NITROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
4-NITROPHENOL	mg/kg	190000 <sup>A</sup>	6 <sup>B</sup>	-	-
PENTACHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-
PHENANTHRENE	mg/kg	190000 <sup>A</sup>	10000 <sup>B</sup>	-	-
PHENOL	mg/kg	18000 <sup>A</sup>	200 <sup>B</sup>	-	-
PYRENE	mg/kg	190000 <sup>A</sup>	2200 <sup>B</sup>	-	-
PYRIDINE	mg/kg	10000 <sup>A</sup>	12 <sup>B</sup>	-	-
QUINOLINE	mg/kg	10000 <sup>A</sup>	0.37 <sup>B</sup>	-	-
1,2,4-TRICHLOROBENZENE	mg/kg	10000 <sup>A</sup>	n/v	-	-
2,4,5-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-
2,4,6-TRICHLOROPHENOL	mg/kg	190000 <sup>A</sup>	n/v	-	-
1-3-Dichloro-2-propanol	mg/kg	n/v	n/v	-	-
3-Methylcholanthrene	mg/kg	n/v	n/v	-	-
5-Nitroacenaphthalene	mg/kg	n/v	n/v	-	-
7h-Dibenzo(c,g)carbazole	mg/kg	n/v	n/v	-	-
Aniline	mg/kg	91 <sup>A</sup>	n/v	-	-
Benz(c)acridine	mg/kg	n/v	n/v	-	-
Benzo(b,j,k)fluoranthene	mg/kg	n/v	n/v	-	-
BENZYL CHLORIDE	mg/kg	52 <sup>A</sup>	n/v	-	-
Bis(2-chloromethyl)ether	mg/kg	0.041 <sup>A</sup>	n/v	-	-
Dibenz(a,i)pyrene	mg/kg	n/v	n/v	-	-
Dibenz(a,j)acridine	mg/kg	n/v	n/v	-	-
Dibenzo(a,e)pyrene	mg/kg	n/v	n/v	-	-
Dibenzo(a,h)pyrene	mg/kg	n/v	n/v	-	-
Hydroquinone	mg/kg	190000 <sup>A</sup>	n/v	-	-



Table 4b

**Historical Soil Analytical Results Summary – AOI 7 (>2 feet)**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

Sample Location				LO-1000-PER-3	LO-1000-SUB-1
Sample Date				29-May-07	29-May-07
Sample ID				LO-1000-PER-3	LO-1000-SUB-1
Sample Depth				3 - 3.5 ft	5 - 5.5 ft
Sampling Company				UNKNOWN	UNKNOWN
Laboratory				PIP	PIP
Laboratory Work Order		A	B	074145	074145
Laboratory Sample ID	Units	MSC-PA	SHS-PA	0706-0472	0706-0473
<b>Metals</b>					
ANTIMONY	mg/kg	190000 <sup>A</sup>	n/v	-	-
ARSENIC	mg/kg	190000 <sup>A</sup>	29 <sup>B</sup>	-	-
BARIUM	mg/kg	190000 <sup>A</sup>	8200 <sup>B</sup>	-	-
BERYLLIUM	mg/kg	190000 <sup>A</sup>	n/v	-	-
CADMIUM	mg/kg	190000 <sup>A</sup>	38 <sup>B</sup>	-	-
CHROMIUM	mg/kg	20000 <sup>A1</sup>	190 <sup>B1</sup>	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-
COBALT	mg/kg	190000 <sup>A</sup>	160 <sup>B</sup>	-	-
LEAD	mg/kg	190000 <sup>A</sup>	450 <sup>B</sup>	-	-
MERCURY	mg/kg	190000 <sup>A</sup>	10 <sup>B</sup>	-	-
NICKEL	mg/kg	190000 <sup>A</sup>	650 <sup>B</sup>	-	-
SELENIUM	mg/kg	190000 <sup>A</sup>	26 <sup>B</sup>	-	-
SODIUM	mg/kg	n/v	n/v	120 J ( )	110 J ( )
VANADIUM	mg/kg	190000 <sup>A</sup>	820 <sup>B</sup>	-	-
ZINC	mg/kg	190000 <sup>A</sup>	12000 <sup>B</sup>	-	-
<b>General Chemistry</b>					
Cation Exchange Capacity	meq/100g	n/v	n/v	-	-
CHROMIUM, HEXAVALENT	mg/kg	20000 <sup>A</sup>	190 <sup>B</sup>	-	-
HEM PETROLEUM HYDROCARBONS	mg/kg	n/v	n/v	-	-
MOISTURE, PERCENT	%	n/v	n/v	-	-
pH, LABORATORY MEASURED	S.U.	n/v	n/v	8.22 ( )	7.80 ( )
Phenols (Phenolics)	mg/kg	n/v	n/v	-	-
SOLIDS, PERCENT	%	n/v	n/v	-	-
SULFIDE	mg/kg	n/v	n/v	-	-
TOTAL CYANIDE (WATER)	mg/kg	190000 <sup>A</sup>	n/v	-	-
TOTAL ORGANIC CARBON	mg/kg	n/v	n/v	-	-
TOTAL ORGANIC HALOGEN	mg/kg	n/v	n/v	-	-



**Table 5**  
**Summary PADEP Open Storage Tank Incidents**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

	<b>PADEP Incident Number</b>	<b>Sunoco/ PES Tank Number</b>	<b>Former PADEP Tank Number</b>	<b>Current PADEP Tank Number (PES)</b>	<b>Quantity Released (Gallons)</b>	<b>Description</b>	<b>Regulatory Program</b>
6/25/2002	29142	271	033A	NA	NA	Cat Cutter	PADEP Chapter 245 Storage Tank Program
11/11/1993	45694	272	054A	022A	142	Crude Oil	PADEP Chapter 245 Storage Tank Program
3/8/2011	42279	272	054A	022A	NA	Crude Oil	PADEP Chapter 245 Storage Tank Program
6/6/1995	45697	273	035A	003A	78	Cutter and VGO	PADEP Chapter 245 Storage Tank Program
9/16/1991	45689	275	057A	NA	84	Cat Charge Stock	PADEP Chapter 245 Storage Tank Program
6/25/2007	38132	277	039A	NA	NA	Petroleum Hydrocarbons	PADEP Chapter 245 Storage Tank Program
9/18/1999	30777	281	043A	025A	84	Cat Charge	PADEP Chapter 245 Storage Tank Program
11/24/2001	5913	281	043A	025A	200	Gas Oil	PADEP Chapter 245 Storage Tank Program
5/2/2006	36456	1002	139A	139A	NA	NA	PADEP Chapter 245 Storage Tank Program
5/30/2006	36578	1100	140A	140A	NA	NA	PADEP Chapter 245 Storage Tank Program
9/6/1998	45700	1108	149A	NA	4200	#6 Fuel Oil	PADEP Chapter 245 Storage Tank Program
01/1998	6134	M4	002	002	NA	Gasoline	PADEP Chapter 245 Storage Tank Program
01/1998	45686	M5	003	003	NA	Diesel Oil	PADEP Chapter 245 Storage Tank Program
01/1998	45699	M5	003	003	NA	Diesel Oil	PADEP Chapter 245 Storage Tank Program
Note: NA indicated information not applicable or not available							



Table 6

**Existing Well Summary**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC**

AOI	Well ID	Former Well ID <sup>2</sup>	Well Status	Disposition of Well	Northing <sup>3</sup>	Easting <sup>3</sup>	Well Type <sup>4</sup>	Well Classification/ Hydrostratigraphic Unit <sup>5</sup>	Soil Boring Log Available (Y/N)	Contruction Detail Available (Y/N)	Date of Well Completion	Well Construction Details <sup>1</sup>							
												Well Completion Depth (ft/bgs) <sup>6</sup>	Well Diameter (in) <sup>7</sup>	Top of Inner Casing Elevation (ft msl) (NAVD88) <sup>8</sup>	Ground Surface Elevation (ft msl) (NAVD88) <sup>8</sup>	Top of Screen Elev (ft msl) (NAVD88) <sup>8</sup>	Bottom of Screen Elevation (ft msl) (NAVD88) <sup>8</sup>	Depth to Screen (ft bgs) <sup>8</sup>	Screen Length (ft) <sup>9</sup>
AOI 7	C-104				219187.87	2679742	MW	Shallow						9.53	6.84				
AOI 7	C-105				219497.38	2679690.47	MW	Shallow						9.17	6.6				
AOI 7	C-106		Destroyed		219755.71	2679710.26	MW	Shallow						11.54	7.9				
AOI 7	C-107			220183.98	2680066.56	MW	Shallow						10.43	7.78					
AOI 7	C-108			219818.81	2680855.79	MW	Shallow						8.27	5.37					
AOI 7	C-109			219230.74	2682312.46	MW	Shallow						10	7.79					
AOI 7	C-110				219405.77	2682469.05	MW	Shallow						12.58	9.2				
AOI 7	C-111				219231.59	2682560.89	MW	Shallow						12.17	9.35				
AOI 7	C-112				218696.61	2682431.45	MW	Shallow						10.96	8.38				
AOI 7	C-113				218797.69	2682817.06	MW	Shallow						11.65	9.16				
AOI 7	C-114				218347.54	2683001.16	MW	Shallow						10.96	8.59				
AOI 7	C-127				220182.15	2680897.06	MW	Shallow	Y	Y	8/20/1992	16	4	9.8	6.7	1.7	-8.3	5	10
AOI 7	C-128		Destroyed		219916.236	2681231.109	MW	Shallow	Y	Y	8/12/1992	16	4	13.57				5	10
AOI 7	C-129				220497.185	2681937.365	MW	Shallow/Intermediate	Y	Y	6/2/2010	12	4	8.941	7.196	5.196	-4.804	2	10
AOI 7	C-130				219981.051	2682139.561	MW	Shallow	Y	Y	6/2/2010	15	4	11.984	10.287	5.287	-4.713	5	10
AOI 7	C-131				218971.277	2682328.675	MW	Shallow	Y	Y	6/3/2010	14	4	10.14	8.279	4.279	-5.721	4	10
AOI 7	C-132				218271.326	2682247.68	MW	Shallow	Y	Y	6/21/2010	14	4	9.973	8.094	4.094	-5.906	4	10
AOI 7	C-133				218336.074	2681693.849	MW	Shallow	Y	Y	6/21/2010	14	4	7.725	8.183	4.183	-5.817	4	10
AOI 7	C-136		Repaired	Converted to Flush Mount	219217.045	2680990.761	MW	Shallow	Y	Y	5/28/2010	14	4	8.846	6.785	2.785	-7.215	4	10
AOI 7	C-137				219098.264	2680719.078	MW	Shallow	Y	Y	5/27/2010	14	4	3.91	4.715	0.715	-9.285	4	10
AOI 7	C-138				218657.809	2680452.928	MW	Shallow	Y	Y	5/27/2010	12	4	6.95	4.477	2.477	-7.523	2	10
AOI 7	C-139				219443.936	2680633.143	MW	Shallow	Y	Y	6/2/2010	12	4	7.315	5.469	3.469	-6.531	2	10
AOI 7	C-140				218857.817	2679799.125	MW	Shallow	Y	Y	5/26/2010	12	4	7.545	7.987	5.987	-4.013	2	10
AOI 7	C-142				220134.108	2680659.962	MW	Shallow/Intermediate	Y	Y	6/3/2010	14	4	11.352	9.622	5.622	-4.378	4	10
AOI 7	C-143				220232.931	2680321.403	MW	Shallow/Intermediate	Y	Y	6/3/2010	14	4	6.45	6.89	2.89	-7.11	4	10
AOI 7	C-145				220222.267	2681007.478	MW	Shallow	Y	Y	8/9/2010	15	4	6.922	7.357	-7.643	-17.643	15	10
AOI 7	C-146				220254.825	2680639.828	MW	Shallow	Y	Y	8/10/2010	15	4	6.739	7.198	-7.802	-17.802	15	10
AOI 7	C-147				220262.747	2680516.947	MW	Shallow	Y	Y	8/10/2010	15	4	6.874	7.312	-7.688	-17.688	15	10
AOI 7	C-148		Destroyed		220266.672	2680540.203	MW	Shallow	Y	Y	5/23/2011	18	4	9.341	6.891	-8.109	-23.109	15	15
AOI 7	C-149		Destroyed		220269.615	2680524.161	MW	Shallow	Y	Y	5/23/2011	11	4	9.325	7.491	-7.509	-14.509	15	7
AOI 7	C-150				220262.743	2680607.068	MW	Shallow						8.19	6.76				
AOI 7	C-151		Damaged		220255.074	2680490.079	MW	Shallow						7.91	7.21				
AOI 7	C-152				220265.627	2680476.565	MW	Shallow						9.38	7.36				
AOI 7	C-153				220219.944	2680514.198	MW	Shallow						8.27	6.56				
AOI 7	C-154				220189.491	2680516.314	MW	Shallow						7.89	6.51				
AOI 7	C-155				220082.15	2680524.532	MW	Shallow						9.17	7.29				
AOI 7	C-156				220254.474	2681408.164	MW	Shallow	Y	Y	8/30/2011	23.5	4	6.7196	7.09	3.4589	-16.41	4	20
AOI 7	C-157				220255.107	2681432.423	MW	Shallow	Y	Y	8/31/2011	24	4	6.5824	6.83	3.8282	-17.17	3	20
AOI 7	C-158		Damaged	Well casing separated underground	220261.4	2681457.3	MW	Shallow	Y	Y	9/1/2011	24	4	6.6311	6.94	3.8786	-17.06	3	20
AOI 7	C-159				220269.235	2681506.198	MW	Shallow	Y	Y	9/6/2011	24	4	6.7927	6.9	3.9777	-17.1	3	20
AOI 7	C-160		Damaged	TIC broken/filled in with gravel	220255.771	2680459.144	MW	Shallow	Y	Y	9/7/2011	10	4	6.87				0	10
AOI 7	C-161				220266.206	2680460.174	MW	Shallow	Y	Y	9/7/2011	10	4	9.07	7.3	7.3	-2.7	0	10
AOI 7	C-162				220197.288	2680323.697	MW	Shallow						8.5	6.47				
AOI 7	C-163				220248.194	2681331.62	MW	Shallow						6.8749	7.25				
AOI 7	C-164				220252.467	2681359.225	MW	Shallow						6.8319	7.18				
AOI 7	C-165			Shallow	220255.493	2681386.442	MW	Shallow			12/31/1999			8.46	7.31				
AOI 7	C-166				220241.93	2680285.122	MW	Shallow						6.99	7.26				
AOI 7	C-167				220238.583	2680255.748	MW	Shallow						7.81	7.99				
AOI 7	C-168		Damaged	Shallow; Needs new riser	220173.58	2679988.45	MW	Shallow			12/31/1999			7.41	7.4				
AOI 7	C-169			Shallow	220266.914	2680430.61	MW	Shallow	Y	Y	12/31/1999	25	6	6.968	7.29	2.29	-17.71	5	20
AOI 7	C-170		Damaged				MW	Shallow	Y	Y	7/6/2016	11.5	4	-	-	-	-	1.5	10
AOI 7	C-171				219648.9	2679794.90	MW	Shallow	Y	Y	7/5/2016	13	4	10.36	7.9	7.36	0.36	3	10
AOI 7	C-172				218450.7	2680374.84	MW	Shallow	Y	Y	7/6/2016	13	4	5.91	3.8	2.91	-4.09	3	10
AOI 7	C-173		Reserved																
AOI 7	C-49				218494.96	2683022.45	MW	Shallow	Y	Y	2/22/1986	18	4	9.58	8.34	0.34	-9.66	8	10
AOI 7	C-50				219618.59	2682341.31	MW	Shallow	Y	Y	2/22/1986	15.5	4	12.77	9.33	3.83	-6.17	6	10
AOI 7	C-51				220073.27	2681621.38	MW	Shallow	Y	Y	2/25/1986	13	4	9.26				3	10
AOI 7	C-52				220206.46	2681216.48	MW	Shallow	Y	Y	2/25/1986	13	4	7.63	6.68	3.68	-6.32	3	10
AOI 7	C-53		Destroyed				MW	Shallow	Y	Y	2/24/1986	15	4					5	10
AOI 7	C-53A				219939.83	2681030.76	MW	Shallow	Y	Y	12/19/1991	14	4	9.47	7.12	5.12	-6.88	2	12
AOI 7	C-54				219458.97	2680975.3	MW	Shallow	Y	Y	12/19/1991	15	4	6.61	5.99	3.49	-8.51	3	12
AOI 7	C-55				218851.05	2680863.56	MW	Shallow	Y	Y	2/24/1986	15	4	9.41	6.49	1.49	-8.51	5	10



Table 6  
Existing Well Summary  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Former Well ID <sup>2</sup>	Well Status	Disposition of Well	Northing <sup>3</sup>	Easting <sup>3</sup>	Well Type <sup>4</sup>	Well Classification/ Hydrostratigraphic Unit <sup>5</sup>	Soil Boring Log Available (Y/N)	Contruction Detail Available (Y/N)	Date of Well Completion	Well Construction Details <sup>1</sup>							
												Well Completion Depth (ft/bgs) <sup>6</sup>	Well Diameter (in) <sup>7</sup>	Top of Inner Casing Elevation (ft msl) (NAVD88) <sup>8</sup>	Ground Surface Elevation (ft msl) (NAVD88) <sup>8</sup>	Top of Screen Elev (ft msl) (NAVD88) <sup>8</sup>	Bottom of Screen Elevation (ft msl) (NAVD88) <sup>8</sup>	Depth to Screen (ft bgs) <sup>8</sup>	Screen Length (ft) <sup>9</sup>
AOI 7	C-56				218775.795	2681367.141	MW	Shallow	Y	Y	2/24/1986	13	4	10.72				3	10
AOI 7	C-57				219572.12	2681650.57	MW	Shallow	Y	Y	2/24/1986	14.5	4	8.5	8.45	3.95	-6.05	5	10
AOI 7	C-58				219017.2	2681692.06	MW	Shallow	Y	Y	2/28/1986	13	4	7.42	7.39	4.39	-5.61	3	10
AOI 7	C-59		Unable to Locate		218657.752	2681702.651	MW	Shallow	Y	Y		14	4					4	10
AOI 7	C-60				218657.01	2680150.7	MW	Shallow	Y	Y	2/24/1986	13	4	7.44	6.02	3.02	-6.98	3	10
AOI 7	C-61				219306.24	2679819.48	MW	Shallow	Y	Y	2/25/1986	13	4	7.93	7.88	4.88	-5.12	3	10
AOI 7	C-62				219889.7	2679892.08	MW	Shallow	Y	Y	2/25/1986	13	4	11.4	8.35	5.35	-4.65	3	10
AOI 7	C-63				219610.62	2680379.05	MW	Shallow	Y	Y	2/24/1986	13	4	7.41	4.17	1.17	-8.83	3	10
AOI 7	C-64				220166.66	2680430.9	MW	Shallow	Y	Y	2/24/1986	13	4	8.14	6.17	3.17	-6.83	3	10
AOI 7	C-65				220116.4	2680266	MW	Shallow	Y	Y	2/25/1986	13	4	10.84	7.47	4.47	-5.53	3	10
AOI 7	C-65D		Destroyed		220116.05	2680259.79	MW	Deep	Y	Y	11/11/1986	75	4	9.62	7.6	-57.4	-67.4	65	10
AOI 7	C-96				219529.38	2681979.8	MW	Shallow	Y	Y	10/23/1986	17	4	12.88	9.82	2.82	-7.18	7	10
AOI 7	C-97				220229.81	2680615.97	MW	Shallow	Y	Y	10/23/1986	15	4	10.52	7.55	2.55	-7.45	5	10
AOI 7	C-98				219208.25	2680220.18	MW	Shallow	Y	Y	10/23/1986	16.5	4	10.55	10.84	4.34	-5.66	7	10
AOI 7	PH-35		Destroyed				MW												
AOI 7	PH-38		Destroyed				MW												
AOI 7	PH-40		Destroyed		219766.99	2681683.823	MW												
AOI 7	PH-41		Destroyed		219112.637	2681758.395	MW												
AOI 7	RW-801				220246.373	2680575.418	RW	Shallow	N	N		25	6	6.272	6.71	1.71	-18.29	5	20
AOI 7	RW-802				220231.545	2680523.528	RW	Shallow	N	N		25	6	5.702	7.1	2.1	-17.9	5	20
AOI 7	RW-803				220259.632	2680481.614	RW	Shallow	N	N		25	6	5.776	7.15	2.15	-17.85	5	20
AOI 7	RW-804	C-170			220256.715	2680431.902	RW	Shallow	N	N		25.5	6	5.782	7.03	2.03	-18.47	5	20.5
AOI 7	RW-805				220256.5	2680430.59	RW	Shallow	Y	Y		25	6	5.7474	7.03	4.937	-17.97	2	20
AOI 7	RW-806				220228.801	2680360.113	RW	Shallow	N	N		25	6	5.41	6.82	1.82	-18.18	5	20
AOI 7	RW-807				220237.02	2680336.5	RW	Shallow	N	N		25	6	6.84	6.78	1.78	-18.22	5	20
AOI 7	RW-808				220230.297	2680285.228	RW	Shallow	N	N		25	6	6.081	7.37	2.37	-17.63	5	20
AOI 7	RW-809				220222.165	2680226.857	RW	Shallow	N	N		25	6	6.551	7.89	2.89	-17.11	5	20
AOI 7	RW-810				220214.629	2680174.32	RW	Shallow	N	N		25	6	6.438	7.82	2.82	-17.18	5	20
AOI 7	WP13-1		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP13-2		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP13-3		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP14-1		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP14-2				220196.331	2680218.708	Temporary Well Point	Shallow	Y	Y	5/27/1993	10.5		7.91	8.13	7.63	-2.37	1	10
AOI 7	WP14-3		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP14-4		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP14-5		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP15-1		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP15-2		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10
AOI 7	WP15-3		Destroyed				Temporary Well Point		Y	Y	5/27/1993	10.5						1	10

Notes:

ft/bgs      Feet below ground surface  
in          Inches  
NAVD88     North American Vertical Datum of 1988



Table 7a  
Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-49	C-50	C-51	C-51	C-52	C-54	C-54	C-57
Sample ID:			GW-11109614-C-49-072116-JM-005	GW-11109614-C-50-072716-JM-022	GW-11109614-C-51-072716-JM-024	GW-11109614-C-51D-072716-JM-026	GW-11109614-C-52-072716-AC-027	GW-11109614-C-54-072116-AC-006	GW-11109614-C54-081916-AC-03	GW-11109614-C-57-072616-JM-018
Sample Date:			07/21/2016	07/27/2016	07/27/2016	07/27/2016	07/27/2016	07/21/2016	08/19/2016	07/26/2016
Parameters	Units	PADEP Act2 Used Aquifer NR MSC				Duplicate				
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	0.6 J	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	0.6 J	ND(2)	ND(2)	3	ND(2)	ND(2)	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	1	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds										
Anthracene	µg/L	66	0.19	0.028 J	0.15	0.32	0.14	0.032 J	0.045 J	0.98
Benzo(a)anthracene	µg/L	4.9	0.017 J	ND(0.051)	0.060	0.12	0.033 J	0.026 J	0.034 J	1.2
Benzo(a)pyrene	µg/L	0.2	ND(0.052)	ND(0.051)	0.019 J	0.053	0.025 J	0.027 J	0.034 J	1.1
Benzo(b)fluoranthene	µg/L	1.2	0.013 J	ND(0.051)	0.031 J	0.071	0.042 J	0.035 J	0.032 J	1.2
Benzo(g,h,i)perylene	µg/L	0.26	0.012 J	ND(0.051)	0.015 J	0.041 J	0.020 J	0.020 J	0.026 J	0.58
Chrysene	µg/L	1.9	ND(0.052)	ND(0.051)	0.059	0.13	0.043 J	0.029 J	0.035 J	1.3
Fluorene	µg/L	1900	0.011 J	0.051	0.99	1.8	0.010 J	0.013 J	0.025 J	1.9
Naphthalene	µg/L	100	ND(0.062)	ND(0.061)	0.041 J	0.070	ND(0.060)	0.045 J	0.10	1.7
Phenanthrene	µg/L	1100	ND(0.062)	ND(0.061)	0.096	0.22	0.11	ND(0.062)	0.091	3.8
Pyrene	µg/L	130	0.040 J	0.065	0.87	1.7	0.15	0.042 J	0.055	2.2
Metals - Dissolved										
Lead (dissolved)	µg/L	5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	0.11 J	ND(1.0)
General Chemistry										
Turbidity	NTU	-	-	-	-	-	-	-	-	-
Field Parameters										
Conductivity, field	umhos/cm	-	-	-	-	-	-	-	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	-	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-	-	-
pH, field	s.u.	-	-	-	-	-	-	-	-	-
Temperature, field	Deg C	-	-	-	-	-	-	-	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	-	-	-

Notes:

- NR MSC Non Residential Medium-Specific Concentrations (MSCs)
- µg/L Micrograms per liter.
- deg c Degrees Celcius.
- S.U. Standard Units.
- NTU Nephelometric Turbidity Units.
- ND Not detected at the associated reporting limit.
- J Estimated concentration.
- ND(10) Indicates reporting limit was above the applicable standard.



Table 7a  
Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-58	C-60	C-61	C-62	C-96	C-104	C-104	C-104	C-105
Sample ID:			GW-11109614-C-58-072516-JM-014	GW-11109614-C-60-072116-AC-008	GW-11109614-C-61-072516-AC-013	GW-11109614-C-62-072716-JM-028	GW-11109614-C-96-072116-JM-009	C-104_20150521	C-104-20160524	GW-11109614-C-104-072616-AC-015	GW-11109614-C-105-072516-AC-011
Sample Date:			07/25/2016	07/21/2016	07/25/2016	07/27/2016	07/21/2016	05/21/2015	05/24/2016	07/26/2016	07/25/2016
Parameters	Units	Used Aquifer NR MSC									
Volatile Organic Compounds											
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	8	ND(10)	ND(20)	ND(0.5)	ND(0.5)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.0096)	ND(0.0096)	ND(0.028)	ND(0.028)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	2	ND(10)	ND(20)	ND(0.5)	ND(0.5)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	2 J	ND(10)	ND(20)	ND(0.5)	ND(0.5)	ND(2)	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	1	ND(1)	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	-	ND() ND	ND() ND	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	1	ND(5)	ND(10)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Semi-Volatile Organic Compounds											
Anthracene	µg/L	66	0.15	0.069	0.19	0.33	0.49	1	0.5 J	0.47	0.089
Benzo(a)anthracene	µg/L	4.9	0.050 J	0.025 J	0.12	0.26	0.27	0.8	0.1 J	0.15	0.080
Benzo(a)pyrene	µg/L	0.2	0.013 J	0.012 J	0.054	0.30	0.19	0.6	ND(0.1)	0.036 J	0.040 J
Benzo(b)fluoranthene	µg/L	1.2	0.015 J	0.020 J	0.042 J	0.34	0.20	0.5 J	ND(0.1)	0.044 J	0.041 J
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.052)	0.012 J	0.018 J	0.22	0.10	0.3 J	ND(0.1)	0.014 J	0.018 J
Chrysene	µg/L	1.9	0.053	0.017 J	0.11	0.28	0.30	1	0.1 J	0.17	0.088
Fluorene	µg/L	1900	0.57	0.012 J	1.1	0.64	0.96	7	6	3.2	0.23
Naphthalene	µg/L	100	0.12	ND(0.062)	1.4	ND(0.061)	0.22	0.2 J	ND(0.1)	ND(0.061)	0.063
Phenanthrene	µg/L	1100	1.6	ND(0.062)	0.16	1.2	2.0	3	0.3 J	0.25	0.038 J
Pyrene	µg/L	130	0.61	0.091	0.85	0.46	1.1	3	2	1.9	0.31
Metals - Dissolved											
Lead (dissolved)	µg/L	5	ND(1.0)	ND(1.0)	ND(1.0)	0.19 J	0.10 J	ND(0.082)	ND(0.13)	ND(1.0)	0.13 J
General Chemistry											
Turbidity	NTU	-	-	-	-	-	-	195	39.6	-	-
Field Parameters											
Conductivity, field	umhos/cm	-	-	-	-	-	-	1180	958	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	1780	4100	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-110	-139	-	-
pH, field	s.u.	-	-	-	-	-	-	7.88	7.47	-	-
Temperature, field	Deg C	-	-	-	-	-	-	13.6	14.75	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	754000	612000	-	-

Notes:

- NR MSC Non Residential Medium-Specific Concentrations (MSCs)
- µg/L Micrograms per liter.
- deg c Degrees Celcius.
- S.U. Standard Units.
- NTU Nephelometric Turbidity Units.
- ND Not detected at the associated reporting limit.
- J Estimated concentration.
- ND(10) Indicates reporting limit was above the applicable standard.



Table 7a

Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-106	C-108	C-112	C-113	C-127	C-127	C-127	C-129
Sample ID:		PADEP	GW-11109614-C-106-080116-AC-042	GW-11109614-C-108-072816-JM-034	GW-11109614-C-112-072916-JM-040	GW-11109614-C-113-072116-JM-007	C-127_20150521	C-127-20160524	GW-11109614-C-127-072616-AC-020	GW-11109614-C-129-080116-AC-041
Sample Date:		Act2	08/01/2016	07/28/2016	07/29/2016	07/21/2016	05/21/2015	05/24/2016	07/26/2016	08/01/2016
Parameters	Units	Used Aquifer NR MSC								
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.5)	ND(0.5)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.029)	ND(0.0097)	ND(0.0097)	ND(0.028)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.5)	ND(0.5)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	ND(2)	2	4	6	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(1)	6	5	5	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	ND() ND	ND() ND	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
Semi-Volatile Organic Compounds										
Anthracene	µg/L	66	0.40	0.073	0.13	0.061	0.5 J	0.4 J	0.59	0.031 J
Benzo(a)anthracene	µg/L	4.9	0.26	0.018 J	0.098	0.034 J	0.1 J	0.1 J	0.11	0.014 J
Benzo(a)pyrene	µg/L	0.2	0.19	ND(0.050)	0.069	0.017 J	ND(0.1)	0.1 J	0.079	ND(0.051)
Benzo(b)fluoranthene	µg/L	1.2	0.27	0.012 J	0.078	0.018 J	ND(0.1)	ND(0.1)	0.058	0.013 J
Benzo(g,h,i)perylene	µg/L	0.26	0.049 J	ND(0.050)	0.022 J	0.011 J	ND(0.1)	0.6	0.36	0.011 J
Chrysene	µg/L	1.9	0.33	0.017 J	0.10	0.034 J	0.2 J	ND(0.1)	0.13	0.015 J
Fluorene	µg/L	1900	0.76	0.076	0.68	0.057	4	3	1.1	ND(0.051)
Naphthalene	µg/L	100	0.15	0.054 J	0.079	ND(0.061)	ND(0.1)	ND(0.1)	ND(0.063)	0.18
Phenanthrene	µg/L	1100	1.5	ND(0.060)	0.25	0.17	0.1 J	0.3 J	0.30	ND(0.061)
Pyrene	µg/L	130	0.93	0.039 J	0.38	0.15	1	0.7	0.92	0.040 J
Metals - Dissolved										
Lead (dissolved)	µg/L	5	0.10 J	0.17 J	ND(1.0)	ND(1.0)	ND(0.082)	ND(0.13)	ND(1.0)	0.42 J
General Chemistry										
Turbidity	NTU	-	-	-	-	-	30.8	17.3	-	-
Field Parameters										
Conductivity, field	umhos/cm	-	-	-	-	-	2390	1540	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	810	3010	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-109	-131	-	-
pH, field	s.u.	-	-	-	-	-	7.8	7.42	-	-
Temperature, field	Deg C	-	-	-	-	-	14.88	16.33	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	1550000	982000	-	-

Notes:

NR MSC Non Residential Medium-Specific Concentrations (MSCs)

µg/L Micrograms per liter.

deg c Degrees Celcius.

S.U. Standard Units.

NTU Nephelometric Turbidity Units.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10) Indicates reporting limit was above the applicable standard.



Table 7a  
Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-130	C-131	C-131	C-132	C-136	C-140	C-142
Sample ID:			GW-11109614-C-130-072516-JM-012	GW-11109614-C-131-072616-JM-016	GW-11109614-C131-081916-AC-04	GW-11109614-C-132-072516-JM-010	GW-11109614-C-136-072916-JM-036	GW-11109614-C-140-072616-AC-017	GW-11109614-C-142-072816-JM-030
Sample Date:			07/25/2016	07/26/2016	08/19/2016	07/25/2016	07/29/2016	07/26/2016	07/28/2016
Parameters	Units	PADEP Act2 Used Aquifer NR MSC							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.028)	ND(0.028)	ND(0.028)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	0.7 J	0.5 J	ND(2)	130
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	13	11	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	0.6 J
Total BTEX	µg/L	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	ND(0.050)	1.4	0.32	0.082	0.080	0.15	0.61
Benzo(a)anthracene	µg/L	4.9	ND(0.050)	0.61	0.034 J	0.061	0.058	0.037 J	0.17
Benzo(a)pyrene	µg/L	0.2	ND(0.050)	0.43	ND(0.050)	0.031 J	0.026 J	0.026 J	0.14
Benzo(b)fluoranthene	µg/L	1.2	0.014 J	0.42	0.012 J	0.044 J	0.029 J	0.031 J	0.092
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.050)	0.23	ND(0.050)	0.024 J	ND(0.051)	0.020 J	0.064
Chrysene	µg/L	1.9	0.012 J	0.67	0.044 J	0.077	0.063	0.035 J	0.33
Fluorene	µg/L	1900	ND(0.050)	3.9	0.67	0.074	0.25	1.3	1.2
Naphthalene	µg/L	100	ND(0.060)	0.65	0.072	0.038 J	ND(0.061)	0.34	0.27
Phenanthrene	µg/L	1100	ND(0.060)	0.63	0.15	0.041 J	ND(0.061)	0.30	0.38
Pyrene	µg/L	130	0.011 J	2.1	0.31	0.59	0.33	0.35	0.38
Metals - Dissolved									
Lead (dissolved)	µg/L	5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	0.53 J	0.17 J
General Chemistry									
Turbidity	NTU	-	-	-	-	-	-	-	-
Field Parameters									
Conductivity, field	umhos/cm	-	-	-	-	-	-	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-	-
pH, field	s.u.	-	-	-	-	-	-	-	-
Temperature, field	Deg C	-	-	-	-	-	-	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	-	-

Notes:

NR MSC Non Residential Medium-Specific Concentrations (MSCs)

µg/L Micrograms per liter.

deg c Degrees Celcius.

S.U. Standard Units.

NTU Nephelometric Turbidity Units.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10) Indicates reporting limit was above the applicable standard.



Table 7a

Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-145	C-146	C-150	C-152	C-152	C-157	C-161
Sample ID:			GW-11109614-C-145-072716-AC-025	GW-11109614-C-146-080116-JM-037	GW-11109614-C-150-080116-JM-039	GW-11109614-C-152-072916-AC-033	GW-11109614-C152-081916-AC-05	GW-11109614-C-157-072816-JM-032	GW-11109614-C-161-080116-JM-035
Sample Date:			07/27/2016	08/01/2016	08/01/2016	07/29/2016	08/19/2016	07/28/2016	08/01/2016
Parameters	Units	PADEP Act2 Used Aquifer NR MSC							
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	46	130	ND(2)	ND(2)	ND(2)	14
1,2-Dichloroethane	µg/L	5	ND(1)	ND(5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.028)	ND(0.028)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	14	48	ND(2)	ND(2)	ND(2)	3
Benzene	µg/L	5	ND(1)	ND(5)	ND(1)	51	2	ND(1)	1
Ethylbenzene	µg/L	700	ND(1)	ND(5)	16	3	ND(1)	ND(1)	7
Isopropyl benzene	µg/L	3500	ND(2)	130	59	15	3	ND(2)	31
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(5)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(5)	3	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	8	190	ND(1)	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.45	220	20	0.18	0.079	0.039 J	1.4
Benzo(a)anthracene	µg/L	4.9	0.53	190	10	0.078	0.037 J	0.012 J	0.87
Benzo(a)pyrene	µg/L	0.2	0.40	130	5.6	0.048 J	0.030 J	0.011 J	0.60
Benzo(b)fluoranthene	µg/L	1.2	0.45	170	6.8	0.060	0.031 J	0.017 J	0.87
Benzo(g,h,i)perylene	µg/L	0.26	0.18	38	1.3	0.021 J	0.018 J	0.011 J	0.22
Chrysene	µg/L	1.9	0.68	210	17	0.12	0.061	0.011 J	0.85
Fluorene	µg/L	1900	0.22	320	45	0.51	0.25	ND(0.050)	5.8
Naphthalene	µg/L	100	0.53	830	110	2.9	0.39	ND(0.060)	3.5
Phenanthrene	µg/L	1100	0.46	1000	120	0.87	0.35	ND(0.060)	5.6
Pyrene	µg/L	130	1.5	370	28	0.30	0.17	0.042 J	2.8
Metals - Dissolved									
Lead (dissolved)	µg/L	5	0.19 J	0.97 J	ND(1.0)	0.11 J	0.12 J	0.19 J	0.19 J
General Chemistry									
Turbidity	NTU	-	-	-	-	-	-	-	-
Field Parameters									
Conductivity, field	umhos/cm	-	-	-	-	-	-	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-	-
pH, field	s.u.	-	-	-	-	-	-	-	-
Temperature, field	Deg C	-	-	-	-	-	-	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	-	-

Notes:

NR MSC Non Residential Medium-Specific Concentrations (MSCs)

µg/L Micrograms per liter.

deg c Degrees Celcius.

S.U. Standard Units.

NTU Nephelometric Turbidity Units.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10) Indicates reporting limit was above the applicable standard.



Table 7a

Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:			C-163	C-163	C-168	C-169	C-170	C-170	C-170
Sample ID:			GW-11109614-C-163-072716-AC-021	GW-11109614-C-163D-072716-AC-023	GW-11109614-C-168-072616-AC-019	GW-11109614-C-169-080216-JM-043	GW-11109614-C-170-072916-AC-029	GW-11109614-C-170-082616-AC-001	GW-11109614-C-170D-082616-AC-002
Sample Date:			07/27/2016	07/27/2016	07/26/2016	08/02/2016	07/29/2016	08/26/2016	08/26/2016
		PADEP Act2 Used Aquifer NR MSC		Duplicate					Duplicate
Parameters	Units								
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	170	250	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(5)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	0.027 J	ND(0.028)	ND(0.029)	ND(0.029)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	65	72	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	600	370	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	79	150	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	1 J	1 J	22	34	ND(2)	ND(2)	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)	ND(1)	ND(5)	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	14	210	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	0.7 J	0.6 J	470	600	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds									
Anthracene	µg/L	66	0.50	0.36	0.96	14	0.17	0.19	0.24
Benzo(a)anthracene	µg/L	4.9	0.065	0.055	1.6	4.9	0.017 J	0.040 J	0.037 J
Benzo(a)pyrene	µg/L	0.2	0.032 J	0.024 J	1.1	2.9	0.011 J	0.047 J	0.041 J
Benzo(b)fluoranthene	µg/L	1.2	0.046 J	0.034 J	1.4	3.1	0.015 J	0.048 J	0.046 J
Benzo(g,h,i)perylene	µg/L	0.26	0.020 J	0.014 J	0.53	0.71	ND(0.050)	0.031 J	0.031 J
Chrysene	µg/L	1.9	0.085	0.074	1.6	19	0.024 J	0.033 J	0.044 J
Fluorene	µg/L	1900	2.2	1.7	3.9	50	0.022 J	0.054	0.062
Naphthalene	µg/L	100	ND(0.061)	ND(0.060)	ND(0.32)	360	0.068	0.11	0.11
Phenanthrene	µg/L	1100	0.89	0.58	3.0	170	ND(0.060)	0.056 J	0.059 J
Pyrene	µg/L	130	0.49	0.42	3.5	17	0.21	0.12	0.11
Metals - Dissolved									
Lead (dissolved)	µg/L	5	ND(1.0)	ND(1.0)	0.62 J	ND(1.0)	1.1	1.2	1.2
General Chemistry									
Turbidity	NTU	-	-	-	-	-	-	711.00	-
Field Parameters									
Conductivity, field	umhos/cm	-	-	-	-	-	-	4960	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	23130	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-162.00	-
pH, field	s.u.	-	-	-	-	-	-	6.98	-
Temperature, field	Deg C	-	-	-	-	-	-	21.44	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	-	-

Notes:

NR MSC Non Residential Medium-Specific Concentrations (MSCs)

µg/L Micrograms per liter.

deg c Degrees Celcius.

S.U. Standard Units.

NTU Nephelometric Turbidity Units.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10) Indicates reporting limit was above the applicable standard.



Table 7a  
Groundwater Analytical Results Summary, Unconfined Aquifer  
Statewide Health Standards  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location:		C-171		C-171		C-172	
Sample ID:		GW-11109614-C-171-072916-AC-031		GW-11109614-C-171-082616-AC-003		GW-11109614-C-172-072916-JM-038	
Sample Date:		07/29/2016		08/26/2016		07/29/2016	
		C-172		C-172		GW-11109614-C-172-082616-AC-004	
		08/26/2016					
Parameters	Units	PADEP Act2 Used Aquifer NR MSC					
Volatile Organic Compounds							
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)		ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)		ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.028)	ND(0.029)		ND(0.028)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)		ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)		ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)		ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)		0.7 J	0.7 J
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	ND(1)		ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)		ND(1)	ND(1)
Total BTEX	µg/L	-	-	-		-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)		ND(1)	ND(1)
Semi-Volatile Organic Compounds							
Anthracene	µg/L	66	0.25	0.32		0.23	0.58
Benzo(a)anthracene	µg/L	4.9	0.028 J	0.042 J		0.15	0.17
Benzo(a)pyrene	µg/L	0.2	0.011 J	0.027 J		0.11	0.097
Benzo(b)fluoranthene	µg/L	1.2	0.014 J	0.033 J		0.13	0.12
Benzo(g,h,i)perylene	µg/L	0.26	ND(0.051)	0.027 J		0.043 J	0.047 J
Chrysene	µg/L	1.9	0.021 J	0.039 J		0.16	0.18
Fluorene	µg/L	1900	0.064	0.036 J		2.8	6.2
Naphthalene	µg/L	100	0.037 J	0.071		0.16	0.25
Phenanthrene	µg/L	1100	0.11	0.13		1.3	7.7
Pyrene	µg/L	130	0.070	0.089		0.65	1.4
Metals - Dissolved							
Lead (dissolved)	µg/L	5	0.12 J	0.64 J		0.24 J	0.77 J
General Chemistry							
Turbidity	NTU	-	-	>1000.00		-	>1000.00
Field Parameters							
Conductivity, field	umhos/cm	-	-	2450		-	1630
Dissolved oxygen (DO), field	µg/L	-	-	2080		-	680
Oxidation reduction potential (ORP), field	millivolts	-	-	-158.00		-	-112.00
pH, field	s.u.	-	-	6.71		-	6.41
Temperature, field	Deg C	-	-	21.67		-	25.55
Total dissolved solids, field (TDS)	µg/L	-	-	-		-	-

Notes:

- NR MSC Non Residential Medium-Specific Concentrations (MSCs)
- µg/L Micrograms per liter.
- deg c Degrees Celcius.
- S.U. Standard Units.
- NTU Nephelometric Turbidity Units.
- ND Not detected at the associated reporting limit.
- J Estimated concentration.
- ND(10) Indicates reporting limit was above the applicable standard.



Table 7b

Groundwater Analytical Results Summary

Semi-Confined (Lower) Aquifer

Statewide Health Standards

AOI 7 Remedial Investigation Report

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location: Sample ID: Sample Date:		PADEP Act2 Used Aquifer NR MSC	C-50D GW-11109614-C-50D-072016-AC-003 07/20/2016	C-129D GW-11109614-C-129D-072116-AC-004 07/21/2016	C-129D GW-11109614-C129D-081916-AC-01 08/19/2016	C-134D GW-11109614-C-134D-072016-AC-002 07/20/2016	C-134D GW-11109614-C134D-081916-AC-02 08/19/2016	C-144D GW-11109614-C-144D-072016-AC-001 07/20/2016
Parameters	Units							
Volatile Organic Compounds								
1,2,4-Trimethylbenzene	µg/L	62	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,2-Dichloroethane	µg/L	5	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	ND(0.029)	ND(0.029)	ND(0.028)	ND(0.029)	ND(0.028)	ND(0.029)
1,3,5-Trimethylbenzene	µg/L	1200	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Benzene	µg/L	5	ND(1)	ND(1)	0.6 J	ND(1)	ND(1)	ND(1)
Ethylbenzene	µg/L	700	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Isopropyl benzene	µg/L	3500	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
Methyl tert butyl ether (MTBE)	µg/L	20	ND(1)	1	0.6 J	ND(1)	ND(1)	ND(1)
Toluene	µg/L	1000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Total BTEX	µg/L	-	-	-	-	-	-	-
Xylenes (total)	µg/L	10000	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Semi-Volatile Organic Compounds								
Anthracene	µg/L	66	0.17	0.016 J	0.041 J	0.011 J	ND(0.050)	ND(0.050)
Benzo(a)anthracene	µg/L	4.9	0.16	ND(0.051)	ND(0.050)	ND(0.051)	ND(0.050)	ND(0.050)
Benzo(a)pyrene	µg/L	0.2	0.24	ND(0.051)	ND(0.050)	ND(0.051)	ND(0.050)	ND(0.050)
Benzo(b)fluoranthene	µg/L	1.2	0.23	ND(0.051)	ND(0.050)	ND(0.051)	ND(0.050)	ND(0.050)
Benzo(g,h,i)perylene	µg/L	0.26	0.15	ND(0.051)	ND(0.050)	ND(0.051)	ND(0.050)	ND(0.050)
Chrysene	µg/L	1.9	0.15	ND(0.051)	ND(0.050)	ND(0.051)	ND(0.050)	ND(0.050)
Fluorene	µg/L	1900	0.71	0.035 J	0.11	0.075	ND(0.050)	ND(0.050)
Naphthalene	µg/L	100	ND(0.060)	ND(0.061)	0.095	ND(0.061)	ND(0.060)	ND(0.060)
Phenanthrene	µg/L	1100	0.20	ND(0.061)	0.13	ND(0.061)	ND(0.060)	ND(0.060)
Pyrene	µg/L	130	0.43	0.14	0.071	0.033 J	ND(0.050)	ND(0.050)
Metals - Dissolved								
Lead (dissolved)	µg/L	5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
General Chemistry								
Turbidity	NTU	-	-	-	-	-	-	-
Field Parameters								
Conductivity, field	umhos/cm	-	-	-	-	-	-	-
Dissolved oxygen (DO), field	µg/L	-	-	-	-	-	-	-
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-	-	-	-
pH, field	s.u.	-	-	-	-	-	-	-
Temperature, field	Deg C	-	-	-	-	-	-	-
Total dissolved solids, field (TDS)	µg/L	-	-	-	-	-	-	-

Notes:

NR MSC Non Residential Medium-Specific Concentrations (MSCs)

µg/L Micrograms per liter.

deg c Degrees Celcius.

S.U. Standard Units.

NTU Nephelometric Turbidity Units.

ND Not detected at the associated reporting limit.

J Estimated concentration.

ND(10) Indicates reporting limit was above the applicable standard.







Table 8

Historical Groundwater Analytical Results Summary - AOI 7 2013 to present  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location	Units	MSC-PA	C-104								C-105	C-106	C-108	C-112	C-113	C-127				
Sample Date			8-Apr-13	8-Apr-13	8-Apr-13	3-Jun-14	3-Jun-14	21-May-15	24-May-16	26-Jul-16	25-Jul-16	1-Aug-16	28-Jul-16	29-Jul-16	21-Jul-16	8-Apr-13	8-Apr-13	8-Apr-13	3-Jun-14	3-Jun-14
Sample ID			C-104	C-104_040813	C-104_040813	C-104	C-104	C-104_20150521	C-104-20160524	GW-11109614-C-104-072616-AC-015	GW-11109614-C-105-072516-AC-011	GW-11109614-C-106-080116-AC-042	GW-11109614-C-108-072816-JM-034	GW-11109614-C-112-072916-JM-040	GW-11109614-C-113-072116-JM-007	C-127	C-127_040813	C-127_040813	C-127	C-127
Sampling Company			UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	GHD	GHD	GHD	GHD	GHD	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	LL	LL	LL	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST
Laboratory Work Order			20140718EZ	JB33644	JB33644	JB33644	JB68336	1563553	1666456	1687764	1687764	1689795	1688921	1689254	1686199	20140718EZ	JB33644	JB33644	JB68336	JB68336
Laboratory Sample ID	Units	MSC-PA	UNKNOWN	JB33644-11	JB33644-11F	JB68336-16	JB68336-16F	7900310	8402595	8496058	8496054	8504222	8501220	8502288	8489356	UNKNOWN	JB33644-12	JB33644-12F	JB68336-17	JB68336-17F
Field Parameters																				
CONDUCTIVITY	mS/cm	n/v	-	-	-	-	-	-	-	1.14	0.74	NM	1.04	1.23	0.545	-	-	-	-	-
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	-	-	-	-	-	1.78	4.1	4.11	3.81	NM	1.11	6.34	5.74	-	-	-	-	-
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-	-	-	-	-	-110	-139	-129	-81	NM	-99.9	-88	-108.2	-	-	-	-	-
pH, FIELD MEASURED	S.U.	n/v	-	-	-	-	-	7.88	7.47	6.96	6.61	NM	6.43	6.44	7.25	-	-	-	-	-
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	1.18	0.958	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	-	-	-	-	-	13.6	14.75	24.77	22.75	NM	21.75	22.38	24.02	-	-	-	-	-
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	0.754	0.612	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	-	-	-	-	-	195	39.6	39.2	117	NM	73.6	269	32.2	-	-	-	-	-
Volatile Organic Compounds																				
BENZENE	µg/L	5	-	ND (1) (0.24)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	ND (1) (0.24)	-	ND (0.50) (0.21)	-
1,2-DICHLOROETHANE (EDC)	µg/L	5	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-
ETHYLBENZENE	µg/L	700	-	ND (1) (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	ND (1) (0.23)	-	ND (1.0) (0.40)	-
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	-	ND (2) (0.45)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	2.2 (0.45)	-	3.6 (0.26)	-
METHYL TERTIARY BUTYL ETHER	µg/L	20	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	7.5 (0.16)	-	4.4 (0.26)	-
TOLUENE	µg/L	1000	-	ND (1) (0.23)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	ND (1) (0.23)	-	ND (1.0) (0.22)	-
TOTAL BTX	µg/L	n/v	0.62 ()	-	-	-	-	ND	ND	-	-	-	-	-	-	0.57 ()	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-
1,3,5-TRIMETHYLBENZENE	µg/L	1200	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	-	0.62 J (0.24)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	-	0.57 J (0.24)	-	0.22 J (0.20)	-
Volatile Organic Compounds (SW8011)																				
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.0096) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-
Semi-Volatile Organic Compounds																				
ANTHRACENE	µg/L	66	-	0.364 (0.02)	-	ND (0.10) (0.021)	-	1 (0.1)	0.5 J (0.1)	0.47 (0.010)	0.089 (0.010)	0.40 (0.010)	0.073 (0.010)	0.13 (0.010)	0.061 (0.010)	-	0.285 (0.02)	-	0.281 (0.021)	-
BENZO(A)ANTHRACENE	µg/L	4.9	-	ND (0.1) (0.012)	-	0.260 (0.012)	-	0.8 (0.1)	0.1 J (0.1)	0.15 (0.010)	0.080 (0.010)	0.26 (0.010)	0.018 J (0.010)	0.098 (0.010)	0.034 J (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-
BENZO(A)PYRENE	µg/L	0.2	-	ND (0.1) (0.012)	-	0.201 (0.013)	-	0.6 (0.1)	ND (0.1) (0.1)	0.036 J (0.010)	0.040 J (0.010)	0.19 (0.010)	ND (0.050) (0.010)	0.069 (0.010)	0.017 J (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.013)	-
BENZO(B)FLUORANTHENE	µg/L	1.2	-	ND (0.1) (0.01)	-	0.240 (0.010)	-	0.5 J (0.1)	ND (0.1) (0.1)	0.044 J (0.010)	0.041 J (0.010)	0.27 (0.010)	0.012 J (0.010)	0.078 (0.010)	0.018 J (0.010)	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-
BENZO(G,H,I)PERYLENE	µg/L	0.26	-	ND (0.1) (0.016)	-	0.122 (0.016)	-	0.3 J (0.1)	ND (0.1) (0.1)	0.014 J (0.010)	0.018 J (0.010)	0.049 J (0.010)	ND (0.050) (0.010)	0.022 J (0.010)	0.011 J (0.010)	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-
CHRYSENE	µg/L	1.9	-	ND (0.1) (0.012)	-	0.202 (0.012)	-	1 (0.1)	0.1 J (0.1)	0.17 (0.010)	0.088 (0.010)	0.33 (0.010)	0.017 J (0.010)	0.10 (0.010)	0.034 J (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-
FLUORENE	µg/L	1900	-	2.35 (0.017)	-	ND (0.10) (0.017)	-	7 (0.1)	6 (0.1)	3.2 (0.010)	0.23 (0.010)	0.76 (0.010)	0.076 (0.010)	0.68 (0.010)	0.057 (0.010)	-	1.64 (0.017)	-	2.15 (0.018)	-
NAPHTHALENE	µg/L	100	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	0.2 J (0.1)	ND (0.1) (0.1)	ND (0.061) (0.030)	0.063 (0.030)	0.15 (0.030)	0.054 J (0.030)	0.079 (0.030)	ND (0.061) (0.030)	-	ND (0.1) (0.036)	-	ND (0.10) (0.037)	-
PHENANTHRENE	µg/L	1100	-	0.633 (0.021)	-	0.161 (0.021)	-	3 (0.1)	0.3 J (0.1)	0.25 (0.030)	0.038 J (0.030)	1.5 (0.030)	ND (0.060) (0.030)	0.25 (0.030)	0.17 (0.030)	-	ND (0.1) (0.021)	-	0.225 (0.022)	-
PYRENE	µg/L	130	-	0.641 (0.015)	-	0.429 (0.015)	-	3 (0.1)	2 (0.1)	1.9 (0.010)	0.31 (0.010)	0.93 (0.010)	0.039 J (0.010)	0.38 (0.010)	0.15 (0.010)	-	0.59 (0.015)	-	0.440 (0.015)	-
Metals																				
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																				
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	ND (3) (1.7)	-	2.3 J (1.3)	ND (0.082) (0.082)	ND (0.13) (0.13)	ND (1.0) (0.090)	0.13 J (0.090)	0.10 J (0.090)	0.17 J (0.090)	ND (1.0) (0.090)	ND (1.0) (0.090)	-	-	ND (3) (1.7)	-	ND (3.0) (1.3)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																				
ALKALINITY, BICARBONATE (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Table 8

Historical Groundwater Analytical Results Summary - AOI 7 2013 to present  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			C-127			C-129							C-129D					C-130
Sample Date			21-May-15	24-May-16	26-Jul-16	8-Apr-13	8-Apr-13	8-Apr-13	3-Jun-14	3-Jun-14	21-May-15	24-May-16	1-Aug-16	2-Apr-13	2-Apr-13	21-Jul-16	19-Aug-16	25-Jul-16
Sample ID			C-127_20150521	C-127-20160524	GW-11109614-C-127-072616-AC-020	C-129	C-129_040813	C-129_040813	C-129	C-129	C-129_20150521	C-129-20160524	GW-11109614-C-129-080116-AC-041	C-129D_40213	C-129D_40213	GW-11109614-C-129D-072116-AC-004	GW-11109614-C129D-081916-AC-01	GW-11109614-C-130-072516-JM-012
Sampling Company			STANTEC	STANTEC	GHD	UNKNOWN	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	GHD	LANGAN	LANGAN	GHD	GHD	GHD
Laboratory			LL	LL	LL	UNKNOWN	ACCUTEST	ACCUTEST	ACCUTEST	ACCUTEST	LL	LL	LL	ACCUTEST	ACCUTEST	LL	LL	LL
Laboratory Work Order			1563553	1666456	1687764	20140718EZ	JB33644	JB33644	JB68336	JB68336	1563553	1666456	1689795	JB33050	JB33050	1686199	1698036	1687764
Laboratory Sample ID	Units	MSC-PA	7900309	8402596	8496064	UNKNOWN	JB33644-13	JB33644-13F	JB68336-18	JB68336-18F	7900308	8402597	8504218	JB33050-4	JB33050-4F	8489352	8541531	8496055
Field Parameters																		
CONDUCTIVITY	mS/cm	n/v	-	-	1.64	-	-	-	-	-	-	-	0.715	-	-	0.73	-	0.518
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	0.81	3.01	2.71	-	-	-	-	-	1.65	2.92	5.01	-	-	2.34	-	4.9
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-109	-131	-115	-	-	-	-	-	1	3	-17	-	-	-202	-	-101
pH, FIELD MEASURED	S.U.	n/v	7.8	7.42	6.76	-	-	-	-	-	8.5	8.04	7.4	-	-	7.53	-	7.78
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	2.39	1.54	-	-	-	-	-	-	0.748	0.584	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	14.88	16.33	27.22	-	-	-	-	-	14.52	16.16	23.21	-	-	20.17	-	19.28
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	1.55	0.982	-	-	-	-	-	-	0.479	0.372	-	-	-	-	-	-
TURBIDITY	NTU	n/v	30.8	17.3	11.4	-	-	-	-	-	39.6	31.4	76.6	-	-	0	-	63.4
Volatile Organic Compounds																		
BENZENE	µg/L	5	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (1) (0.24)	-	ND (0.50) (0.21)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	0.6 J (0.5)	ND (1) (0.5)
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (1) (0.26)	-	ND (1.0) (0.30)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (1) (0.23)	-	ND (1.0) (0.40)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	2 (0.5)	4 (0.5)	6 (0.5)	-	ND (2) (0.45)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	6 (0.5)	5 (0.5)	5 (0.5)	-	ND (1) (0.16)	-	ND (1.0) (0.26)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	0.82 J (0.16)	-	1 (0.5)	0.6 J (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (1) (0.23)	-	ND (1.0) (0.22)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOTAL BTEX	µg/L	n/v	ND	ND	-	ND	-	-	-	-	ND	ND	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (2) (0.19)	-	ND (2.0) (0.19)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	-	ND (2) (0.36)	-	ND (2.0) (0.17)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (2) (0.5)	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	-	ND (1) (0.24)	-	ND (1.0) (0.20)	-	ND (0.5) (0.5)	ND (0.5) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																		
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.0097) (0.010)	ND (0.0097) (0.010)	ND (0.028) (0.010)	-	ND (0.02) (0.011)	-	ND (0.020) (0.011)	-	ND (0.0096) (0.010)	ND (0.0097) (0.010)	ND (0.029) (0.010)	ND (0.020) (0.011)	-	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)
Semi-Volatile Organic Compounds																		
ANTHRACENE	µg/L	66	0.5 J (0.1)	0.4 J (0.1)	0.59 (0.010)	-	ND (0.1) (0.02)	-	ND (0.10) (0.020)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.031 J (0.010)	ND (0.10) (0.020)	-	0.016 J (0.010)	0.041 J (0.010)	ND (0.050) (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	0.1 J (0.1)	0.1 J (0.1)	0.11 (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.014 J (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	ND (0.050) (0.010)
BENZO(A)PYRENE	µg/L	0.2	ND (0.1) (0.1)	0.1 J (0.1)	0.079 (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	ND (0.051) (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	ND (0.050) (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	ND (0.1) (0.1)	ND (0.1) (0.1)	0.058 (0.010)	-	ND (0.1) (0.01)	-	ND (0.10) (0.010)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.013 J (0.010)	ND (0.10) (0.010)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.014 J (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	ND (0.1) (0.1)	0.6 (0.1)	0.36 (0.010)	-	ND (0.1) (0.016)	-	ND (0.10) (0.016)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.011 J (0.010)	ND (0.10) (0.016)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	ND (0.050) (0.010)
CHRYSENE	µg/L	1.9	0.2 J (0.1)	ND (0.1) (0.1)	0.13 (0.010)	-	ND (0.1) (0.012)	-	ND (0.10) (0.012)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.015 J (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.012 J (0.010)
FLUORENE	µg/L	1900	4 (0.1)	3 (0.1)	1.1 (0.010)	-	ND (0.1) (0.017)	-	ND (0.10) (0.017)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	ND (0.051) (0.010)	0.207 (0.017)	-	0.035 J (0.010)	0.11 (0.010)	ND (0.050) (0.010)
NAPHTHALENE	µg/L	100	ND (0.1) (0.1)	ND (0.1) (0.1)	ND (0.063) (0.030)	-	ND (0.1) (0.036)	-	ND (0.10) (0.036)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.18 (0.030)	ND (0.10) (0.036)	-	ND (0.061) (0.030)	0.095 (0.030)	ND (0.060) (0.030)
PHENANTHRENE	µg/L	1100	0.1 J (0.1)	0.3 J (0.1)	0.30 (0.030)	-	ND (0.1) (0.021)	-	ND (0.10) (0.021)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	ND (0.061) (0.030)	ND (0.10) (0.021)	-	ND (0.061) (0.030)	0.13 (0.030)	ND (0.060) (0.030)
PYRENE	µg/L	130	1 (0.1)	0.7 (0.1)	0.92 (0.010)	-	ND (0.1) (0.015)	-	ND (0.10) (0.015)	-	ND (0.1) (0.1)	ND (0.1) (0.1)	0.040 J (0.010)	ND (0.10) (0.015)	-	0.14 (0.010)	0.071 (0.010)	0.011 J (0.010)
Metals																		
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	2.6 J (0.97)	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	ND (50) (0.59)	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	76100 (24)	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	2.2 J (1.7)	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	1540 (0.40)	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.089)	-	-	-	-
Metals, Dissolved																		
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	ND (3.0) (0.97)	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	ND (50) (0.59)	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	54300 (24)	-	-	-
LEAD	µg/L	5	ND (0.082) (0.082)	ND (0.13) (0.13)	ND (1.0) (0.090)	-	-	ND (3) (1.7)	-	2.2 J (1.3)	0.13 J (0.082)	ND (0.13) (0.13)	0.42 J (0.090)	-	2.5 J (1.7)	ND (1.0) (0.090)	ND (1.0) (0.090)	ND (1.0) (0.090)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	1500 (0.40)	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.20) (0.089)	-	-	-
General Chemistry																		
ALKALINITY, BICARBONATE (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	447000 (5000)	-	-	-	-
ALKALINITY, TOTAL (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	447000 (3500)	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	33200 (48)	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	83 B (5.1)	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	32400 (1600)	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	36 B (5.6)	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	36 B (4.6)	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	ND (10) (1)	-	-	-	-



Table 8

Historical Groundwater Analytical Results Summary - AOI 7 2013 to present  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location			C-131		C-132	C-134D				C-136	C-140	C-142	C-144D		C-145	C-146	C-150	
Sample Date			26-Jul-16	19-Aug-16	25-Jul-16	1-Apr-13	1-Apr-13	20-Jul-16	19-Aug-16	29-Jul-16	26-Jul-16	28-Jul-16	2-Apr-13	2-Apr-13	20-Jul-16	27-Jul-16	1-Aug-16	1-Aug-16
Sample ID			GW-11109614-C-131-072616-JM-016	GW-11109614-C131-081916-AC-04	GW-11109614-C-132-072516-JM-010	C-134D_40113	C-134D_40113	GW-11109614-C-134D-072016-AC-002	GW-11109614-C134D-081916-AC-02	GW-11109614-C-136-072916-JM-036	GW-11109614-C-140-072616-AC-017	GW-11109614-C-142-072816-JM-030	C-144D_40213	C-144D_40213	GW-11109614-C-144D-072016-AC-001	GW-11109614-C-145-072716-AC-025	GW-11109614-C-146-080116-JM-037	GW-11109614-C-150-080116-JM-039
Sampling Company			GHD	GHD	GHD	LANGAN	LANGAN	GHD	GHD	GHD	GHD	GHD	LANGAN	LANGAN	GHD	GHD	GHD	GHD
Laboratory			LL	LL	LL	ACCUTEST	ACCUTEST	LL	LL	LL	LL	LL	ACCUTEST	ACCUTEST	LL	LL	LL	LL
Laboratory Work Order			1687764	1698036	1687764	JB32976	JB32976	1686199	1698036	1689254	1687764	1688921	JB33050	JB33050	1686199	1688921	1689795	1689795
Laboratory Sample ID			8496059	8541534	8496053	JB32976-6	JB32976-6F	8489350	8541532	8502286	8496060	8501217	JB33050-5	JB33050-5F	8489349	8501213	8504220	8504221
Field Parameters																		
CONDUCTIVITY	mS/cm	n/v	4.212	-	0.574	-	-	0.725	-	1.6612	1.41	1.91	-	-	0.415	1.26	NM	NM
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	4.25	-	1.38	-	-	2.83	-	4.63	14.63	6.59	-	-	5.08	1.54	NM	NM
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	-138.2	-	-173	-	-	-48	-	-35	-54	-122	-	-	64	-116	NM	NM
pH, FIELD MEASURED	S.U.	n/v	7	-	7.47	-	-	6.58	-	6.5	7.51	6.93	-	-	9.26	6.88	NM	NM
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	20.01	-	22.6	-	-	22.45	-	21.05	25	30.43	-	-	21.88	28.1	NM	NM
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	230.3	-	50	-	-	76.4	-	11.6	93.2	0	-	-	0	504	NM	NM
Volatile Organic Compounds																		
BENZENE	µg/L	5	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.26)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	16 (0.5)
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	ND (2) (0.5)	ND (2) (0.5)	0.7 J (0.5)	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	0.5 J (0.5)	ND (2) (0.5)	130 (0.5)	ND (2.0) (0.45)	-	ND (2) (0.5)	ND (2) (0.5)	130 (0.5)	59 (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	13 (0.5)	11 (0.5)	ND (1) (0.5)	0.92 J (0.16)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	2.4 (0.16)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	0.6 J (0.5)	ND (1.0) (0.23)	-	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	3 (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.19)	-	ND (2) (0.5)	ND (2) (0.5)	46 (0.5)	130 (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2.0) (0.36)	-	ND (2) (0.5)	ND (2) (0.5)	14 (0.5)	48 (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1.0) (0.24)	-	ND (1) (0.5)	ND (1) (0.5)	8 (0.5)	190 (0.5)
Volatile Organic Compounds (SW8011)																		
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.020) (0.011)	-	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.020) (0.011)	-	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.010)
Semi-Volatile Organic Compounds																		
ANTHRACENE	µg/L	66	1.4 (0.010)	0.32 (0.010)	0.082 (0.010)	ND (0.10) (0.020)	-	0.011 J (0.010)	ND (0.050) (0.010)	0.080 (0.010)	0.15 (0.010)	0.61 (0.010)	ND (0.10) (0.020)	-	ND (0.050) (0.010)	0.45 (0.010)	220 (0.010)	20 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	0.61 (0.010)	0.034 J (0.010)	0.061 (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.058 (0.010)	0.037 J (0.010)	0.17 (0.010)	ND (0.10) (0.012)	-	ND (0.050) (0.010)	0.53 (0.010)	190 (0.010)	10 (0.010)
BENZO(A)PYRENE	µg/L	0.2	0.43 (0.010)	ND (0.050) (0.010)	0.031 J (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.026 J (0.010)	0.026 J (0.010)	0.14 (0.010)	ND (0.10) (0.012)	-	ND (0.050) (0.010)	0.40 (0.010)	130 (0.010)	5.6 (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	0.42 (0.010)	0.012 J (0.010)	0.044 J (0.010)	ND (0.10) (0.010)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.029 J (0.010)	0.031 J (0.010)	0.092 (0.010)	ND (0.10) (0.010)	-	ND (0.050) (0.010)	0.45 (0.010)	170 (0.010)	6.8 (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	0.23 (0.010)	ND (0.050) (0.010)	0.024 J (0.010)	ND (0.10) (0.016)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	ND (0.051) (0.010)	0.020 J (0.010)	0.064 (0.010)	ND (0.10) (0.016)	-	ND (0.050) (0.010)	0.18 (0.010)	38 (0.010)	1.3 (0.010)
CHRYSENE	µg/L	1.9	0.67 (0.010)	0.044 J (0.010)	0.077 (0.010)	ND (0.10) (0.012)	-	ND (0.051) (0.010)	ND (0.050) (0.010)	0.063 (0.010)	0.035 J (0.010)	0.33 (0.010)	ND (0.10) (0.012)	-	ND (0.050) (0.010)	0.68 (0.010)	210 (0.010)	17 (0.010)
FLUORENE	µg/L	1900	3.9 (0.010)	0.67 (0.010)	0.074 (0.010)	ND (0.10) (0.017)	-	0.075 (0.010)	ND (0.050) (0.010)	0.25 (0.010)	1.3 (0.010)	1.2 (0.010)	ND (0.10) (0.017)	-	ND (0.050) (0.010)	0.22 (0.010)	320 (0.010)	45 (0.010)
NAPHTHALENE	µg/L	100	0.65 (0.030)	0.072 (0.030)	0.038 J (0.030)	ND (0.10) (0.036)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	ND (0.061) (0.030)	0.34 (0.030)	0.27 (0.030)	ND (0.10) (0.036)	-	ND (0.060) (0.030)	0.53 (0.030)	830 (0.030)	110 (0.030)
PHENANTHRENE	µg/L	1100	0.63 (0.030)	0.15 (0.030)	0.041 J (0.030)	ND (0.10) (0.021)	-	ND (0.061) (0.030)	ND (0.060) (0.030)	ND (0.061) (0.030)	0.30 (0.030)	0.38 (0.030)	0.203 (0.021)	-	ND (0.060) (0.030)	0.46 (0.030)	1000 (0.030)	120 (0.030)
PYRENE	µg/L	130	2.1 (0.010)	0.31 (0.010)	0.59 (0.010)	ND (0.10) (0.015)	-	0.033 J (0.010)	ND (0.050) (0.010)	0.33 (0.010)	0.35 (0.010)	0.38 (0.010)	0.173 (0.015)	-	ND (0.050) (0.010)	1.5 (0.010)	370 (0.010)	28 (0.010)
Metals																		
ARSENIC	µg/L	10	-	-	-	4.9 (0.97)	-	-	-	-	-	-	10.6 (0.97)	-	-	-	-	-
COBALT	µg/L	35	-	-	-	ND (50) (0.59)	-	-	-	-	-	-	1.7 J (0.59)	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	17100 (24)	-	-	-	-	-	-	23100 (24)	-	-	-	-	-
LEAD	µg/L	5	-	-	-	5.7 (1.7)	-	-	-	-	-	-	ND (3.0) (1.7)	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	785 (0.40)	-	-	-	-	-	-	95.9 (0.40)	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	ND (0.20) (0.089)	-	-	-	-	-	-	ND (0.20) (0.089)	-	-	-	-	-
Metals, Dissolved																		
ARSENIC	µg/L	10	-	-	-	-	2.1 J (0.97)	-	-	-	-	-	-	1.9 J (0.97)	-	-	-	-
COBALT	µg/L	35	-	-	-	-	ND (50) (0.59)	-	-	-	-	-	-	1.6 J (0.59)	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	1150 (24)	-	-	-	-	-	-	4470 (24)	-	-	-	-
LEAD	µg/L	5	ND (1.0) (0.090)	ND (1.0) (0.090)	ND (1.0) (0.090)	-	6.0 (1.7)	ND (1.0) (0.090)	ND (1.0) (0.090)	ND (1.0) (0.090)	0.53 J (0.090)	0.17 J (0.090)	-					



Table 8

Historical Groundwater Analytical Results Summary - AOI 7 2013 to present  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Sample Location Sample Date			C-152		C-157	C-161	C-163		C-168	C-169	C-170			C-171		C-172	
			29-Jul-16	19-Aug-16	28-Jul-16	1-Aug-16	27-Jul-16	27-Jul-16	26-Jul-16	2-Aug-16	29-Jul-16	26-Aug-16	26-Aug-16	29-Jul-16	26-Aug-16	29-Jul-16	26-Aug-16
Sample ID			GW-11109614-C-152-072916-AC-033	GW-11109614-C152-081916-AC-05	GW-11109614-C-157-072816-JM-032	GW-11109614-C-161-080116-JM-035	GW-11109614-C-163-072716-AC-021	GW-11109614-C-163D-072716-AC-023	GW-11109614-C-168-072616-AC-019	GW-11109614-C-169-080216-JM-043	GW-11109614-C-170-072916-AC-029	GW-11109614-C-170-082616-AC-001	GW-11109614-C-170D-082616-AC-002	GW-11109614-C-171-072916-AC-031	GW-11109614-C-171-082616-AC-003	GW-11109614-C-172-072916-JM-038	GW-11109614-C-172-082616-AC-004
Sampling Company			GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD	GHD
Laboratory			LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
Laboratory Work Order			16889254	1698036	1688921	1689795	1688921	1688921	1687764	1689795	1689254	1700683	1700683	1689254	1700683	1689254	1700683
Laboratory Sample ID	Units	MSC-PA	8502285	8541535	8501219	8504219	8501209	8501211	8496062	8504223	8502282	8553542	8553543	8502283	8553545	8502287	8553546
Field Parameters																	
CONDUCTIVITY	mS/cm	n/v	NM	-	1.155	NM	1.66	1.66	NM	NM	4.03	4.96	-	2.44	2.45	0.995	1.63
DISSOLVED OXYGEN, FIELD MEASURED	mg/L	n/v	NM	-	4	NM	NM	NM	NM	NM	7.15	23.13	-	1.63	2.08	3.64	0.68
OXIDATION REDUCTION POTENTIAL, FIELD MEASURED	mV	n/v	NM	-	-86.4	NM	-114	-114	NM	NM	-126	-162	-	-121	-158	-48	-112
pH, FIELD MEASURED	S.U.	n/v	NM	-	6.89	NM	6.82	6.82	NM	NM	6.76	6.98	-	6.53	6.71	6.4	6.41
SPECIFIC CONDUCTANCE FIELD	mS/cm	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TEMPERATURE, FIELD MEASURED	deg c	n/v	NM	-	26.68	NM	23.99	23.99	NM	NM	25.11	21.44	-	23.28	21.67	22.49	25.55
TOTAL DISSOLVED SOLIDS, FIELD MEASURED	g/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TURBIDITY	NTU	n/v	NM	-	10	NM	0	0	NM	NM	310	711	-	0	1000.00 >	178.7	1000.00 >
Volatile Organic Compounds																	
BENZENE	µg/L	5	51 (0.5)	2 (0.5)	ND (1) (0.5)	1 (0.5)	ND (1) (0.5)	ND (1) (0.5)	600 (0.5)	370 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
1,2-DICHLOROETHANE (EDC)	µg/L	5	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
ETHYLBENZENE	µg/L	700	3 (0.5)	ND (1) (0.5)	ND (1) (0.5)	7 (0.5)	ND (1) (0.5)	ND (1) (0.5)	79 (0.5)	150 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
ISOPROPYLBENZENE (CUMENE)	µg/L	3500	15 (0.5)	3 (0.5)	ND (2) (0.5)	31 (0.5)	1 J (0.5)	1 J (0.5)	22 (0.5)	34 (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	0.7 J (0.5)	0.7 J (0.5)
METHYL TERTIARY BUTYL ETHER	µg/L	20	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (5) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOLUENE	µg/L	1000	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	14 (0.5)	210 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
TOTAL BTEX	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-TRIMETHYLBENZENE	µg/L	62	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	14 (0.5)	ND (2) (0.5)	ND (2) (0.5)	170 (0.5)	250 (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)
1,3,5-TRIMETHYLBENZENE	µg/L	1200	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	3 (0.5)	ND (2) (0.5)	ND (2) (0.5)	65 (0.5)	72 (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)	ND (2) (0.5)
XYLENES, TOTAL (DIMETHYLBENZENE)	µg/L	10000	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	0.7 J (0.5)	0.6 J (0.5)	470 (0.5)	600 (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)	ND (1) (0.5)
Volatile Organic Compounds (SW8011)																	
1,2-DIBROMOETHANE (EDB)	µg/L	0.05	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.029) (0.010)	0.027 J (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)	ND (0.028) (0.010)	ND (0.029) (0.010)
Semi-Volatile Organic Compounds																	
ANTHRACENE	µg/L	66	0.18 (0.010)	0.079 (0.010)	0.039 J (0.010)	1.4 (0.010)	0.50 (0.010)	0.36 (0.010)	0.96 (0.010)	14 (0.010)	0.17 (0.010)	0.19 (0.010)	0.24 (0.010)	0.25 (0.010)	0.32 (0.010)	0.23 (0.010)	0.58 (0.010)
BENZO(A)ANTHRACENE	µg/L	4.9	0.078 (0.010)	0.037 J (0.010)	0.012 J (0.010)	0.87 (0.010)	0.065 (0.010)	0.055 (0.010)	1.6 (0.010)	4.9 (0.010)	0.017 J (0.010)	0.040 J (0.010)	0.037 J (0.010)	0.028 J (0.010)	0.042 J (0.010)	0.15 (0.010)	0.17 (0.010)
BENZO(A)PYRENE	µg/L	0.2	0.048 J (0.010)	0.030 J (0.010)	0.011 J (0.010)	0.60 (0.010)	0.032 J (0.010)	0.024 J (0.010)	1.1 (0.010)	2.9 (0.010)	0.011 J (0.010)	0.047 J (0.010)	0.041 J (0.010)	0.011 J (0.010)	0.027 J (0.010)	0.11 (0.010)	0.097 (0.010)
BENZO(B)FLUORANTHENE	µg/L	1.2	0.060 (0.010)	0.031 J (0.010)	0.017 J (0.010)	0.87 (0.010)	0.046 J (0.010)	0.034 J (0.010)	1.4 (0.010)	3.1 (0.010)	0.015 J (0.010)	0.048 J (0.010)	0.046 J (0.010)	0.014 J (0.010)	0.033 J (0.010)	0.13 (0.010)	0.12 (0.010)
BENZO(G,H,I)PERYLENE	µg/L	0.26	0.021 J (0.010)	0.018 J (0.010)	0.011 J (0.010)	0.22 (0.010)	0.020 J (0.010)	0.014 J (0.010)	0.53 (0.010)	0.71 (0.010)	ND (0.050) (0.010)	0.031 J (0.010)	0.031 J (0.010)	ND (0.051) (0.010)	0.027 J (0.010)	0.043 J (0.010)	0.047 J (0.010)
CHRYSENE	µg/L	1.9	0.12 (0.010)	0.061 (0.010)	0.011 J (0.010)	0.85 (0.010)	0.085 (0.010)	0.074 (0.010)	1.6 (0.010)	19 (0.010)	0.024 J (0.010)	0.033 J (0.010)	0.044 J (0.010)	0.021 J (0.010)	0.039 J (0.010)	0.16 (0.010)	0.18 (0.010)
FLUORENE	µg/L	1900	0.51 (0.010)	0.25 (0.010)	ND (0.050) (0.010)	5.8 (0.010)	2.2 (0.010)	1.7 (0.010)	3.9 (0.010)	50 (0.010)	0.022 J (0.010)	0.054 (0.010)	0.062 (0.010)	0.064 (0.010)	0.036 J (0.010)	2.8 (0.010)	6.2 (0.010)
NAPHTHALENE	µg/L	100	2.9 (0.030)	0.39 (0.030)	ND (0.060) (0.030)	3.5 (0.030)	ND (0.061) (0.030)	ND (0.060) (0.030)	ND (0.32) (0.030)	360 (0.030)	0.068 (0.030)	0.11 (0.030)	0.11 (0.030)	0.037 J (0.030)	0.071 (0.030)	0.16 (0.030)	0.25 (0.030)
PHENANTHRENE	µg/L	1100	0.87 (0.030)	0.35 (0.030)	ND (0.060) (0.030)	5.6 (0.030)	0.89 (0.030)	0.58 (0.030)	3.0 (0.030)	170 (0.030)	ND (0.060) (0.030)	0.056 J (0.030)	0.059 J (0.030)	0.11 (0.030)	0.13 (0.030)	1.3 (0.030)	7.7 (0.030)
PYRENE	µg/L	130	0.30 (0.010)	0.17 (0.010)	0.042 J (0.010)	2.8 (0.010)	0.49 (0.010)	0.42 (0.010)	3.5 (0.010)	17 (0.010)	0.21 (0.010)	0.12 (0.010)	0.11 (0.010)	0.070 (0.010)	0.089 (0.010)	0.65 (0.010)	1.4 (0.010)
Metals																	
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals, Dissolved																	
ARSENIC	µg/L	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
COBALT	µg/L	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LEAD	µg/L	5	0.11 J (0.090)	0.12 J (0.090)	0.19 J (0.090)	0.19 J (0.090)	ND (1.0) (0.090)	ND (1.0) (0.090)	0.62 J (0.090)	ND (1.0) (0.090)	1.1 (0.090)	1.2 (0.090)	1.2 (0.090)	0.12 J (0.090)	0.64 J (0.090)	0.24 J (0.090)	0.77 J (0.090)
MANGANESE	µg/L	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MERCURY	µg/L	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																	
ALKALINITY, BICARBONATE (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALKALINITY, TOTAL (AS CaCO3)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHLORIDE (AS CL)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUORIDE	µg/L	4000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, AMMONIA (AS N)	µg/L	30000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE (AS N)	µg/L	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRATE-NITRITE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NITROGEN, NITRITE	µg/L	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFATE (AS SO4)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SULFIDE	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CARBON	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL DISSOLVED SOLIDS (RESIDUE, FILTERABLE)	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Historical Groundwater Analytical Results Summary - AOI 7 2013 to present  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

Notes:

MSC-PA	Pennsylvania Department of Environmental Protection - 2016 Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Groundwater - Used Aquifer, Non Residential, TDS ≤ 2500
6.5	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.50)	Laboratory reporting limit was greater than the applicable standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value in database - 2016 values have been populated for Evergreen Comprehensive List only. Criteria for other analytes may be available but may not be represented here.
-	Parameter not analyzed / not available.
NM	Not measured.
>	Report value is greater than associated value
B	Indicates the analyte is detected in the associated blank as well as in the sample.
J	Indicates an estimated value.
µg/L	Micrograms per liter.
mg/L	Milligrams per liter.
mV	Millivolts.
S.U.	Standard Units.
mS/cm	Microsiemens per centimeter.
deg c	Degrees Celcius.
g/L	Grams per liter.
NTU	Nephelometric Turbidity Units.
LL	Eurofins Lancaster Laboratories Environmental
	Method detection limit is shown in second set of parentheses.



Table 9

2016 Gauging Data for AOI 7 and Surrounding Area  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a Series of Evergreen Resources Group, LLC

AOI	Well ID	Top Inner Casing Elevation (ft msl) (NAVD88)	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent NAPL Thickness (ft)	Corrected Groundwater Elevation (ft AMSL)	Product Density	LNAPL Denisty Source Well	Comments	Date	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	Apparent NAPL Thickness (ft)	Corrected Groundwater Elevation (ft AMSL)	Product Density	LNAPL Denisty Source Well	Comments
AOI 7	C-104	9.53	7/19/2016		6.96		2.57											
AOI 7	C-105	9.17	7/19/2016		4.23		4.94											
AOI 7	C-106	11.54	8/1/2016	7.93	10.42	2.49	3.44	0.9306	C-106							0.9306	C-106	
AOI 7	C-108	8.27	7/19/2016		4.43		3.84											
AOI 7	C-112	10.96	7/29/2016		3.17		7.79											
AOI 7	C-113	11.65	7/19/2016		4.24		7.41											
AOI 7	C-127	9.8	7/21/2016		8.57		1.23											
AOI 7	C-129	8.941	8/1/2016		4.79		4.15											
AOI 7	C-129D	9.19	7/19/2016		9.71		-0.52											
AOI 7	C-130	11.984	7/19/2016		6.89		5.09											
AOI 7	C-131	10.14	7/19/2016		3.23		6.91											
AOI 7	C-132	9.973	7/19/2016		4.63		5.34											
AOI 7	C-134D	9.4	7/19/2016		11.81		-2.41											
AOI 7	C-136	8.846	7/19/2016		4.38		4.47											
AOI 7	C-138	6.95	7/19/2016		5.1		1.85											
AOI 7	C-140	7.545	7/19/2016		1.38		6.17											
AOI 7	C-142	11.352	7/19/2016		8.48		2.87											
AOI 7	C-144D	8.96	7/19/2016		13.48		-4.52											
AOI 7	C-145	6.922	7/19/2016		6.68		0.24											
AOI 7	C-146	6.739	8/1/2016	11.03	11.17	0.14	-4.31	0.8428	C-150							0.8428	C-150	
AOI 7	C-150	8.19	8/1/2016	13.45	13.46	0.01	-5.26	0.8428	C-150							0.8428	C-150	
AOI 7	C-152	9.38	7/21/2016	10.62	10.63	0.01	-1.25											
AOI 7	C-158	6.6311	7/19/2016		3.56		3.07											
AOI 7	C-161	9.07	8/1/2016		10.29		-1.22											
AOI 7	C-162	8.5	7/19/2016		11.52		-3.02											
AOI 7	C-163	6.8749	7/19/2016		4.6		2.27											
AOI 7	C-168	7.41	7/26/2016	3.66	3.92	0.26	3.71	0.8487	C-168							0.8487	C-168	
AOI 7	C-169	6.968	7/21/2016	11.71	12.61	0.9	-4.86	0.8737	C-161							0.8737	C-161	
AOI 7	C-49	9.58	7/21/2016		4.86		4.72											
AOI 7	C-50	12.77	7/19/2016		7.58		5.19											
AOI 7	C-50D	11.49	7/19/2016		12.15		-0.66											
AOI 7	C-51	9.26	7/19/2016		4.91		4.35											
AOI 7	C-52	7.63	7/27/2016		4.88		2.75											
AOI 7	C-54	6.61	7/19/2016		0.2		6.41											
AOI 7	C-57	8.5	7/26/2016		2.37		6.13											
AOI 7	C-58	7.42	7/19/2016		2.03		5.39											
AOI 7	C-60	7.44	7/21/2016		3.72		3.72											
AOI 7	C-61	7.93	7/21/2016		3.81		4.12											
AOI 7	C-62	11.4	7/19/2016		4.29		7.11											
AOI 7	C-96	12.88	7/19/2016		5.99		6.89											
AOI 7	C-97	10.52	7/21/2016	16.65	17.94	1.29	-6.33	0.8428	C-150							0.8428	C-150	
AOI 7	C-170	Damaged	7/28/2016		4.50		-				8/25/2016		4.81	-				
AOI 7	C-171	10.36	7/28/2016		3.58		6.78				8/25/2016		4.09	6.27				
AOI 7	C-172	5.91	7/28/2016		3.06		2.85				8/25/2016		3.88	2.03				

Notes:

ft btoc      feet below top of casing

NAVD88    North American Vertical Datum of 1988

ft AMSL    feet above mean sea level



Table 10

**Generalized Stratigraphic Section and Interpreted Hydrostratigraphic Units  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC**

System	Series	Hydrogeologic Unit		Hydrostratigraphic Unit
Quaternary	Holocene	Alluvium		
	Pleistocene	Trenton "gravel"		
Cretaceous	Upper Cretaceous	Potomac-Raritan-Magothy aquifer system	Upper clay unit	Unconfined (Water-Table) aquifer
			Upper sand unit	
			Middle clay unit	
			Middle sand unit	Lower aquifer
			Lower clay unit	
	Lower sand unit			
	Lower Cretaceous			
Pre-Cretaceous		Wissahickon Formation		

## Notes:

1. Adopted from Figure 2 of Schreffler, 2001.
2. Hydrostratigraphic units interpreted by Stantec based on observed AOI 1 subsurface conditions.



Table 11

**Summary of Available LNAPL Sample Data**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC**

Generalized LNAPL Type	Well ID	Sample Date	LNAPL Sub Types		Weathering	LNAPL Type Interpretation By
				Proportions %		
Heavy Distillate	C-106	2004	Heavy Distillate	100	Extreme	Stantec
Crude	C-146	2012	Crude	100	Extreme	Stantec
	C-150	2012	Crude	100	Extreme	Stantec
	C-152	2012	Crude	100	Severe	Stantec
	C-168	2012	Crude	100	Severe	Stantec
	C-169	2012	Crude	100	Extreme	Stantec
	C-97	2012	Crude	100	Extreme	Stantec



Table 12

**Vapor Intrusion Screening Building Information**  
**AOI 7 Remedial Investigation Report**  
**Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC**

<b>AOI</b>	<b>Building Number</b>	<b>Building Name</b>	<b>Approximate Footprint (square feet)</b>	<b>Height of Building</b>	<b>Basement</b>	<b>Description of Use</b>	<b># Indoor Air Samples Collected</b>
7	440	Shops/Offices	43350	2	No	2nd Floor 221	2
7						2nd Floor Meeting Room	2
7						1st Floor Lunch	0
7						1st Floor Lunch	0
7	442	Fire House	8250	1	No	Office Area	1
7	450	Electrical Bldg	53261	1	No	Electrical Building	5
7	595	Canteen Bldg	3763	1	No	Canteen	1
7	711	WTP Control House	1525	1	No	Control Room	1
7	6622	Control Room	1144	1	No	Control Room	1
7	6625	Control Room	800	1	No	Control Room	1
7	6626	Control Room	1000	1	No	Control Room	1



Table 13

Indoor Air Sampling Summary  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location									AOI7-AA-16-001	AOI7-AI-16-001	AOI7-AI-16-002	AOI7-AI-16-003
									Ambient, Near WTP Fence	595 Canteen Building	450 Elect Building, Computer Room	450 Building Elect Warehouse, Back Addition on Shelf
Sample Date									29-Mar-16	29-Mar-16	29-Mar-16	29-Mar-16
Sample ID									IA-AOI7-OUTDOOR	IA-AOI7-595	IA-AOI7-450-1	IA-AOI7-450-2
Sampling Company									GHD	GHD	GHD	GHD
Laboratory									ESC	ESC	ESC	ESC
Laboratory Work Order									L827327	L827327	L827327	L827327
Laboratory Sample ID									L827327-15	L827327-07	L827327-08	L827327-09
Sample Type	Units	VI-PA	OSHA	USEPA RSL	ACGIH TLV	NIOSH	MH Air Tox	USEPA Res IA				
Volatile Organic Compounds												
Benzene	µg/m <sup>3</sup>	16 <sup>A</sup>	3,190 <sup>B</sup>	1.6 <sup>CD</sup>	1,600 <sup>E</sup>	319 <sup>F</sup>	2.59	29	1.32	<b>4.63<sup>CD</sup></b>	1.00	0.860
1,2-Dibromoethane (EDB)	µg/m <sup>3</sup>	0.2 <sup>A</sup>	153,700 <sup>B</sup>	0.02 <sup>CD</sup>	n/v	346 <sup>F</sup>	n/v	n/v	ND (1.54)	ND (1.54)	ND (1.54)	ND (1.54)
1,2-Dichloroethane (EDC)	µg/m <sup>3</sup>	4.7 <sup>A</sup>	202,400 <sup>B</sup>	0.47 <sup>CD</sup>	40,500 <sup>E</sup>	4,000 <sup>F</sup>	0.16	0.2	ND (0.810)	ND (0.810)	ND (0.810)	ND (0.810)
Ethylbenzene	µg/m <sup>3</sup>	49 <sup>A</sup>	435,000 <sup>B</sup>	4.9 <sup>CD</sup>	86,800 <sup>E</sup>	435,000 <sup>F</sup>	0.68	17	ND (0.867)	ND (0.867)	1.12	ND (0.867)
Isopropylbenzene (Cumene)	µg/m <sup>3</sup>	1,800 <sup>A</sup>	245,000 <sup>B</sup>	1,800 <sup>C</sup> 180 <sup>D</sup>	246,000 <sup>E</sup>	245,000 <sup>F</sup>	11.2	n/v	ND (0.983)	ND (0.983)	ND (0.983)	ND (0.983)
Methyl Tert-Butyl Ether	µg/m <sup>3</sup>	470 <sup>A</sup>	n/v	47 <sup>CD</sup>	180,000 <sup>E</sup>	n/v	n/v	72	ND (0.721)	ND (0.721)	ND (0.721)	ND (0.721)
Naphthalene	µg/m <sup>3</sup>	3.6 <sup>A</sup>	50,000 <sup>B</sup>	0.36 <sup>CD</sup>	52,000 <sup>E</sup>	50,000 <sup>F</sup>	n/v	4.8*	ND (3.30)	ND (3.30)	ND (3.30)	ND (3.30)
Toluene	µg/m <sup>3</sup>	22,000 <sup>A</sup>	754,000 <sup>B</sup>	22,000 <sup>C</sup> 2,200 <sup>D</sup>	75,400 <sup>E</sup>	375,000 <sup>F</sup>	4.52	144	4.05	5.51	10.5	3.15
1,2,4-Trimethylbenzene**	µg/m <sup>3</sup>	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	1.12	19	ND (0.982)	1.09	1.05	ND (0.982)
1,3,5-Trimethylbenzene**	µg/m <sup>3</sup>	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	0.38	6.5	ND (0.982)	ND (0.982)	ND (0.982)	ND (0.982)
Total Xylene	µg/m <sup>3</sup>	440 <sup>A</sup>	435,000 <sup>B</sup>	44 <sup>CD</sup>	434,000 <sup>E</sup>	435,000 <sup>F</sup>	3.14	63.5	1.99	3.371	6.25	2.09

Notes:

VI-PA <sup>A</sup>	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (Draft, July 2015)
OSHA <sup>B</sup>	Occupational Safety and Health Administration - Permissible Exposure Limits
USEPA RSL	United States Environmental Protection Agency
<sup>C</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 1.0.
<sup>D</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
**	The RSL for TMB were calculated using the September 2016 final IRIS RfD.
ACGIH TLV	American Conference of Governmental Industrial Hygienists
<sup>E</sup>	Threshold Limit Value
NIOSH	National Institute for Occupational Safety and Health
<sup>F</sup>	Recommended Exposure Limits
MH Air Tox	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
<b>6.5<sup>A</sup></b>	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
J	Indicates an estimated value.



Table 13

Indoor Air Sampling Summary  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location									AOI7-AI-16-004	AOI7-AI-16-005	AOI7-AI-16-006	AOI7-AI-16-007
									450 Building Elect Warehouse, North Side	450 Building Elect Warehouse, Walled area Middle Bldg, Elect Testing	450 Building Elect Warehouse Table East Side Near Open Offices	442 Building Firehouse Office Table Office
Sample Date									29-Mar-16	29-Mar-16	29-Mar-16	29-Mar-16
Sample ID									IA-AOI7-450-3	IA-AOI7-450-4	IA-AOI7-450-5	IA-AOI7-442
Sampling Company									GHD	GHD	GHD	GHD
Laboratory									ESC	ESC	ESC	ESC
Laboratory Work Order									L827327	L827327	L827327	L827327
Laboratory Sample ID									L827327-10	L827327-11	L827327-12	L827327-13
Sample Type	Units	VI-PA	OSHA	USEPA RSL	ACGIH TLV	NIOSH	MH Air Tox	USEPA Res IA				
Volatile Organic Compounds												
Benzene	µg/m³	16 <sup>A</sup>	3,190 <sup>B</sup>	1.6 <sup>CD</sup>	1,600 <sup>E</sup>	319 <sup>F</sup>	2.59	29	0.973	1.54	<u>1.99</u> <sup>CD</sup>	<u>1.68</u> <sup>CD</sup>
1,2-Dibromoethane (EDB)	µg/m³	0.2 <sup>A</sup>	153,700 <sup>B</sup>	0.02 <sup>CD</sup>	n/v	346 <sup>F</sup>	n/v	n/v	ND (1.54)	ND (1.54)	ND (1.54)	ND (1.54)
1,2-Dichloroethane (EDC)	µg/m³	4.7 <sup>A</sup>	202,400 <sup>B</sup>	0.47 <sup>CD</sup>	40,500 <sup>E</sup>	4,000 <sup>F</sup>	0.16	0.2	ND (0.810)	ND (0.810)	ND (0.810)	ND (0.810)
Ethylbenzene	µg/m³	49 <sup>A</sup>	435,000 <sup>B</sup>	4.9 <sup>CD</sup>	86,800 <sup>E</sup>	435,000 <sup>F</sup>	0.68	17	ND (0.867)	1.19	2.58	1.38
Isopropylbenzene (Cumene)	µg/m³	1,800 <sup>A</sup>	245,000 <sup>B</sup>	1,800 <sup>C</sup> 180 <sup>D</sup>	246,000 <sup>E</sup>	245,000 <sup>F</sup>	11.2	n/v	ND (0.983)	ND (0.983)	ND (0.983)	ND (0.983)
Methyl Tert-Butyl Ether	µg/m³	470 <sup>A</sup>	n/v	47 <sup>CD</sup>	180,000 <sup>E</sup>	n/v	n/v	72	ND (0.721)	ND (0.721)	ND (0.721)	ND (0.721)
Naphthalene	µg/m³	3.6 <sup>A</sup>	50,000 <sup>B</sup>	0.36 <sup>CD</sup>	52,000 <sup>E</sup>	50,000 <sup>F</sup>	n/v	4.8*	ND (3.30)	ND (3.30)	ND (3.30)	ND (3.30)
Toluene	µg/m³	22,000 <sup>A</sup>	754,000 <sup>B</sup>	22,000 <sup>C</sup> 2,200 <sup>D</sup>	75,400 <sup>E</sup>	375,000 <sup>F</sup>	4.52	144	4.12	8.91	49.8	19.1
1,2,4-Trimethylbenzene**	µg/m³	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	1.12	19	ND (0.982)	1.23	2.13	1.22
1,3,5-Trimethylbenzene**	µg/m³	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	0.38	6.5	ND (0.982)	ND (0.982)	ND (0.982)	ND (0.982)
Total Xylene	µg/m³	440 <sup>A</sup>	435,000 <sup>B</sup>	44 <sup>CD</sup>	434,000 <sup>E</sup>	435,000 <sup>F</sup>	3.14	63.5	ND (1.73)	4.46	10.76	4.99

Notes:

VI-PA <sup>A</sup>	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (Draft, July 2015)
OSHA <sup>B</sup>	Occupational Safety and Health Administration - Permissible Exposure Limits
USEPA RSL	United States Environmental Protection Agency
<sup>C</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 1.0.
<sup>D</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
**	The RSL for TMB were calculated using the September 2016 final IRIS RfD.
ACGIH TLV	American Conference of Governmental Industrial Hygienists
<sup>E</sup>	Threshold Limit Value
NIOSH	National Institute for Occupational Safety and Health
<sup>F</sup>	Recommended Exposure Limits
MH Air Tox	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
<b>6.5<sup>A</sup></b>	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
J	Indicates an estimated value.



Table 13  
Indoor Air Sampling Summary  
AOI 7 Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Sample Location									AOI7-AI-16-008	AOI7-AI-16-009	AOI7-AI-16-010	AOI7-AI-16-011
									711 Building, WTP	6622 Building, Control Room, Rear Table Center of Room	6626 Building, Control Room	6625 Building, Control Room, MF Unit
Sample Date									29-Mar-16	29-Mar-16	29-Mar-16	29-Mar-16
Sample ID									IA-AOI7-711	IA-AOI7-6622	IA-AOI7-6626	IA-AOI7-6625
Sampling Company									GHD	GHD	GHD	GHD
Laboratory									ESC	ESC	ESC	ESC
Laboratory Work Order									L827327	L827327	L827327	L827327
Laboratory Sample ID									L827327-14	L827327-16	L827327-17	L827327-18
Sample Type	Units	VI-PA	OSHA	USEPA RSL	ACGIH TLV	NIOSH	MH Air Tox	USEPA Res IA				
Volatile Organic Compounds												
Benzene	µg/m <sup>3</sup>	16 <sup>A</sup>	3,190 <sup>B</sup>	1.6 <sup>CD</sup>	1,600 <sup>E</sup>	319 <sup>F</sup>	2.59	29	<u>2.22</u> <sup>CD</sup>	<u>3.52</u> <sup>CD</sup>	<u>3.36</u> <sup>CD</sup>	<u>1.63</u> <sup>CD</sup>
1,2-Dibromoethane (EDB)	µg/m <sup>3</sup>	0.2 <sup>A</sup>	153,700 <sup>B</sup>	0.02 <sup>CD</sup>	n/v	346 <sup>F</sup>	n/v	n/v	ND (1.54)	ND (1.54)	ND (1.54)	ND (1.54)
1,2-Dichloroethane (EDC)	µg/m <sup>3</sup>	4.7 <sup>A</sup>	202,400 <sup>B</sup>	0.47 <sup>CD</sup>	40,500 <sup>E</sup>	4,000 <sup>F</sup>	0.16	0.2	ND (0.810)	ND (0.810)	ND (0.810)	ND (0.810)
Ethylbenzene	µg/m <sup>3</sup>	49 <sup>A</sup>	435,000 <sup>B</sup>	4.9 <sup>CD</sup>	86,800 <sup>E</sup>	435,000 <sup>F</sup>	0.68	17	ND (0.867)	<u>4.94</u> <sup>CD</sup>	1.60	4.22
Isopropylbenzene (Cumene)	µg/m <sup>3</sup>	1,800 <sup>A</sup>	245,000 <sup>B</sup>	1,800 <sup>C</sup> 180 <sup>D</sup>	246,000 <sup>E</sup>	245,000 <sup>F</sup>	11.2	n/v	ND (0.983)	1.27	2.09	ND (0.983)
Methyl Tert-Butyl Ether	µg/m <sup>3</sup>	470 <sup>A</sup>	n/v	47 <sup>CD</sup>	180,000 <sup>E</sup>	n/v	n/v	72	ND (0.721)	ND (0.721)	ND (0.721)	ND (0.721)
Naphthalene	µg/m <sup>3</sup>	3.6 <sup>A</sup>	50,000 <sup>B</sup>	0.36 <sup>CD</sup>	52,000 <sup>E</sup>	50,000 <sup>F</sup>	n/v	4.8*	ND (3.30)	ND (3.30)	ND (3.30)	ND (3.30)
Toluene	µg/m <sup>3</sup>	22,000 <sup>A</sup>	754,000 <sup>B</sup>	22,000 <sup>C</sup> 2,200 <sup>D</sup>	75,400 <sup>E</sup>	375,000 <sup>F</sup>	4.52	144	3.93	7.29	3.06	71.4
1,2,4-Trimethylbenzene**	µg/m <sup>3</sup>	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	1.12	19	2.94	21.6	3.81	6.40
1,3,5-Trimethylbenzene**	µg/m <sup>3</sup>	31 <sup>A</sup>	n/v	260 <sup>C</sup> 26 <sup>D</sup>	123,000 <sup>E</sup>	125,000 <sup>F</sup>	0.38	6.5	0.984	6.81	1.19	1.78
Total Xylene	µg/m <sup>3</sup>	440 <sup>A</sup>	435,000 <sup>B</sup>	44 <sup>CD</sup>	434,000 <sup>E</sup>	435,000 <sup>F</sup>	3.14	63.5	3.5	24.69	7.19	17.05

Notes:

VI-PA <sup>A</sup>	PADEP Indoor Air Statewide Health Standard Vapor Intrusion Screening Values, Non-Residential (Draft, July 2015)
OSHA <sup>B</sup>	Occupational Safety and Health Administration - Permissible Exposure Limits
USEPA RSL	United States Environmental Protection Agency
<sup>C</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 1.0.
<sup>D</sup>	Regional Screening Level for Non-residential indoor air Hazard Index of 0.1.
**	The RSL for TMB were calculated using the September 2016 final IRIS RfD.
ACGIH TLV	American Conference of Governmental Industrial Hygienists
<sup>E</sup>	Threshold Limit Value
NIOSH	National Institute for Occupational Safety and Health
<sup>F</sup>	Recommended Exposure Limits
MH Air Tox	Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.
USEPA Res IA	USEPA Background Residential Indoor Air 2011, 95th percentile.
*	95th percentile value not provided, value is 90th percentile.
<b>6.5<sup>A</sup></b>	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
ND (0.03)	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v	No standard/guideline value.
J	Indicates an estimated value.



Table 14

**Outdoor Air Sampling Summary  
Remedial Investigation Report  
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC**

<b>Sample Location:</b>				<b>AOI7-AA-16-001</b>	<b>AOI7-AA-16-002</b>	<b>AOI7-AA-16-003</b>
<b>Sample ID:</b>				<b>AOI7-AA-16-001</b>	<b>AOI7-AA-16-002</b>	<b>AOI7-AA-16-003</b>
<b>Sample Date:</b>				<b>07/28/2016</b>	<b>07/28/2016</b>	<b>07/28/2016</b>
<b>Parameters</b>	<b>Units</b>	<b>MH Air Tox</b>	<b>USEPA Res IA</b>			
<b>Volatile Organic Compounds</b>						
1,2,4-Trimethylbenzene	µg/m <sup>3</sup>	1.12	19	2.1 J	1.4 J	1.8 J
1,2-Dibromoethane (Ethylene dibromide)	µg/m <sup>3</sup>	N/V	N/V	ND(7.7)	ND(7.7)	ND(7.7)
1,2-Dichloroethane	µg/m <sup>3</sup>	0.16	0.2	ND(4.0)	ND(4.0)	ND(4.0)
1,3,5-Trimethylbenzene	µg/m <sup>3</sup>	0.38	6.5	1.0 J	ND(4.9)	ND(4.9)
Benzene	µg/m <sup>3</sup>	2.59	29	4.7	5.4	4.5
Ethylbenzene	µg/m <sup>3</sup>	0.68	17	2.0 J	1.6 J	1.8 J
Isopropyl benzene	µg/m <sup>3</sup>	11.2	N/V	1.5 J	1.4 J	1.7 J
Methyl tert butyl ether (MTBE)	µg/m <sup>3</sup>	N/V	72	ND(3.6)	ND(3.6)	ND(3.6)
Naphthalene	µg/m <sup>3</sup>	N/V	4.8*	4.8 J	ND(5.2)	ND(5.2)
Toluene	µg/m <sup>3</sup>	4.52	144	5.5	5.9	3.9
Xylenes (total)	µg/m <sup>3</sup>	3.14	63.5	10.2 J	7.6 J	8.8 J

## Notes:

J - Estimated concentration.

ND - Not detected at the associated reporting limit.

N/V - No criteria value.

MH Air Tox - Marcus Hook Air Toxics Monitor 2015, maximum value of PADEP data accessed February 5, 2016.

USEPA Res IA - USEPA Background Residential Indoor Air 2011, 95th percentile.

\* 95th percentile value not provided, value is 90th percentile.