Philadelphia Coke Co., Inc.

REMEDIAL INVESTIGATION REPORT AND CLEANUP PLAN

Former Philadelphia Coke Plant

Philadelphia, Pennsylvania

PADEP eFACTS Site ID #833593
& Facilities ID #609978

EPA ID #PAD000427906

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July 2021

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
AMSL	above mean sea level
ASTM	American Society Testing and Materials
BaA	benz(a)anthracene
BaP	benzo(a)pyrene
BbF	benzo(b)fluoranthene
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
cm/sec	centimeters per second
CFR	Code of Federal Regulations
COCs	constituents of concern
COPEC	constituent of potential ecological concern
CSM	conceptual site model
DNAPL	dense non-aqueous phase liquid
DRBC	Delaware River Basin Commission
E&SC	Erosion and Sedimentation Control
EPA	United State Environmental Protection Agency
ESBs	ecotoxicological screening benchmarks
ES	ecological screening
ft/day	feet per day
g/cm^3	grams per cubic centimeter
GC/FID	gas chromatography with flame ionization detector
GC/TCD	gas chromatography with thermal conductivity detector
GEI	GEI Consultants Inc.
GPS	global positioning system
GW	groundwater
HASP	Health and Safety Plan
HQ	hazard quotient

HSA	hollow-stem auger
HWMU	RCRA Hazardous Waste Management Unit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSCs	medium-specific concentrations
MTBE	methyl-tert-butyl ether
NAD 83	North American Datum of 1983 State Plane of Pennsylvania-South
NAPL	non-aqueous phase liquid
NAVD 88	North American Vertical Datum of 1988
NTUs	Nephelometric Turbidity Units
NIR	Notice of Intent to Remediate
PFBC	Pennsylvania Fish and Boat Commission
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources (predecessor of PADEP)
PADNR	Pennsylvania Department of Natural Resources
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCC	Philadelphia Coke Company, Inc.
PID	photoionization detector
PIP	Public Involvement Plan
PNDI	Pennsylvania Natural Diversity Inventory
PP	Priority Pollutant
PPE	personal protective equipment
PS&S	Paulus, Sokolowski and Sartor, Engineering, PC
PVC	polyvinyl chloride
QA/QC	quality assurance and quality control
QD	Quick Domenico
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
S-GW	soil-to-groundwater MSCs for a non-residential used aquifer with TDS less than or equal to 2,500 ppm

SHS	Statewide Health Standards
SMD	scientific/management decision
SRI	Supplemental Remedial Investigation
SVOCs	semivolatile organic compounds
SWMU	RCRA Solid Waste Management Units
TAL	Target Analyte List
TCE	trichloroethene
TCL	Target Compound List
TDS	total dissolved solids
TGM	PADEP Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil Under Act 2 (PADEP 2019)
TSCA	Toxic Substances Control Act
TPH	Total Petroleum Hydrocarbon
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USDOT	United States Department of Transportation
UST	underground storage tank
USFWS	United States Fish and Wildlife Service
VI	vapor intrusion
VOCs	volatile organic compounds
WCC	Woodward-Clyde Consultants

EXECUTIVE SUMMARY

On behalf of Philadelphia Coke, Co., Inc., Arcadis U.S. Inc. (Arcadis) has prepared this Remedial Investigation (RI) Report and Cleanup Plan for the Former Philadelphia Coke Plant location in the Bridesburg Borough of Philadelphia, Pennsylvania (the Site). The Site is located at 4501 Richmond Street between Orthodox Street and Buckius Street and is adjacent to the Delaware River. The Site is approximately 63 acres in size and is currently unoccupied. The Site is overgrown with vegetation and only remnants of the former operating structures, foundations, and concrete pads remain. All former structures at the Site have been demolished to ground level. A mix of residential, industrial, and commercial uses surrounds the Site. Plans are currently being prepared for Site redevelopment and use for commercial warehousing (see Exhibit 1).

Site operations concluded in 1989. Resource Conservation and Recovery Act (RCRA) Closure actions were conducted at the plant in the late 1980s to address source area contamination located at specific RCRA Hazardous Waste Management Units. Extensive soil remediation was performed as part of the RCRA closure with nearly 39,000 tons of soil transported offsite for treatment/disposal. In addition, bioremediation was performed in a former fuel blending area and former underground storage tanks and residual oil in piping removed. Periodic (typically quarterly) groundwater monitoring began in April 1985 to evaluate groundwater conditions at the Site. The Certificate of Completion for RCRA Site Closure was issued by the United States Environmental Protection Agency (EPA) on December 28, 1994 (WCC 1994). Following receipt of the Certificate of Completion, PCC continued to monitor groundwater quarterly, until the Pennsylvania Department of Environmental Protection (PADEP) authorized termination of the groundwater monitoring program in a July 26, 1999 letter. No outstanding closure responsibilities associated with the RCRA Corrective Action remain. The Site has not been occupied since 1991. Other than the Site investigations discussed herein and site investigations conducted for Site redevelopment (under a Site-specific health and safety plan), no other Site activities or operations besides routine mowing and maintenance of the perimeter chain-link fence have been conducted since the RCRA Closure.

RI Activities and Results

The RI was undertaken to assess the nature and extent of residual Site-related environmental impacts, if any, and evaluate the risks posed to human health and the environment by those impacts. The RI was performed in two major phases: (1) the Initial RI activities from 2003 through 2006; and (2) the Supplemental RI activities from 2018 and 2019. When combined, work activities performed for the RI consisted of the following:

- Excavating 197 test pits and collecting soil samples from 145 test pits.
- Installing 179 soil borings and collecting soil samples from 150 soil borings.
- Installing and sampling 33 shallow groundwater monitoring wells, 13 deep groundwater monitoring wells, and 7 hydropunch borings.
- Analyzing approximately 540 soil samples and 112 groundwater samples for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), inorganics, cyanide, pesticides, and/or polychlorinated biphenyls (PCBs).

- Collecting 21 soil gas samples and one ambient air sample for VOCs (via Method TO-15), Naphthalene (via GC/MS in the full scan mode) methane, and fixed gases (via American Society Testing and Materials Method D-1946).
- Performing sediment probing in the Delaware River and a visual reconnaissance of the shoreline for sheens, tar-like material, elevated photoionization detector readings, or other observable indications of Site-related impacts.

The results of the RI provide adequate coverage across the Site to: (1) identify and delineate residual environmental conditions; (2) support a Risk Assessment Report; (3) develop a Cleanup Plan; and (4) support Site redevelopment.

Based on observations of soil samples recovered from soil borings across the Site, there are three hydrogeological units above weathered metamorphic schist bedrock. Nearest the ground surface is a layer of man-made fill materials that generally meets the description of historic fill as defined in Pennsylvania Department of Environmental Protection's Management of Fill Policy (Document #258-2182-773) dated January 1, 2020. A confining unit of silt and clay material underlies the fill materials and underneath that confining unit is a sand and gravel unit. Groundwater at the Site is separated into a shallow and deep zone by the silt and clay layer. Shallow groundwater is located within the historic fill and mounds in the central/southern portion of the Site and flows radially outward from the mound. The shallow aquifer was formed by the historical placement of fill above native surface soils. Due to the presence and characteristics of the historic fill, it is not suitable for use. Deep groundwater is located within the sand and gravel unit flows eastward toward the Delaware River. Groundwater does not appear to be tidally influenced or affected by the presence of the municipal Upper Delaware Connecting Sewer (reportedly 11-foot-3-inch to 12-foot-3-inch diameter) that bisects the western portion of the Site, other than a limited tidal influence on deep groundwater (generally less than 1 foot) nearest to the Delaware River. The Upper Delaware Collecting Sewer conveys regional storm water deep beneath the Site; however, it does not collect any storm water from the Site itself.

Soil analytical results and visual impacts (e.g., viscous tar, oil-like material, and solidified tar) indicate the presence of localized impacts in the center of the Site and at isolated locations on the remainder of the Site. In general, visual impacts are associated with the former process piping and foundations, except for impacts found in the vicinity of a former aboveground storage tank farm (east of Former Byproducts Building). Visual impacts are limited to the fill layer or the top few feet of the silt and clay layer and were not observed to have penetrated the confining unit. Based on the observed variations between original and revisited sampling locations from the Initial RI to the Supplemental RI, viscous tar and oil-like material appear to be limited to isolated pockets and not reproduceable from the original sampling event (i.e., not as extensive and/or contiguous as the Initial RI indicates). Additionally, groundwater analytical results do not indicate the presence of source material onsite.

Areas of the Site exhibiting elevated concentrations of chemical constituents and visual impacts have been delineated for purposes of cleanup plan development. Laboratory analytical results of soil, groundwater, and soil gas samples are summarized below:

- Surface soil with chemical constituents at concentrations exceeding non-residential direct contact medium-specific concentrations (MSCs) is mostly limited to polycyclic aromatic hydrocarbons (PAHs), arsenic, and lead at concentrations commonly associated with urban/historic fill. PAH concentrations for benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenz(a,h)anthracene were not typical of urban fill at one location (PCTP-66) which was revisited during the Supplemental RI and surrounded by additional sampling locations to delineate the extent of the impacts around this location. Additionally, lead concentrations not typical of urban fill were observed in the Fuel Blending Area and at two locations in the center of the Site. Surface soil impacts (concentrations above MSCs) are encountered throughout the Site given the presence of urban fill.

- Non-residential direct contact MSCs for subsurface soil are not exceeded at any location for the parameters analyzed (i.e., VOCs, SVOCs, inorganics including cyanide, PCBs, and pesticides). VOC and SVOC concentrations that exceed the non-residential soil-to-groundwater MSCs by an order or magnitude or more are typically collocated with visual impacts. Based on exceedances of the non-residential soil-to-groundwater MSCs, arsenic and lead in subsurface soil are the primary inorganic constituents of concern (COCs) for subsurface soil.
- Groundwater impacts are generally limited to areas where viscous tar and oil-like materials were observed. Groundwater monitoring wells installed downgradient of these areas indicate that Site-related groundwater impacts do not extend offsite. Outside of these isolated areas, groundwater is unimpacted by former Site operations; existing groundwater conditions are typical of groundwater in urban/historic fill.
- When compared to applicable non-residential vapor intrusion (VI) standards, soil and groundwater analytical results indicate the potential for soil related VI in future buildings in certain areas onsite in the absence of remediation or mitigation. However, soil gas analytical results did not exceed the sub-slab VI screening values, indicating that the VI potential may be over-predicted by the soil and groundwater analytical results.
- No surface or subsurface soil sample concentrations exceed the applicable non-residential, direct contact or soil-to-groundwater MSCs for pesticides and PCBs. Therefore, further activities will be focused on the VOCs, SVOCs, and inorganic constituents.

Based on the RI results, several PAHs, arsenic, and lead related to urban/historic fill were detected in surface soil throughout the Site. The COCs related to Site operations include: several PAHs and lead in surface soil; several VOCs, SVOCs, and inorganics in subsurface soil; and benzene, several SVOCs, and inorganics in groundwater. Site-related impacts in soil and groundwater have been delineated for purposes of developing a cleanup plan.

From a risk perspective, there are currently no complete exposure pathways for human receptors. Soil exposure is controlled by Site use (i.e., the Site is vacant), Site fencing, vegetation, and the presence of non-permeable surface covers (e.g., old asphalt parking lots). No current exposure pathways are complete for groundwater or soil vapor.

Future use of the Site will be restricted to non-residential by use of an environmental covenant. Potentially complete future exposure pathways could exist via soil, groundwater, and VI. However, groundwater is not used or anticipated to be used for potable purposes at the Site and in the surrounding area. Pathway elimination strategies will be integrated with the Site development plans to mitigate potentially complete future exposure pathways to ensure protection of human health and the environment.

Potentially complete exposure pathways for ecological receptors are direct contact and incidental ingestion of surface soil, and ingestion of contaminated prey. Direct contact to the historic fill is most likely to occur from burrowing mammals or small mammals that may incidentally ingest soil as part of their dietary exposure to prey items in the existing leaf litter. Larger wildlife (e.g., deer) may forage on the vegetation present, but would have limited dietary exposure to surface soil. Similar to the means for addressing human exposure, capping and/or limited removal of COCs as part of a protective cleanup plan will effectively eliminate potential ecological exposure to surface soil at the Site.

Cleanup Plan Summary

Based on the RI results, Philadelphia Coke Co., Inc. proposes to pursue a release of liability under the Act 2 Site-Specific Standard via a “pathway elimination” cleanup approach. Potentially complete future exposure pathways will be eliminated using engineering and institutional controls. The Cleanup Plan has been developed and presents the proposed methods to prevent further migration and eliminate potentially complete future exposure pathways. Although source material (e.g., non-aqueous phase liquid), was not encountered in the RI, the Cleanup Plan also includes provisions for addressing source material if encountered in the future. The remedial strategies presented in the Cleanup Plan will be integrated with Site development plans, once finalized. Conceptual development plans are currently being prepared and include commercial warehouse buildings, parking lots, access roads, driveways, and various landscape features, as shown in Exhibit 1.

The proposed remediation will achieve the Site cleanup objectives to protect human health by mitigating identified future exposure pathways with soils and groundwater impacted by applicable Site COCs. The Cleanup Plan:

- Provides methods to achieve pathway elimination for soils using engineering controls (i.e., capping of soils with structures, roadways, parking lots, and landscaping).
- Provides methods to achieve pathway elimination for vapor intrusion using engineering controls (i.e., use of a vapor barrier specifically designed, manufactured and installed for use in VOC mitigation) within areas of potential VI concern.
- Outlines procedures and plans to allow for safe execution of future Site remediation and/or redevelopment activities.
- Specifies institutional controls to be implemented (i.e., deed notice, restrictions, or other appropriate vehicles).
- Outlines a Post-Remediation Care Plan.

The remedial goals for soil will be to allow historic fill and impacted soils to remain in place or be reused onsite (e.g., as subsurface fill), to the extent possible, while mitigating potentially complete exposure pathways via engineering and institutional controls.

The engineering controls may consist of: (1) caps(s) overlaying areas where potential pathways exist for direct contact exposure; and (2) a VI mitigation system(s) within areas of potential VI concern identified by initial VI screening (as specified within this report) or a building-specific VI risk assessment addressing any potential future development. The proposed cap may include concrete floor slabs/foundations for new buildings; asphalt pavement and/or concrete for driveways, parking areas, and sidewalks; and/or 2-feet of clean soil (e.g., in landscaped areas) to eliminate potential direct contact exposure scenarios. Engineering controls (e.g., vapor barriers) may be used, where appropriate, to mitigate the potential VI pathway for COCs. Although not needed in certain areas of the Site (e.g., the western portion of the Site along Richmond Street), the current redevelopment plans are to install VI mitigation systems for all proposed occupied structures onsite. Alternatively, the Site-Specific Standard may also be pursued through completion of a cumulative VI risk assessment and/or additional soil-gas sampling to demonstrate that VI mitigation is not needed.

An environmental covenant with deed restrictions/notifications will be incorporated as an institutional control. The Site will be restricted to non-residential use to limit potential future receptors, and groundwater use will be prohibited to eliminate potential future groundwater exposure pathways. In addition, institutional controls will stipulate inspection, periodic maintenance/repair activities, and reporting requirements for soil caps and VI mitigation systems, as appropriate.

Additional details of site-specific engineering controls will be provided in the future (via Cleanup Plan Addendum), when site development occurs in the near term. Following implementation of the remedy included in the approved Cleanup Plan, a Final Report will be prepared in accordance with Act 2 requirements to obtain a release of environmental liability for the Site.

1 INTRODUCTION

On behalf of Philadelphia Coke Co., Inc. (PCC), Arcadis U.S. Inc (Arcadis) has prepared this Remedial Investigation (RI) Report and Cleanup Plan for the Former Philadelphia Coke Plant location in the Bridesburg borough of Philadelphia, Pennsylvania (the Site). This RI Report and Cleanup Plan was prepared in accordance with Pennsylvania's Land Recycling Program Technical Guidance Manual updated on January 19, 2019, the Land Recycling and Environmental Remediation Standards Act (Act 2), and its enabling regulations, 25 PA Code, Chapter 250. This report provides:

- A summary of the RI activities performed to delineate the nature and extent of Site-related chemical constituents (constituents of concern [COCs]) at the Site.
- An Ecological Screening to evaluate potential exposure of environmental receptors at the Site.
- An assessment of potentially complete exposure pathways (current and future) associated with the COCs.
- A Cleanup Plan for affected media at the Site to mitigate the potentially complete future exposure pathways based on identified conditions.
- A post-remediation care plan to ensure that no future exposure pathways to remaining COCs at the Site exist.

A Notice of Intent to Remediate (NIR) was submitted to Pennsylvania Department of Environmental Protection (PADEP) on November 19, 2018 (Appendix A). The NIR stated that PCC is seeking a release of liability under the Act 2 Site-Specific Standard.

The objective of the Act 2 Site-Specific Standard is to develop and evaluate detailed site information to provide a protective cleanup standard unique to that site. The Site-Specific Standard is a risk management approach (PADEP 2019a). For the purposes of this Site, the proposed Site-Specific Standard will generally be the "pathway-elimination" approach, which means that potentially completed future exposure pathways will be eliminated using engineering and institutional controls. Engineering controls that may be implemented at the Site include covering impacted soils with asphalt/ concrete paving, building structures and/or clean soil covers to prevent direct contact exposure to Site COCs and installation of barriers or vapor mitigation systems to mitigate potential vapor intrusion (VI) into future buildings constructed on the property. Institutional controls that could be considered include deed restrictions/environmental covenants: (1) prohibiting use of groundwater at the Site; (2) limiting future soil disturbance in areas with engineering controls; (3) limiting future development in specific areas of the Site; and/or (4) requiring a Soil Management Plan that stipulates inspection, periodic maintenance/repair activities, and reporting requirements for engineering controls, as appropriate (PADEP 2019a).

The information presented in this RI Report and Cleanup Plan reflects, in part, the information provided in a March 5, 2019 Kick-Off Meeting and March 8, 2021 Project Update Meeting with PADEP and the United States Environmental Protection Agency (EPA).

Remedial alternatives based on the future development of the Site as an industrial and/or commercial property are presented in the Cleanup Plan. Remedial strategies presented in the Cleanup Plan will be integrated with Site development plans, once finalized by the purchaser/developer of the property.

Conceptual development plans are currently being prepared and include commercial warehouse buildings, parking lots, access roads, driveways, and various landscape features, as shown in Exhibit 1. The Cleanup Plan presents the general approach and typical methods that will be used to mitigate potentially complete exposure pathways in accordance with Act 2. Specific details on engineering and institutional controls to be employed through any potential site development will be prepared and provided to PADEP for review/approval in addenda to the Cleanup Plan.

1.1 Report Organization

The organization of this RI Report and Cleanup Plan is presented below.

Table 1-1: Report Organization

Section		Purpose
Section 1	Introduction	Provides information relevant to the development of this report and the objectives of this report.
Section 2	Site Information	Presents a description of the Site setting, production history, and historical investigations and remediation.
Section 3	Remedial Investigation	Describes the field investigation to evaluate the extent of former Site-related environmental impacts and the findings of that investigation.
Section 4	Fate and Transport Model	Evaluates the extent of constituent migration in groundwater in the absence of any remedial activities.
Section 5	Conceptual Site Model	Evaluates the risks posed to human health and the environment by Site-related impacts. This section summarizes the potential current and future migration and exposure pathways for the identified impacts.
Section 6	Ecological Screening	Evaluates the potential exposure of environmental receptors at the Site.
Section 7	Public Benefits to Remediation and Reuse	Presents a summary of public benefits of the redevelopment and reuse of the property. Industrial and commercial development benefits are evaluated.
Section 8	Remedial Investigation Conclusions	Presents a summary of the RI and the Site-related environmental impacts.

Section		Purpose
Section 9	Cleanup Plan	Presents the proposed cleanup objective and process, project personnel, selected remedial standards, the public participation, the cleanup actions to attain the remedial standards, and the post-remediation activities.
Section 10	Summary and Conclusions	Presents a summary of the proposed cleanup actions to address the impacts.
Section 11	Signatures	Provides a signature of the Site owner's representative.
Section 12	References	Presents a list of the references cited in the RI Report and Cleanup Plan.

1.2 Objectives

The overall objective of this RI Report is to define the nature and extent of residual Site-related environmental impacts, if any, and evaluate the risks posed to human health and the environment by those impacts. The RI identifies the potential human exposure pathways and environmental risks in sufficient detail to support the proposed Site remedial approach and non-residential use redevelopment scenario. The RI objectives were met by filling data gaps from previous investigations and cleanup activities.

The RI results are used to develop a conceptual Cleanup Plan for the property. The Cleanup Plan has been developed to meet the Act 2 Site-Specific Standard. Based on the RI findings, the cleanup objective for the Site is to protect human health by mitigating identified exposure pathways with soil and groundwater impacted by select volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics in locations where COC concentrations exceed the respective non-residential medium-specific concentrations (MSCs).

Following implementation of the remedial alternatives included in the approved Cleanup Plan, a Final Report will be prepared in accordance with Act 2 requirements to obtain a release of environmental liability for the Site.

2 SITE INFORMATION

This section presents relevant background information used to develop the RI scope. The Site location and history are described below, followed by a summary of previous investigations and remediation activities.

2.1 Location and Description

The Site is located on 4501 Richmond Street between Orthodox Street and Buckius Street in the Bridesburg borough of Philadelphia, Pennsylvania. The Site is bounded to the west by Richmond Street, Lefevre Street, and Garden Street; to the north by Buckius Street; to the south by Orthodox Street; and to the east by the Delaware River[1]. The Site is approximately 63 acres in size and is currently unoccupied. The Site is overgrown with vegetation and only remnants of the former operating structures, foundations, and concrete pads remain. All former structures at the Site have been demolished to ground level, and the Site is currently vacant and unoccupied. The Site is secured by a perimeter chain-link fence that is routinely inspected and repaired, as needed. The Site will remain unoccupied until redevelopment. The Site location is shown on Figure 1.

The Delaware River is the primary hydrologic feature within the region. The river is classified by PADEP as a warm-water fish designated use river/stream. The Delaware River flows north to south to the Atlantic Ocean at the Delaware Bay. Surface flow onsite drains southeast into the Delaware River. A watershed map of the Lower Delaware River Watershed is included as Figure 2.

A large municipal storm sewer identified as the “Upper Delaware Collecting Sewer” (reportedly 11-foot-3-inch to 12-foot-3-inch diameter) extends across the western portion of the Site, from the intersection of Bath Street with Orthodox Street to the south and Buckius Street to the north but does not collect or convey stormwater from the Site. The invert elevation of this sewer was estimated to be at least 29 feet below ground surface (bgs; equivalent to 15.79 feet below mean sea level). An active utility corridor and the inactive Philadelphia Beltway Railroad extend through the eastern portion of the Site.

A mix of residential, industrial, and commercial properties surround the Site. To the west (along Richmond Street) is a mix of commercial enterprises and residential housing. To the south (along Orthodox Street) and to the north (along Buckius Street) are commercial and industrial properties. To the east is the Delaware River.

Ground surface elevations vary throughout the property. The ground surface is lowest near the bulkhead at the Delaware River (at elevations ranging from 5-6.5 feet above mean sea level [AMSL]) and then rises slightly to the west to approximately 8-9 feet AMSL near the utility corridor. West of the utility corridor, the ground surface elevation changes significantly, advancing into the upland areas of the Site in a westerly and northerly direction towards the Site center. The highest ground surface is near former tar holders in the approximate center of the Site, and in the southeast corner of the Site. The ground surface elevations west of the utility corridor range from approximately 10 to 21 feet above AMSL.

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[1] For purposes of this report, north (i.e., plant north) is perpendicular to Buckius Street (55 degrees each of the true north shown on the Site figures.

2.2 History

The Site was developed in the mid-1920s to provide manufactured gas to the City of Philadelphia (the City). Facility operations from January 1929 to May 1982 focused on the production of metallurgical coke by the Philadelphia Coke Co., Inc. Principal processes included coal and coke storage, coke production, tar storage, by-product operations, and iron oxide storage. The Site also included an iron oxide waste area and tar plain area. A fuel oil blending facility operated on the eastern 2.5 acres of the Site from approximately 1969 through 1989 by Patterson Oil Co. and Eastern Gas Co.

Coal and Coke Storage Areas were located in the northern portion of the Site. The main Coking Operations Area was in the center of the Site and consisted of the coke ovens, the by-products building, tar storage, and oxide boxes. The facility had two aboveground storage tanks (ASTs) that were used to store product coal tar with estimated capacities of 500,000 and 1,000,000 gallons. Additionally, there was one tank farm with concrete secondary containment for four ASTs and a second tank farm with two fuel oil tanks surrounded with an earthen berm (Woodward-Clyde Consultants [WCC] 1992a). The Main Operations Area is where Resource Conservation and Recovery Act (RCRA) closure activities were implemented and included the Spent Iron Oxide Storage and Tar Plain Areas. The Fuel Blending Area was in the eastern portion of the Site and consisted mainly of aboveground storage and below ground piping. The overall layout of the Former Philadelphia Coke Plant is shown on Figure 3. Historical aerial photographs, Sanborn maps, and other Site plans, including a generalized process flow diagram, are included as Electronic Attachment 1.

The facility carbonized coal in coke ovens. Bituminous coal and limited amounts of anthracite coal were used as raw materials to make metallurgical coke. When combined with limestone and iron ore at high temperatures, metallurgical coke is used to form iron and steel. Metallurgical coke is both fuel and a reactant essential for steelmaking.

During its active years, the facility produced upwards of 220,000 tons of metallurgical coke annually. The facility formerly operated as a large quantity generator of hazardous waste under EPA number PAD000427906. The facility also operated under a National Pollutant Discharge Elimination permit number PAD0011401.

The primary waste materials (residual tar, spent iron oxide, etc.) generated by the coal carbonization process resulted from coal gas cleaning and cooling systems. During the coal carbonization process and subsequent gas cleaning and cooling operations, various heavy hydrocarbons were generated and combined with fine coal or coke solids in the gas stream. This combination then settled in the tar decanters, which principally functioned as tar/water separators. Periodically, the settled mixture in the decanters (decanter tank sludge), as well as waste material in the iron oxide waste storage area, was removed for offsite disposal. The facility manufactured and generated several types of products and wastes. Former Site operations and waste generated is summarized in the Engineer's and Owner's Certification of Closure for Waste Management Units, prepared by WCC in December 1992 (RCRA Closure Report; WCC 1992b) which is included in Electronic Attachment 2.

In the early days of plant operation, discharge to surface water from the Site occurred through a single outfall into the Delaware River (Outfall 001). On March 13, 1951, the Philadelphia Coke Company was issued a discharge permit from the Pennsylvania Department of Health. While no documentation was identified regarding the installation of the oil skimmer leading to Outfall 001, it is assumed that it was installed in the early 1950s. In 1975, a substantial portion of the plant's process water was diverted to the

City's sanitary sewer system on Orthodox St. According to a June 28, 1982 letter, Outfall 001 was plugged following the end of Site operations.

The former Fuel Oil Blending Area supported a process whereby Number 2 and Number 6 fuel oils were brought to the Site by barge and off-loaded. The oil was stored and blended prior to local distribution by tanker truck.

All above-ground structures have been demolished to ground level.

2.3 Historical Investigations and Cleanups

Prior to the RI, various investigations were performed at the Site from the mid-1980s through 2001. The initial investigations were conducted in conjunction with Site closure activities under the federal RCRA program. The results of these investigations are summarized in the RCRA Closure Report (WCC 1992b; Electronic Attachment 2). The RCRA Closure actions conducted at the plant in the late 1980s addressed source area contamination located at specific RCRA Hazardous Waste Management Units. A series of limited investigations of the Fuel Blending Area were also conducted from 1988 to 1993 and in 2001.

As part of these historical investigations, cleanup activities were performed. Approximately 39,000 tons of material were transported for offsite treatment and disposal. A timeline of historical cleanup activities is provided in the table below, and a discussion of these investigations and cleanups is provided in the following paragraphs.

Table 2-1: Historical Cleanups

Year	Cleanup Description
1982-1988	Removed RCRA waste management units
1988	Removed approximately 9,370 tons of soil impacted with decanter tank tar sludge and spent iron oxide
1988-1993	Removed approximately 29,400 tons of soil impacted with coke breeze, paving material, and coal tar
1992-1993	Performed in-situ soil bioremediation in Fuel Blending Area
1991-2001	Removed underground storage tanks (USTs) and residual oil from pipe segments

2.3.1 RCRA Closure Investigation and Remediation

The initial RCRA investigation was conducted in October 1986. The results indicated that coal tar-related base neutral organic compounds were reported above standards in soil and groundwater in the former operational areas.

2.3.1.1 Historical Groundwater Evaluation

Six onsite shallow groundwater monitoring wells (MW-1 through MW-6[2]) and one deep groundwater monitoring well MW-2D were installed in the central portion of the Site as shown on Figure 4. These wells were generally sampled on a quarterly basis for 14 years, from April 1985 through November 1998. After November 1998, the frequency of groundwater monitoring was decreased to annual monitoring events. In a July 26, 1999 letter, PADEP approved the termination of RCRA groundwater monitoring based on the continuous decreasing trend of constituent concentrations.

The monitoring wells were located in the center of the Site and downgradient from the RCRA soil removal areas. Potentiometric surface maps from the 1980s indicate groundwater flow originating near MW-2 (in the Spent Iron Oxide Storage Area in the center of the Site) and flowing radially west to Garden Street, south to Orthodox Street, and east towards the Delaware River. No monitoring wells were installed north of MW-2 to evaluate groundwater flow to Richmond Street or Buckius Street. Historical potentiometric surface maps are provided in Appendix B.

Groundwater analytical results from the sampling events generally indicated the presence of benzene, toluene, ethylbenzene, and SVOCs. In addition, trichloroethene (TCE), 1,1-dichloroethane, and cis-1,2-dichloroethene were periodically detected at elevated levels onsite. VOC and SVOC impacts were primarily observed at MW-1 (located downgradient from the Former Tar Plain, near the existing PCMW-10 cluster) and MW-2. Benzene, toluene, ethylbenzene, xylene, (BTEX) and EPA's 16 priority pollutant polycyclic aromatic hydrocarbons (PAHs) were not detected in monitoring wells MW-3 or MW-4. MW-3 is located in the eastern half of the Site between the Site center and the former Fuel Blending Area, and MW-4 is located on the western property boundary near the Garden Street properties. Some general water quality parameters (i.e., total base neutral extractables and total VOCs) were slightly elevated in MW-3 and MW-4, but those impacts were attributed to fill materials rather than plant-related activities.

During the final year of groundwater monitoring (1998), benzene and naphthalene remained at concentrations greater than the Maximum Contaminant Levels[3] (5 and 20 micrograms per liter [5 µg/L], respectively) in MW-2R (replacement for well MW-2). In 1998, PAH results (including naphthalene results) were lower than the current applicable groundwater MSCs (i.e., PADEP Non-Residential MSCs for Used Aquifers containing Total dissolved solids [TDS] ≤ 2,500 milligrams per liter [mg/L]).

In the July 26, 1999 letter, PADEP indicated that benzene and naphthalene have not migrated to downgradient wells (MW-1 and MW-3) and that these compounds were not found to be at "any appreciable levels" (according to the PADEP) in MW-2D, MW-4, MW-5, or MW-6 since 1994. Therefore, PADEP indicated that groundwater impacts for these compounds were localized and have been since 1994.

In the July 26, 1999 letter, PADEP also indicated that concentrations of the VOC and SVOC constituents have "significantly decreased from 1985 and 1998". Upon termination of the groundwater program, PADEP acknowledged that concentrations of iron, manganese, specific conductance, potassium, sodium, calcium, magnesium, sulfate, and chloride remained elevated. However, PADEP attributed these

[2] Wells identified above as MW-1 through MW-6 were originally identified as W-1 through W-6 in the RCRA closure documentation.
[3] The Maximum Contaminant Levels are from the federal and state Safe Drinking Water Act standards available at the time of the July 26, 1999 letter.

elevated levels as a natural phenomenon (i.e., related to the fill material). In 1999, PADEP concluded that groundwater impacts at the Site were localized, delineated, and stable. PADEP indicated that PCC is no longer subject to any additional groundwater monitoring.

2.3.1.2 RCRA Closure Activities

Closure activities, consisting of excavation and offsite disposal of soil contaminated with decanter tank tar sludge from coking operations (RCRA Waste Code K087), and spent iron oxide (RCRA Waste Code D003) were initiated on July 12, 1988. In total, five RCRA Hazardous Waste Management Units (HWMU) were closed, and 9,370 tons of hazardous waste were removed. Hazardous waste material originated from the tar storage tanks, waste liquor pit, tar plains, tar decanters, and the iron oxide boxes and pile. Hazardous waste removal activities were mostly complete by December 30, 1988.

Following closure of the HWMU, four RCRA Solid Waste Management Units (SWMU) were closed from 1988 to 1992. The SWMUs consisted of a trash pile, clean oxide, wood trays, and process piping throughout the Site. Generated waste consisted of three non-hazardous waste streams: coke breeze, paving material, and coal tar-impacted soil. Approximately 29,400 tons of the coal tar-contaminated soils were removed from the Site and disposed as residual waste at the G.R.O.W.S. landfill facility between February 19 and July 24, 1992. Additionally, approximately 439,800 gallons of groundwater were transported offsite for treatment.

In all closure areas, post-closure sampling demonstrated that the sum of benz(a)anthracene (BaA), benzo(a)pyrene (BaP), benzo(b)fluoranthene (BbF), chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene was less than the 50 milligrams per kilogram (mg/kg) cleanup criteria and none of these constituents were detected at a concentration greater than 15 mg/kg. At the time, these six PAHs were considered to be suspected carcinogens. The results of the post-closure sampling indicated that the cleanup criteria had been achieved.

In 1993, a sixth HWMU was closed. Approximate 20 cubic yards of soil hazardous for benzene were removed from the former seal pot for offsite incineration. The seal pot was in the Former Byproducts Building piping trench. The seal pot was discovered during excavation activities and cleaned in September 1992. Seal pot closure activities were completed on October 19, 1993.

The RCRA excavation areas are shown on Figure 3. The excavation depths were based on visual characterization and varied based on former Site operation locations, as summarized below:

- Decanter Area – excavation depth ranged from 10-13 feet bgs (averaging at 12 feet bgs).
- Oxide Box and Wash Area – excavation depth ranged from 3-10 feet bgs (average 8 feet bgs)
- Tar Plains – excavation depth averaged 11 feet bgs.

The Certificate of Completion for RCRA Site Closure was issued on December 28, 1994 (WCC 1994). No outstanding closure responsibilities associated with the RCRA Corrective Action remain. The Site has not been occupied since the conclusion of the RCRA Site Closure. Other than the Site investigations discussed herein, no other Site activities or operations (besides the routine mowing and maintenance of the perimeter chain-link fence) have been conducted since the RCRA Closure.

2.3.2 Fuel Blending Area Investigation

In 1988, oily residue was observed on surface soils near a former pump house in the Fuel Blending Area. This observation prompted the initiation of a series of limited investigations between 1988 and 1991. Total Petroleum Hydrocarbon (TPH) concentrations ranging from 1,000 to 250,000 mg/kg were reported in various locations within the Fuel Blending Area. The highest concentrations were reported from the unsaturated zone in the fill layer.

Cleanup activities in the Fuel Blending Area were initiated in 1992. These activities included the excavation and disposal of potential fuel oil sources consisting of subsurface piping between the former aboveground tanks and the pump house and oily residues present in the basement of the former pump house. A bioremediation project was conducted for almost two years and reported moderate success in reducing hydrocarbon concentrations in the surface soils (0 to 3 feet bgs), but only limited success with deeper contamination. The project was discontinued in late 1993 and the above-grade facilities were dismantled and removed in early 1998.

In 2001, Miller Environmental Group, Inc. removed oil from the transport pipe that extended from the pier to the fuel oil tanks. No. 2 fuel oil was encountered in the piping and removed for appropriate offsite disposal. During pipe removal, oil was reported floating on the perched groundwater near the western terminus of the pipe segments.

URS Corporation (URS) completed a test pit investigation in 2001 to delineate fuel oil impacts in the Fuel Blending Area observed during the pipe cleaning. A total of 18 test pits were excavated. Based on the observations during the investigation, a relatively thin zone of fuel oil impacts was encountered from 1 and 2 feet above the observed water table to 1 and 2 feet below the water table in the six test pits completed inside the Fuel Oil Blending Area berm. Sheens were observed in an additional five test pits. Impacts were not observed in the test pits completed outside this berm near the Delaware River. The results of the test pit investigation are summarized in a December 13, 2002 URS letter report (Electronic Attachment 3).

2.3.3 Underground Storage Tank Removals

Seven USTs were removed from the Site in July 1991. These USTs were registered with the Pennsylvania Department of Environmental Resources (PADER) at the time of the authorization and assigned Facility Identification No. 51-44990. The UST removals were performed under the oversight of PADER and the City of Philadelphia Department of Licenses and Inspections. According to PADEP Region 1 Office, the UST closures were approved by PADER on June 22, 1992. A description of the USTs removed, including the UST locations and the results of post-excavation soil sampling and analysis, are summarized below.

- Four 1,000-gallon gasoline USTs were removed from the Buckius Street Garage Area (Building 12 on Figure 3, likely in the vicinity of the RI soil boring location PCSB-01). TPH levels reported from the eight post-excavation soil samples ranged from non-detect to 190 mg/kg. A total xylene concentration of 0.019 mg/kg was reported in one of the eight samples. No BTEX were reported in any of the other samples. The excavation was backfilled with clean fill.
- One 1,000-gallon gasoline UST was removed from the Machine Shop Area (Building 12 on Figure 3). TPH levels reported from the three final post-excavation soil samples ranged from non-detect to 180

mg/kg. BTEX concentrations reported in the bottom sample ranged from 0.007 mg/kg (toluene) to 0.037 mg/kg (benzene). BTEX concentrations reported in the wall samples ranged from 0.007 mg/kg (toluene) to 0.18 mg/kg (benzene). Groundwater samples were also collected from seeps entering the excavation at three locations. Benzene was the only BTEX compound detected in the groundwater samples. Benzene was detected at 7 and 8 µg/L. A TPH concentration of 200 µg/L was reported in one sample. The excavation was backfilled with clean fill.

- Two 3,500-gallon diesel USTs were removed from the former scale house area (the scale house could not be located on historical figures). Post-excavation soil sampling indicated that TPH concentrations ranged from not detected to 220 mg/kg. No groundwater was observed in the excavation. The excavation was backfilled with clean fill.

2.4 EPA Environmental Indicator Determinations

In April 2013, EPA completed two Environmental Indicator Determinations concluding that both human exposures and impacted groundwater migration are under control at the Site. The Environmental Indicator process was initiated in response to a notification to PCC Land Company, Inc. (PCC) from EPA Region III on April 18, 2011. The notification included an attached letter dated June 22, 2010 prepared by PADEP requesting information regarding the status of the Site in relation to RCRA Corrective Action. In response to the notification, PCC conducted an August 11, 2011 site walk with PADEP and EPA's representative from Michael Baker International (Baker).

Based on the initial Site walk and file review, Baker prepared a January 2012 Environmental Indicator Inspection Report for the Site. Following the report, EPA issued the following RCRA Environmental Indicator Forms on April 10, 2013:

- CA-725: Current Human Exposures Under Control
- CA-750: Migration of Contaminated GW Under Control

The RCRA Environmental Indicator Forms concluded that both human exposures and impacted groundwater migration are under control at the Site. The RCRA Environmental Indicator Forms are provided as Appendix C. Any further work needed will be performed to satisfy the requirements of PADEP Act 2.

3 REMEDIAL INVESTIGATION

The RI was performed in two major phases. An initial phase of RI activities was performed by Paulus, Sokolowski and Sartor, Engineering, PC (PS&S) from 2003 through 2006 (hereinafter referred to as the Initial RI activities). Additional investigation activities were implemented by Arcadis in 2018 and 2019 (hereinafter referred to as the Supplemental Remedial Investigation [SRI] Activities). Each phase of the RI involved two or more rounds of fieldwork, with the scope of each round developed based on the results of preceding round(s). Between the Initial RI and SRI, the Site was unoccupied, and no activities were performed onsite other than periodic mowing of vegetation or maintenance of the perimeter fence.

The Initial RI activities consisted of sample collection from various media, including surface soil, subsurface soil, groundwater, soil gas, and ambient air to evaluate the nature and extent of impacts at the Site. Initial sampling locations were selected based on a review of available environmental database reports, Sanborn maps, aerial photographs, the RCRA Closure Report (including the associated soil and groundwater data), and other historical documents and figures. Test pit excavations and resulting soil samples were obtained from all areas of the Site, with the sampling locations generally biased towards the former operation areas. Subsequent phases of the Initial RI activities were developed to: (1) further delineate identified COCs; (2) complete characterization of the former operational areas; and (3) establish general Site conditions.

The SRI activities consisted of installing and sampling additional monitoring wells, soil borings, and test pits to: (1) confirm prior results, and that Site conditions had not significantly changed since samples were collected as part of the Initial RI activities; (2) fill identified data gaps from previous investigation and remedial activities and delineate the extent of impacts for purposes of developing a Cleanup Plan; and (3) assess current groundwater conditions.

The RI activities are summarized in Section 3.1 below and the RI findings are presented in Section 3.2.

3.1 Remedial Investigation Activities

The Initial and Supplemental RI activities consisted of the following:

- Excavating 197 test pits to characterize surface and shallow subsurface soil, evaluate subsurface structures, and assess geotechnical conditions. Soil samples from 145 test pits were collected for laboratory analysis.
- Installing 179[4] soil borings to characterize subsurface soils and Site stratigraphy. Soil samples from 150 soil borings were collected for laboratory analysis.
- Installing, developing, and sampling 33 shallow groundwater monitoring wells and 13 deep groundwater monitoring wells to characterize groundwater quality and evaluate groundwater flow.
- Drilling 7 hydropunch borings for a preliminary evaluation of groundwater conditions where visual impacts were observed.

[4] Count includes borings drilled for the monitoring wells installed in 2018 and 2019 because soil was characterized during drilling for the well installations.

- Collecting and analyzing approximately 540 soil samples and 112 groundwater samples for a combination of Target Compound List (TCL) VOCs, TCL SVOCs, Priority Pollutant (PP) metals, Target Analyte List (TAL) inorganics, cyanide, pesticides, and polychlorinated biphenyls (PCBs) to evaluate the nature and extent of environmental impacts in Site media.
- Collecting 21 soil gas samples and one ambient air sample to evaluate the potential for soil VI in future building development.
- Performing sediment probing in the Delaware River and a visual reconnaissance of the shoreline to evaluate nearshore conditions adjacent to the Site.
- Collecting data to support an ecological screening (ES; Section 6).

The test pit, soil boring, monitoring well, hydropunch boring, and soil gas sampling locations are shown on Figure 5. A summary of the laboratory analyses performed on soil samples collected from each soil boring and test pit is presented in Table 1, and a summary of the laboratory analyses performed on groundwater samples collected from each monitoring well and hydropunch location is presented in Table 2.

Sample collection was performed in accordance with PADEP guidelines and Act 2 requirements. The work conducted on the Site was performed in accordance with a site-specific Health and Safety Plan (HASP). The sampling activities, including techniques and analytical testing used to conduct this RI are presented below.

3.1.1 Initial Remedial Investigation Activities (2003-2006)

The Initial RI activities were performed through an iterative process from 2003 through 2006. These activities included the installation of test pits, soil borings, groundwater probes, and monitoring wells and the collection of soil, soil gas, and groundwater samples for laboratory analysis. To obtain data to characterize Site conditions a preliminary test pit and soil sampling program was conducted in March 2003 and additional field investigation activities were conducted from February through March 2005, and July 2005 through March 2006.

During the Initial RI activities, Earth Engineering Incorporated (EEI) also drilled soil borings and excavated test pits to collect soil samples for geotechnical testing. Based upon field observations and/or field instrumentation, select soil samples were also collected during the geotechnical investigation for laboratory analysis for Site-related COCs to aid in the Site characterization.

The components of the Initial RI activities are summarized in the table below.

Table 3-1: Overview of Initial RI Activities

Dates	Consultant	Sample Numbers	RI Activity
March 2003	PS&S	PSSTP-1 to PSSTP-30	Preliminary test pit investigation.
February 2005	EEI and PS&S	PC-B1 to PC-B15	Soil borings for geotechnical testing. Soil samples were collected for laboratory analysis at select locations, based on visible impacts.
February 2005	PS&S	PCTP-01 to PCTP-60	Second test pit investigation.
March 2005	EEI and PS&S	TP-01 to TP-78	Test pits for geotechnical testing. Soil samples were collected for laboratory analysis at select locations, based on visible impacts.
March 2005	PS&S	PCHP-01 to PCHP-07	Hydropunch sampling.
February and March 2005	PS&S	PCSB-01 to PCSB-25	Soil boring investigation.
July and August 2005	PS&S	PCSB-26 to PCSB-60	Additional soil boring investigation.
September 2005	PS&S	PCTP-61 to PCTP-79	Third test pit investigation.
August to October 2005	PS&S	PCMW-01 to PCMW-20S/D	Monitoring well installation.
November 2005 and January/ February 2006	PS&S	PCMW-01 to PCMW-20S/D	Groundwater investigations.
January 2006	PS&S	PCSV-01 to PCSV-22	Soil gas investigation.

The groundwater and soil samples were analyzed by Hampton-Clarke, Veritech Laboratories (Veritech), a PADEP certified laboratory (laboratory certification number #68-463), in accordance with EPA SW-846 methods. Approximately 350 soil samples were collected for laboratory analysis for TCL VOCs, TCL SVOCs, PP Metals, and total cyanide. Approximately 140 of these samples were also analyzed for PCBs and pesticides. A total of 7 groundwater samples from hydropunch borings and 66 groundwater samples from monitoring wells (obtained during two rounds of sampling the 33 monitoring wells) were collected and analyzed for TCL VOCs, TCL SVOCs, PP Metals (total and dissolved), PCBs and pesticides (monitoring well samples only).

Soil gas samples were analyzed by Air Toxics LTD, located in Folsom, California. The laboratory performed analyses via Modified EPA Compendium Method TO-15, plus Naphthalene, using GC/MS in the full scan mode, as well as a Modified American Society Testing and Materials (ASTM) Method D-1946 for methane and fixed gases in air using gas chromatography with flame ionization detector (GC/FID) or gas chromatography with thermal conductivity detector (GC/TCD). Soil gas samples were analyzed in accordance with current methodologies that are consistent with the PADEP Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil Under Act 2 (PADEP 2019; TGM).

Details of the Initial RI fieldwork are provided in the subsections below.

3.1.1.1 Initial Soil Investigation

During the Initial RI activities conducted from 2003 to 2006, surface soil sampling (0 to 2 feet bgs) and a combination of test pits and soil borings to facilitate subsurface soil sampling (>2 feet bgs) were used to evaluate soil conditions. The test pit and soil boring locations are shown on Figure 5. The test pit and soil boring locations where soil samples were collected for laboratory analysis are shown on Figure 6.

Test Pits

The purpose of this test pit program was to:

- Characterize the horizontal and vertical extent of fill across the Site.
- Identify COCs in the various fill areas.
- Identify subsurface utilities that may have been abandoned in-place in former areas of operation.

PS&S conducted a preliminary test pit evaluation in March 2003 during which 30 test pits were excavated in the Former Coke Operations Area and the Fuel Blending Area. The geotechnical investigation involved advancing an additional 78 test pits. Based upon the findings of the initial round, subsequent investigations consisting of characterization and delineation of COCs were implemented. An additional 60 test pits were excavated from February 2005 through March 2005. From August through September 2005, 19 additional test pits were excavated to provide additional Site perimeter characterization data.

Long-reach backhoes were used to excavate test pits to define the depth of the fill areas prior to initiating the boring program. Test pits were located based upon review of Site historical maps, aerial photographs, and previous investigations.

Generally, soil samples were collected from the ground surface (0 to 6 inches) and at the fill and native soil interface (determined based upon visual and physical description). The test pit soil samples were collected using a dedicated polyethylene scoop and placed into laboratory-supplied sample containers. Two soil samples were typically collected from each test pit, although additional samples were collected at some locations based on visual observations.

Soil samples collected from the test pits were handled as follows: (1) screened for volatile organic vapors using a photoionization detector (PID); (2) observed for the presence of staining, discoloration, non-aqueous phase liquid (NAPL), ash, and tar; and (3) logged by a geologist using the Unified Soil Classification System (USCS). The information gathered during the test pit program was documented on test pit logs provided in Appendix D and summarized in Table 3.

Following completion of the test pits and the collection of soil samples, the test pits were backfilled with the excavated material and restored to the original grade. Upon backfilling of the test pits, material that was not retained for laboratory analysis or placed back in the excavation was transferred to a roll-off container and disposed of in accordance with applicable federal, state and local regulations.

Soil Borings

The objectives of the soil boring program were to:

- Supplement the test pit program to further characterize the horizontal and vertical extent of fill material and to investigate the nature and extent of potential impacts to the native soils.
- Characterize the subsurface soils within the Former Coke Operations Area and Fuel Blending Area.
- Characterize Site stratigraphy.
- Identify physical characteristics of the subsurface soils.
- Identify potential physical and Site-related impacts in the Site soils resulting from the former Site operations.

Between February 2005 and October 2005, PS&S advanced a total of 60 soil borings. PCSB-01 to PCSB-25 were advanced in February and March 2005 using a conventional hollow-stem auger (HSA) drill rig and PCSB-26 to PCSB-60 were advanced in July and August 2005 using a GeoProbe direct push rig. Most borings were located within the RCRA Closure Areas, the Former Coke Operation Area, and the Fuel Blending Area. In February and March 2005, the soil borings were advanced through a silt and clay layer and into an underlying sand and gravel layer (between approximately 18 and 50 feet bgs). Three soil borings (PCSB-05, PCSB-13, and PCSB-16) were advanced through the sand and gravel layer and into bedrock. Based on observations from these soil borings, it was concluded that a silt and clay layer was continuous across the Site and acting as a confining unit for subsurface soil impacts. Therefore, soil borings drilled after March 2005 were only advanced into the silt and clay layer (i.e., confining unit). The geotechnical investigation consisted of the advancement of an additional 14 soil borings.

Subsurface soil samples were collected using a decontaminated split-spoon sampler advanced by the conventional HSA drill rig or macro-core liner advanced by the direct-push drill rig. In those instances where the HSA was used to penetrate the sand and gravel layer into the underlying confining unit, steel casing was used to prevent vertical migration of contaminants from the material within the fill layer.

Soil boring locations were selected to supplement the coverage provided by the test pits. The recovered soil samples were handled as follows: (1) screened for volatile organic vapors using a PID; (2) observed for the presence of staining, discoloration, NAPL, ash, and tar; (3) checked for odors; and (4) logged by a geologist using the USCS. The information gathered during the soil boring program was documented on soil boring logs which are contained in Appendix D and summarized in Table 3.

Generally, soil samples were collected from two or more depth intervals from each boring. The depth of the soil samples was based primarily upon field observations (i.e., visual observations, field screening results, etc.) that indicated potential impacts. In general, soil samples were collected at one or more of the above conditions:

- Surficial soils (the upper 0- to 2-foot interval).
- At the bottom of the encountered fill material or at the upper 2-foot interval of the native soils.
- A 6-inch interval (0- to 6-inches) immediately above the water table.

- Immediately above and below the silt and clay confining unit.
- At visually impacted zones and/or elevated PID readings.
- At the completion depth of the boring.

Following completion of the boreholes and the collection of soil samples, the boreholes were grouted to the surface using a cement-bentonite grout. All borings were finished to match pre-disturbance grades. Recovered soil sample material that was not retained for laboratory analysis was placed in a roll-off container and disposed of in accordance with applicable federal, state and local regulations.

3.1.1.2 Initial Groundwater Investigation

During the Initial RI activities, PS&S installed and sampled 20 shallow groundwater monitoring wells and 13 deep groundwater monitoring wells to characterize groundwater quality and evaluate groundwater flow. In addition, seven hydropunch borings were advanced and sampled to evaluate groundwater conditions. The hydropunch borings and monitoring well locations are shown on Figure 7.

Hydropunch Sampling

Following completion of the February and March 2005 test pit and soil boring program, initial groundwater sampling was conducted on March 24 and 25, 2005. A groundwater probe, or hydropunch, was advanced at seven locations in areas where visual impacts were observed during the initial soil investigation. The goal of the hydropunch sampling was to gather groundwater data to identify and generally characterize the constituents present in the shallow groundwater located in the fill above the confining silt and clay layer.

The groundwater samples were collected by driving hydropunch rods to the bottom of the designated sample depth interval and retracting 4 feet of the outer steel casing to expose a decontaminated stainless-steel screen. Actual sample intervals were determined based on observed field conditions (i.e., soil visual observations, soil field screening results, etc.).

The water collected in the sampling rod was poured directly into the laboratory-provided sample containers. The hydropunch rods were decontaminated between each sampling location. Any evidence of odors, sheens, or the presence of NAPL was noted. The observations and results were logged in project field forms. Upon completion of the sampling, each probe hole was left to naturally collapse into itself. All probe holes were restored at grade with the same material that was originally in place.

Monitoring Well Installation

Following completion of the test pit and soil boring phase of the Initial RI activities, a total of 33 monitoring wells were installed from August through October 2005 in accordance with the applicable PADEP Groundwater Monitoring Guidance Manual at the time. The monitoring well locations were located upgradient and downgradient of impacts identified during the soil boring and test pit program and at the property boundaries to serve as “point of compliance” locations. The wells were constructed as either shallow or deep wells based upon their screened depth in relation to the confining unit. The screen interval for shallow groundwater monitoring wells was installed within the fill material above the confining unit, and the screen interval for deep groundwater monitoring wells was installed within the sand and gravel layer below the confining unit.

Of the 33 wells, seven were installed on the riverward portion of the Site and consisted of only shallow wells. The remaining 26 wells were comprised of 13 well clusters, each consisting of a shallow well and a deep well. Shallow wells are generally screened from 1 to 10 feet bgs near the river and from 5 to 15 feet bgs for the remainder of the Site. The deep wells are generally screened below the bottom of the silt and clay layer with a 10-foot screen between 18 and 40 feet bgs, depending on the depth of the silt and clay layer.

The shallow monitoring well construction consisted of 2-inch and 4-inch diameter casings. The 4-inch diameter wells were installed in the riverward portion of the Site. The deep monitoring wells were constructed as double cased wells. Six-inch steel casings were placed approximately 10 feet into the confining clay layer, through the overlying fill material, and grouted in-place. Following a minimum of 24 hours set time, the remaining depth of the boreholes for deep wells was drilled, and the wells were constructed from 2-inch diameter casings. The deep and shallow monitoring well were constructed with polyvinyl chloride (PVC) 20-slot well screens and PVC Schedule 40 casing. Typically, the monitoring well screen length was 10 feet and the casing extended from the top of the screen to grade.

A No. 2-grade sand pack was installed in the annular space from the bottom of the monitoring well screen to approximately one to three feet above the top of the well screen, except for shallow wells where the top of the screen was within one foot of the ground surface. In these shallow wells, the sand pack extends up to the concrete surface seal. A bentonite seal was placed into the annulus above the gravel pack. A bentonite/grout slurry was pumped into the annulus via a tremie pipe, from the top of the bentonite seal to the surface. The monitoring wells were protected and secured with above-grade (“stick-up”) locking steel casings. Well construction details are summarized in Table 4. Monitoring well construction logs are provided in Appendix D.

Following installation, the groundwater monitoring wells were developed by purging with a submersible pump. The development process continued until the turbidity readings were at or below 50 Nephelometric Turbidity Units (NTUs) or a two-hour development period, whichever occurred first. Development water was temporarily containerized onsite in 55-gallon steel drums. After waste characterization, containerized liquids were removed from the Site for proper offsite transportation and disposal.

Soil cuttings generated during the installation of each well were placed into a roll-off container and properly disposed of in accordance with applicable federal, state and local regulations.

Groundwater Sampling

The first round of groundwater sampling from the permanent monitoring wells was conducted approximately two weeks after well development in November 2005. A second round of groundwater sampling was completed in January/February 2006.

The monitoring wells were sampled using a “low-flow” sampling protocol. As part of the protocol, wells were purged at a low pumping rate using a Grundfos Rediflo® submersible pump or peristaltic pump and dedicated tubing. Prior to sample collection, groundwater was circulated through a flow-through cell to record pH, specific conductance, temperature, turbidity, dissolved oxygen, and oxidation-reduction potential. Following stabilization of the field parameters, groundwater was collected in laboratory-supplied sample containers. In those instances where a peristaltic pump was used to purge the well, the VOC fraction of the sample was obtained using a dedicated bailer. The water level meters, submersible pump, peristaltic pump and flow cell were decontaminated prior to each use. Completed low-flow groundwater monitoring and purge logs are provided as Appendix E.

Water Level Measurements

During the above-identified groundwater sampling events, a complete round of groundwater level measurements was collected from the monitoring wells before sampling. Additional rounds of groundwater level measurements were collected in December 2005 and March 2006. The groundwater level measurement process documented the presence/absence of NAPL and the groundwater depth in each monitoring well. Groundwater depths were measured using a Solinst water level indicator to an accuracy of 0.01 feet. A Solinst oil/water interface probe, cotton string, and disposable bailers were used to determine if any NAPL was present in the monitoring wells. No measurable NAPL was identified during the two rounds of groundwater sampling other than an apparent emulsion at PCMW-05. Groundwater level data is discussed in Section 3.2.2. Water level measurements are presented in Table 5.

Hydraulic Conductivity Testing and Other Soil Physical Parameters

During the RI field program monitoring well installation activities, select soil samples were collected from the three Site strata to obtain the physical characteristics of this material through laboratory testing. Samples were collected in glass containers and Shelby tubes of the fill material, silt and clay layer, and sand and gravel layers. The samples were analyzed in the PS&S geotechnical laboratory for grain size, bulk density, permeability, and porosity. The data for these parameters were used to calculate hydraulic conductivity for each stratum. A copy of the soil physical parameter data is included as Appendix F.

3.1.1.3 Soil Gas Investigation

A total of 21 soil gas samples and one ambient air sample were collected at onsite locations in January 2006. The sampling locations were biased toward areas where visual observations and/or concentrations of VOCs and SVOCs were identified in Site soils and groundwater during the Initial RI activities. The sampling locations were concentrated toward the center, northeast corner, and eastern portions of the Site (see Figure 5 for the sampling locations). Soil gas samples were collected in unsaturated soil (i.e., fill) above the water table. The soil gas sampling locations were biased toward areas where visual impacts and/or elevated VOC or SVOC concentrations were identified in soil and groundwater. However, these locations may not have been ideal for soil gas sample collection because the water table was less than 5 feet bgs and the ground surface was not covered with an impermeable material (e.g., the ground surface at these locations consisted of soil or deteriorated asphalt).

The soil gas samples were obtained using a stainless-steel sampling system that uses driving rods (shaft sections) equipped with a small diameter hollow-tip sampling point (shield point). Teflon tubing was installed to allow extraction of soil gas samples. The shaft sections were driven into the ground to a depth of approximately one foot above the observed groundwater table. Due to the shallow groundwater at the Site, soil gas samples were generally collected at depths less than 5 feet bgs. The probe was then removed, leaving the expendable shield point and tubing in place allowing the collection of the soil gas sample.

The probe hole was sealed with bentonite to prevent intrusion of ambient “surface” air. Prior to the collection of soil gas, a vacuum pump was used to purge the line of ambient air at a rate of 0.1 to 0.2 liters/minute. Continuous or excessive pumping was avoided so that the soil gas would not be diluted with surface air.

Samples were extracted using Summa canisters attached to Teflon sample lines that extend from the shield points. Summa canisters were supplied by Air Toxics Limited (Air Toxics LTD) and evacuated to a vacuum pressure of approximately 30 inches of mercury. The pressure gradient between the vacuum in the canister and the subsurface atmosphere provided the driving force for sample flow and gas collection. The canisters were equipped with flow controllers with an integral vacuum gauge adjusted to provide a nominal one-hour integrated sample collection period (approximately 0.1 liters/minute). A vacuum gauge was used to measure the initial and final vacuum in the canister to document sample integrity. Following sample collection, real-time instrument readings were recorded for the presence of hydrogen sulfide, oxygen, carbon dioxide, and methane.

Soil gas sample integrity was maintained by using experienced field personnel, good sampling techniques, proper sampling equipment, and adequate documentation. Pre- and post-sample vacuum checks conducted in the field and at the laboratory demonstrated that leakage had not occurred before or after sample collection and provided documentation of sample integrity.

A field “replicate” soil gas sample was taken at two locations (one replicate for every 11 samples) to provide an assessment of the compositional consistency of the soil gas samples. One ambient air sample was also taken at a central location (adjacent to PCSV-22) for quality assurance and quality control (QA/QC) purposes.

After sampling was completed, the sample canisters were shipped overnight to Air Toxics LTD, located in Folsom, California for analysis. The laboratory performed analyses via the Modified EPA Compendium Method TO-15, plus Naphthalene, using GC/MS in the full scan mode, as well as a Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. Analysis of a laboratory blank was performed by the laboratory as an internal QA/QC check.

3.1.2 Supplemental Remedial Investigation Activities (2018-2019)

The SRI Activities were performed in multiple phases from 2018 through 2019 to confirm the results and fill data gaps from the Initial RI work. Activities included additional groundwater and soil investigations, a Delaware River reconnaissance, and sediment probing in the nearshore area adjacent to the Site at low tide. As part of an interim Site review and inspection (performed between the Initial RI and SRI), GEI Consultants Inc. (GEI) performed Site walks on June 21, 2011 and July 12, 2011 to review current Site conditions. For purposes of this report, GEI’s activities are presented together with the SRI Activities in Subsection 3.1.2.4. Most of the supplemental groundwater investigation was performed in 2018, and the supplemental soil investigation and sediment probing were performed in 2019. The components of the SRI Activities are summarized in the table below.

Table 3-2: Overview of SRI Activities

Dates	Sample Numbers	RI Activity
March 2018	MW-5, MW-6, and the 21 available PCMW- wells	Phase 1 groundwater investigation.
May 2018	MW-101 to MW-107, and seven PCMW- wells	Phase 2 groundwater investigation.
August 2018	PCMW-10D, PCMW-15S	Groundwater sampling for free cyanide.
March 2019	MW-107, PCMW-05, PCMW-16D	Groundwater sampling for total metals, dissolved metals, and TDS.
April and May 2019	S-101 through S-162, revisited 28 Initial RI Soil Sampling Locations (suffix "R" added to designate a revisited sampling location)	Phase 1 soil investigation.
April 2019	Not applicable	Delaware River reconnaissance and sediment probing.
September 2019	S-163 to S-173, MW-108 to MW-113, and PCTP-07R	Phase 2 soil investigation. Additional groundwater monitoring well installation.
October 2019	MW-108 to MW-113	Phase 3 groundwater investigation (groundwater sampling).

The groundwater and soil samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS), a PADEP certified laboratory in accordance with the EPA SW-846 methods. A total of 186 soil samples were collected and analyzed for a combination of TCL VOCs, TCL SVOCs, TAL inorganics, total or free cyanide, pesticides, and PCBs. A total of 48 groundwater samples were collected and analyzed for a combination of TCL VOCs, TCL SVOCs, TAL inorganics (total and dissolved), total cyanide, pesticides, and PCBs. The laboratory analytical reports are provided in Electronic Attachment 4.

In addition, three groundwater samples were analyzed for free cyanide by TestAmerica, located in Amherst New York. The laboratory performed analyses via EPA SW-846 Method 9016.

3.1.2.1 Supplemental Groundwater Investigation

The supplemental groundwater investigation was performed to:

- Evaluate potential changes to groundwater conditions, if any, since the Initial RI activities and provide additional data to fully characterize the onsite extent of any impacts in Site groundwater (both shallow and deep groundwater zones).
- Help further refine the focus of the soil investigation (e.g., soil sampling targeted where groundwater impacts were observed).

- Fill data gaps that have been identified based on comparison of the Initial RI Activity data to the updated PADEP MSCs.

During the SRI, not all groundwater monitoring wells previously installed as part of the Initial RI or earlier investigations could be found or repaired for use in groundwater sampling. However, the existing wells that were found and the additional wells installed as part of the SRI provide sufficient coverage for evaluating groundwater flow patterns and water quality across the Site.

The first phase (Phase 1) of the SRI groundwater investigation fieldwork was performed between February 26, 2018 and March 23, 2018, and included land surveying, monitoring well integrity surveys, monitoring well redevelopment, water-level gauging, groundwater sampling and analysis, and a storm sewer reconnaissance.

The second phase (Phase 2) was conducted between May 8 and 31, 2018 to fill data gaps from Phase 1, including: (1) where certain previously-installed monitoring wells could not be located and sampled (the wells are considered lost or destroyed); and (2) where there were no previously-installed wells to evaluate conditions (e.g., downgradient from a former soil removal area and in certain areas where Initial RI soil investigation data suggested that residuals may remain).

The third phase (Phase 3) of the SRI groundwater investigation was performed on October 3 and 4, 2019 to evaluate groundwater conditions at: (1) locations where the SRI soil investigation identified a combination of visual impacts (e.g., coal tar-like material) and COCs at concentrations an order of magnitude or higher than potentially applicable PADEP MSCs; and (2) at the Site property boundaries and areas downgradient of Site-related impacts.

Monitoring Well Integrity Surveys and Redevelopment

Arcadis conducted well integrity surveys on February 26 and 27, 2018 to assess the condition of the existing groundwater monitoring wells at the Site (as those wells were installed more than 12 years earlier). Arcadis located 23 of the 33 stickup monitoring wells (wells identified by the prefix “PCMW-”), plus two of the nine monitoring wells that were of “unknown construction” (wells identified with the ID “MW-”). Based on the well integrity surveys, 23 of the 25 identified wells were found to be intact and usable for the groundwater investigation. Monitoring wells PCMW-7 and PCMW-12S were both found, but inspections with a downhole camera revealed that the well screens were damaged and blocked by roots and not usable for groundwater sampling. During Phase 2 investigation activities, the roots in monitoring wells PCMW-7 and PCMW-12S could not be cleared with available drilling equipment without irreparably damaging the wells. The monitoring well integrity survey forms are included in Appendix G.

The locations of the monitoring wells at the Site, with color-coding identifying those that were or were not found, are shown on Figure 7. As indicated by the figure, the usable existing wells in combination with the newly installed wells provided suitable coverage to evaluate the groundwater conditions across the Site.

Arcadis redeveloped existing monitoring wells on February 28, 2018 and March 5, 2018. This included monitoring wells where soft sediment was identified in the bottom of the well and where the measured depth of the well was less than the reported installation depth. Fine sands and silts were observed entering certain wells during redevelopment. The surging portion of the redevelopment process was discontinued at these wells to limit the potential for additional sediment accumulation in the wells.

Monitoring Well Installation

Arcadis installed monitoring wells MW-101 through MW-107 as part of the Phase 2 supplemental groundwater investigation and monitoring wells MW-108 through MW-113 as part of the Phase 3 supplemental groundwater investigation. These newly installed monitoring wells are in the shallow groundwater (water table) aquifer and screened within the fill material above the confining unit.

Phase 2 groundwater wells were installed from May 14 to 16, 2018 to provide coverage in the following areas of the Site:

- Where impacts were previously identified but the corresponding monitoring wells could not be located during the Phase 1 RI groundwater investigation.
- Downgradient from areas where Initial RI soil investigation data suggests that residuals may remain (e.g., soil containing NAPL and/or elevated concentrations of PAHs).
- Downgradient from a former soil removal area and near or along part of the property boundary where groundwater quality had not previously been evaluated.

Monitoring wells installed during the SRI to replace initial RI monitoring wells are identified in the table below.

Table 3-3: Replacement Wells

Initial RI Monitoring Well	Replacement Well	Notes on Location
PCMW-14S	MW-101	Slightly downgradient of PCMW-14S.
PCMW-13S	MW-103	Upgradient of PCMW-13S. Approximately hallway between PCMW-13S and PCMW-14S.
PCMW-16S	MW-105	In immediate vicinity of PCMW-16S.
PCMW-02	MW-106	In immediate vicinity of PCMW-02.

Phase 3 groundwater wells were installed on September 24 and 25, 2019 to provide coverage in and downgradient from areas where Site-related impacts were identified in soil and groundwater conditions were unknown.

The soil boring for MW-101 was advanced using conventional HSA drilling method, and soil samples from the boring were collected using a 2-foot-long, 2-inch-outside-diameter, split spoon sampling device. Based on the soil conditions observed at MW-101, Arcadis determined that using direct-push techniques would achieve good soil recovery and increase investigation efficiency. Therefore, soil borings for the remainder of the monitoring wells were advanced using the direct-push method and associated soil samples were continuously collected using a 5-foot macro-core liner. After the direct-push borings were completed, the borings were over-drilled using the HSA drilling method to enable installation of monitoring wells. This change was accomplished “on-the-fly” (without delay) using a drilling rig equipped with tooling for both methods. Monitoring well installation and boring logs are included in Appendix D.

The new groundwater monitoring wells were constructed using 2-inch-diameter Schedule 40 PVC pipe with a 0.010-inch slotted screen. The top of the screen was positioned approximately 1 foot above the water table, with the filter pack extending 1 foot above the top of the screen, a 1-foot thick bentonite seal above the filter pack, and at least 4 feet of solid PVC pipe extending below the ground surface. Screen lengths varied depending on the thickness of saturated shallow soil above the confining unit. The wells were protected at the surface using a 4-inch steel “stick-up” casing with a locking cap. The protective casings extend approximately 2.2 to 2.5 feet above ground surface and were set in concrete. Monitoring well construction details are presented in Table 4.

Soil Sampling

Soil samples recovered from the monitoring well borings were handled as follows: (1) screened for volatile organic vapors using a PID; (2) inspected for the presence of staining, odor, discoloration, NAPL, ash, and tar; and (3) characterized by a geologist (i.e., via soil classification by the USCS). The information gathered during the soil boring program was documented on soil boring logs which are contained in Appendix D and summarized in Table 3. Soil samples were collected from the borings during installation of MW-102, MW-103, MW-108, and MW-111 for laboratory analysis for the following reasons:

- MW-102 – A sample was collected to characterize a white plaster-like material that was encountered in the soil sample.
- MW-103 – Soil samples were collected at the water table and at the interface of the fill and silt and clay layer to evaluate soil conditions near sampling location PCTP-75 (adjacent to Buckius Street) where soil from 10-12 feet bgs was previously characterized (during Initial RI) as having an oil-like material and found to contain high concentrations of naphthalene.
- MW-108 and MW-111 – Soil samples were collected where the presence of coal tar-like material was observed and at the first interval without visual impacts or odors.

Soil samples were analyzed for TCL VOCs, TCL SVOCs, and TAL inorganics (including cyanide). The soil samples from MW-102 and MW-103 were also characterized for PCBs and pesticides.

Groundwater Sampling

Arcadis collected groundwater samples using low-flow methods on the following dates and at the following locations:

- *March 19 to 23, 2018* – groundwater samples were collected from the 23 monitoring wells that were found to be intact and usable during well surveying.
- *May 29 to 31, 2018* – groundwater samples were collected from monitoring wells MW-101 through MW-107, PCMW-04, PCMW-05, PCMW-06, PCMW-08S, PCMW-09S, PCMW-16D, and PCMW-19S.
- *July 27, 2018* – groundwater samples were collected from PCMW-10D and PCM-15S.
- *March 28, 2019* – groundwater samples were collected from MW-107, PCMW-05, and PCMW-16D.
- *October 4, 2019* – groundwater samples were collected from MW-108 through MW-113.

Field parameters (pH, conductivity, dissolved oxygen, temperature, turbidity, and oxidation-reduction potential) were monitored every five minutes during purging. After turbidity levels decreased to below the

50 NTU goal (where possible) and parameters stabilized, groundwater samples were collected for laboratory analysis. Groundwater sampling logs are included in Appendix E.

The groundwater samples collected in March 2018, May 2018, March 2019, and October 2019 were submitted to SGS Accutest of Dayton, New Jersey where they were analyzed as follows:

- Each groundwater sample was analyzed for TAL inorganic constituents, including total cyanide, except the May 30, 2018 groundwater sample collected from PCMW-16D.
- Each 2019 groundwater sample was analyzed for dissolved inorganics.
- March 2018, May 2018, and October 2019 groundwater samples were analyzed for TCL VOCs and TCL SVOCs.
- Each 2018 groundwater sample was analyzed for PCBs and pesticides.
- Select 2019 samples were analyzed for TDS.

The May 30, 2018 groundwater sample from PCMW-16D and the July 27, 2018 groundwater samples from PCMW-10D and PCMW-15S were submitted to Test America of Amherst, New York where they were analyzed for free cyanide. The free cyanide analysis was performed to evaluate the fraction of free cyanide present in the total cyanide concentration previously identified in samples from the respective wells. A sampling summary identifying each monitoring well and the corresponding sampling dates and laboratory analyses is presented in Table 2.

Water Level Measurements

Arcadis collected three synoptic rounds of groundwater level measurements on the following dates: (1) March 19, 2018 from 8:30 to 10:00 am, finishing approximately at low tide; (2) May 29, 2018 from approximately 9:00 to 11:00 am finishing approximately one hour after low tide; and (3) October 3, 2019 from 9:00 am to 1:00 pm finishing at low tide. Groundwater level measurements referenced to the North American Vertical Datum of 1988 (NAVD 88) are presented in Table 5. Groundwater potentiometric surface maps developed for the shallow and deep zones (for the above dates) are shown on Figures 8 through 12.

The groundwater flow patterns are consistent with those observed during the Initial RI activities. As indicated by Figures 8 through 10, shallow groundwater mounds in the central/southern portion of the Site and flows radially outward from the mound in all directions. As indicated by Figures 11 and 12, groundwater flow in the deep zone is eastward, toward the Delaware River.

3.1.2.2 Storm Sewer Reconnaissance

Existing site mapping shows a large City storm sewer identified as the “Upper Delaware Collecting Sewer” (reportedly 11-foot-3-inch to 12-foot-3-inch diameter) extending across the western portion of the Site, from the intersection of Bath Street with Orthodox Street to the south and Buckius Street to the north. The Upper Delaware Collecting Sewer conveys regional storm water deep beneath the Site. The sewer does not collect any storm water from the Site. The depth and construction of this sewer and the potential interaction (if any) between the sewer and shallow groundwater (whether groundwater may be infiltrating into the sewer, or the sewer may be leaking) were unknown prior to conducting the Phase 1 groundwater investigation.

Arcadis identified a manhole in the western portion of the Site (MH-4) within the approximate alignment of this sewer as shown on site mapping. The manhole location is approximately 175 feet south of the intersection of LeFevre Street and Garden Street, as shown on Figure 7. Arcadis observed a wire extending down in the manhole. Aboveground, the wire appeared to extend from MH-4 toward a nearby power pole with an elevated control box. The power pole is labelled, “Philadelphia Water Department, CSO Site, H07”. Downhole camera photos of MH-4 are shown below.

Figure 3-1: Downhole Photos of MH-4

Water was observed in the manhole at a depth of 26.5 bgs (equivalent to negative 13.29 feet NAVD 88). Groundwater elevations beneath the Site within the vicinity of the Upper Delaware Collecting Sewer range from approximately positive 6 to 8 feet NAVD 88, which is approximately 19 feet above the water level in the sewer. Based on this large head difference and as indicated in the existing shallow zone potentiometric surface maps, the Upper Delaware Collecting Sewer appears to have little or no influence on groundwater flow patterns at the Site. Accordingly, any groundwater collected by the sewer would be negligible.

3.1.2.3 Supplemental Soil Investigation

The supplemental soil investigation was performed to:

- Confirm that soil conditions have not changed since the Initial RI data were collected (i.e., that the existing data continue to be representative) and that Initial RI analytical data are still usable for developing the conceptual site model (CSM) and site cleanup plan.
- Delineate known impacted areas to assist in defining the limits of potential cleanup activities.

- Evaluate the elevation of the silt and clay confining unit to further assess the migration potential of any dense non-aqueous phase liquid (DNAPL) in the shallow/water table aquifer.
- Investigate soil conditions along the property boundary to evaluate the potential for offsite migration of site-related constituents or DNAPL.

The first phase (Phase 1) of the soil investigation fieldwork was performed between March 25 and May 3, 2019, and included land surveying, subsurface utility clearance, soil borings, and test pit installation.

The second phase (Phase 2) was conducted between September 19 and 25, 2019 to fill data gaps from Phase 1, where: (1) soil exhibited a combination of visual impacts (e.g., coal tar-like material) and COCs at concentrations an order of magnitude or higher than potentially applicable PADEP MSCs; and (2) data for nearby locations were insufficient to evaluate extent of the impacted soil requiring removal/in-situ treatment.

Soil samples were collected from soil borings or test pits, depending on the purpose of each sampling location, and submitted for laboratory analysis. Soil borings were used more frequently to achieve sampling depths to the confining unit. Test pits were used in locations where subsurface structures were expected and where a broader evaluation of shallow subsurface soil was desired.

Soil Borings

Arcadis advanced a total of 80 soil borings during Phase 1 and a total of 12 soil borings during Phase 2. These numbers are in addition to the soil borings drilled to install monitoring wells MW-101 through MW-113. To confirm Initial RI soil analytical results, approximately 10% of the Initial RI soil sampling locations were revisited and sampled. In total, 25 soil borings revisited previous soil sampling areas, 21 of which were originally test pit sampling locations. Revisited sampling locations were selected to: (1) provide spatial coverage across the site; and (2) represent a range of conditions (e.g., highest concentrations, medium concentrations, and lowest concentrations, with approximately equal focus on each concentration range). Revisited sampling locations were also selected to provide site-wide information on the elevation of the confining silt and clay layer.

Soil borings were drilled into the silt and clay layer using direct-push methods. Soil samples were continuously collected from the borings using a 4-foot-long, 1.5-inch-inside-diameter macro-core sampling device. Recovered soil samples were visually characterized (for color, texture, and moisture content) and were screened using a PID. The presence of visible impacts (e.g., tar-like material, sheens) and obvious odors encountered in the soil were documented. The information gathered during the soil boring program was documented on soil boring logs which are contained in Appendix D and summarized in Table 3.

One or more soil samples were collected from 86 of the soil borings drilled for laboratory analysis. Selection of soil samples for laboratory analysis was primarily based on visual observations and data from nearby Initial RI sampling locations. The proposed sample depths were generally selected for laboratory analysis following one of the scenarios below:

- *Scenario 1* – For revisited sampling locations, samples were collected at approximately the same depth intervals as the Initial RI samples. As needed, additional samples were collected from these locations based on visual observations and at the discretion of the onsite geologist overseeing the work (e.g., if the geologist observed visual impacts, obvious odors, or elevated PID readings not previously documented at the sampling location).

- *Scenario 2* – For sampling locations where visible staining, tar-like material, obvious odors, or elevated PID readings were identified, one sample was collected from the “worst-case” sampling interval and a second sample was collected from the first apparent “clean” interval underlying the impacted materials.

- *Scenario 3* – For perimeter sampling locations where no visible staining, NAPL, obvious odors, or elevated PID readings were identified, one surface soil sample (0-0.5 feet bgs) and one shallow subsurface soil sample (0.5-2 feet bgs) were collected for laboratory analysis.

- *Scenario 4* – If the scenarios above did not apply, two samples were collected from depths selected based on nearby Initial RI sampling locations and identified data gaps.

Soil samples were not collected from below the water table (as identified by saturated soil in the soil boring) for the Phase 2 soil investigation.

Soil samples collected for laboratory analysis were generally analyzed for TCL VOCs, TCL SVOCs, and TAL inorganics including cyanide, except as indicated:

- Samples from S-101 through S-104 were only analyzed for TCL VOCs and SVOCs.
- Samples from S-138 through S-140 were only analyzed for PCBs.

Surface soil samples from PCSB-30R, PCSB-41R, and PCTP-73R and revisited sampling locations from the Initial RI’s PSSTP- series were also analyzed for PCBs and pesticides. A summary of the laboratory analyzes performed in soil from each soil boring is presented in Table 1.

Test Pits

Arcadis excavated nine test pits during Phase 1 of the supplemental soil investigation. No test pits were excavated during Phase 2. To confirm Initial RI soil analytical results, three of the test pits were excavated at revisited sampling locations, one of which was originally a soil boring location.

Test pits were excavated using a rubber-tire backhoe. Soil excavated from each 2-foot depth interval was visually characterized (for color, texture, and moisture content) and screened using a PID. The presence of visible impacts and obvious odors encountered in the soil was documented. The information gathered during the test pit excavations is documented on the logs included in Appendix D and summarized in Table 3.

One or more soil samples were collected from eight test pits for laboratory analysis. Selection of soil samples for laboratory analysis was primarily based on visual observations and data from nearby Initial RI sampling locations and in general, followed the same sampling scenarios as the soil borings.

Soil samples collected for laboratory analysis were generally analyzed for TCL VOCs, TCL SVOCs, and TAL inorganics including cyanide, except one of two soil samples from S-142 (i.e., from 6-6.5 feet bgs) was only analyzed for cyanide because of the potential presence of purifier waste. An underlying sample from S-142 (7-8 feet bgs) was analyzed for TCL VOCs, TCL SVOCs, and TAL inorganics including cyanide. Additionally, soil samples from PCSB-26R and PCTP-66R were analyzed for PCBs and pesticides. A summary of the laboratory analyzes performed in soil from each soil boring is presented in Table 1.

3.1.2.4 Delaware River Reconnaissance and Sediment Probing

To evaluate potential impacts from the Site to the Delaware River, Arcadis performed reconnaissance activities along the shoreline adjacent to the Site. Initial evaluations of the shoreline were performed on March 25 and April 8, 2019. Additional evaluations of the shoreline were performed on May 3 and November 12, 2019. During these site visits, the shoreline was assessed for sheens, tar-like material, elevated PID readings, or other observable indications of Site-related impacts, and the current shoreline conditions were photo-documented during the low tide.

The shoreline was found to contain a rubble-armored seawall (i.e., riprap-like material), two dilapidated piers, and a narrow sandy/gravel area. Additionally, a shopping cart, three submerged vehicles, and other trash were observed along the shoreline. From reconnaissance conducted along the tidal shoreline habitat at low tide, no visible impacts (e.g., sheens) to sediment were observed.

Arcadis evaluated potential habitat for the northern red-bellied cooter during a November 12, 2019 site visit. The northern red-bellied cooter had been identified by the Pennsylvania Fish and Boat Commission (PFBC) as a threatened species in the area of the Site. Arcadis did not encounter prime habitat for the red-bellied cooter or any rare plant or wildlife communities. Observations indicated limited basking habitat areas along the near-shoreline tidal areas.

Arcadis visually assessed and surveyed Outfall 001 south of the southernmost pier and a potential transfer pipe on north side of northern pier. GEI had also assessed Outfall 001 during its Site walks and found no impacts. Outfall 001 is constructed of concrete and approximately two feet in diameter. At low tide the pipe is fully exposed, except where it is silted in with surrounding sand, gravel, and debris. The potential transfer pipe is constructed from steel and approximately 8 to 12 inches in diameter. This pipe is level with the top of the pier and is not expected to be submerged at any point of the tidal schedule. No discharges were observed during Arcadis' or GEI's Site visits. A photograph of Outfall 001 at low tide is shown as Figure 3-2. No site-related environmental impacts were observed at Outfall 001.

Figure 3-2: Outfall 001

Sediment probing was performed on the shoreline adjacent to the Site on May 3, 2019 during low tide. Probing was done from south of the northernmost pier to the southern property boundary and extended approximately 20 feet from the shore into the Site. Probing was performed approximately every 2 feet in this area to evaluate the presence of any sheens, seeps, or other indications of Site-related impacts. The sediment was soft and silty. A metal rod was commonly advanced 3 to 4 feet in the sediment and at some locations up to 5 feet into the sediment. No oil-like sheens, elevated PID readings, or noticeable odors were observed. Volatile organics were not detected (i.e., PID readings were 0.0 parts per million [ppm]) at these film locations. Based on the probing observations, sediment was not further evaluated.

3.1.3 Fish and Wildlife Evaluation

Arcadis performed a fish and wildlife evaluation to support the development of the Ecological Screening (Section 6). The evaluation generally consisted of the following three parts:

- An onsite wetland delineation.
- A formal review of the Site from Pennsylvania Department of Natural Resources (PADNR) in conjunction with United States Fish and Wildlife Service (USFWS) in response to a request from Arcadis in the form or a Pennsylvania Natural Diversity Inventory (PNDI) receipt submitted on October 3, 2019.
- An onsite habitat delineation.

Findings of the fish and wildlife evaluation are provided in Section 6.1.

3.1.4 Decontamination

Sampling equipment was decontaminated before implementing sampling, probing, and drilling activities and between boring locations. Excavation and drilling equipment, including augers and split spoon samplers, were decontaminated using a steam cleaner or hot water pressure washer over a temporary decontamination pad or 55-gallon drum. Non-dedicated sampling equipment was decontaminated between each use by steam cleaning and/or thoroughly washing with alconox and water, using a brush to remove particulate matter or surface film, followed by a thorough rinsing with tap water. Liquids generated from the decontamination process were pumped into 55-gallon steel drums and disposed of in accordance with federal, state and local regulations.

3.1.5 Air Monitoring

During the Initial RI, a PID, quad gas meter and dust monitor (data RAM) were used to monitor volatile organic vapors, hazardous vapors and soil particulates, respectively, in the breathing zone during ground intrusive activities. During field activities that used the HSA drilling method or during test pit excavation activities, calibrated air monitoring instruments were also employed to monitor for potential releases of VOCs and dust at upwind and downwind air monitoring stations. The monitoring instruments were calibrated on at least a daily basis. Equipment calibration was documented in the project field forms and instrument calibration logs. The results of the perimeter air monitoring showed no exceedances of VOC levels or levels of particulate matter with a diameter less than 10 microns as a result of the ground intrusive activities.

Based on the observations during the Initial RI activities, monitoring during the SRI was conducted only in the worker breathing zone for volatile organic vapors using a PID. Perimeter air monitoring was not performed during the SRI. No elevated PID readings were observed in the work breathing zone.

3.1.6 Surveying

During the Initial RI activities, the locations, measuring point and surface elevations of test pits, new monitoring wells, soil probes/borings, and groundwater probes were either surveyed by a licensed surveyor or documented using a field global positioning system (GPS) unit and placed on a georeferenced base map. Top of casing and associated ground surface elevations were surveyed. These data were used in determining groundwater elevations.

Arcadis's survey subcontractor, Paul James Olszewski, PLS, PLLC (PJ Olszewski), established three semi-permanent survey control points at the Site relative horizontally to the North American Datum of 1983 State Plane of Pennsylvania-South (NAD 83) State Plane of Pennsylvania-South and vertically to NAVD 88. Each semi-permanent survey monument was tied into at least three planimetric features. Using the semi-permanent survey control points, PJ Olszewski resurveyed the located monitoring wells that remained from the Initial RI. The top of outer casing, top of inner casing, and ground surface elevations for each groundwater monitoring well were surveyed relative to NAVD 88. PJ Olszewski also surveyed the horizontal location and rim elevation of the Upper Delaware Collecting Sewer manhole MH-4 and subsurface piping and structures encountered at the Site. The horizontal location and ground surface elevation of each soil sampling location were also surveyed relative to NAD 83 and NAVD 88. The groundwater monitoring well, soil boring, test pit, MH-4, and subsurface pipe coordinates and elevations are presented in Table 6.

Before implementing the supplemental soil investigation, PJ Olszewski laser-scanned four preliminary soil delineation areas and associated building foundation areas. Laser technology measures distance with laser "time of flight" and then verifies the space with "wave technology" to generate a point cloud of data that is subsequently overlain by high-definition black and white photographs. The combination of the technologies and smart software tools allows for survey quality measurements of an entire area. The scanned areas were selected based on review of the Initial RI activities. Laser scanning technologies provided detailed survey ("point cloud" data) of the primary areas of interest at the Site in areas where the most significant impacts were suspected to be present. The survey and site photographs were used to evaluate/select SRI sampling locations based on surface condition, vegetation density, and proximity to remaining site features.

Arcadis used a handheld Trimble Geo 7X GPS to survey water and wetlands boundaries. A handheld Trimble R1 GPS was used to survey other points of ecological interest, Outfall 001, and the potential intake pipe.

3.1.7 Data Management and Quality Control

The data quality objective was to obtain valid data to be used to determine the nature, extent and sources of COCs at the Site. For the SRI, the QA/QC samples were collected in accordance with the most recent version of National Grid's generic Field Sampling Plan/Quality Assurance Project Plan. In addition, Arcadis performed a Tier 2 validation for each sample delivery group. Findings of the validation process are documented in the Data Usability Summary Reports included in Appendix H.

To document data quality in the soil and groundwater analyses, several types of QA/QC measures were implemented. QA/QC samples were collected (field blanks, matrix spikes and matrix spike duplicates) at a rate of 1 per 20 environmental samples (soil and groundwater). Trip blanks accompanied shipments of water samples that required volatile organic analysis. Samples for organic analyses were spiked with surrogate and/or internal standard compounds in order to determine the integrity/reliability of the sample results.

To determine the comparability of the sample results, matrix spikes and matrix spike duplicates were analyzed. In addition, specific laboratory QA/QC measures were taken during analysis (i.e., calibrations, blanks, control samples, spiked blanks, etc.), as required by the analytical methods.

3.1.8 Waste Management

All investigation-derived waste was contained onsite for waste characterization before offsite disposal. Soil cuttings, personal protective equipment (PPE), and spent disposable sampling materials were segregated by waste type and placed in United States Department of Transportation- (USDOT-) approved 55-gallon steel drums. Decontamination water, purged groundwater, and drilling water was stored in 55-gallon drums.

During the SRI Activities, a total of 13 drums of non-hazardous liquids (consisting of purge, decontamination, and well-development water), 5 drums of non-hazardous solids (consisting of drill cuttings, decontamination pad materials, and probe liners), and 4 drums of lead-hazardous soil mixture (EPA waste code D008) were generated. Drums were managed and removed from the Site under the direction of National Grid’s Waste Management subcontractor, Capital Environmental.

3.2 Remedial Investigation Findings

This section presents the findings of the RI activities described in Section 3.1. Visual impacts, PID headspace readings, and laboratory analytical results are used together to form a “weight of evidence” to evaluate Site-related impacts and cleanup requirements. A discussion of regional geology in the vicinity of the Site is presented below, followed by a discussion of the Site geology and hydrogeology, distribution of visual impacts, and sampling results for soil, groundwater, and soil vapor.

3.2.1 Physical Setting and Geology

The Site is situated on the westernmost margin of the Atlantic Coastal Plain Physiographic Province. The Coastal Plain is a narrow strip of land in southeastern Pennsylvania. The entire area is about 45 miles long and up to five miles wide and runs parallel to the Delaware River. Most of the Coastal Plain deposits are sand, gravel, silt and clay, which drape over crystalline igneous and metamorphic rocks. The Coastal Plain deposits range in thickness from a thin film at edge of the Coastal Plain to over 6,000 feet beneath the mouth of Delaware Bay (PADEP 2001).

The Site is within the Lower Delaware River Watershed (Hydrologic Unit Code 02040202), which encompasses approximately 1,151 square miles. The watershed is primarily characterized as urban, industrial, and agricultural lands. The region is characterized by sands and gravels storing large quantities of water with extensive streams and wetlands present. Precipitation is primarily adsorbed through direct infiltration processes into surface soils or absorbed through root uptake by vegetation. As mentioned in Section 2.1, vegetation cover exists throughout a large portion of the Site, and limits potential for dust generation or migration to downgradient areas.

According to the Soil Survey of Bucks and Philadelphia Counties (USDA 1975), soil in the vicinity of the Site is characterized as Urban Land. Areas characterized as Urban Land are often so disturbed by construction that identification is not practical. Native soils are typically displaced by fill material during construction activities. Subsurface investigations confirm the presence of substantial fill materials above native soils at the Site. Fill materials consist of cinders, metal, glass, brick, concrete rubble, coal, ash, and cinders comingled with varying amounts of sand and gravel. The fill material at the Site generally meets the definition of historic fill described in Pennsylvania Department of Environmental Protection's Management of Fill Policy (Document #258-2182-773) dated January 1, 2020. The fill material at the Site ranges in thickness from approximately 10- to 20-feet and is thickest in the northeast portion of the Site. In general, the fill thickness decreases from north to southeast, where it pinches out near the Delaware River. The regional geography near the Site is shown on Figure 13.

An organic-rich silt and clay layer underlies the fill material beneath the entire Site. The silt and clay layer was the original land surface prior to filling and development of the area and was likely deposited in a flood-plain/marshy area of the Delaware River. The silt and clay ranges in thickness from approximately 5- to 45- feet and is thickest in the eastern portion of the Site, near the Delaware River. This confining unit was determined to be the separation between the shallow and deep groundwater at the Site and for practicable purposes prevents the movement of groundwater between the shallow and deep groundwater zones at the Site.

Fine-to-coarse sand and gravel of the Pennsauken Formation is observed beneath the silt and clay. Only two Site borings (PCSB-05 and PCSB-16) penetrated the sand and gravel unit, and the thickness of the sand and gravel at these locations was approximately 40 and 60 feet bgs, respectively. Weathered metamorphic schist (saprolite) of the Wissahickon Formation was observed at PCSB-05 and PCSB-16 at approximately 70 and 85 feet bgs, respectively. A cross-section location map and two geologic cross-sections are provided on Figures 14 through 16.

3.2.2 Hydrogeology

Regional groundwater generally flows from the northwest to the southeast, toward the Delaware River. Groundwater elevation data at the Site was measured on October 31, 2005, December 30, 2005, January 30, 2006, March 14, 2006, March 19, 2018, May 29, 2018, and October 3, 2019. The March 14, 2006 data include groundwater elevation data collected during both high and low tides in the Delaware River to assess tidal influence on the shallow and deep groundwater at the Site. The monitoring conducted to date does not indicate a tidal influence on the Site other than at select deep monitoring well locations where levels change by generally less than 1 foot between low and high tides. The groundwater measurements are presented in Table 5. Groundwater contour maps for the shallow and deep groundwater are shown on Figures 8 through 12.

Three hydrostratigraphic units exist at the site: the fill, silt and clay, and sand and gravel. Hydrostratigraphic units are defined based on formations that have similar hydraulic properties. The water table is encountered in the urban/historic fill unit across the site at depths of approximately 2- to 12- feet bgs. Based on regional groundwater information, this shallow groundwater zone is a perched aquifer that was created by the placement of fill over the native silt and clay layer. Composition of this aquifer is expected to be heavily influenced by the urban/historic fill, and therefore, the groundwater is not suitable for use. As shown on Figures 8, 9, and 10, groundwater in the fill is mounded in the central/southern portion of the Site and flows radially outward from the mound. The horizontal hydraulic gradient in the fill is approximately 0.005 to 0.01, depending on location. It appears that flow in the fill is largely controlled by the topography of the underlying silt and clay. That is, where the silt and clay unit has a higher topographic relief, the water table is also higher in elevation. A small amount of groundwater is expected to leak downward and into the silt and clay unit, as demonstrated by a downward hydraulic gradient that exists between the fill and sand and gravel of approximately 0.27. The hydraulic conductivity of the fill ranges from approximately 1.47×10^{-4} to 2.93×10^{-3} centimeters per second (cm/sec)[5].

Groundwater flow within the silt and clay is expected to be minimal due to its low permeability. The hydraulic conductivity of the silt and clay is calculated to be approximately 8.76×10^{-8} to 1.38×10^{-7} cm/sec. Flow within this unit is both horizontal and downward into the sand and gravel.

The potentiometric surface within the sand and gravel of the deep aquifer zone is observed at approximately 9- to 17-feet bgs. The deep aquifer is the primary groundwater aquifer for the Philadelphia region. Groundwater elevations in the sand and gravel do not appear to vary as much as those in the fill, likely because of hydraulic connection with the Delaware River. As indicated by Figures 11 and 12, groundwater in the sand and gravel flows eastward, toward the Delaware River. The horizontal hydraulic gradient in the sand and gravel is approximately 0.002. The sand and gravel is the most permeable hydrostratigraphic unit beneath the site and has a hydraulic conductivity of 2.73×10^{-3} to 1.79×10^{-1} cm/sec.

3.2.2.1 Local Wells and Groundwater Use Around the Site

Per the Philadelphia Water Department Records, residents around the Site consume city water. However, according to the Pennsylvania Groundwater Information System (accessed via the internet on October 13, 2020), there are a total of 65 groundwater wells within a ½-radius around the Site boundaries. Groundwater wells within a ½-mile radius around the Site boundaries are shown on Figure 13 and local well details are presented in Appendix I. Per well type, the number of local wells around the Site are as follows:

- 55 Unused/Abandoned/Destroyed Wells
- 6 Groundwater Monitoring Wells
- 1 Unknown Withdrawal Well
- 1 “Domestic Withdrawal Well”
- 2 Other Withdrawal Wells

A total of 38 of the 65 wells around the Site are directly related to the environmental investigation and cleanup efforts at the former Rohm and Haas Chemical Company Facility (Pennsylvania Facility ID 742771 and NIR number 61614). This facility is approximately 1/3 mile north of the Site. Three monitoring wells, the two “other withdrawal wells”, and the one “unknown withdrawal well” appear to be directly related to the former Rohm and Haas Chemical Company environmental investigation and cleanup.

The one “domestic well” located near the Site is also listed as a monitoring well. This well is located on 3099 Orthodox Street immediately south of the Site at a facility with an active environmental cleanup (Facility ID 609536). This well appears to be related to a former diesel spill from a UST (Pennsylvania Notification of Contamination Form number 33352). For this reason, it is likely that the well is only used for monitoring.

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[5] Hydraulic conductivity values were calculated based on slug test data reported by WCC (WCC 1986) and laboratory soil testing results reported by PSS.

The cluster of wells on the south side of Orthodox Street (immediately south of the Site) appear to be related to an environmental cleanup effort for USF Holland Inc (Pennsylvania Facility IDs 608210/832196 and NIR number 69661).

In conclusion, groundwater around the Site is not used for potable purposes and groundwater wells installed around the Site are generally only used for environmental investigations and clean-ups.

3.2.3 Visual Observations / Headspace Readings

Soil samples collected from soil borings and test pits underwent visual inspection and field screening with a PID. The observed Site-related impacts were characterized by degree of impact. For purposes of characterizing visual observations in the soil, three categories are used to describe the observed impacts as follows (ordered from most impacted to least impacted):

- *Viscous tar or oil-like material* – Viscous or tacky substance that is in a liquid or partially liquid phase. Viscous tar or oil-like material was sometimes observed throughout the soil sample and in the pore space around soil granules. The magnitude of the observed tar was also described (e.g., coated, stringers or blebs).
- *Solidified tar or tar-like material* – Residual tar or similar material that is in a semi-solid to solid phase.
- *Sheen* – Soil and/or groundwater exhibiting an iridescent or rainbow petroleum-like sheen.

Based on the three categories above, 118 of the 377 test pits and soil borings exhibit visual impacts from former Site operations. Visible staining was observed in soil from an additional 15 sampling locations, and soil from three of these locations had bluish-green staining commonly associated with potential purifier waste. However, cyanide analytical results did not indicate the presence of purifier wastes (cyanide concentrations ranged from 0.11 to 20 mg/kg at locations with bluish-green staining, and these values are each below applicable MSCs). Pockets of viscous tar or oil-like material were observed in 20 test pits and soil borings. Solidified tar or tar-like material was observed in 43 test pits and soil borings. Sheens were observed in soil from 77 test pits and soil borings. Odors were noticed at approximately 135 test pits and soil borings. Field observations are summarized in Table 3. Photographs of soil sampling intervals collected from the SRI are included as Electronic Attachment 5.

The Site-related visual impacts were predominately encountered within the central portion of the Site surrounding the Former Coke Operations Area and structures (i.e., former tar storage area, former by-products building and former oxide boxes). Isolated areas of visual soil impacts were encountered at locations on the remainder of the Site. The observed visual impacts in the central portion of the Site were generally associated with the former process piping and foundations, except for impacts found near the former AST farms, east of Former Byproducts Building (later in this RI Report referred to as Area 4). Table 3 summarizes the impacts encountered at the soil boring and test pit locations and identifies the general area of the site where each boring/test pit was completed. Additionally, the extent of Site-related visual impacts and the designated color scheme representing the three categories above (e.g., viscous tar or oil-like material, solidified tar or tar-like material, and sheen) are shown on Figure 17.

Occurrences of viscous tar or oil-like material are limited to the central portion of the Site surrounding the Former Coke Operation Area, except at the following locations: PCSB-01, PCTP-66, PCTP-75, PSSTR-04R, and S-151. The quantity of viscous tar or oil-like material was not well documented during the Initial RI. For the SRI, viscous tar was generally only observed as stringers or blebs, except at sampling locations PCTP-17R, S-160, and S-161 where lenses of coal-tar like material were encountered in available pore space. Sampling locations with viscous tar or oil-like material have been revisited, and viscous tar or oil-like material in surrounding soil has been delineated. Viscous tar or oil-like material in the center of the Site have also been delineated.

Visual impacts are limited to the fill layer or the top two feet of the silt and clay layer, except at soil boring location PCTP-17R near the Former Tar Holders where visual impacts were observed 8 feet into the silt and clay layer. Based on observations at PCSB-09 (located approximately 30 feet northeast of PCTP-17R), the silt and clay layer is approximately 25 feet thick at PCTP-17R. Both PCSB-09 and PCTP-17R are shown on cross-section A-A' (Figure 15). If visual impacts were encountered in a soil boring, the soil boring was advanced to at least the first "clean" interval where no visual impacts or odors were observed. No impacts were observed penetrating the confining silt and clay layer. Within the fill layer, the depths of the visual impacts ranged from surface soils to the bottom of the layer (up to 22 feet bgs) depending on location. Odors were noted at depths up to 26 feet bgs.

For the revisited sampling locations, the visual observations from the SRI Activities are generally consistent with or indicate lesser degree of impacts than those originally documented during the Initial RI activities. In total, seven sampling locations where PS&S observed viscous tar or oil-like material were revisited, and Arcadis only confirmed the presence of this material at one location (PCTP-17). In addition, Arcadis encountered viscous tar or oil-like material at a revisited sampling location (PSSTP-04R) where PS&S did not observe this impact during the Initial RI Activity. The variation between locations where viscous tar and oil-like material were observed during the Initial RI and SRI indicate that viscous tar and oil-like material is not as extensive and/or contiguous as the Initial RI indicates. Therefore, locations with viscous tar and oil-like material are likely limited in size and were not reproduceable.

Generally consistent observations of solidified tar, staining, and sheens were observed between original and revisited sampling locations. For the revisited sampling locations, the reported top of clay surface depths (when encountered) were generally within 1 to 3 feet of that reported for the original boring, except for PCTP-10 and PCTP-32 where the clay surface depths are reported with an 8-foot and 10.5-foot difference, respectively (neither of these locations exhibit viscous tar or oil-like material). In addition, the reported groundwater depths at each soil sampling location were generally reported within 1 to 4 feet from Initial RI and SRI activities. The difference in observations from the Initial RI and SRI Activities is potentially due to a combination of factors, including the potential difference in sampling method (test pits vs. soil borings), survey discrepancies[6], changes in location because of access issues (e.g., because of vegetation or terrain), difference in precipitation and infiltration at the time of sampling, and interpretation of conditions by different onsite geologists. To help distinguish between the SRI and the Initial RI sample locations, the SRI sample locations are shaded in gray on Table 3, and the SRI data for a revisited sampling location is presented immediately after the Initial RI data.

PID headspace readings greater than zero ppm are also presented in Table 3. Figure 17 also indicates locations where PID headspace readings are greater than or equal to 100 ppm. Although there is no regulatory screening value for PID readings, the observations are used in conjunction with visual impacts

[6] A horizontal datum was not referenced during the Initial RI activities. When revisiting the sampling locations, Arcadis used the horizontal coordinates available in PS&S notes and from their existing Geographic Information System map.

to gather a “weight of evidence” of Site-related impacts to inform the Site cleanup and redevelopment plan. Additional information about the PID readings is provided below.

A total of 12 sampling locations with visual impacts also had volatile organic vapors at concentrations greater than 100 ppm. However, PID headspace readings greater than 100 ppm were also encountered at 13 sampling locations where no visual impacts were observed. The highest PID readings were encountered at PCSB-01R which is in the northeast-most corner of the Site. At this location, the PID identified volatile organic vapors greater than 15,000 ppm (instrument maximum) from 16 to 17 feet bgs. The elevated PID readings immediately dropped to 23.1 ppm at the next interval. The initial interval with an elevated PID reading at PCSB-01R was from 14 to 15 feet bgs at 111.8 ppm. Initial RI PID Readings from PCSB-01 peaked at 1,050 ppm from 14.5 to 15 feet bgs. The second highest PID reading was observed at SRI boring location S-144 (458.9 ppm from 14 to 15 feet bgs) which is a step-out delineation boring beyond PSCB-01R, and the third highest PID reading was observed at PCSB-45 (349.2 ppm) which is in the Fuel Blending Area where URS encountered fuel oil impacts in 2001.

3.2.4 Soil Quality Evaluation

This section summarizes the quality of surface and subsurface soil at the Site based on the analytical results for the soil samples collected during the RI.

Approximately 540 soil samples were collected from the 150 soil borings and 145 test pits completed as part of the RI activities. Up to five soil samples were collected from a soil boring or test pit. As described in Section 3.1, soil samples were submitted for laboratory analysis for a combination of VOCs, SVOCs, inorganics including cyanide, pesticides, and PCBs.

For the purposes of evaluating the soil analytical results, the results have been compared to the following PADEP Statewide Heath Standards (SHS) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program:

1. The non-residential direct contact MSC for surface soil (if appliable).
2. The non-residential direct contact MSC for subsurface soil (if appliable).
3. The soil-to-groundwater MSCs for a non-residential used aquifer with TDS less than or equal to 2,500 ppm. The higher of the 100 X groundwater MSC or generic value is used. However, groundwater is not used for potable purposes at the Site and in the surrounding area.

These SHS are potentially applicable to the Site given the anticipated current and future site use. The property is currently zoned as industrial, and as indicated in the Cleanup Plan, the property will be deed restricted to non-residential use only. Please note, that the soil results are compared to VI screening values in Section 3.2.6.

A separate evaluation of the applicability of the Toxic Substances Control Act (TSCA) PCB regulations to PCBs identified in soil at the Site was submitted to the EPA on May 12, 2021, and EPA’s response is provided in a July 8, 2021 letter to Arcadis (refer to Appendix J for copies of the evaluation and EPA’s response). As indicated by EPA’s response, EPA agrees that PCBs identified in soil samples collected at the Site, except in the southeast corner (Historic Tar Plains/Fill Area), are related to pre-April 1978 release(s) and are therefore not regulated under TSCA. PCBs in soil will be addressed in accordance with the Cleanup Plan contained in Section 9 of this document and a self-implementing cleanup plan for the TSCA-regulated soils in the southeast corner that will be submitted to EPA in accordance with 40

CFR 761.61. The cleanup method to be used for the southeast corner (PCB-containing soils) will be the same as that used for other areas of the Site (i.e., capping and deed restriction).

To make the soil analytical results more manageable, the attached data tables (Tables 7 through 13) separate the soil analytical results into surface soils, unsaturated subsurface soils, and saturated subsurface soils. A soil sample was considered saturated if its elevation was below the higher of either: (1) the groundwater elevation encountered in the soil boring and test pit; or (2) the groundwater surface elevation from the highest potentiometric surface map (January 30, 2006 for Initial RI samples and March 2018 for SRI samples). Therefore, the saturated soil dataset also includes soil samples collected from the anticipated capillary fringe area. Surface soil analytical results for detected constituents are presented in Tables 7 and 8, and sampling locations with results exceeding the non-residential direct contact MSCs are highlighted on Figure 18. Subsurface soil analytical results for detected constituents are presented in Tables 9 through 12. Table 13 presents a statistical summary table for the soil analytical data.

Additionally, detail figures are provided for four areas of the Site where the sampling density is high (delineation areas) as follows:

- ***Area 1:*** *Eastern Part of Former Coal Storage Area*. Sampling locations PCTP-75 and PSSTP-04 where revisited and environmental impacts around these locations were delineated. Additionally, Arcadis installed four new monitoring wells in this area (MW-103, MW-108, MW-109, and MW-110).
- ***Area 2:*** *North/Northwest of Former Tar Storage Area*. Environmental impacts in soil around the Former Tar Storage Area have been delineated. Additionally, sampling locations PCTP-12 and PCTP-17 were revisited.
- ***Area 3:*** *South of Former Tar Storage Area*. Sampling locations PCTP-66 and TP-15 were revisited and environmental impacts around these locations were delineated.
- ***Area 4:*** *Former AST Farm East of Former Byproducts Operations*. Environmental impacts in soil near the former AST farm have been delineated. Sampling location TP-63 was revisits. Additionally, Arcadis installed three new monitoring wells in this area (MW-111 through MW-113).

The four above-identified areas are shown in Figure 19, and sampling locations with visual impacts in those areas are highlighted on Figures 20 through 23.

For the PSSTP- test pit series, please note that the sample IDs with the …A and …B suffix originate from the same sampling location and just represent different depth intervals (e.g., PSSTP-01A was a surface or shallow soil sample and PSSTP-01B was a subsurface sample collected from test pit sampling location PSSTP-01).

During the Initial RI activities, PS&S labelled the blind duplicate samples with “fake” sample IDs. Arcadis could not identify a key or table linking the duplicate samples with their associated parent samples. However, it appears that, in general, PS&S labelled the duplicate samples with a “2” in front of the parent sample ID (e.g., the parent for PCTP-260 (0.5) is PCTP-60 (0.5)). However, in some cases, the sample depth does not match that of the parent sample. In these cases, the blind duplicate data are not presented with a parent sample, the duplicate is not associated with a sample location in this RI Report’s figures, and the duplicate is counted as a separate sample but not a separate sampling location when presenting statistics[7]. Duplicate sample IDs without parent samples are limited to only the following: PCTP-214 (7.5), PCTP-236 (7), and TP-278 (9).

3.2.4.1 Surface Soil Analytical Results

A total of 104 surface soil samples from 102 sampling locations[8] were collected and analyzed for VOCs, SVOCs, and inorganics. In addition, 93 samples were also collected for pesticides analysis, and 101 samples were collected for PCB analysis. For sampling locations S-138 through S-140, soil samples were only analyzed for PCBs (two samples from each boring for a total of six samples). Surface soil samples were generally collected throughout the Site, but with a higher density of samples from the Fuel Blending Area. Pesticides and PCBs were not detected in surface soil at concentrations greater than non-residential direct contact or soil-to-groundwater MSCs. Therefore, the discussion of surface soil analytical results below focuses on VOC, SVOCs, and inorganics. The locations of surface soils and associated MSC exceedances are shown on Figure 18.

Surface Soil Analytical Results for VOCs

No VOCs were detected in surface soil at concentrations greater than the non-residential direct contact MSCs. Other than benzene, no VOCs were detected in surface soil above the non-residential soil-to-groundwater MSC. Benzene was detected at a concentration greater than the 0.5 mg/kg soil-to-groundwater MSC at only three locations (PCTP-66 [0.5 feet bgs], PSSTP-22 [1-2 feet bgs], and S-113B [1-3 feet bgs]). The highest benzene concentration identified in surface soil was 29 mg/kg in the sample from PCTP-66 located in the southwest corner of the Site. As part of the SRI Activities, PCTP-66 was revisited and surrounded by delineation sampling locations. Benzene was not detected in the surface soil sample from PCTP-66R or surface soil samples from the four delineation sampling locations (S-119 through S-122). Benzene concentrations at the other two locations (PCTP-22A in the center of the Site and S-113B in Area 2) were both below 1 mg/kg. VOCs in soil around both locations have been delineated.

Surface Soil Analytical Results for SVOCs

SVOCs were not detected at concentrations greater than the non-residential direct contact MSCs or the non-residential soil-to-groundwater MSCs in surface soil samples from 84 of 102 sampling locations. At the remaining 18 sampling locations, several PAHs common in urban/historic fill were generally detected at concentrations slightly higher than non-residential direct contact MSCs. Of these 18 sampling locations, 9 sampling locations contained PAH concentrations exceeding the non-residential soil-to-groundwater MSCs.

BaP concentrations exceeding direct contact MSCs were encountered at each of the 18 surface soil sampling locations where MSC exceedances were identified. At 10 of the 18 locations, there were no other SVOCs besides BaP exceeding the MSCs. At 5 of those 18 locations, BbF was the only other SVOC besides BaP exceeding the MSCs.

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[7] During statistical discussions in this RI Report, duplicate samples with identified parents are counted as one sample.
[8] Location count does not include sampling locations S-138 through S-140 where soil samples were only analyzed for PCBs.

Multiple PAHs were identified at concentrations exceeding MSCs in surface soil collected from sampling locations PCTP-66 (0.5 feet bgs), PCTP-68 (0.5 feet bgs), and S-163 (0.5-2 feet bgs). BaA, BaP, BbF, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene were identified as COCs. The highest PAH concentrations were identified at location PCTP-66 in the southwest corner of the Site. As indicated above, PCTP-66 was revisited during the SRI. BaA, BaP, BbF, and dibenz(a,h)anthracene were detected in the surface soil sample collected from PCTP-66 at concentrations up to two orders of magnitude greater than non-residential direct contact MSCs. PAHs in soil around PCTP-66 were delineated during the SRI. Solidified tar was found on a cobble at PCTP-66R. Only BaP and BbF were detected at concentrations exceeding MSCs in the surface soil sample collected from PCTP-66R. Additionally, No SVOC were detected at concentrations exceeding MSCs from the delineation soil samples around PCTP-66.

PAH concentrations from PCTP-68 and S-163 are an order of magnitude less than those detected in PCTP-66. PCTP-68 is located in the center of the Site, and S-163 is located in Area 2. PAHs in soil around both locations have been delineated.

Surface Soil Analytical Results for Inorganics

Inorganic constituents were not detected at concentrations greater than non-residential direct contact MSCs in surface soil from 81 of 102 sampling locations. Arsenic and lead were the most frequently detected inorganic constituents encountered at concentrations greater than MSCs in surface soil. Arsenic MSC exceedances in surface soil appear to be randomly distributed across the Site. Lead MSC exceedances in surface soil are mostly located in the Fuel Blending Area and at select locations in the center of the Site. Arsenic and lead impacts do not appear to be collocated with one another.

Arsenic concentrations in surface soil exceed the 61 mg/kg non-residential direct contact MSC at 13 sampling locations and the 29 mg/kg soil-to-groundwater MSC at 22 sampling locations. The highest arsenic concentrations are 170 mg/kg at PSSTP-30A, 120 mg/kg at PCTP-70, and 105 mg/kg at S-120. Outside these locations, arsenic concentrations are 100 mg/kg or less.

Lead concentrations in surface soil exceed the 1,000 mg/kg non-residential direct contact MSC at 12 sampling locations and the 450 mg/kg soil-to-groundwater MSC at 30 sampling locations. The highest lead concentrations were identified in surface soil samples collected from the Fuel Blending Area. The highest lead concentrations are 14,000 mg/kg at PCSB-36 (0.5 feet bgs), 6,200 mg/kg at PCSB-55 (0.5 feet bgs), and 5,400 mg/kg at PCSB-44 (0.5 feet bgs). Outside of the Fuel Blending Area, lead concentrations exceeding non-residential direct contact MSCs were only identified at two sampling locations: PCTP-78 (just west of the utility corridor at 1,100 mg/kg) and PSSTP-22 (near the middle of the Site at 1,130 mg/kg). Although lead concentrations may exceed the soil-to-groundwater MSCs, lead was not detected in any filtered groundwater samples at concentrations greater than the 5 µg/L residential and non-residential MSC.

Mercury is the only other inorganic that exceeds the 10 mg/kg soil-to-groundwater MSC. Mercury only exceeds the soil-to-groundwater MSC in surface soil collected from PCSB-06 (17 mg/kg), which is located in the Fuel Blending Area. Mercury was not identified in any groundwater samples at concentrations greater than the 2 µg/L residential and non-residential groundwater MSC.

3.2.4.2 Subsurface Soil Analytical Results

In total, subsurface soil samples from 285 sampling locations were analyzed for a combination of VOCs, SVOCs, inorganic constituents, pesticides, and PCBs. The sample count includes 39 sampling locations where both saturated and unsaturated soil samples were collected.

In the unsaturated zone, 77 subsurface soil samples from 75 sampling locations were collected and analyzed for VOCs, SVOCs, and inorganics. Of those 77 samples, 17 samples were also analyzed for pesticides and PCBs.

In the saturated zone, 354 subsurface soil samples from 249 sampling locations were collected and analyzed for VOCs and SVOCs. Of those 354 samples, 349 samples were also analyzed for metals, and 59 samples were analyzed for pesticides and PCBs.

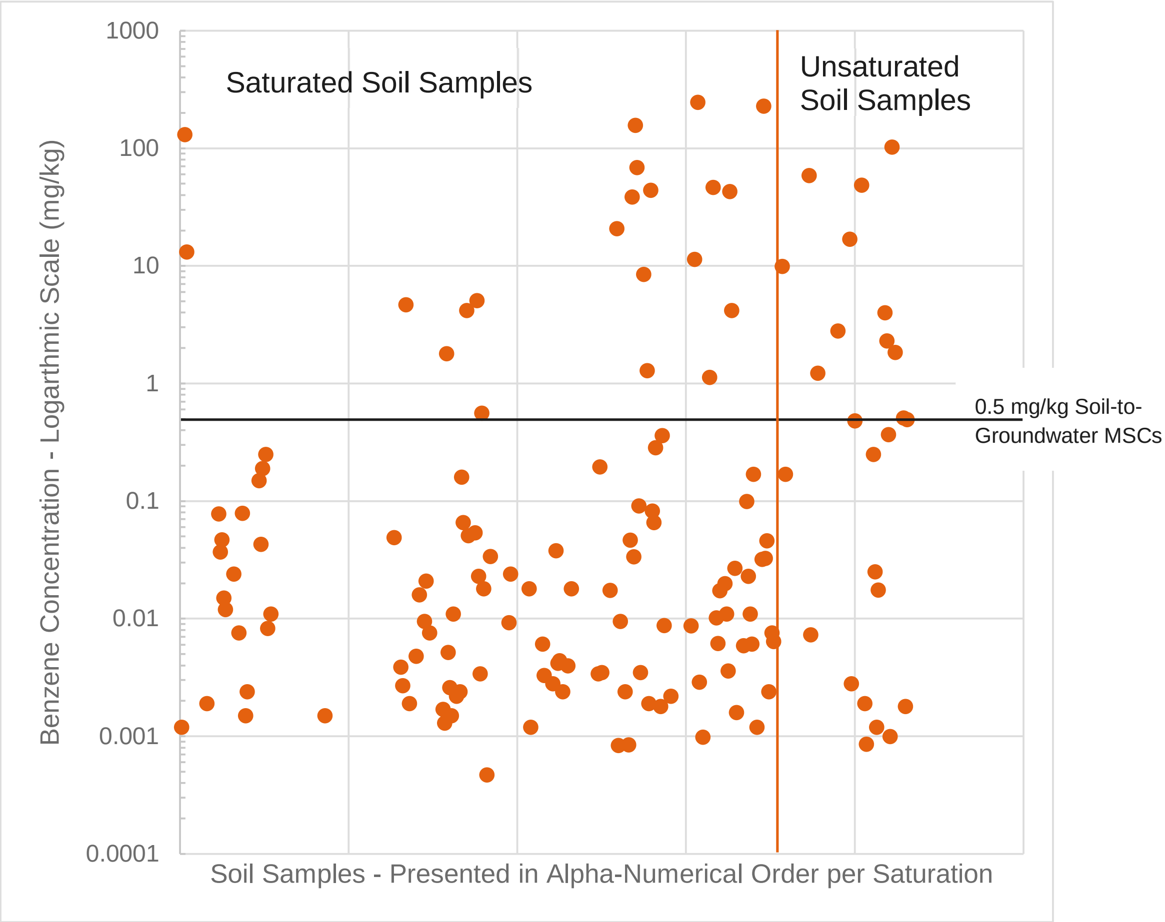
No constituents were detected at concentrations exceeding the non-residential direct contact MSCs for subsurface soil. Similar to surface soil samples, pesticides and PCBs were not detected at concentrations exceeding the non-residential soil-to-groundwater MSCs. Therefore, the discussion of subsurface impacts below focuses on VOCs, SVOCs, and inorganic results exceeding non-residential soil-to-groundwater MSCs.

Subsurface Soil Analytical Results for VOCs

VOCs were not detected at concentrations greater than the non-residential soil-to-groundwater MSCs in subsurface soil samples from 254 of 285 sampling locations. From the remaining 31 subsurface soil sampling locations, several VOCs were detected at concentrations greater than the soil-to-groundwater MSCs in 11 unsaturated and 23 saturated soil samples (three sampling locations contained both unsaturated and saturated soil samples with VOCs exceeding the MSCs). Benzene was the only VOC detected in unsaturated soil at concentrations greater than the corresponding MSC. In saturated soil, benzene was detected at a concentration exceeding the MSC at each location that exhibited a VOC exceedance, except S-122 (Area 3B) and TP-33 (Former Coke Operations Area) where dichloromethane was the only VOC detected at a concentration greater than MSCs.

In general, subsurface soil sampling locations with higher concentrations of benzene also had higher concentrations of other VOCs. The highest benzene concentrations were detected in saturated soil in Area 4 (Former AST Farm East of Former Byproducts Operations): 247 mg/kg at S-155 (10-12 feet bgs), 230 mg/kg at TP-63 (8 feet bgs), and 157 mg/kg at S-125 (7 to 9 feet bgs). The highest benzene concentration in unsaturated soil is 103 mg/kg at S-161 from 5 to 7 feet bgs (also in Area 4). The distribution of benzene concentrations in unsaturated and saturated subsurface soil is shown on Figure 3-3 below. TP-63 had the most VOCs detected at concentrations greater than MSCs and S-155 had the second most VOCs detected at concentrations greater than MSCs. Viscous tar or oil-like material was observed at both locations (blebs at S-155; the quantity of viscous tar at TP-63 was not documented). TP-63 and S-155 are both located within Area 4. The viscous tar or oil-like material in Areas 4 has been delineated as part of the SRI Activities.

Figure 3-3: Distribution of Benzene Concentrations in Subsurface Soil Samples



Note: Data are presented in logarithmic scale on y-axis. Each sample where benzene was detected is represented by an orange dot. As illustrated above, most data are below the S-GW MSC for benzene of 0.5 mg/kg.

Chlorobenzene, dichloromethane, ethylbenzene, styrene, and toluene exceedances in saturated subsurface soil are collocated with benzene, except as noted above. Locations where each of these VOCs was found to exceed the corresponding soil-to-groundwater MSCs are summarized below:

- Chlorobenzene concentrations exceeded the 10 mg/kg MSC in subsurface soil samples from three sampling locations (S-125 [47.5 and 19 mg/kg], S-155 [40.7 mg/kg], and TP-63 [53 mg/kg]).
- Dichloromethane concentrations exceeded the 0.5 mg/kg MSC in subsurface soil samples from five sampling locations (PCTP-42 [0.91 mg/kg], PCTP-46 [1.2 mg/kg], S-122 [0.829 mg/kg], TP-15 [1.8 mg/kg], and TP-33 [3.2 mg/kg]).
- Ethylbenzene concentrations exceeded the 70 mg/kg MSC in subsurface soil samples from three sampling locations (PCTP-42 [180 mg/kg], S-155 [76 mg/kg], and TP-63 [140 mg/kg]).
- Styrene concentrations exceeded the 24 mg/kg MSC in subsurface soil samples from two sampling locations (MW-111 [29.5 mg/kg] and TP-63 [47 mg/kg]).

- The toluene concentration exceeded the 100 mg/kg MSC in the subsurface soil sample from one sampling location (TP-63 [140 mg/kg]).

No other VOCs were detected in subsurface soil at the Site at concentrations exceeding the non-residential soil-to-groundwater MSCs. Chlorobenzene, dichloromethane, ethylbenzene, styrene, and toluene were not detected in any groundwater samples at concentrations greater than applicable residential and non-residential groundwater MSCs.

Subsurface Soil Analytical Results for SVOCs

SVOCs were not detected at concentrations greater than the non-residential soil-to-groundwater MSCs in subsurface soil samples from 238 of 285 sampling locations. From the remaining 47 subsurface soil sampling locations, SVOCs were detected at concentrations greater than the soil-to-groundwater MSCs in 15 unsaturated and 35 saturated soil samples. Naphthalene was detected in subsurface soil at a concentration exceeding the MSC at each sampling location that exhibited an SVOC MSC exceedance, except locations PCTP-22 and TP-16 where BaP was the only SVOC detected at a concentration greater than the MSC.

In general, locations with higher naphthalene concentrations also had higher concentrations of other SVOCs. To evaluate the variability and magnitude of SVOC results, it is helpful to compare the total PAH concentrations[9]. Sampling locations exhibiting the highest total PAH concentrations are within the four delineation areas (Areas 1 through 4). Additionally, the SRI sampling results indicate that PAH concentrations at these locations are at least an order of magnitude less than the Initial RI results. Viscous tar or oil-like material was commonly observed at locations with elevated PAH concentrations.

Subsurface Soil Analytical Results for Inorganics

Inorganic constituents were not detected in subsurface soil samples from 174 of 281 sampling locations at concentrations greater than non-residential soil-to-groundwater MSCs. Similar to surface soil analytical results, arsenic and lead were the inorganic constituents most frequently detected in subsurface soil at concentrations greater than MSCs. In addition, antimony, cyanide, mercury, nickel, and selenium were detected at select sampling locations (three or fewer separate sampling locations for each constituent) at concentrations greater than the non-residential MSCs. Arsenic concentrations greater than MSCs in subsurface soil are distributed across the Site. Lead concentrations greater than MSCs in subsurface soil are mostly located in the Fuel Blending Area and at select locations elsewhere onsite. Arsenic and lead impacts do not appear to be collocated with one another. Antimony, cyanide, mercury, nickel, and selenium were detected at concentrations greater than MSCs at subsurface sampling locations where lead was generally also detected at concentrations greater than the MSC, but these constituents are not collocated among themselves.

Arsenic concentrations exceed the 29 mg/kg soil-to-groundwater MSC at 76 sampling locations (8 unsaturated samples and 70 saturated samples). The highest detected arsenic concentrations are 170 mg/kg at S-105 from 2 to 4 feet bgs (unsaturated), 140 mg/kg at PCSB-30 at 2 feet bgs (unsaturated), and 140 mg/kg at PCTP-19 at feet bgs (saturated). The distribution of arsenic concentrations in

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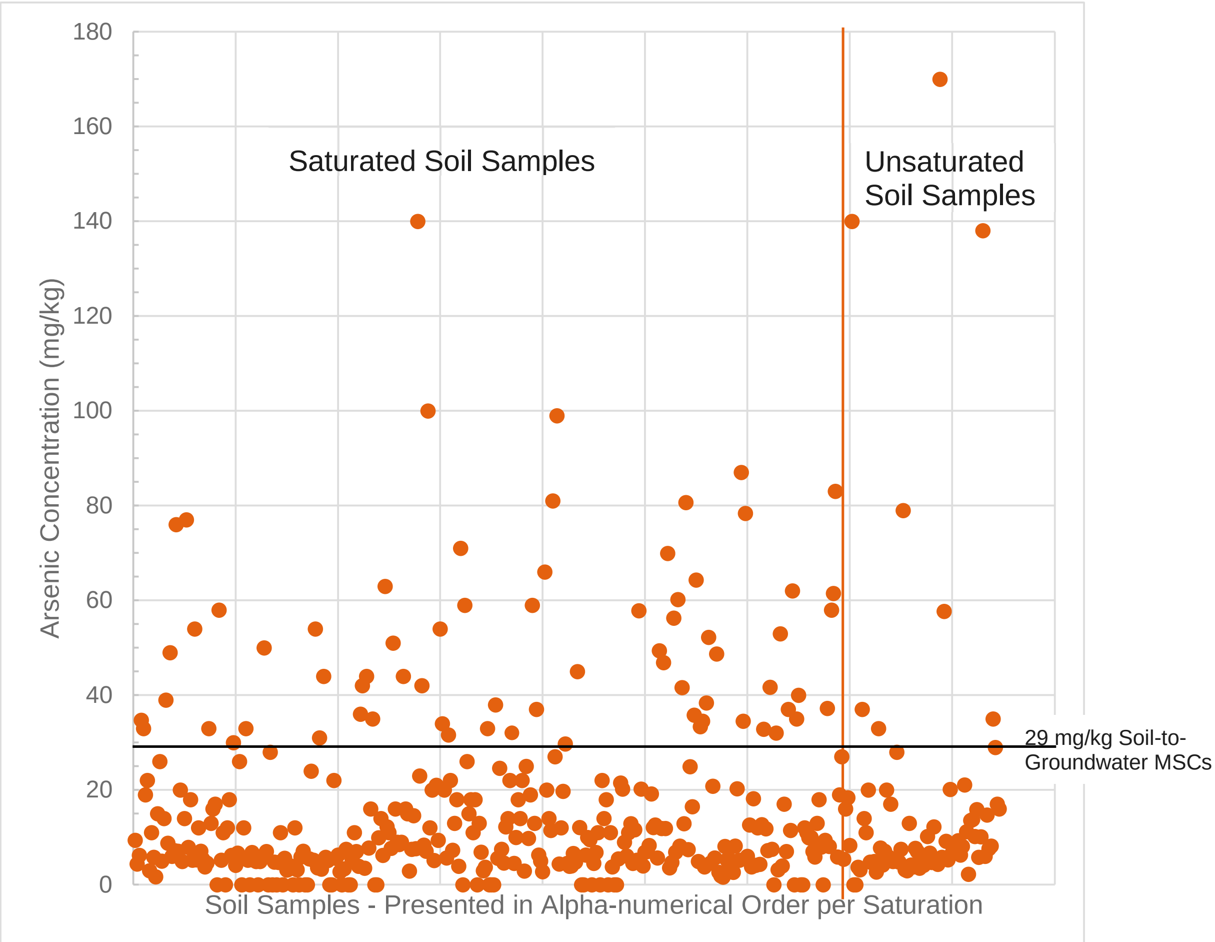
[9] For purposes of this RI Report, total PAH is considered the sum of EPA 16 priority pollutant PAHs and 2-methylnaphthalene.

subsurface soil is shown on Figure 3-4 below. Arsenic impacts appear to be randomly distributed across the Site.

Figure 3-4: Distribution of Arsenic Concentrations in Subsurface Soil Samples



Note: Each sample is represented by an orange dot. As illustrated above, most data are below the S-GW MSC for arsenic of 29 mg/kg.

Lead concentrations exceed the 450 mg/kg soil-to-groundwater MSC at 58 sampling locations (14 unsaturated samples and 45 saturated samples). The highest detected lead concentrations are 62,000 mg/kg at PCTP-28 at 7 feet bgs (saturated), 26,000 mg/kg at PCSB-08 at 10.5 feet bgs (saturated), and 9,600 mg/kg at TP-44 at 4 feet bgs (unsaturated). PCTP-28 and PCSB-08 are located in the center of the Site. TP-44 is located in the Fuel Blending Area. Sampling locations PCTP-28 and TP-44 were revisited during the SRI. Lead concentrations at PCTP-28R did not exceed the soil-to-groundwater MSC. Lead concentrations at TP-44R exceeded the soil-to-groundwater MSC at one of three sampling intervals (2,840 mg/kg at 5-7 feet bgs). As discussed in Section 3.2.5, lead was not detected in any filtered groundwater samples at concentrations greater than the 5 µg/L residential and non-residential MSC.

Antimony, cyanide, mercury, nickel, and selenium exceedances are summarized below:

- Antimony concentrations exceeded the 27 mg/kg MSC in subsurface soil samples from three sampling locations (PCTP-09 [92 mg/kg], PCTP-12 [33 mg/kg], and PCTP-41[34 mg/kg]).
- Cyanide concentrations exceeded the 200 mg/kg MSC in subsurface soil samples from three sampling locations (PCTP-12 [340 mg/kg], PCTP-17 [670 mg/kg], and TP-64 [789 mg/kg]). No other inorganic constituents were detected in subsurface soil from TP-64 at concentrations greater than MSCs.
- The mercury concentration exceeded the 10 mg/kg MSC at one location (31 mg/kg at PCTP-68).
- The nickel concentration exceeded the 650 mg/kg MSC at one location (2,480 mg/kg at PSSTP-04R).
- The selenium concentration exceeded the 26 mg/kg MSC at one location (29 mg/kg at PCSB-30).

No other inorganic constituents were detected in subsurface soil at the Site at concentrations greater than the non-residential soil-to-groundwater MSCs. Cyanide (free), mercury, and selenium were not identified in any groundwater samples at concentrations greater than the applicable residential and non-residential MSC.

3.2.4.3 Comparison of Initial RI and SRI Results for Revisited Sampling Locations

Similar to the outcome of the visual characterization comparison between the Initial RI and SRI soil samples (which showed fewer visual impacts in SRI soil samples), laboratory analytical results show that most of the revisited sampling locations had lower concentrations than those identified at the original sampling locations, sometimes by an order of magnitude or more. Therefore, the Initial RI data may be biased (i.e., potentially focusing on small blebs or pockets of impacted material and not representing overall conditions at the sampling location). Considered alone, the Initial RI data likely over-predicts the magnitude of Site-related impacts as the impacts were often not reproduced in the revisited sampling locations. However, the site-wide distributions of soil impacts are generally consistent between the Initial RI and SRI results, and the overall site model is unchanged by the SRI data.

The differences in concentrations from the Initial RI and SRI Activities are potentially due to a combination of factors, including survey discrepancies, location adjustments because of access issues (e.g., due to vegetation or terrain), natural attenuation/degradation processes, and selection of soil samples by different onsite geologists (different bias). Additionally, Initial RI concentrations may be higher than SRI concentrations because the majority of the initial RI subsurface soil samples were collected from test pits instead of borings, and test pits may expose more potentially impacted soil for sample selection.

3.2.4.4 Soil Investigation Conclusion

In total, 104 surface and more than 430 subsurface samples were collected for laboratory analysis to characterize the nature and extent of Site-related impacts. The number and density of samples is more than sufficient to complete delineation of the Site COCs and advance the project into cleanup.

No surface or subsurface samples exceed the non-residential direct contact or soil-to-groundwater MSCs for pesticides and PCBs. Therefore, cleanup activities will be focused on areas where the VOC, SVOC, and inorganic concentrations exceed MSCs.

Constituents in surface soil exceeding non-residential direct contact MSCs are limited to select SVOCs, arsenic, and lead. The SVOC and arsenic concentrations found in surface soil are typical of urban/historic fill, except SVOC results at surface soil sampling location PCTP-66 which was resampled during the SRI. SVOC impacts in surface soil around PCTP-66 have been delineated. SVOC impacts in surface soil at PCTP-66 are collocated with solidified tar or tar-like material. Surface soil containing lead concentrations greater than non-residential direct contact MSCs are in the Fuel Blending Area and at two locations in the center of the Site. COCs in surface soil are listed in Table 3-4 below.

Table 3-4: Soil Constituents in Surface Soil Exceeding Non-Residential Direct Contact MSCs

Analyte	CAS Number	Direct Contact Exceedance Frequency
Semi-Volatile Organic Compounds		
Benz(a)anthracene	56-55-3	3/104
Benzo(a)pyrene	50-32-8	18/104
Benzo(b)fluoranthene	205-99-2	8/104
Benzo(k)fluoranthene	207-08-9	2/104
Chrysene	218-01-9	1/104
Dibenz(a,h)anthracene	53-70-3	3/104
Indeno(1,2,3-cd)pyrene	193-39-5	3/104
Naphthalene	91-20-3	2/104
Metals		
Arsenic	7440-38-2	13/104
Lead	7439-92-1	12/104

No constituents were identified in subsurface soil at concentrations exceeding non-residential direct contact MSCs for subsurface soil. The subsurface soil sampling locations exhibiting the highest VOC and SVOC concentration also have the highest benzene and naphthalene concentrations. The highest VOC concentrations in subsurface soil are in Area 4 and the highest SVOC concentrations in subsurface soil are in the four delineation areas (Areas 1 through 4). Elevated VOC and SVOC concentrations are typically collocated with visual impacts (e.g., pockets of viscous tar, oil-like material, and solidified tar). VOC and SVOC concentrations have been delineated. Similar to surface soil findings, arsenic and lead are the primary inorganic COCs in subsurface soil. Additionally, groundwater is characterized throughout the Site (as discussed in Section 3.2.5), and many of the constituents detected in soil at concentrations greater than the S-GW MSC were not detected in groundwater samples at concentrations greater than applicable residential and non-residential groundwater MSCs. This includes the following constituents: chlorobenzene, dichloromethane, ethylbenzene, styrene, toluene, 1,1-biphenyl, 2-methylnaphthalene, 4-methylphenol, anthracene, fluoranthene, fluorene, phenanthrene, phenol, pyrene, cyanide, lead, mercury, and selenium. The COCs in surface and subsurface soil are identified in Table 3-5 below.

Table 3-5: Soil Constituents Exceeding Non-Residential Soil-to-Groundwater MSCs

Analyte	CAS Number	S-GW Exceedance Frequency	Concentration in GW Above Applicable GW MSCs (discussed in Section 3.2.5)
Volatile Organic Compounds			
Benzene	**71-43-2**	**36/530**	**Yes**
Chlorobenzene	108-90-7	4/530	No
Dichloromethane	75-09-2	5/530	No
Ethylbenzene	100-41-4	3/529	No
Styrene (Monomer)	100-42-5	2/470	No
Toluene	108-88-3	1/532	No
Semi-Volatile Organic Compounds			
1,1-Biphenyl	92-52-4	4/168	No
2-Methylnaphthalene	91-57-6	4/535	No
4-Methylphenol	106-44-5	1/296	No
Anthracene	120-12-7	15/535	No
Benz(a)anthracene	**56-55-3**	**12/535**	**Yes**
Benzo(a)pyrene	**50-32-8**	**39/535**	**Yes**
Benzo(b)fluoranthene	**205-99-2**	**22/535**	**Yes**
Benzo(g,h,i)perylene	**191-24-2**	**13/535**	**Yes**
Benzo(k)fluoranthene	**207-08-9**	**6/535**	**Yes**
Carbazole	**86-74-8**	**18/535**	**Yes**
Chrysene	**218-01-9**	**18/535**	**Yes**
Dibenz(a,h)anthracene	**53-70-3**	**2/535**	**Yes**
Dibenzofuran	**132-64-9**	**16/535**	**Yes**
Fluoranthene	206-44-0	8/535	No
Fluorene	86-73-7	4/535	No
Naphthalene	**91-20-3**	**54/535**	**Yes**
Phenanthrene	85-01-8	4/535	No
Phenol	108-95-2	2/535	No
Pyrene	129-00-0	6/535	No
Metals			
Antimony	**7440-36-0**	**3/527**	**Yes**
Arsenic	**7440-38-2**	**101/527**	**Yes**
Cyanide	57-12-5	3/333	No
Lead	7439-92-1	89/527	No
Mercury	7439-97-6	2/525	No
Nickel	**7440-02-0**	**1/527**	**Yes**
Selenium	7782-49-2	1/527	No

Notes: S-GW indicates the soil-to-groundwater MSCs for a non-residential used aquifer with TDS less than or equal to 2,500 ppm; GW = groundwater.

3.2.5 Groundwater Quality Evaluation

This section summarizes the groundwater quality at the Site based on analytical results of groundwater samples collected from monitoring wells and hydropunch sampling locations during the RI.

During the Initial RI activities, groundwater samples were collected from 33 monitoring wells and 7 hydropunch locations. The 33 monitoring wells were sampled in November 2005 and January/February 2006 for VOCs, SVOCs, total metals, dissolved metals, pesticides, and PCBs, except PCMW-08S which was only sampled in November 2005. Groundwater samples collected from the hydropunch locations were analyzed for VOCs, SVOCs, and total metals.

During the monitoring well integrity survey performed as part of the SRI Activities, Arcadis located 23 of the 33 Initial RI monitoring wells (wells identified by the prefix “PCMW-”) as shown on Initial RI site maps, plus two of the nine pre-2003 monitoring wells (wells identified with the ID “MW-”). As listed in Table 3-3 (Subsection 3.1.2.1), Arcadis installed four monitoring wells to replace Initial RI monitoring wells that could not be located in 2018. Arcadis also installed nine additional monitoring wells in areas where groundwater was not sufficiently characterized by the Initial RI monitoring well network, including Areas 1 and 4 where the most impacted soils were observed.

During the SRI Activities, Arcadis sampled groundwater from 23 existing wells (including two wells of unknown construction) and 13 new SRI monitoring wells for a combination of VOCs, SVOCs, total inorganics, dissolved inorganics, total cyanide, free cyanide, TDS, pesticides, and PCBs.

The groundwater analytical results have been compared to the PADEP Non-Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L. These MSCs are applicable to the Site given the anticipated current and future site use for commercial or industrial purposes. Groundwater is not used for potable purposes at the Site and in the surrounding area. For documentation purposes, the groundwater analytical results are also compared in this Section to the PADEP Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L. Please note that the groundwater results are compared to VI screening values in Section 3.2.6.

Groundwater analytical results for hydropunch locations are presented in Table 14. Groundwater analytical results for monitoring wells are presented in Tables 15 through 17. A statistical summary of groundwater analytical data for samples collected from the monitoring wells is presented in Table 18. Additionally, groundwater analytical results exceeding the above-identified MSCs are shown in Figures 24 and 25.

During the Initial RI activities, PS&S labelled the blind duplicate samples with “fake” sample IDs. Arcadis could not identify a key or table linking the duplicate samples with their associated parent samples. However, it appears that, in general, PS&S labelled the duplicate samples with a “2” in front of the parent sample ID (e.g., the parent for PCMW-214D (11/9/05) is PCMW-14D (11/9/05)). However, in some cases, the duplicate ID does not indicate if the sample was collected from the deep or shallow well in the cluster. In these cases, the blind duplicate data are not included in the discussion below. Duplicate sample IDs without parent samples are limited to only the following: PCMW-211 (2/2/2006) and PCMW-212 (2/1/2006). However, results for these duplicate samples are included in the statistics in Table 18.

3.2.5.1 Hydropunch Groundwater Sampling Results

In general, hydropunch samplers were advanced in the areas where soil impacts were observed in the Initial RI. The analytical results for groundwater samples collected from hydropunch locations are summarized below:

- VOCs and SVOCs were not detected in any of the hydropunch groundwater samples at concentrations exceeding the MSCs, except the sample from PCHP-03 which is located in the center of the Site. At PCHP-03, benzene was detected at a concentration of 290 µg/L vs the 5 µg/L on-residential MSC and select PAHs were detected at concentrations up to 6.3 µg/L (BaA at 6 µg/L, BaP at 4.6 µg/L, BbF at 6.3 µg/L, benzo(g,h,i) perylene at 2.18 µg/L, benzo(k)fluoranthene at 1.8 µg/L, and chrysene at 5.1 µg/L vs. non-residential MSCs of 4.9, 0.2, 1.2, 0.26, 0.55, and 1.9 µg/L, respectively). No other VOCs or SVOCs were detected above MSCs in the hydropunch groundwater samples. Groundwater impacts around PCHP-03 have been delineated by PCHP -01, PCHP-06, PCHP-07, PCMW-14S/MW-101 and PCMW-15S.
- Amenable cyanide was not detected in any of the hydropunch groundwater samples at concentrations exceeding the MSCs.
- Metals were detected at concentrations exceeding the MSCs in unfiltered groundwater samples collected from 6 of the 7 hydropunch locations. Elevated metal concentrations are likely the result of the sample collection method. Hydropunch samples are not collected using standard low-flow methods through a developed monitoring well and typically have very high turbidity biasing metal results to be high due to entrained solids.

3.2.5.2 Shallow Groundwater Sampling Results

A total of 35 monitoring wells are screened in the shallow groundwater zone located within the historic fill unit, including 20 wells installed during the Initial RI activities, 13 wells installed during the SRI activities, and two wells installed sometime before 2003 (i.e., those two wells were found and sampled in 2018). Except for the observation of emulsified petroleum in PCMW-05 during the Initial RI, NAPL was not encountered in any shallow groundwater monitoring wells. This emulsion was not observed during the SRI. During both the Initial RI and SRI, pesticides and PCBs were not detected at concentrations greater than the applicable MSCs (residential or non-residential MSCs for used aquifers with TDS ≤2,500 mg/L). Therefore, the discussion of shallow groundwater analytical results below focuses on VOC, SVOCs, and inorganics. The shallow groundwater analytical results are summarized below.

Shallow Groundwater Sampling Results for VOCs

When combining the Initial RI and SRI data, VOCs were not detected at concentrations greater than the MSCs in 28 of the 35 shallow groundwater monitoring wells. SRI groundwater analytical results indicate that groundwater quality has improved onsite since the Initial RI investigation, demonstrated by the decreasing benzene concentrations. VOCs were detected above MSCs at the following locations:

- *PCMW-10S, PCMW-14S, PCMW-15S, & PCMW-17S* – During the Initial RI, benzene was detected in groundwater at concentrations greater than the 5 µg/L non-residential and residential MSCs in each of these four monitoring wells. However, benzene was not detected above the 5 µg/L MSCs in groundwater collected from these wells (or MW-14S replacement well MW-101) during the SRI.

- *MW-107* - Methyl-tert-butyl ether (MTBE) was detected in the May 30, 2018 groundwater sample from this well at a concentration of 20.7 µg/L which is slightly greater than the 20 µg/L residential and non-residential MSC. MTBE was not evaluated in groundwater samples collected during the Initial RI groundwater samples and is not considered to be related to Site operations.
- *MW-111* – Based on the SRI results, the highest benzene concentration (686 µg/L) was detected in a groundwater sample collected from this well on October 4, 2019. Benzene was not detected above laboratory detection limits in groundwater downgradient from MW-111 (i.e., MW-112 or MW-113 to the east of MW-111) during the same event. Therefore, benzene groundwater impacts are limited to the vicinity of MW-111.
- *MW-5* –TCE was detected in the March 19, 2018 groundwater sample from this well at a concentration of 6.1 µg/L which is slightly higher than the 5 µg/L residential and non-residential MSC. TCE was not identified in the Initial RI groundwater samples collected from any of the wells at the Site. TCE was not detected elsewhere on-site during the March 2018 event.

Shallow Groundwater Sampling Results for SVOCs

SVOCs were not detected in 30 of the 35 shallow groundwater monitoring wells at concentrations greater than the MSCs. SVOCs were detected above MSCs at the following locations:

- *MW-102* – Bis(2-ethylhexyl) phthalate was detected in the May 31, 2018 groundwater sample from this well at a concentration of 11.3 µg/L which is greater than the 6 µg/L residential and non-residential MSC. However, since bis (2-ethylhexyl) phthalate was not detected in the duplicate sample collected from this well, the detection is potentially indicative of laboratory contamination. Groundwater samples were not collected from this well on any other date.
- *MW-107* – Multiple low-level PAHs were detected in the May 30, 2018 groundwater sample from this well at concentrations slightly greater than one or both groundwater MSCs. Low-level PAHs are typically associated with urban/historic fill such as the fill observed onsite. BbF was identified in this well at the highest concentration of any PAHs exceeding MSCs (1.7 µg/L vs. 1.2 µg/L non-residential MSC). BaP and benzo(g,h,i)perylene were also detected above the non-residential MSCs (1.2 and 0.95 µg/L vs. MSCs of 0.2 and 0.26 µg/L, respectively). Groundwater samples were not collected from this well on any other date.
- *MW-111* – The highest PAH concentrations in groundwater were detected in the October 4, 2019 groundwater sample collected from this well. The two PAHs with the highest concentrations at this well were naphthalene (973 µg/L vs. 100 µg/L non-residential MSC) and carbazole (189 µg/L vs. 170 µg/L non-residential MSC). PAHs were not detected above MSCs in groundwater downgradient from MW-111 (i.e., MW-112 or MW-113 to the east of MW-111).
- *PCMW-16S* – Multiple low-level PAHs were detected in the February 1, 2006 groundwater sample from PCMW-16S at concentrations slightly greater than one or both groundwater MSCs. PAHs were not detected at concentrations greater than MSCs in the replacement monitoring well for PCMW-16S (MW-105) sampled on May 30, 2018.
- *PCMW-17S* – On February 3, 2006, carbazole was detected in groundwater from this well at a concentration of 51 µg/L which is greater than the 37 µg/L residential MSCs but less than the 170

µg/L non-residential MSC). During the most recent sampling event (March 2018), carbazole was not detected above laboratory limits in the groundwater sample from PCMW-17S.

Shallow Groundwater Sampling Results for Inorganics

Inorganics that are commonly present in urban/historic fill or considered naturally occurring minerals were detected in the groundwater samples from across the Site at concentrations exceeding the MSCs[10]. Some of the samples collected were turbid and contained suspended particulates that are the likely source of the elevated metals concentrations. For this reason, groundwater samples collected from 27 of the 35 shallow groundwater monitoring wells (18 wells during the Initial RI only, 7 wells during the SRI only, and 2 wells during both the Initial RI and SRI) were also filtered in the laboratory and analyzed for dissolved inorganic constituents. After groundwater sample filtration, only six inorganic constituents (antimony, arsenic, manganese, and nickel) were identified in the shallow groundwater at concentrations greater than MSCs. The total and dissolved laboratory analytical results for constituents exceeding MSCs are summarized below:

- Antimony was detected at concentrations slightly exceeding the 6 µg/L residential/non-residential MSC in three unfiltered and one filtered groundwater samples collected from the shallow groundwater monitoring wells. This includes unfiltered groundwater samples from PCMW-07 (6.4 µg/L on November 3, 2005), PCMW-08S (9.9 µg/L on March 22, 2018), and PCMW-13S (6.4 µg/L on November 9, 2005) and a filtered groundwater sample from PCMW-11S (7.8 µg/L on November 7, 2005). As indicated above, each groundwater sample containing antimony exceeding the MSC was collected from a separate groundwater monitoring well.
- Arsenic, a common groundwater constituent in urban/historic fill, was detected at concentrations greater than the 10 µg/L MSC in unfiltered groundwater samples collected from 9 of the 35 shallow groundwater monitoring wells (concentrations ranging from 12 to 160 µg/L). Dissolved arsenic was only detected at concentrations greater than MSCs in filtered groundwater collected from the two monitoring wells exhibiting the highest concentration of total arsenic, including PCMW-08S (21 µg/L on November 3, 2005) and PCMW-19S (11 µg/L on November 14, 2005).
- Total cyanide was identified at concentrations exceeding the 200 µg/L residential/non-residential MSC for free cyanide in SRI groundwater samples collected from three shallow groundwater monitoring wells, including MW-104 (670 µg/L on May 30, 2018), MW-113 (an estimated 380 µg/L October 4, 2019), and PCMW-15S (an estimated 210 µg/L March 20, 2018). There is no MSC for total cyanide. Initial RI groundwater samples were not analyzed for total cyanide. A July 27, 2018 groundwater sample from PCMW-15S was analyzed for free cyanide, and the free cyanide concentration was 9.0 µg/L which is two orders of magnitude below the 200 µg/L MSC, indicating that only a small fraction of total cyanide is free (i.e., bioavailable).
- Lead was identified at concentrations exceeding the 5 µg/L residential/non-residential MSC in groundwater samples from 21 of the 35 shallow monitoring wells. Lead concentrations were generally consistent between Initial RI samples and SRI samples. Lead was not detected in the filtered groundwater samples at concentrations greater than the MSC, indicating that lead impacts are related to turbidity.

[10] Note that there is no difference between residential and non-residential MSCs for the detected inorganics.

- Nickel was detected at concentrations exceeding the 100 µg/L residential/non-residential MSC in groundwater samples (unfiltered or filtered) from only one well (PCMW-05, which is in the former Fuel Blending Area). Nickel was identified in three of four unfiltered samples from PCMW-05 (250 µg/L on January 1, 2006, 450 µg/L on March 23, 2018, and 524 µg/L on May 30, 2018) and one filtered sample from PCMW-05 (210 µg/L on January 31, 2006). This indicates that nickel impacts in groundwater are isolated.

Additionally, naturally occurring mineral constituents, manganese and zinc, were detected in groundwater at concentrations greater than MSCs. Manganese was detected at concentrations most frequently above the MSCs (in 25 of 28 monitoring wells sampled for total manganese and 8 of 9 wells sampled for dissolved manganese[11]). Zinc was detected at concentrations greater than MSCs in one of the 30 monitoring wells sampled for zinc (PCMW-05), but dissolved zinc was not detected above MSCs.

3.2.5.3 Deep Groundwater Sampling Results

A total of 13 monitoring wells were installed below the silt and clay confining unit and screened in the deep groundwater zone (wells PCMW-08D through PCMW-20D). NAPL was not encountered in any deep groundwater monitoring wells. Similar to the groundwater analytical results for the shallow monitoring wells, pesticides and PCBs were not detected at concentrations greater than the residential or non-residential MSCs in any of the groundwater samples from the deep monitoring wells. Therefore, the discussion of deep groundwater analytical results below focuses on VOCs, SVOCs, and inorganics.

Deep Groundwater Sampling Results for VOCs

VOCs were not detected in 12 of 13 deep groundwater monitoring wells at concentrations greater than the MSCs. Tetrachloroethene was the only VOC identified in the deep groundwater samples at a concentration greater than its corresponding residential/non-residential MSC (5 µg/L) and only during the initial RI. Tetrachloroethene was detected in the November 8, 2005 groundwater sample from PCMW-11D at a concentration of 37 µg/L. Tetrachloroethene was detected at a concentration of 4 µg/L when well PCMW-11D was resampled in 2006. PCMW-11D could not be located for resampling during the SRI. Tetrachloroethene was not identified above 5 µg/L in any of the other deep groundwater samples. Based on Site history and soil analytical results, tetrachloroethene is not a Site-related constituent.

Deep Groundwater Sampling Results for SVOCs

SVOCs were not detected in 11 of 13 deep groundwater monitoring wells at concentrations greater than the MSCs. SVOCs were detected above MSCs at the following locations:

- *PCMW-09D* – BaA, BaP, BbF, and chrysene were detected in the January 31, 2006 groundwater sample from this well at concentrations slightly greater than the corresponding residential and/or non-residential groundwater MSCs. Of these four PAHs, BbF was detected at the highest concentration at 2.5 µg/L (the corresponding non-residential MSC is 1.2 µg/L). PCMW-09D could not be located for resampling during the SRI.
- *PCMW-16D* – 2,4-Dinitroluene was detected in the March 19, 2018 groundwater sample from this well at a concentration of 13.3 µg/L, which is greater than the 2.4 µg/L residential and slightly in

[11] Initial RI groundwater samples were not analyzed for manganese which is why the count of sampled wells differs from the previous discussion.

excess of the 11 µg/L non-residential MSCs. This constituent was not detected in any of the other SRI groundwater samples. Initial RI groundwater samples were not analyzed for 2,4-dinitrolouene. The presence of 2,4-dinitroluene in groundwater appears to be isolated to this area near the intersection of Orthodox Street and Casper Street. The deep zone potentiometric surface map in the vicinity of PCMW-16D indicates that groundwater is flowing primarily parallel to Orthodox Street with a component of groundwater flow directed easterly to the Site from offsite. Therefore, it is not likely that the groundwater impacts from PCMW-16D are Site-related but are likely due to background conditions. Additionally, 2,4-dinitroluene is not related to former Site operations.

Deep Groundwater Sampling Results for Inorganics

Similar to the analytical results for groundwater samples collected from the shallow monitoring wells, inorganics that are commonly present in urban fill or considered naturally occurring minerals were detected at concentrations exceeding the MSCs in groundwater samples collected from the deep wells across the Site. Some of the samples collected were turbid and contained suspended particulates that are the likely source of the elevated metals. For this reason, samples from the deep groundwater monitoring wells were also filtered in the laboratory and analyzed for dissolved inorganic constituents. After groundwater sample filtration, only arsenic and manganese were identified in the deep groundwater at concentrations greater than MSCs. Therefore, beryllium, lead, and cyanide in the deep groundwater zone appear to be attributed to suspended particulates. The total and dissolved laboratory analytical results for inorganic constituents exceeding MSCs are summarized below:

- Arsenic was detected at concentrations greater than the 10 µg/L MSC in unfiltered groundwater samples collected from 6 of 13 deep groundwater monitoring wells. Dissolved arsenic was only detected at concentrations greater than the 10 µg/L MSC in one filtered groundwater sample (i.e., the November 14, 2005 sample from PCMW-20D at a concentration of 11 µg/L).
- Beryllium and lead were detected at concentrations greater than their corresponding MSCs (4 µg/L and 5 µg/L, respectively) in the January 31, 2006 groundwater sample from PCMW-09D (concentrations of 5.1 µg/L and 170 µg/L, respectively). Neither constituent was detected in the November 7, 2005 groundwater sample collected from PCMW-09D or the filtered groundwater samples from any of the deep groundwater monitoring wells.
- Total cyanide was identified at a concentration exceeding the 200 µg/L residential/non-residential MSC for free cyanide in groundwater from only one deep monitoring well (350 µg/L in the March 22, 2018 groundwater sample collected from PCMW-10D). There is no MSC for total cyanide. Initial RI groundwater samples were not analyzed for total cyanide. A July 27, 2018 groundwater sample from PCMW-10D was analyzed for free cyanide, and the free cyanide concentration was 4.1 µg/L. Additionally, free cyanide was detected in the May 30, 2018 groundwater sample from PCMW-16D at an estimated concentration of 9.1 µg/L (18 µg/L in the duplicate sample from the well).
- Manganese, a naturally occurring mineral constituent, was detected at concentrations greater than the 300 µg/L MSC in groundwater samples collected from 8 of the 13 monitoring wells. Dissolved manganese was only detected at a concentration greater than MSCs in the March 28, 2019 filtered groundwater sample from PCMW-16D (3,130 µg/L).

3.2.5.4 Groundwater Investigation Conclusions

In addition to the extensive groundwater investigation performed from April 1985 through November 1998, the RI groundwater investigation provides sufficient data for evaluating groundwater quality across the Site. Groundwater analytical results indicate that groundwater quality at the Site is relatively unimpacted by former site operations and that source material is not present onsite. Select VOCs and SVOCs were identified in groundwater samples from 12 of 50 monitoring wells at concentrations exceeding applicable MSCs. However, the results indicate that VOCs and SVOCs were: (1) detected at concentrations within an order of magnitude of MSCs in the most-recent monitoring event in all but one location (MW-111); and (2) detected at much lower concentrations during the SRI then the Initial RI at the same well or a replacement well. The extent of VOCs and SVOCs in shallow groundwater downgradient from MW-111 is delineated by the samples from downgradient monitoring wells (MW-112 and MW-113, both located east of MW-111). Based on groundwater data from point-of-compliance wells, COCs are not migrating offsite at concentrations above residential MSCs.

Inorganic constituents were identified at concentrations exceeding applicable groundwater MSCs. However, these constituents are commonly present in urban/historic fill or considered naturally occurring minerals and are not necessarily attributed to former Site operations. Additionally, most inorganic constituents were not detected at concentrations above the corresponding MSC in groundwater samples that were filtered in the laboratory to evaluate dissolved concentrations of inorganics.

When reviewing the groundwater and soil analytical data together, the groundwater analytical results in Areas 1 and 2 indicate that residual soil impacts are not affecting the groundwater as follows:

- ***Area 1:*** *Eastern Part of Former Coal Storage Area*. SVOCs were not detected at concentrations greater than either the residential or non-residential MSCs in groundwater samples from any monitoring well in this area (MW-103, MW-108, MW-109, and MW-110).
- ***Area 2:*** *North/Northwest of Former Tar Storage Area*. SVOCs were not detected at concentrations greater than either the residential or non-residential MSCs in groundwater samples from any monitoring wells in this area (MW-101, PCMW-11S/D, PCMW-14S/D, and PCMW-17S/D) during the SRI.

Additionally, lead was not detected in any filtered groundwater samples at concentrations greater than the 5 µg/L MSCs indicating that lead concentrations in soil are not impacting groundwater.

The COCs in deep and shallow groundwater are identified in Table 3-6 below.

Table 3-6: Groundwater Constituents Exceeding Residential and Non-Residential MSCs

Analyte	CAS Number	Residential MSC Exceedance Frequency	Non-Residential MSC Exceedance Frequency
Volatile Organic Compounds			
Benzene	71-43-2	8/103	8/103
Methyl-tert-butylether	1634-04-4	1/36	1/36
Tetrachloroethene	127-18-4	1/103	1/103

Analyte	CAS Number	Residential MSC Exceedance Frequency	Non-Residential MSC Exceedance Frequency
Trichloroethene	79-01-6	1/103	1/103
Semi-Volatile Organic Compounds			
Benz(a)anthracene	56-55-3	4/103	0/103
Benzo(a)pyrene	50-32-8	4/103	4/103
Benzo(b)fluoranthene	205-99-2	4/103	4/103
Benzo(g,h,i)perylene	191-24-2	3/103	3/103
Benzo(k)fluoranthene	207-08-9	3/103	2/103
bis(2-Ethylhexyl)phthalate	117-81-7	1/103	1/103
Carbazole	86-74-8	2/103	1/103
Chrysene	218-01-9	3/103	3/103
Dibenz(a,h)anthracene	53-70-3	1/103	0/103
Dibenzofuran	132-64-9	1/103	0/103
Indeno(1,2,3-cd)pyrene	193-39-5	3/103	0/103
Naphthalene	91-20-3	1/103	1/103
Metals (Dissolved)			
Antimony	7440-36-0	1/76	1/76
Arsenic	7440-38-2	3/76	3/76
Manganese	7439-96-5	8/9	8/9
Nickel	7440-02-0	1/76	1/76
Vanadium	7440-62-2	1/9	0/9

3.2.6 Soil Gas Quality

This section summarizes the quality of soil gas at the Site based on comparison of soil gas analytical results and existing soil and groundwater data to the screening values presented in the TGM.

3.2.6.1 Soil Gas Results

During the Initial RI activities, soil gas samples were collected from 21 locations to evaluate the potential for VI in future building development (see Figure 26). Due to the shallow water table, 20 of the 21 soil gas samples were collected from depths less than the desired depth of 5 feet bgs. The cover material at most of the soil gas sampling locations consisted of gravel or deteriorated asphalt pavement (not impervious surfaces). The soil gas sample data set is limited for use in VI evaluation in that only one round of soil gas data was collected (the TGM specifies two rounds) and the data were collected from shallower intervals than prescribed (i.e., intervals less than 5 feet below pervious surfaces can result in atmospheric air being introduced into the samples). Therefore, when paired with soil and groundwater data, the soil gas data are used herein as a semi-quantitative screening tool to aid in identifying areas that could potentially exhibit vapor intrusion concerns.

In response to the above circumstances, the soil gas analytical results were conservatively compared to residential and non-residential sub-slab soil gas SHS VI screening values (SV_{SS}) instead of near-source soil gas SHS VI screening values (SV_{NS}) for qualitative screening assessment purposes. The SV_{SS} screening values are much lower than the SV_{NS} screening values. As presented in Table 19, no VOCs were detected above the non-residential SV_{SS} in any of the soil gas samples. At sampling location PCSV-11, 1,4-dioxane was detected at a concentration of 440 micrograms per cubic meter (µg/m^3) which exceeds the 120 µg/m^3 residential SVss. No other constituents exceed the residential SVss in any of the soil gas samples. More information on soil gas quality compared to residential standards is provided in Subsection 3.2.6.4.

3.2.6.2 Soil Analytical Results Compared to Vapor Intrusion Standards

The existing unsaturated soil analytical results were compared to the residential and non-residential VI standards from the TGM to evaluate the potential for VI concerns for future development. The soil analytical results compared to VI screening values are presented in Table 20.

From a total of 152 sampling locations where unsaturated soil samples were collected for laboratory analysis, soil analytical results exceed the non-residential VI screening values at 24 sampling locations and soil analytical results exceed the residential VI screening values at 26 sampling locations (two additional sampling locations compared to the non-residential standards). Benzene and naphthalene are the constituents that most frequently exceed the residential and non-residential VI screening values. Toluene, 1,1-biphenyl, and 2-methylnaphthalene also exceed the residential and non-residential VI screening values at select locations but were identified at the same locations where benzene and/or naphthalene exceedances were observed. Dichloromethane exceeds only the residential VI screening levels at three locations, and at two of these locations, dichloromethane was the only constituent exceeding VI screening values. Most of the exceedances are within one of the four delineation areas (Areas 1 through 4), the Fuel Blending Area, or in the Site center near the Former Coke Operations Area. Soil sampling locations where constituents have been identified in vadose zone soil at concentrations greater than non-residential VI screening values are shown on Figure 27.

3.2.6.3 Groundwater Analytical Results Compared to Vapor Intrusion Standards

Groundwater samples collected from monitoring wells screened in the shallow groundwater zone were compared to applicable VI standards. At monitoring wells where groundwater was never observed to be within 5 feet of the ground surface, Arcadis compared the existing groundwater analytical results to the residential and non-residential VI standards. Per the TGM, Arcadis used the PADEP residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L as the VI screening value for any wells where groundwater was at one point observed within 5 feet of the ground surface. Groundwater has been observed within 5 feet of the ground surface in 20 of 33 shallow monitoring wells. For the shallow groundwater zone, the groundwater analytical results compared to VI screening values are presented in Table 21.

Groundwater analytical results exceed the applicable non-residential VI screening values at 5 of 33 shallow monitoring wells (i.e., the same wells where groundwater was found to be impacted with constituents at concentrations exceeding MSCs for groundwater, as described in Subsection 3.2.5). Groundwater analytical results exceed the applicable residential VI screening values at 6 of 33 shallow monitoring wells (i.e., one additional monitoring well compared to the VI exceedance of the non-residential standard). Based on the SRI groundwater analytical results, potential VI concerns associated with groundwater appear to be limited to only three monitoring well locations (MW-5, MW-107, and MW-111). VOC and SVOC concentrations in groundwater samples collected from MW-5 and MW-107 are generally consistent with or only slightly greater than VI screening values in groundwater samples collected from MW-5 and MW-107. Based on the groundwater analytical results for wells located downgradient of MW-111 (i.e., MW-112 and MW-113), potential vapor concerns from groundwater impacts are isolated to the immediately vicinity of MW-111 (Area 4). Groundwater monitoring wells where constituents have been identified at concentrations greater than VI screening values are shown on Figure 28.

3.2.6.4 Off-site Soil Vapor Evaluation

To evaluate the potential for VI concerns off-site, the soil-gas, soil, and groundwater analytical data were compared to the applicable residential VI screening values, as introduced in the previous subsections. Based on available data, there are no potential VI concerns for the residential properties adjacent to the Site.

When comparing the analytical data to residential VI standards, one soil-gas sampling location, two additional soil sampling locations, and one additional groundwater monitoring well are added to areas of potential VI concern that had been identified based on comparison to non-residential VI standards. Where applicable residential VI screening values are exceeded, proximity distances were used to evaluate the potential for VI concerns off-site in accordance with the TGM. Proximity distances of 30 feet for petroleum constituents and 100 feet for non-petroleum constituents are specified in the TGM.

Most sampling locations or monitoring wells where constituents were identified at concentrations exceeding applicable VI standards are near the center of the Site and would not affect off-site properties. However, 100-foot proximity distances around sampling locations PCTP-66 and S-156 extend offsite for non-petroleum constituents, but the proximity distances do not extend below off-site buildings. These locations are not adjacent to, or across the street from, residential properties. Sampling location PCTP-66 is across the street from a commercial/industrial property where clothing is sold and printed with custom prints. Sampling location S-156 is across the street from a car impoundment lot that appears to be loose gravel. The proximity distances for sampling locations and monitoring wells where constituents exceed the residential VI screening values are shown on Figure 29. In conclusion, there are no potential VI concerns off-site from conditions on-Site.

3.2.6.5 Soil Vapor Constituents of Concern

When compared to applicable non-residential VI standards, soil and groundwater analytical results indicate the potential for soil VI in future buildings in certain limited areas onsite in the absence of remediation or mitigation. Benzene is the constituent most frequently detected above non-residential VI standards in both soil and groundwater samples, and benzene is the only constituent detected at concentrations greater than an order of magnitude above the non-residential VI standards in both soil and groundwater[12]. However, soil gas sampling results did not exceed any of the sub-slab VI screening values

[12] Naphthalene is also detected at concentrations an order of magnitude above the non-residential VI standards in soil, but naphthalene concentrations in soil gas are limited by the 73.2 mg/kg soil saturation level (at an assumed soil/groundwater temperature of 62.6°F), and therefore, soil naphthalene concentrations have limited VI potential.

indicating that the VI potential is likely over predicted by the soil and groundwater analytical results. The COCs potentially causing IV concerns are identified in Table 3-7 below.

Table 3-7: Groundwater Constituents Exceeding Residential and Non-Residential MSCs

Analyte	CAS Number	VI Screening Values for Soil Exceedance Frequency	VI Screening Values for GW Exceedance Frequency
Volatile Organic Compounds			
Benzene	71-43-2	20/175	5/103
Methyl-tert-butyl ether	1634-04-4	0/53	1/36
Toluene	108-88-3	3/177	0/103
Trichloroethene	79-01-6	0/136	1/103
Semi-Volatile Organic Compounds			
1,1-Biphenyl	92-52-4	3/54	0/36
2-Methylnaphthalene	91-57-6	1/179	0/103
Naphthalene	91-20-3	19/179	0/103

Note: GW = groundwater.

4 FATE AND TRANSPORT MODEL

Fate and transport modeling was conducted upon completion of the groundwater sampling to assess the groundwater conditions at the Site and at the property boundaries. The purpose of the groundwater fate and transport modeling was to evaluate: (1) the extent of constituent migration in groundwater in the absence of any remedial activities (i.e., baseline conditions); and (2) the potential to either achieve equilibrium/stabilization or a reduction of constituent concentrations. Model development, analysis, and documentation were performed in accordance with the guidelines provided in Pennsylvania's Land Recycling Program Technical Guidance Manual updated on January 19, 2019. Results of the fate and transport simulations are used to estimate the movement of the constituents over time, and to assess the potential for impacts due to constituent mass migration and discharge to adjacent surface waters.

This Section documents the modeling effort, provides an evaluation of model applicability, and reports the results of the fate and transport simulations.

4.1 Study Objectives

The objective is to develop a fate and transport model for the Site that can be used as a basis for predicting the current and potential future extent of groundwater concentrations for select VOCs and SVOCs at Site boundaries above MSCs. Results of the fate and transport simulations are used to estimate the movement of the constituents over time and assess the potential for impacts due to constituent mass migration and discharge to the Delaware River.

At monitoring well MW-107, the closest well to the Delaware River within the flow path toward the river, the SVOCs that exceed groundwater MSCs were also compared to the following surface water criteria:

1. Delaware River Basin Commission (DRBC) Surface Water Criteria (recorded from Tables 3 through 7 of the Administrative Manual - Part III Water Quality Regulations with Amendments through December 4, 2013: 18 CFR Part 410 for the DRBC).
2. PADEP Surface Water Criteria for Fish and Aquatic life from 25 Pa. Code § 93.8c Table 5.
3. PADEP Surface Water Criteria for Human Health from 25 Pa. Code § 93.8c Table 5.

Although 25 PA Code § 93.9e defines the portion of the Delaware River adjacent to the Site (Tidal Portions from River-Mile 108.3 to Big Timber Creek) for warm water fish (maintenance only) and migratory fish (passage only), the human health criteria were used as the edge criterion when modeling to be conservative. This portion of the Delaware River is also DRBC Water Quality Zone 3.

4.2 Hydrogeologic Setting

As discussed in Section 3.2.2, three hydrostratigraphic units exist at the Site: the fill, silt and clay, and sand and gravel, and groundwater at the Site is separated into a shallow and deep zone by the silt and clay layer.

The shallow groundwater is encountered in the urban/historic fill unit across the Site at depths of approximately 2- to 12- feet bgs. Based on regional groundwater information, this shallow groundwater zone is a perched aquifer that was created by the placement of fill over the native silt and clay layer. As shown on Figures 8, 9, and 10, groundwater in the fill is mounded in the central/southern portion of the

Site and flows radially outward from the mound. The hydraulic conductivity of the fill ranges from approximately $1.47x10^{-4}$ to $2.93x10^{-3}$ centimeters per second (cm/sec)[13].

The deep aquifer zone is observed at approximately 9- to 17-feet bgs in the sand and gravel unit. As indicated by Figures 11 and 12, groundwater in the sand and gravel flows eastward, toward the Delaware River. The sand and gravel is the most permeable hydrostratigraphic unit beneath the Site and has a hydraulic conductivity of $2.73x10^{-3}$ to $1.79x10^{-1}$ cm/sec.

4.2.1 Hydraulic and Hydrologic Boundaries

The Site is in the Lower Delaware River Watershed and borders the Delaware River to the southeast. Frankfort Creek and the Tookany/Tacony-Frankford watershed is approximately 2,000 feet southwest of the Site (from Site boundary). The Bridesburg Channel (which aerials indicate was the historical course of Frankford Creek), is north of the Site. Both Frankford Creek and the Bridesburg Channel drain to the Delaware River. The shallow groundwater, which mounds in the center of the Site and flows radially outward, is expected to drain to the Delaware River via Frankford Creek, Bridesburg Channel, or other local drainage features between the Site and these water bodies.

As indicated in Subsection 3.2.2.1, a groundwater use survey was conducted in the vicinity of the Site to confirm that no known or suspected users of groundwater exist in the regulatory-required survey area. A total of 65 wells were located within a ½-mile radius of the Site. All the wells surrounding the Site are, or are suspected to be, unused, abandoned, or only used for environmental investigations and clean-ups. A total of 4 wells surrounding the Site are listed as withdrawal wells. The withdrawal wells appear to be related to the environmental investigation and cleanup efforts at the former Rohm and Haas Chemical Company Facility (Pennsylvania Facility ID 742771 and NIR number 61614). This facility is approximately 1/3 mile north of the Site.

4.3 Constituents and Monitoring Wells Selected for Modeling

As discussed in Section 3.2.5, groundwater quality at the Site is relatively unimpacted by former Site operations and source material is not present onsite. Only the SRI groundwater data was considered for fate and transport analysis because the Initial RI data is more than 12 years old, and the SRI groundwater data indicates that VOCs and SVOCs were detected at much lower concentrations during the SRI then the Initial RI at the same wells (or installed replacement wells). Additionally, fate and transport analysis was only performed on groundwater impacts identified in point-of-compliance monitoring wells, defined herein as the most downgradient well in that area of the Site.

During the SRI, select VOCs and SVOCs were identified in groundwater samples from three point-of-compliance monitoring wells at concentrations exceeding applicable MSCs (MW-5, MW-102, and MW-107). The point-of-compliance monitoring wells are screened in the fill layer and sample the shallow groundwater zone. The constituents that exceed MSCs and were considered for Fate and Transport analysis at these monitoring wells are listed on Table 4-1 below:

[13] Hydraulic conductivity values were calculated based on slug test data reported by WCC (WCC 1986) and laboratory soil testing results reported by PSS.

Table 4-1: Groundwater Constituents Considered for Modeling

Monitoring Well	Date	Constituent	Concentration (µg/L)	MSC (µg/L)	Modelled (Y/N)
MW-5	3/19/18	Trichloroethene	6.1	5	Y
MW-102	5/31/18	Bis(2-ethylhexyl)phthalate	<2.4 [11.3]	6	Y
MW-107	5/30/18	Methyl-tert-butyl ether	20.7	20	N
MW-107	5/30/18	Benzo(a)pyrene	1.2	0.2	Y
MW-107	5/30/18	Benzo(b)fluoranthene	1.7	1.2	Y
MW-107	5/30/18	Benzo(g,h,i)perylene	0.95	0.26	N

Notes: MSCs are the soil-to-groundwater MSCs for a non-residential used aquifer with TDS less than or equal to 2,500 ppm. Bis(2-ethylhexyl)phthalate) was not detected above the 2.4 µg/L laboratory detection limit in the parent sample from MW-102, but the constituent was detected at 11.3 µg/L in the duplicate sample collected from the same location.

TCE, bis(2-ethylhexyl)phthalate, BaP, and BbF were selected for modeling. Methyl-tert-butyl ether and benzo(g,h,i)perylene were not modeled because surface water criteria has not been established for these constituents. BaP and BbF concentrations at MW-107 exceed the surface water criteria as indicated in Table 4-2 below:

Table 4-2: MW-107 Groundwater Constituents Exceeding MSCs Surface Water Criteria

Constituent	PADEP Human Health Surface Water Criteria	DRBC Water Quality Criteria		MW-107
		Marine Objective - Fish Ingestion Only	Max	5/30/18
Methyl-tert-butyl ether	- -	- -	- -	20.7
Benzo(a)pyrene	0.0001	0.018	0.2	**1.2**
Benzo(b)fluoranthene	0.001	0.18	- -	**1.7**
Benzo(g,h,i)perylene	- -	- -	- -	0.95 J

Notes: The bolded values indicate that the constituent's concentration at MW-107 exceeds the criteria. All concentrations reported in µg/L. “- -“ indicates constituent not listed in guidance document.

4.4 Analytical Models

Domenico analysis was used to model the groundwater impacts for the constituents listed in Table 4-1 (Domenico 1987). The Domenico Model was chosen per Pennsylvania’s Land Recycling Program Technical Guidance Manual because there is little variation in conditions over the model domain, with a simple plume geometry and conceptual model. The spreadsheets used were downloaded from the PADEP website following link: https://www.dep.pa.gov/Business/Land/LandRecycling/Standards-Guidance-Procedures/Guidance-Technical-Tools/Pages/Fate-and-Transport-Analysis-Tool.aspx

Both spreadsheets are based on the following equation:

$$C(x,y,z,t) = (\frac{C_o}{8})\exp\left\{ x\Big/2\alpha_x \left[1-\left(1+4\lambda\alpha_x\Big/v\right)^{\frac{1}{2}}\right]\right\} erfc\left\{\left[x-vt\left(\sqrt{1+4\lambda\alpha_x/v}\right)\right]/2\sqrt{\alpha_x vt}\right\}$$

$$\left\{erf\left[(y+Y/2)/2\sqrt{\alpha_y x}\right]-erf\left[(y-Y/2)/2\sqrt{\alpha_y x}\right]\right\}\left\{erf\left[(z+Z/2)2\sqrt{\alpha_z x}\right]-erf\left[(z-Z/2)/2\sqrt{\alpha_z x}\right]\right\}$$

where:

C(x,y,z,t) = the concentration of the constituent at location x, y, z from the source at time t.

C_o = source concentration – the highest concentration of the constituent in the groundwater at the source (derived from site-specific data).

α_x = longitudinal dispersivity (well- / location- specific data).

α_y = transverse dispersivity (well- / location- specific data).

α_z = vertical dispersivity (default value of 0.001 foot).

K = hydraulic conductivity (calibrated data).

i = hydraulic gradient (well- / location- specific data).

f_{oc} = fraction of organic carbon expressed as a decimal (default value of 0.005).

p_b = bulk density (laboratory soil testing results).

n_e = effective porosity (calibrated data).

K_{OC} = the organic carbon partition coefficient (default value from Table 5 in PA Code Title 25, Chapter 250).

R = retardation factory (calculated as $1+((K_{OC}*f_{oc}*p_b)/n_e)$.

v = constituent velocity (calculated as v_s/R).

v_s = seepage velocity (calculated as $v_s = Ki/n_e$).

λ = first order decay constant (default value from Table 5 in PA Code Title 25, Chapter 250).

Y = width of source area (well- / location- specific data).

Z = depth of source area (well- / location- specific data).

x,y,z = spatial coordinates in the horizontal, transverse and vertical directions.

t = time since the plume started moving.

Groundwater impacts originating from MW-5 and MW-102 were modeled using PADEP's Quick Domenico (QD) spreadsheet to evaluate groundwater concentrations of the selected constituents at the property boundary. Groundwater impacts originating from MW-107 were modeled using PADEP's SWLoad5B spreadsheet to estimate the mass loading of the selected constituents from groundwater to the Delaware River.

The results were loosely calibrated to available data from the MW-111 to MW-112 monitoring well pair.

4.4.1 Quick-Domenico Model

The QD application spreadsheet calculates the concentration anywhere in a plume of impacts at any time after a continuous, source becomes active. The QD model is intended for dissolved organic constituents whose fate and transport can be described or influenced by first order decay and reaction with organic carbon in the soil. The model assumes a constant source of a user-defined width which contributes impacts to the groundwater system, which has a defined constant flow velocity and direction, dispersion, linear isotherm adsorption (retardation), and first-order decay. All parameters are assumed constant in space and time. The QD mode also calculates the concentrations in a two-dimensional 5x10 grid whose length and width are set by the user.

4.4.1.1 Quick-Domenico Model Limitations

The major limitation of the QD model is that steady, uniform, one dimensional groundwater flow is assumed. The QD model is limited so that it should not be utilized for sites where flow and transport parameters vary significantly in direction or magnitude over the model domain. The QD model is intended for use in unconsolidated aquifers with reasonably uniform physical and hydrogeologic properties. The QD model does not simulate the transformation of parent compounds into daughter compounds, nor does it consider reactions between compounds. The mounding groundwater flow at this Site is simplified by isolating constituent concentrations (as supported by available groundwater data) to portions of the water table where flow is uniform and one dimensional.

4.4.2 SWLoad

The SWLoad spreadsheet uses a rearrangement of the Domenico equation to calculate concentrations at different points in the cross section of a plume at a distance from a continuous finite source. The concentrations are then added and multiplied by the groundwater flux and can be used to estimate the mass loading of a particular constituent from diffuse groundwater flow to a stream or surface water body. SWLoad assumes that the calculated loading is discharged to the subject stream.

SWLoad is intended to provide an estimate of the mass loading and is intended as screening tool. Therefore, if the mass loading is within the neighborhood of 30-50% of the level that would violate a stream standard, more rigorous in-stream sampling, monitoring and modelling efforts should be considered.

4.4.2.1 SWLoad Model Limitations

SWLoad has the same limitations as the QD model and is primarily intended for use in unconsolidated (soil) aquifers with reasonably uniform physical and hydrogeologic properties.

4.5 Groundwater Flow Model Construction and Parameters

As indicated in Section 4.4 model parameters were selected based on a combination of literature values, site-specific data, and calibration. Parameters obtained using the QD model were also used for SWLoad.

4.5.1 Literature Values

The chemical specific values (i.e., first order decay constant [λ] and the organic carbon partition coefficient [K_{OC}]) were those provided in Table 5a of PA Code Title 25, Chapter 250. Additionally, the default value of 0.5% organic carbon was used.

4.5.2 Laboratory Soil Testing Results

Site-specific parameters were estimated via laboratory soil testing performed on soil samples collected from the borings drilled to install monitoring wells PCMW-14D and PCMW-16D. Laboratory soil samples were collected from each hydrostratigraphic unit. Soil samples were not collected from the monitoring wells selected for modelling (MW-5, MW-102, or MW-107). Therefore, physical parameters of soil samples collected from monitoring wells PCMW-14D and PCMW-16D were used as starting points for calibrating the model. Parameters relevant to modelling provided by laboratory soil testing are hydraulic conductivity, porosity, and soil bulk density. For the fill unit, laboratory soil tests provided the following value range for each of these parameters:

- Hydraulic Conductivity (K): 0.417 to 8.31 feet per day (ft/day: $1.47x10^{-4}$ to $2.93x10^{-3}$ cm/sec).
- Porosity (n_e): 0.519 to 0.529.
- Density (p_b): 1.19 to 1.29 grams per cubic centimeter (g/cm^3).

The results of the laboratory soil testing are included in Appendix F. As a note, hydraulic conductivity, porosity, and bulk density are used to calculate constituent velocity used in the Domenico equation. Therefore, infinite combinations of these parameters could result in the same velocity and, thus, the same results.

4.5.3 Well- / Location- Specific Data

Many of the parameters in the Domenico equation are based on well location or the site-specific conditions in the vicinity of that well. These parameters include the hydraulic gradient, dispersivity, and source dimensions. As noted on the QD information sheet, longitudinal dispersivity (αx) is derived by dividing the distance from the source to the point of concern (property boundary) by 10 and the transverse dispersivity (αy) is calculated by dividing longitudinal dispersivity by 10. Vertical dispersivity selected was 0.001 feet, as suggested as a conservative value in the SWLoad Instructions. Source dimensions were roughly selected based on soil data. The hydraulic gradients used in the QD model were estimated using the groundwater contour maps (Figures 8 through 10) and averaging the approximate hydraulic gradient for each event. Well- and location- specific physical parameters selected for modeling are provided in Table 4-3 below.

Table 4-3: Well- / Location- Specific Parameters

Monitoring Well	Hydraulic Gradient (ft/ft)	Dispersivity (feet)		Source Width (feet)	Source Depth (feet)
		ax	ay		
Calibration Pair					
MW-111 to MW-112	0.0101	20.4	2.4	200	10
Modeled Wells					
MW-5	0.00855	13.8	1.38	200	10

Monitoring Well	Hydraulic Gradient (ft/ft)	Dispersivity (feet)		Source Width (feet)	Source Depth (feet)
		ax	ay		
MW-102	0.00506	30	3	200	10
MW-107	0.00294	7	0.7	160	10

4.5.4 Calibration

During the SRI, monitoring wells cluster MW-108 through MW-110 and cluster MW-111 through MW-113 were installed to investigate groundwater concentrations at and downgradient from potential source areas. Downgradient wells, MW-109, MW-110, MW-112, and MW-113, indicate that groundwater is not migrating offsite from the source areas at concentrations exceeding MSCs. Furthermore, most VOC and PAH constituents were not detected in groundwater at these downgradient monitoring wells above laboratory detection limits.

Benzene in well cluster MW-111 through MW-113 was selected for calibration. This well cluster is approximately 1,260 feet from MW-5, 1,240 feet from MW-102, and 600 feet from MW-107. Groundwater direction at the calibration well cluster is most similar to the groundwater direction at MW-102.

Benzene was detected in groundwater from MW-111 at a concentration of 686 µg/L, and benzene was not detected above the 0.5 µg/L laboratory detection limit in groundwater from the downgradient wells (i.e., MW-112, MW-113). For calibration purposes, a benzene concentration half the laboratory detection limit (0.25 µg/L) was modeled at downgradient wells.

For calibration, a time of 37 years was used because the groundwater data was collected in 2019 which is approximately 37 years since Site closure in 1982. The lowest laboratory values for porosity (0.519) and bulk soil density (1.19 g/cm^3) were used as a conservative measure to provide the fastest constituent velocity. A 0.005 organic carbon fraction was used as recommended in the SWLoad Construction Manual (PADEP 2008). Additionally, the October 3, 2019 shallow groundwater potentiometric surface is different than the previous shallow groundwater potentiometric surfaces in this immediate area. Therefore, the model was calibrated twice: first using the March 19, 2018 shallow groundwater flow direction; and second using the October 3, 2019 shallow groundwater flow direction. Benzene isoconcentration maps modelled based on both flow directions are shown on Figures 30 and 31.

Hydraulic conductivity was the only parameter further calibrated. The hydraulic conductivity for the March 19, 2018 groundwater model was 1.185 ft/day, and the hydraulic conductivity for the October 3, 2019 groundwater model was 1.317 ft/day. Both calibrated values for hydraulic conductivity fall within the 0.417 to 8.31 ft/day range established by laboratory soil testing. The 1.317 ft/day hydraulic conductivity was used for modelling at MW-5, MW-102, and MW-107.

4.6 Predictive Simulations

The QD model was adjusted to determine concentrations at the point of compliance (property line) in 5, 10, 15 and 30-year durations. The SWLoad model assumes a near infinite time (when concentrations at boundary locations would be the highest for a constant source). Copies of the results of the QD and SWLoad models are included as Appendix K. For some models, please note that the constituent concentration was inputted as µg/L opposed to the default mg/L to provide a cleaner presentation of the results (i.e., to limit the use of scientific notation for results much less than 0). Unit changes are noted in PDF edits for the model. The modeling results are presented below:

- *TCE at MW-5* – The 30-year (highest) modeled concentration for TCE is 1 µg/L at the Site boundary. Modelling indicates that the constituent would not leave the Site in groundwater at concentrations greater than the 5 µg/L MSC.
- *Bis(2-ethylhexyl)phthalate at MW-102* – The modeled concentration for bis(2-ethylhexyl)phthalate is 0 µg/L at the Site boundary for each of the timeframes modelled. Modelling indicates that the constituent would not leave the Site in groundwater.
- *Benzo(a)pyrene and benzo(b)fluoranthene at MW-107* – The modeled concentrations for both these constituents indicate that groundwater conditions at the Site boundary would not exceed surface water criteria. The estimated concentrations are many orders of magnitude less than the conservative PADEP Surface Water Criteria for Human Health. At the Site boundary, the predicted concentrations for both these constituents are rounded to zero in the model causing a #DIV/0! error in the spreadsheet when outputting the mass loading estimate.

When combined with the groundwater data at point-of-compliance wells, fate and transport modeling results indicate that COCs are not currently, and are not predicted in the future, to migrate offsite in groundwater. Therefore, PCC proposes to prepare an Act 2 Final Report for groundwater upon approval of this RI Report and Cleanup Plan.

5 CONCEPTUAL SITE MODEL

This section presents the CSM which has been prepared in accordance with the PA Code Title 25, Chapter 250.404 and follows EPA (1989) guidance. The CSM outlines potential source areas, release and transport mechanisms, environmental media that currently show or may show the presence of COCs in the future, possible exposure pathways to potentially exposed human populations, and potential exposure routes. It considers current Site conditions and surrounding land use, as well as the most likely future conditions upon redevelopment for future commercial or industrial land use.

The primary exposure source is onsite soil that contains COCs common in urban/historic fill and/or residual COCs from former Site-related activities. Figure 32 contains a graphic illustration of the CSM for the Site. As shown in the figure, the primary exposure source is onsite soil. Table 22 includes information on pathway elimination for both current and future Site receptors.

A complete exposure pathway is composed of the following four elements (EPA 1989):

- A source and mechanism of COC release.
- Retention or transport media.
- A potential contact point with an affected medium.
- An exposure route (i.e., ingestion, dermal contact, inhalation) at the potential contact point.

If any of the elements are or will be missing, the exposure pathway is incomplete, and there is no potential for exposure or health risk. This is the premise behind “pathway elimination” cleanup strategy. Exposure pathways are depicted as potentially complete where it has not been confirmed that any of the elements of an exposure pathway are missing.

5.1 Current Exposure Pathways

The Site is currently vacant; therefore, based on the current use of the Site there are no potential human receptor populations that may contact COCs onsite. In the event that the Site is redeveloped, and buildings are constructed, there are potentially complete future VI pathways.

5.1.1 Current Soil Pathways

The Site is currently vacant and access to the impacted areas of soil on-site is currently restricted by a chain-link fence that encloses the entire Site. In addition, most of the Site is either densely vegetated (woodlands and mowed grass) or covered by impervious surfaces such as pavement or remaining building structures or features such as concrete pads or footings, which limit the ability of surface soils to be eroded or mobilized and encountered by human receptors.

Outdoor maintenance workers mow herbaceous vegetation at the Site a few times a year and mow to a grass height of 6 inches or higher. Subsurface utility work is not anticipated because subsurface utilities were disconnected as part of Site demolition activities, except for the Upper Delaware Collecting Sewer which extends beneath the Site and can be accessed from a manhole near the western end of the Site. Additionally, any Site workers must follow the HASP and use PPE that will mitigate soil exposure pathways. Site worker (both outdoor worker and utility worker) exposure to soils are eliminated by the presence of vegetation and impervious surfaces, as well as the adherence of safe work practices as prescribed in the HASP. Therefore, there are no potential receptors for on-site soil dermal contact or ingestion and this pathway is incomplete.

5.1.2 Current Groundwater Pathways

Drinking water in Philadelphia is solely sourced from the Delaware and Schuylkill Rivers. Groundwater is not used for drinking water in Philadelphia. As shown in Figure 13 and presented in Appendix I, there are no active groundwater wells at the Site or in the immediate Site area. Therefore, the current exposure pathway for groundwater as potable water or industrial water is incomplete. In the future, as part of the Site redevelopment, institutional controls will be established that prohibit groundwater use.

There are no groundwater seeps at the Site, so there is no pathway to groundwater exposure unless intrusive work is performed below the water table. There is only one active manhole which provides access to the Upper Delaware Collecting Sewer. All other utilities were disconnected during previous Site demolition/decommissioning activities. The Upper Delaware Collecting Sewer does not collect any storm water from the Site. No installation, maintenance, or repair of underground utilities is anticipated under current conditions.

5.1.3 Current Vapor Intrusion Pathways

There are no buildings currently onsite; therefore, the current VI pathways via onsite groundwater and soil are incomplete.

5.2 Future Exposure Pathways

The following hypothetical potential human receptor populations were identified and the potential for their exposure was evaluated under the future exposure scenario:

- Construction workers
- Utility workers who may install or maintain utilities on the Site
- Outdoor workers
- Building occupants and indoor workers
- Residents, if Site use is not restricted
- Recreational users
- Trespassers

Biota may be exposed to COCs in surface soil (top 2 feet) via direct contact, ingestion, inhalation, and food-web transfer. Potential risks from inhalation or dermal exposures are typically not quantified for wildlife because of the lack of acceptable methodology to quantify exposure.

5.2.1 Future Soil Pathways

Future exposure pathways via direct contact with soils for incidental ingestion, dermal contact and/or inhalation of fugitive dusts or COCs volatilized from soils would be complete in scenarios where the

Cleanup Plan is not implemented. Future soil exposure pathways would include the following individuals who may encounter COCs in surface and subsurface soil via incidental ingestion, dermal contact, and the inhalation of VOCs and/or particulates in windblown soil:

- Residents.
- Recreational users.
- Building occupants and indoor workers.
- Construction and utility workers.
- Outdoor workers (such as lawn maintenance personnel).
- Trespassers.

5.2.2 Future Groundwater Exposure Pathways

The depth to groundwater ranges from approximately 2 to 15 feet bgs across the Site, except at one isolated location, PCMW-12S, where groundwater (likely perched) was observed at a depth of 0.78 feet bgs. Therefore, similar to future soil exposure pathways, future exposure pathways via direct contact with groundwater for incidental ingestion, dermal contact, and/or inhalation of COCs volatilized from groundwater may potentially exist for future residents, construction workers, and utility workers. There is a complete exposure pathway for utility workers and residents who may be exposed to COCs in shallow groundwater, via dermal contact and inhalation of VOCs while performing utilities installation or maintenance on the Site or using groundwater (without restrictions or treatment) for drinking water. Volatile constituents in groundwater may volatilize into utility trenches. Construction workers are potential candidates for exposure to COCs in groundwater, if excavation dewatering is performed during Site redevelopment. If fill material were to be placed in areas of the Site with a shallow groundwater table prior to building construction, this may limit excavation below the water table (e.g., for installation of utilities).

As previously discussed, groundwater is not used as potable water in Philadelphia. However, a potential future pathway is conservatively evaluated because an official Non-Use aquifer determination has not been made for the immediate area of the Site or Philadelphia. Since there is no official non-use aquifer determination for portion of the city around the Site, this pathway hypothetically could be considered potentially complete in the future in the absence of an environmental covenant restricting groundwater use for the following receptors:

- Indoor workers via ingestion, dermal contact, or inhalation if potable wells are installed in the absence of an environmental covenant restricting groundwater use onsite.
- Hypothetical future onsite residents via ingestion, dermal contact, and inhalation of groundwater in the absence of a deed restriction restricting the property to industrial/commercial use.

5.2.3 Future Vapor Intrusion Pathway

Based on the results of the RI Activities discussed in Section 3, in potential VI source areas (i.e., Areas 1 through 4, and select locations in the center of the Site and in the northern portion of the Fuel Blending Area), there could be complete exposure pathways for indoor workers via VI exposure from soil and groundwater if future buildings are constructed onsite without some mitigation, although these risks may be over-predicted (see Section 3.2.6). In these areas, the VOC concentrations identified in vadose zone soil and groundwater at the Site may have the potential to cause VI concerns. Therefore, future buildings will be evaluated prior to construction to determine if a VI risk assessment and/or VI mitigation system is necessary. The results of a VI risk assessment and/or additional soil gas characterization may demonstrate or eliminate the need to install a VI mitigation system in certain areas. Alternatively, a VI mitigation system (e.g., vapor barrier) may be installed to address the potential VI pathway in lieu of performing a risk assessment. Implementation of institutional controls will provide assurance that the VI pathway is eliminated in future Site development.

6 ECOLOGICAL SCREENING

The ES evaluates potential exposure of environmental receptors at the Site. It focuses on potentially complete exposure pathways for terrestrial receptors that may be impacted by constituents of potential ecological concern (COPECs). The ES evaluates environmental conditions at the Site in accordance with the PADEP Ecological Screening Process presented in the PADEP Land Recycling Program Technical Guidance Manual (PADEP 2019a). The procedure follows EPA interim final guidance on *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997). This procedure uses eight discrete steps, with a decision option after Step 2 or Step 7 to determine whether a substantial impact has resulted from regulated substances. The information provided in this ES includes Step 1 (Fundamental Concepts) and Step 2 (Preliminary Exposure Estimate and Risk Estimate). The ES supports the use of pathway elimination as part of the scientific/management decision (SMD) concluded after Step 2. No further ecological evaluation is recommended beyond Step 2 as explained below. Under the future CSM, capping soils impacted by COPECs during site redevelopment would effectively eliminate potential ecological exposure at the Site. The requirements for Step 1 are provided in the section below, and the following section presents the findings of Step 2.

6.1 Step 1 – Fundamental Concepts

Step 1 describes the fundamental components of the Site and the environmental setting. To support Step1, a Site visit was conducted, online ecological databases were reviewed, and appropriate regulatory agencies were consulted (via the Pennsylvania Natural Diversity Inventory receipt). Step 1 evaluates the site environmental settings and potential species and habitats of concern. The CSM is developed as part of Step 1.

6.1.1 Site Environmental Setting – Vegetation and Wetland Communities

The Site environmental setting, including Site location, history, geomorphology, hydrogeology, and characterization are provided in Sections 2 and 3 of this report. The supplemental information below is provided to support the ES. It describes the vegetation and wetland communities in more detail.

Signs of observable impacts to environmentally sensitive natural areas or species were not present during the Site reconnaissance. No indication of stressed vegetation, seeps, free-product discharges, or short-term effects on biota were observed.

The vegetative communities that exist within the project area consist mostly of early successional grasslands which are dominated by invasive species, with intermittent hardwood forest mix scattered throughout the Site. Dominant vegetation within the project area includes mugwort (*Artemisia vulgaris*), orchard grass (*Dactylis glomerate*), big bluestem (*Andropogon gerardii*), eastern cottonwood (*Populus deltoides*), common reed (*Phragmites australis*), stickywilly (*Galium apartine*), and poison ivy (*Toxicodendron radicans*). A listing of vegetative species observed throughout the plant communities found at the Site is provided in Table 23.

A wetland delineation was performed at the Site on May 1, 2019. Wetlands and waters of the U.S. were identified in the field using the 1987 “U.S. Army Corps of Engineers Wetland Delineation Manual” (USACE Manual) and the associated regional supplement for the Atlantic and Gulf Coastal Plain Region

(USACE 2010). Areas within the defined project limits exhibiting wetland characteristics were flagged in the field with sequentially numbered survey tape or pin flags. The flag locations were surveyed with a handheld Trimble Geo 7X GPS. The hydrology, soils, and vegetation conditions were documented.

Six isolated wetland complexes were identified at the Site. These wetland features receive hydrology primarily from surface water flows due to their low topographic position within the landscape. Surface hydrology onsite is controlled by fill material historically placed onsite resulting in a shallow impermeable layer ranging from approximately 8 to 14 inches below the surface. Four of the wetlands are present on the western portion of the Site within a mosaic of upland and palustrine forested and emergent wetlands. A fifth palustrine emergent wetland exists as an isolated depression within the upland topography and located in the eastern portion of the Site. A sixth wetland is located within a man-made ditch associated with a retired rail line on the eastern portion of the Site. A figure showing the location of wetlands and adjacent uplands is provided in Figure 33.

6.1.2 Potential Species and Habitats of Concern

As introduced in Section 3.1.3, an evaluation of the potential occurrence of threatened, endangered, and/or special concern species or resources onsite was initiated through consultation with PADNR and USFWS.

The PNDI search was submitted online through the PADNR which identified the Delaware River Shoreline as a Natural Heritage Area. This habitat indicated potential species of concern "…are only found in specific areas where tidal habitat remains protected and in a few of the more naturally managed park areas." A formal review for the Site was provided by PADNR on October 2, 2019. From review of PNDI records, the PFBC[14] indicated one threatened species of turtle (northern red-bellied cooter, *Pseudemys rubriventris*) may potentially utilize habitats occurring at the Site. No other species of concern were indicated by PADNR agencies or USFWS. After review of the additional site information, PFBC concluded in their October 30, 2019 response letter that the current Site conditions pose no adverse impacts to the species of concern. The PADNR and PFBC consultation correspondence is provided in Appendix L.

On November 12, 2019, Arcadis performed a cover-type and habitat evaluation, searching for potential northern red-bellied cooter habitat. Observations were documented in a field book and accompanied by a photograph log (Appendix M). Site observations indicated limited basking habitat areas along the near-shoreline tidal areas. Based on the nature of the historic fill found throughout the surface layer of the upland portions of the Site, suitable nesting habitat of sandy and silty loam soils is not present. Per these observations, there is little to no potential for species or habitats of concern to be impacted by existing conditions found at the Site. Following Site development, species or habitats of concern will be further protected from remaining environmental residuals at the Site.

6.1.3 Ecological Conceptual Site Model

The CSM identifies exposure pathways and potential receptor populations that may be exposed to COPECs in environmental media. Potential ecological receptors can be exposed directly or indirectly (i.e., through the food web) to COPECs if a complete exposure pathway exists. A complete exposure pathway

[14] The PFBC has jurisdiction for aquatic species in Pennsylvania.

includes the following elements: (1) constituent source; (2) release mechanism to the environment; (3) transport medium; (4) receptor contact at the exposure point; and (5) exposure route. If an element is missing, the exposure pathway is considered incomplete and is generally excluded from evaluation. Important features that need to be considered when evaluating whether an exposure pathway is complete include the COPEC concentrations in different media and their respective locations, the physical and chemical properties of the COPECs, and the locations of environmentally sensitive areas.

The CSM identifies ecological receptors and potential exposure pathways (e.g., ingestion of constituents in soil or food, direct contact with impacted media). For wildlife (i.e., birds and mammals), oral exposures are predominantly considered. Potential risks from substances via inhalation or dermal exposures are typically not quantified for wildlife because of the lack of acceptable methodology to quantify exposure.

Preliminary ecological exposure pathways were evaluated during the Site visits. No visible seeps and/or springs were observed within the upland portion of the Site. No significant surface water drainages are present. No significant surface erosion patterns in surface soils are present. Therefore, shallow groundwater, surface water, and subsurface soil (defined as greater than 2 feet bgs) are not considered complete exposure pathways and are not part of the CSM, leaving surface soil as the only potential pathway. Additionally, an evaluation of COPECs that may have migrated from upland source areas to sediment were not evaluated as part of the CSM because probing revealed no observable impacts to the sediment. As shown in the CSM diagram (Figure 34), only terrestrial habitats were evaluated per existing complete or potentially complete exposure pathways from surface soils.

Under future conditions, it is expected that sources of environmental contaminants will be isolated or removed during redevelopment, thereby mitigating potential ecological exposure pathways.

6.1.3.1 Ecological Receptors

Limited wildlife species (i.e., ecological receptors) were observed onsite. Based on the disturbed nature of the habitat and industrial setting surrounding the Site, the primary wildlife species that may utilize the Site include those common species adapted to fragmented habitats found in urban landscapes (e.g., common grackle, crow, deer mice, house finch, meadow voles, mourning dove, rabbits, raccoons, robins, squirrels, and woodchucks). Species observed during the Site visits are summarized in Table 24. The following ecological receptor groups are identified for evaluating potential exposure within the current CSM:

- Plants
- Soil invertebrates
- Wildlife (e.g., American robin, meadow vole, short-tailed shrew, red fox, red-tailed hawk)

6.1.3.2 Ecological Exposure Pathways

Potential exposure routes associated with surface soil, as defined as the top 2 feet within the PADEP Ecological Screening Process, include direct contact, ingestion, inhalation, and food-web transfer. The COPECs identified in soil each possess varying degrees of potential for exposure depending on chemical-specific parameters. The following complete or potentially complete exposure pathways were identified:

- Direct contact with COPECs in soil is a potentially complete exposure pathway for wildlife and a complete exposure pathway for terrestrial plants and soil invertebrates. However, soil chemistry and nature of historical fill components may limit the potential bioavailability for some COPECs. Wildlife may have direct exposure to soil while burrowing and/or preening; however, fur or feathers greatly reduces the potential exposure.
- Incidental ingestion of COPECs in soil is a potentially complete exposure pathway for soil invertebrates and a complete exposure pathway for wildlife. Soil-bound COPECs may be ingested during foraging or grooming activities.
- For COPECs in soil that are potentially bioaccumulative, food-web transfer is a potentially complete exposure pathway. These COPECs can accumulate in soil invertebrates and plants, potentially allowing constituents to accumulate in lower trophic level organisms. In turn, mammalian and avian wildlife could consume these COPECs in their diet.

Under the future CSM, exposure routes associated with impacted surface soil would be addressed during the remedial design process and subsequent redevelopment phase, thereby eliminating the current exposure pathways.

6.2 Step 2 – Preliminary Exposure Estimate and Risk Assessment

Step 2 is the Preliminary Exposure Estimate and Risk Estimate. Under Step 2, surface soil data are compared to ecotoxicological screening benchmarks (ESBs) to evaluate the exposure and risk to ecological receptors.

Surface soil data are compared to ESBs to evaluate the exposure and risk to ecological receptors. The ecological screening process identified a total of 62 potential COPECs, including 17 metals (including cyanide), 6 pesticides, 9 VOCs, 26 SVOCs (primarily PAHs and phenol), and PCBs. The initial COPEC screening of available surface soil data collected at the Site is provided in Appendix N.

A risk characterization was conducted by comparing COPEC EPCs to conservative ESBs. The derived value is identified as a hazard quotient (HQ). An HQ less than or equal to 1 indicates the potential for adverse effects to ecological receptors is absent or minimal and additional evaluation is likely not necessary. An HQ greater than 1 indicates a potential for adverse effects to ecological receptors may exist and that additional evaluation of potential risks may be necessary. Using the ESBs derived for plants, soil invertebrates, and wildlife the highest HQs for COPECs were found for metals (aluminium, chromium, cyanide, iron, lead, mercury, and zinc), individual PAHs (anthracene, benzo(a) pyrene, fluoranthene, phenanthrene, and pyrene), and total PCB Aroclors. For each COPEC identified, the HQ values is provided in Appendix N.

6.3 Conclusions

Under the PADEP ES Process framework, a SMD is made to determine if:

1. The ES should be continued to develop a site-specific clean-up goal, or to reduce uncertainty in the evaluation of risk and impact.
2. The preliminary screening is adequate to determine that no substantial risk exists.

3. There is substantial impact and remediation can eliminate or reduce exposure to an acceptable level.

The results of the ES indicate potentially complete exposure pathways for ecological receptors exposed to COPECs in surface soil. However, through pathway elimination as provided in the Cleanup Plan, future ecological exposure would effectively be eliminated. Therefore, no further ecological evaluation is recommended or required to reach this remedial decision.

7 PUBLIC BENEFITS TO REMEDIATION AND REUSE

The Site is ideal for a variety of commercial or industrial uses and Site development will benefit the public in various ways. The Site is currently being considered for commercial warehousing (see preliminary plans in Exhibit 1). The primary economic and health benefits gained by Site redevelopment are directly related to returning the property to a functional use. Site development will generate the following benefits to the Bridesburg area:

- Increased employment opportunities for the Bridesburg borough and the surrounding communities. Per a September 2019 US Bureau of Labor Statistics Report, Philadelphia County has the highest unemployment rate in the Philadelphia-Camden-Wilmington Metropolitan Area.
- Increased revenues to the Bridesburg borough. The Site is in a Federally Qualified Opportunity Zone. Opportunity Zones are a community investment tool established by Congress in the Tax Cuts and Jobs Act of 2017 to encourage long-term investments in low-income urban and rural communities nationwide.

8 REMEDIAL INVESTIGATION CONCLUSIONS

The RI was undertaken to assess the nature and extent of Site-related environmental impacts remaining after the extensive soil remediation performed as part of the RCRA closure from 1982 to 1994. The RI evaluates the risks posed to human health and the environment by those remaining impacts that will be addressed in the Cleanup Plan.

The Initial RI activities were performed by PS&S from 2003 through 2006. Based on a review of the Initial RI results, Arcadis performed a supplemental investigation in 2018 and 2019 to: (1) confirm that Site soil conditions have not significantly changed since samples were collected as part of the Initial RI activities; (2) fill identified data gaps from previous investigation and remedial actions for purposes of developing a Cleanup Plan; and (3) assess current groundwater conditions. The Site is unoccupied, and no Site use or redevelopment activities were performed between the Initial RI and the SRI. When combined, work activities performed for the RI consisted of the following:

- Excavating 197 test pits and collecting soil samples from 145 test pits.
- Installing 179 soil borings and collecting soil samples from 150 soil borings.
- Installing and sampling 33 shallow groundwater monitoring wells, 13 deep groundwater monitoring wells, and 7 hydropunch borings.
- Analyzing approximately 540 soil samples and 112 groundwater samples for a combination of TCL VOCs, TCL SVOCs, PP metals, TAL inorganics, cyanide, pesticides, and PCBs.
- Collecting 21 soil gas samples and one ambient air.
- Performing sediment probing in the Delaware River and a visual reconnaissance of the shoreline for sheens, tar-like material, elevated photoionization detector readings, or other observable indications of Site-related impacts.

The RI results provide adequate data coverage across the Site to: (1) identify and delineate the environmental conditions; (2) support a CSM; (3) develop a cleanup plan; and (4) support Site redevelopment. Based on the RI results, site-related impacts are relatively limited to the center of the Site and at isolated locations on the remainder of the Site.

Based on observations of soil samples recovered from soil borings across the Site, there are three hydrogeological units above weathered metamorphic schist bedrock. Nearest the ground surface is a layer of man-made fill materials that generally meets the description of historic fill as defined in PADEP's Management of Fill Policy (Document #258-2182-773) dated January 1, 2020. The fill layer is where most soil samples were collected and where most groundwater wells are screened. A confining unit of silt and clay material underlies the fill materials and underneath that confining unit is a sand and gravel unit. Groundwater at the Site is separated into a shallow and deep zone by the silt and clay layer. The shallow aquifer was formed by the historical placement of fill above native surface soils. Due to the presence and characteristics of the historic fill, it is not suitable for use.

Based on the RI results, no COCs have been identified in subsurface soil at the Site at concentrations exceeding non-residential direct contact MSCs. Several PAHs and lead were detected throughout the Site in surface soil at concentrations typical of urban/historic fill and, at select locations, at concentrations exceeding the non-residential direct contact MSCs. Additionally, soil containing viscous tar, oil-like material, and solidified tar was observed at isolated and limited locations at the Site. Visually impacted material was generally collocated with select VOCs, SVOCs, and inorganics at concentrations greater than non-residential soil-to-groundwater MSCs. These limited areas have been delineated, and groundwater monitoring wells were installed and sampled within and downgradient of them to assess the potential impact to groundwater from soil.

Outside of these isolated areas, shallow groundwater is relatively unimpacted by former Site operations. In the shallow aquifer, existing groundwater conditions are typical of groundwater in urban/historic fill. Groundwater impacts were generally not observed in point-of-compliance wells downgradient from impacted areas, and fate and transport modelling indicates that the limited residual groundwater impacts are not migrating offsite. Deep groundwater (the primary Philadelphia region aquifer) is shown to be unimpacted by former Site operations.

Taken together, the RI soil and groundwater analytical results indicate the presence of stable, residual impacts limited to defined areas within the boundaries of the Site. Based on these RI findings, PCC will prepare an Act 2 Final Report for groundwater upon PADEP's approval of the RICP.

VOCs were not detected above the screening values for non-residential, sub-slab, soil gas samples collected during the Initial RI. Additionally, a comparison of existing unsaturated soil and groundwater data to residential VI standards from the TGM indicate there are no potential VI concerns for the residential properties adjacent to the Site. However, the existing unsaturated soil and groundwater results indicate the potential for VI in future Site buildings.

The COCs for the Site are listed in Table 8-1 below.

Table 8-1: COC For Each Environmental Medium

Analyte	CAS Number	Surface Soil COC (Yes/No)	Subsurface Soil COC (Yes/No)	GW COC (Yes/No)	VI COC (Yes/No/na)
Volatile Organic Compounds					
Benzene	71-43-2	No	**Yes**	**Yes**	**Yes**
Chlorobenzene	108-90-7	No	**Yes**	No	No
Dichloromethane	75-09-2	No	**Yes**	No	No
Ethylbenzene	100-41-4	No	**Yes**	No	No
Methyl-tert-butylether	1634-04-4	No	No	**Yes**	**Yes**
Styrene (Monomer)	100-42-5	No	**Yes**	No	No
Tetrachloroethene	127-18-4	No	No	**Yes**	No
Toluene	108-88-3	No	**Yes**	No	**Yes**
Trichloroethene	79-01-6	No	No	**Yes**	**Yes**
Semi-Volatile Organic Compounds					
1,1-Biphenyl	92-52-4	No	**Yes**	No	**Yes**
2-Methylnaphthalene	91-57-6	No	**Yes**	No	**Yes**
4-Methylphenol	106-44-5	No	**Yes**	No	No
Anthracene	120-12-7	No	**Yes**	No	No
Benz(a)anthracene	56-55-3	**Yes**	**Yes**	**Yes**	na
Benzo(a)pyrene	50-32-8	**Yes**	**Yes**	**Yes**	na

Analyte	CAS Number	Surface Soil COC (Yes/No)	Subsurface Soil COC (Yes/No)	GW COC (Yes/No)	VI COC (Yes/No/na)
Benzo(b)fluoranthene	205-99-2	**Yes**	**Yes**	**Yes**	na
Benzo(g,h,i)perylene	191-24-2	No	**Yes**	**Yes**	na
Benzo(k)fluoranthene	207-08-9	**Yes**	**Yes**	**Yes**	na
bis(2-Ethylhexyl)phthalate	117-81-7	No	No	**Yes**	na
Carbazole	86-74-8	No	**Yes**	**Yes**	na
Chrysene	218-01-9	**Yes**	**Yes**	**Yes**	na
Dibenz(a,h)anthracene	53-70-3	**Yes**	**Yes**	**Yes**	na
Dibenzofuran	132-64-9	No	**Yes**	**Yes**	na
Fluoranthene	206-44-0	No	**Yes**	No	na
Fluorene	86-73-7	No	**Yes**	No	na
Indeno(1,2,3-cd)pyrene	193-39-5	**Yes**	No	**Yes**	na
Naphthalene	91-20-3	**Yes**	**Yes**	**Yes**	**Yes**
Phenanthrene	85-01-8	No	**Yes**	No	na
Phenol	108-95-2	No	**Yes**	No	na
Pyrene	129-00-0	No	**Yes**	No	na
Inorganics					
Antimony	7440-36-0	No	**Yes**	**Yes**	na
Arsenic	7440-38-2	**Yes**	**Yes**	**Yes**	na
Cyanide	57-12-5	No	**Yes**	No	na
Lead	7439-92-1	**Yes**	**Yes**	No	na
Manganese	7439-96-5	No	No	**Yes**	na
Mercury	7439-97-6	No	**Yes**	No	na
Nickel	7440-02-0	No	**Yes**	**Yes**	na
Selenium	7782-49-2	No	**Yes**	No	na
Vanadium	7440-62-2	No	No	**Yes**	na

Notes: na = not applicable analyte does not readily volatilize; GW = groundwater; the inorganics shown for groundwater are based on dissolved-phase analytical results.

Currently, there is no complete exposure pathway to impacted soil and groundwater. Future exposure pathways via direct contact with Site soil or groundwater for incidental ingestion, direct dermal contact and/or inhalation of windblown particulates (fugitive dusts) or volatilized COCs will potentially be complete if no controls are implemented.

Based on the concentrations of select COCs in unsaturated soil and groundwater, there is potential for a complete VI exposure pathway when buildings are constructed onsite in the future. The potentially complete exposure pathway would be for indoor occupants, residents, and workers via VI from soil and groundwater if future buildings are constructed onsite in the absence of engineering and institutional controls.

The findings of the RI provide the basis for performing a “pathway elimination” cleanup approach.

9 CLEANUP PLAN

The NIR was submitted to PADEP stating that PCC is seeking a release of liability under the Act 2 Site-Specific Standard (Appendix A). Current potentially complete exposure pathways and hypothetical future exposure pathways (without engineering and institutional controls) are presented in Section 5 and summarized in Table 9-1 below:

Table 9-1: Summary of Current and Hypothetical Future Exposure Pathways

Current and/or Future Exposure Pathway	Potential Current Receptors	Potential Future Receptors without Remedy
Incidental Soil and GW Ingestion, Dermal Contact, and Inhalation of VOCs and Particulates	1. Utility/Construction Worker 2. Outdoor Worker	1. Resident 2. Recreational User 3. Building Occupant 4. Utility/Construction Worker 5. Outdoor Worker 6. Trespasser
Potable Water Ingestion and Use	None	1.Resident 2.Building Occupant 3.Indoor Worker
Soil Vapor Intrusion	None	1. Resident 2. Building Occupant 3. Indoor Worker

Based on the characterization data for soils and groundwater presented in Section 3 and review of migration pathways and potential receptors, the remedial action objective for the Site is to protect human health by eliminating identified exposure pathways with soils and groundwater impacted by VOCs, SVOCs, and inorganics. The Cleanup Plan:

- Provides methods to achieve pathway elimination for impacted soils using engineering controls (e.g., capping of soils with structures, roadways, parking lots, and landscaping).
- Outlines procedures and plans to allow for safe execution of proposed Site redevelopment activities.
- Specifies institutional controls to be implemented (i.e., Environmental Covenants, restrictions, or other appropriate vehicles).
- Outlines a Post-Remediation Care Plan.

The proposed Site-Specific Standard for this Site generally consists of “pathway-elimination,” which means that potentially complete future exposure pathways will be mitigated using engineering and/or institutional controls. Details of site-specific engineering controls will be updated in the future if and as Site development occurs. Engineering controls proposed in this Cleanup Plan include:

1. Covering impacted soils with asphalt/concrete pavement, building structures, and/or a 2-foot clean soil cover (for areas that contain surface soil exceeding the non-residential direct-contact standards) to prevent direct contact exposure and/or to mitigate potential migration of constituents from soil-to-groundwater.

2. Employing VI mitigation measures for future buildings constructed onsite if and where needed. An initial screening of areas with potential VI concerns is provided as Figure 35. Additional soil gas characterization and/or a cumulative risk assessment may demonstrate that mitigation measures are not needed.

Proposed institutional controls are a deed restriction/environmental covenant that: (1) prohibits use of groundwater at the Site; (2) restricts the Site to non-residential use; and (3) requires a Post-Remediation Care Plan that stipulates inspection, periodic maintenance/repair activities, and reporting requirements for engineering controls, as appropriate. These restrictions will be embodied in a recorded and enforceable Environmental Covenant.

This Cleanup Plan may be implemented in conjunction with Site redevelopment. Surface elements of redevelopment, such as paving, building foundations and slabs may be used to form an integral part of the planned final cap for the Site and eliminate potential exposure pathways. The Cleanup Plan may be implemented using an iterative process that results in elimination of potential exposure pathways as any potential redevelopment is conducted; however, the general remedial scheme will be implemented even in the absence of redevelopment.

9.1 List of Contacts

Table 9-2: Site Contacts

Name/Affiliation	Address	Contact Information
PADEP		
Ms. Sarah Pantelidou PADEP Case Manager	2 East Main Street Norristown, PA 19401	T: 484 250-5778
PCC – Property Owner / Remediator		
Brian M. Stearns, P.E. Site Investigation and Remediation	300 Erie Boulevard Syracuse, New York 13202	T: 315 428-5731 brian.stearns@nationalgrid.com
Michael E. Guerin Director, Property Strategy & Transactions	40 Sylvan Road 1st Floor East Waltham, MA 02451	T: 781 907-1741 michael.guerin@nationalgrid.com
Arcadis U.S., Inc. – Project Consultant		
Daniel P. Sheehan, P.E. Principle in Charge	824 N Market Street, STE 820, Wilmington, Delaware 19801-4939	T: 302 884-6919 daniel.sheehan@arcadis.com

9.2 Site Maps

The following figures are referenced as part of the Cleanup Plan:

- Figure 1: Site Location Map
- Figure 17: Soil Boring Observations

- Figure 18: Surface Soil Analytical Results
- Figure 19: Soil Delineation Areas
- Figure 24: Groundwater Analytical Results – VOCs and SVOCs Exceeding MSCs
- Figure 25: Groundwater Analytical Results – Dissolved Inorganics Exceeding MSCs
- Figure 27: Soil Sampling Locations Exhibiting Potential Vapor Intrusion Concerns in Vadose Zone
- Figure 28: Groundwater Monitoring Wells Exhibiting Potential Vapor Intrusion Concerns
- Figure 35: Site Locations with Potential Vapor Intrusion Concerns

A comprehensive list of report figures is included in the table of contents, and figures are referred to throughout the text.

9.3 Remedial Goals

Based on the analysis of remedial alternatives presented herein, the remedial goals for soil will be to allow historic fill and impacted soils to remain in place with capping (e.g., asphalt/concrete pavement, building structures, clean soil cover, etc.), to the extent practicable, and provide new cover/capping to the disturbed soil across the Site, where needed to meet the Site-Specific Standard, as discussed below.

9.4 Remedial Alternatives

The technical guidance recommends the identification of remediation alternatives, and an evaluation of the effectiveness of the selected remedy to achieve the Site-Specific Standards, based on the factors set forth in Section 304(j) of Act 2. The evaluation should consider: 1) the long-term risks and effectiveness; 2) the ability of the remedy(ies) to reduce the toxicity, mobility or volume of regulated substance; 3) the short-term risks and effectiveness; 4) the ease or difficulty of implementation; 5) the cost of the remedial measure; and 6) the incremental health and economic benefits of the remedy.

9.4.1 Selection of Remedial Alternatives

General response actions are broad categories of remedial technologies that can potentially be used to meet remedial action objectives. The general response actions typically include:

- Institutional Controls
- Containment
- Treatment
- Removal and Disposal

Institutional controls and containment processes reduce the risk of exposure, but do not remove or destroy the COCs.

Containment technology options are those that control the release or minimize the potential for contact. Examples of containment approaches include surface capping, vertical barriers, and horizontal barriers.

Treatment technology options are those that reduce the mobility, toxicity, or volume of the source of impacts. Treatment can employ physical, chemical, or biological methods and can be applied in-situ (in place) or ex-situ (following removal from the source location).

Removal and disposal options remove impacted media from an area of concern and relocate it to a more secure area. An example of a removal and disposal option is excavation of impacted soil and disposal in a permitted landfill.

9.4.2 Evaluation of Remedial Alternatives

The selection of an acceptable remedial alternative requires the establishment of comparison criteria that address the major factors required for successful remedial action. Additionally, a mechanism to rank the various factors is also important.

The criteria used to evaluate the retained remedial alternatives are those described in Section 304(j) of Act 2, summarized as follows:

- "Long-term Risks and Effectiveness" – The magnitude of residual risk following implementation of the alternatives are evaluated. The type, degree and duration of post-remediation care, potential for exposure, and adequacy and reliability of controls are also considered.
- "Reduction of Toxicity, Mobility or Volume" – This criterion addresses hazardous constituents, treated contaminants and residuals remaining after the remedial alternative is implemented. The degree of reduction in toxicity, mobility and volume is evaluated.
- “Short-Term Risks and Effectiveness" – During implementation, potential short-term impacts to onsite workers, adjacent residents, and the environment are considered.
- "Implementability" – Ability to construct, operate, monitor, maintain and obtain regulatory approvals for an alternative are considered. The evaluation also includes availability of technologies, equipment, trained personnel and offsite disposal services.
- "Cost" – Capital, operation and maintenance costs are estimated and evaluated. In generating these calculations, Arcadis has assumed that some construction requirements are applicable to all remedies associated with the potential reuse of the property for development. Therefore, costs such as sediment and erosion control for each remedy would be essentially equal.
- "Incremental Health and Economic Benefits" – The long-term economic benefits are evaluated for each of the potential remedies.

The selected soil remedy, groundwater, and soil vapor remedies are summarized in the Sections 9.6 through 9.8.

9.5 Community Participation

The selected remedial alternative will be adjusted, as appropriate, based on community feedback. A Public Involvement Plan (PIP) has been prepared for the Site that defines procedures for community engagement and the communication of findings from ongoing Site remediation in accordance with the latest updates to Act 2 and the TGM. The PIP establishes the framework for educating interested parties about past and ongoing Site environmental remediation efforts and enables communication between the public, PCC, the site developers, PADEP, EPA, Philadelphia Department of Public Health, and other Philadelphia Departments and elected officials. The PIP:

- Provides public access to project documents at convenient locations.

- Designates a central point of contact to address questions from the community.
- Identifies a location for public hearings and meetings near the Site.

The PIP is available to the public at the Frankford Library, Councilman Bobby Henon's Office, and online at: http://www.4501richmondstreet.com/.

9.6 Selected Soil Remedy

The following COCs have been reported as detected in surface soil at concentrations above the non-residential direct contact MSCs in surface soil:

- SVOCs: BaA, BaP, BbF, benzo(k)flouranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene.
- Metals: arsenic and lead.

The sampling locations where constituents have been detected in surface soil at concentrations greater than the non-residential direct contact MSCs in surface soil are shown in Figure 18. No constituents have been identified in subsurface soil at concentrations above the non-residential direct contact MSCs for subsurface soil. The subsurface soil COCs are presented in Table 9-3 (constituents that exceeded the soil-to-groundwater MSCs in soil samples. The number of exceedances of each constituent is also presented vs. the total number of soil samples collected. In general, visual impacts and elevated PID readings were also observed at the same soil sampling locations that contained the highest concentrations of constituents. Figure 17 shows sampling locations where visual impacts or elevated PID readings were observed.

Table 9-3: Subsurface Soil COCs

Analyte	CAS Number	S-GW Exceedance Frequency
Volatile Organic Compounds		
Benzene	71-43-2	36/530
Chlorobenzene	108-90-7	4/530
Dichloromethane	75-09-2	5/530
Ethylbenzene	100-41-4	3/529
Styrene (Monomer)	100-42-5	2/470
Toluene	108-88-3	1/532
Semi-Volatile Organic Compounds		
1,1-Biphenyl	92-52-4	4/168
2-Methylnaphthalene	91-57-6	4/535
4-Methylphenol	106-44-5	1/296
Anthracene	120-12-7	15/535
Benz(a)anthracene	56-55-3	12/535
Benzo(a)pyrene	50-32-8	39/535
Benzo(b)fluoranthene	205-99-2	22/535

Analyte	CAS Number	S-GW Exceedance Frequency
Benzo(g,h,i)perylene	191-24-2	13/535
Benzo(k)fluoranthene	207-08-9	6/535
Carbazole	86-74-8	18/535
Chrysene	218-01-9	18/535
Dibenz(a,h)anthracene	53-70-3	2/535
Dibenzofuran	132-64-9	16/535
Fluoranthene	206-44-0	8/535
Fluorene	86-73-7	4/535
Naphthalene	91-20-3	54/535
Phenanthrene	85-01-8	4/535
Phenol	108-95-2	2/535
Pyrene	129-00-0	6/535
Metals		
Antimony	7440-36-0	3/527
Arsenic	7440-38-2	101/527
Cyanide	57-12-5	3/333
Lead	7439-92-1	89/527
Mercury	7439-97-6	2/525
Nickel	7440-02-0	1/527
Selenium	7782-49-2	1/527

Note: S-GW indicates the soil-to-groundwater MSCs for a non-residential used aquifer with TDS less than or equal to 2,500 ppm

Due to the relatively low levels of COCs identified at the Site and the scattered and often isolated locations across the Site, the selected remedial alternative will be capping and/or covering of the impacted areas.

This selected remedy will:

- Significantly reduce the risk of exposure following installation of the remedy.
- Minimize the type and duration of post remediation care required.
- Significantly reduce the potential exposure to human and ecological receptors.
- Be accomplished in a reasonable period of time at a realistic cost.

While the proposed remedy does not reduce the toxicity or volume of impacted soils, the mobility of the impacted soils is significantly reduced by the proposed capping system. In addition, as noted above, the concentrations of these COCs are generally low and often isolated.

Site characteristics that may affect the implementation or effectiveness of the remedial action are as follows:

- The location of the impacted soils will dictate the mechanism for soils capping. The identified impacted soils are generally at depths less than 15 ft bgs.

- The locations of impacted soil areas will be marked prior to implementation of remedial activities in that area. Additional care will be taken if these areas need to be excavated and the disposition of excavated materials from these areas will be documented.

The short-term risks are minimal to construction workers and will be further reduced by onsite monitoring of the soil removal as discussed in Subsection 9.5.1. The short-term effectiveness of the remedy has been proven in numerous applications of a cap as a remedial alternative. The ease of implementation of the remedy has been proven in many prior instances. Commercially available equipment will be used along with established construction practices. The incremental health and economic benefits gained by implementation of the selected remedy include returning the property to a functional use with associated benefits to the community.

An Erosion and Sedimentation Control Plan (E&SC documents) will be prepared; remedial activities will not proceed without approved E&SC documents.

9.6.1 Detailed Description of Remedial Action for Soil

The selected remedial action for soils with reported detections above the non-residential MSCs will be capping of the impacted soil areas with either concrete, asphalt, or two feet of clean fill. Any soil which needs to be excavated from impacted areas associated with grading, utility, or foundation installation, will be relocated and will be capped as appropriate. If excavated soils are visually impacted, they will be moved to other areas of the Site that will be capped and/or removed and disposed of at a facility permitted to accept the material. During implementation of the remedial work (and any Site redevelopment if applicable) specific environmental controls, decontamination, health and safety requirements, and soil management, handling, and disposal requirements will need to be followed. Work conducted on the Site will be in accordance with the procedures defined in a site-specific HASP. The proposed remedial actions and associated construction requirements are summarized below.

Prior to starting any excavation at the Site, the planned excavation activities will be reviewed to evaluate if the proposed excavation will occur in areas known to contain impacts and/or areas that have the potential to contain impacts. The proposed ground-intrusive activities will be monitored if the excavation likely will encounter, or holds the potential to encounter, impacted soil. Additionally, the Site will be surveyed and staked/marked to identify areas (Areas 1 through 4 shown on Figure 19) and sampling locations where viscous tar or tar-like material was previously observed. Soil screening will be performed for visual impacts, odors, or elevated PID readings during excavations into known or potentially impacted material.

9.6.1.1 Earthwork and Soil Management

Site grading or excavation activities within marked areas will be documented to identify the relocation of any impacted soils. Soil onsite can be reused as fill in areas that will be covered as part of site redevelopment. Fill material removed from the Site, including historic fill, will be managed in accordance with PADEP’s Management of Fill Policy (Document #258-2182-773). Soil impacted with tar- and oil-like material remaining onsite may be left in place unless encountered during the installation of utilities, drainage features, and/or foundations. Impacted soil that is excavated will be managed in accordance with the PADEP Guidelines for E&SC. At a minimum, the E&SC measures will include silt fencing and/or hay bales that will be installed in appropriate locations in and around the remedial work area to minimize surface soil in the disturbed areas from potentially being transported, via wind and/or surface water, to areas outside of the limits of disturbance. If staged, impacted soil will be placed on plastic sheeting (minimum 6 mil thickness) adjacent to the excavation area and kept covered with appropriately anchored tarps when inactive. Small quantities of waste, along with drums of used PPE and similar small debris type items, may be stored in labeled USDOT Specification containers before onsite reuse or offsite disposal.

If soil saturated with viscous tar or oil-like material is encountered and not suitable from a geotechnical perspective for use as subsurface fill, it will be:

- Characterized in accordance with the disposal facility's requirements.
- Transported by a permitted waste hauler contracted to transport waste materials to the certified waste disposal facility in accordance with appropriate local, State, and Federal regulations.
- Documented in a waste manifest containing a summary of transport tonnage and disposal destination. The waste manifest will be maintained onsite and submitted to the PADEP in the Final Report.

For any materials disposed offsite, disposal quantities and associated documentation will be reported to the PADEP in the Final Report. This documentation will include waste profiles, test results, facility acceptance letters, manifests, bills of lading, and facility receipts.

9.6.1.2 Soil Capping System

When constructing the soil cap, surface soil sampling locations that contain COCs at concentrations greater than direct contact MSCs will be surveyed and marked, as appropriate. The capping of impacted soil areas, either by asphalt/concrete paving, building slabs, or soil cover will be documented. The soil cap will extend across areas of the Site where: (1) COCs are in surface soil at concentrations greater than the non-residential direct contact MSCs (see Figure 18); and (2) excavated soil impacted by COCs is reused onsite (unless laboratory analytical data demonstrates that COCs do not exceed non-residential direct-contact MSCs for surface soil). Final cap across the Site will be constructed in accordance with the PADEP draft guidance entitled, "The Use of Caps as Activity and Use Limitations" and consist of:

- Two feet of clean fill, including landscaping topsoil, in the greenspace and other landscaped areas underlain by a geotextile fabric to serve as a visual distinction between the clean fill cap and the existing impacted soil; or
- Site paving, building foundations and floor slabs.

A Post-Remediation Care Plan (institutional control) will be developed for long-term care and maintenance of the final cap(s).

9.7 Selected Groundwater Remedy

The following have been reported as detected in groundwater at concentrations above the PADEP non-residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L:

- VOCs: benzene, MTBE, tetrachloroethene, TCE

- SVOCs: 2,4-dinitrotoluene, BaP, BbF, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, and chrysene.
- Total Metals: antimony, arsenic, beryllium, lead, manganese, nickel, and zinc.
- Dissolved Metals: antimony, arsenic, manganese, and nickel.

VOCs and SVOCs detected in groundwater at concentrations greater than MSCs are shown in Figure 24, and dissolved inorganics detected in groundwater at concentrations greater than MSCs are shown in Figure 25. In general, SRI groundwater data indicates that groundwater conditions are improving across the Site, especially in regard to VOCs and SVOCs in replacement wells, and groundwater impacts are isolated and limited in extent.

Due to the relatively low levels of COCs identified at the Site and groundwater data from point-of-compliance wells showing that impacted groundwater is not migrating offsite, an Environmental Covenant prohibiting onsite groundwater use for any purpose is the selected remedy. The EC will also restrict Site use to non-residential use. Such a restriction will ensure that exposure to groundwater from beneath the Site does not occur. With groundwater use prohibited, there will be no future complete exposure pathway to groundwater at the Site. Appropriate institutional controls are proposed to effectively mitigate the complete exposure pathways listed in Section 5.

This selected remedy will:

- Significantly reduce the risk of exposure following establishment of the institutional controls.
- Minimize the type and duration of post-remediation care required.
- Significantly reduce the potential exposure to human and ecological receptors.
- Be accomplished in a reasonable period of time at a reasonable cost.

Construction or utility workers may encounter shallow groundwater during utility excavations for installation, maintenance, or repair of underground utilities. Volatile constituents in groundwater may volatilize into the utility trench. If future excavation were to be required to the depth of the perched water or groundwater table, the procedures listed in Section 9.5.1 will be followed to limit construction worker exposure from groundwater impacts.

Upon approval of this RI Report and Cleanup Plan, an Act 2 Final Report for groundwater will be prepared, and once the Final Report is approved, all onsite monitoring wells will be abandoned and decommissioned in accordance with applicable requirements.

9.8 Soil Vapor Remedy

VOCs were not detected at concentrations above the non-residential sub-slab screening values in subsurface soil gas samples collected during the Initial RI. As discussed in Section 3.2.6, soil and groundwater analytical results likely overpredict VI potential because the soil gas sampling results did not exceed any of the sub-slab VI screening values. However, a comparison of existing unsaturated soil and groundwater data to non-residential VI standards from the TGM indicates the potential for soil VI if buildings are constructed in the future. The following constituents have been detected in soil and/or groundwater samples at concentrations above non-residential VI standards: benzene, MTBE, TCE, toluene, 1,1-biphenyl, 2-methylnaphthalene, and naphthalene. A detailed analysis of the VI COCs is included in the VI Evaluation provided as 3.2.6.

Unsaturated soil sampling locations where COCs have been identified at concentrations exceeding the non-residential VI standards are shown in Figure 27 and groundwater sampling locations where COCs have been identified at concentrations exceeding the non-residential VI standards (or for groundwater within 5 feet of the ground surface, the non-residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L) are shown on Figure 28. In summary, based on the TGM VI guidance, the locations where VI is a potential concern at the Site are shown on Figure 35.

For buildings installed in locations where VI is a potential concern, the selected soil vapor remedy will be pathway elimination via the installation of a vapor barrier designed and manufactured for use in VOC mitigation. Alternatively, the results of a VI risk assessment and/or additional soil gas characterization may eliminate the need to install a VI mitigation system in certain areas. To achieve pathway elimination, the vapor barrier material will be chemically resistant and have demonstrated low permeability for the VOCs present. Additionally, the EC will prohibit construction of basements in areas of potential VI concern.

The two proposed buildings shown in Exhibit 1 (i.e., a 148,611 square-foot building located in the northern portion of the Site and a 740,701 square-foot building located in the central portion of the Site) were evaluated for VI potential. Based on the areas of potential VI concern, as shown on Figure 35, VI mitigation will be installed for the larger building consisting of a vapor barrier that is chemically resistant to and demonstrated low permeability for benzene. The vapor barrier will be installed and tested pursuant to the manufacturer's recommendations. The selected vapor barrier remedy will:

- Significantly reduce the risk of potential exposure to human receptors in the proposed future building.
- Be accomplished in a reasonable period of time at a reasonable cost.

While not needed from a vapor risk protection perspective, to be pro-active and conservative, a passive sub-slab ventilation system will be installed in general accordance with American National Standards Institute's 2018 Standard Soil Gas Control System in New Construction Buildings (ANSI/AARST CC-1000) as an additional protective measure.

9.9 Post-Remediation Care Plan

9.9.1 Soil

If engineering or institutional controls are needed to maintain a standard, a post-remediation care plan must be documented in the Final Report. Remedial measures are anticipated to incorporate capping of residual soil impacts.

If an engineering control (i.e., capping) will be incorporated over those areas where residual impacted soil remains following remedial activities/potential redevelopment, a post-remediation care plan will be outlined in the Final Report and listed in the environmental covenant.

Accordingly, the following provisions would be required to assure continued function of the engineering controls:

- Inspecting the engineered caps on a periodic basis.

- Maintaining the engineered cap and repairing any identified deterioration of the cap units regularly, as encountered.
- Documenting and recording where and when the inspection and maintenance is being conducted.
- Reporting inspection/maintenance results to the PADEP as provided in the environmental covenant (to be developed).

Inspection records, documentation associated with any necessary modifications/repairs and copies of notification letters will be maintained by the property owner.

As a component of the Final Report, an environmental covenant will be developed that requires the identification, and long-term inspection and maintenance of those areas where a cap must be maintained, if any.

9.9.2 Groundwater

A site-wide deed restriction prohibiting groundwater use will be incorporated into an Environmental Covenant and recorded with the Philadelphia County Recorder of Deeds.

9.9.3 Vapor Intrusion

The EC will require that a vapor barrier will be installed, tested and maintained in accordance with the manufacturer's specifications. Alternatively, the requirements for a VI mitigation system may be eliminated if the results of a cumulative risk assessment demonstrate that a VI mitigation system is not needed. If the risk assessment identifies an unacceptable VI risk, the Environmental Covenant will require the installation and maintenance of a VI mitigation system for any future inhabited structures within areas of potential VI concern.

9.10 Final Report

Following completion of remediation/development activities at the Site, an Act 2 Final Report will be prepared for submittal to PADEP. The Final Report will be signed and sealed by a PADEP Professional Geologist or Professional Engineer licensed in Pennsylvania. The report will contain the following:

- A discussion of the remedial activities performed.
- Proof of submissions and notifications of the Final Report.
- All necessary fees.
- Chronological summary of the remediation work performed.
- A list identifying the quantity of materials removed from the Site, and transport bills of lading and/or manifests generated.
- A discussion of any deviations from this Cleanup Plan.
- Relevant permits issued.
- Analytical data generated.

- A Post-Remediation Care Plan.
- Contact information.
- Documentation of the field remedial/redevelopment activities.
- As-built drawings.

Upon approval of the Final Report, an Environmental Covenant that defines the long-term maintenance requirements for any onsite engineering controls and documents the institutional controls requirements that will be needed for remaining soil and groundwater impacts will be recorded. Groundwater monitoring wells will be abandoned, as appropriate following PADEP approval of the Final Report for groundwater, in accordance with applicable regulatory requirements.

10 CLEANUP PLAN SUMMARY

The RI was undertaken to assess the nature and extent of Site-related environmental impacts and evaluate the risks posed to human health and the environment by those impacts. The RI results provide adequate data coverage across the Site to: (1) identify and delineate the environmental conditions; (2) support an CSM; (3) develop a cleanup plan; and (4) support Site redevelopment. Based on the RI results, site-related impacts are relatively limited to the center of the Site and at isolated locations on the remainder of the Site.

Currently, there is no complete exposure pathway to impacted soil and groundwater. Future exposure pathways via direct contact with Site soil or groundwater for incidental ingestion, direct dermal contact and/or inhalation of windblown particulates (fugitive dusts) or volatilized COCs will potentially be complete if no controls were to be implemented. Additionally, there is potential for a complete VI exposure pathway when buildings are constructed onsite in the future.

The future exposure pathways can be mitigated via “pathway-elimination” pursuant to an Act 2 Site-Specific Standard. The Site-Specific Standard is a risk management approach. Potentially complete future exposure pathways will be eliminated using engineering and/or institutional controls. Engineering controls proposed for the Site to prevent direct contact exposure include capping impacted soils with asphalt pavement, concrete, building structures and/or clean soil. The Engineering control proposed to prevent potential VI into future buildings on the property includes installing a vapor barrier specifically designed and manufactured for use in VOC mitigation below buildings constructed in areas of potential VI concern unless a VI risk assessment demonstrates that such a control is not needed. Proposed institutional controls include use of deed restriction/environmental covenant prohibiting use of groundwater at the Site. The future exposure pathways and how the proposed remedy eliminates these pathways is summarized in Table 10-1 below.

Table 10-1: Summary of Pathway-Elimination Remedy

Current and/or Future Exposure Pathway	Potential Current Receptors	Potential Future Receptors without Remedy	Proposed Remedy	Potential Future Receptors with Remedy
Incidental Soil and GW Ingestion, Dermal Contact, and Inhalation of VOCs and Particulates	1. Utility/ Construction Worker 2. Outdoor Worker	1. Resident 2. Recreational User 3. Building Occupant 4. Utility/Construction Worker 5. Outdoor Worker 6. Trespasser	• Soil Cap(s) • Institutional Controls	Utility/Construction Workers (i.e., during ground-intrusive activities. Managed in accordance with a HASP)
Potable Water Ingestion and Use	None	1. Resident 2. Building Occupant 3. Indoor Worker	• GW Use Restrictions	None
Soil Vapor Intrusion	None	1. Resident 2. Building Occupant 3. Indoor Worker	• Vapor Barrier Specific for Site COCs • VI Risk Assessment	None

Note: GW = groundwater

The future use of the property will be restricted to non-residential purposes. The remedial goals for soil will be to allow historic fill and impacted soils to remain in place or be reused onsite underneath a cap (e.g., asphalt/concrete pavement, building structures, clean soil cover, etc.), to the extent practicable, and provide cover/capping to the disturbed soil across the Site.

The Cleanup Plan has been developed and details the proposed methods to prevent further migration and eliminate potentially complete exposure pathways.

11 SIGNATURES

Mr. Michael E. Guerin, Philadelphia Coke Co., Inc., 40 Sylvan Road, 1st Floor East
Waltham, MA 02451

Relationship to the Site: Authorized Representative for current Site Owner

Signature: ______________________________

Michael Guerin
Philadelphia Coke Co., Inc. / National Grid USA

12 REFERENCES

ANSI/AART, 2018. American National Standards Institute's 2018 Standard Soil Gas Control System in New Construction Buildings. Accessed online: https://standards.aarst.org/CC-1000-2018/

Baker, 2012. United States Environmental Protection Agency Region III Corrective Action Program: Environmental Indicator Inspection Report for Philadelphia Coke Co., Inc. January 2012.

Delaware River Basin Commission (DRBC), 2013. Administrative Manual - Part III Water Quality Regulations with Amendments through December 4, 2013: 18 CFR Part 410.

Domenico, P.A., 1987. An Analytical Model for Multidimensional Transport of a Decaying Contaminant Species. Journal of Hydrology, 91, 49-58.

PADEP, 1999. Philadelphia Coke Company, City and County of Philadelphia, Termination of Groundwater Monitoring Requirements, Letter from PADEP to Eastern Enterprises, Inc, July 26, 1999.

PADEP, 2001. Groundwater, Pennsylvania's Cool Resource. 3800-BK-DEP-2579, Rev. 5/2001.

PADEP, 2002. Land Recycling Program Technical Guidance Manual. Department of Environmental Protection, Bureau of Environmental Cleanup and Brownfields, Last Updated on January 19, 2019.

PADEP, 2008. Swloadinstructionsrev3-08. March 2008. Accessed online: http://files.dep.state.pa.us/EnvironmentalCleanupBrownfields/LandRecyclingProgram/LandRecyclingProgramPortalFiles/GuidanceTechTools/swloadinstructionsrev3-08.pdf

PADEP, 2014. User's Manual for the Quick Domenico Groundwater Fate-and-Transport Model. Version No. 3b. February 28, 2014. Accessed online: http://files.dep.state.pa.us/EnvironmentalCleanupBrownfields/LandRecyclingProgram/LandRecyclingProgramPortalFiles/GuidanceTechTools/QD_manual_v3b%2002-28-2014.pdf

PADEP, 2019a. Technical Guidance Manual for Vapor Intrusion (VI) into Buildings from Groundwater and Soil Under Act 2, November 19, 2016, updated January 19, 2019.

PADEP. 2019b. PA DEP Johnson & Ettinger (J&E) Models. Soil-gas Residential – FEB 2019. Accessed online: https://www.dep.pa.gov/Business/Land/LandRecycling/Standards-Guidance-Procedures/Guidance-Technical-Tools/Pages/Vapor-Intrusion.aspx

PADEP. 2020. Management of Fill Policy (Document #258-2182-773), January 1, 2020. Accessed online: http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=1526726&DocName=MANAGEMENT%20OF%20FILL.PDF%20%20%3Cspan%20style%3D%22color%3Agreen%3B%22%3E%3C%2Fspan%3E%20%3Cspan%20style%3D%22color%3Ablue%3B%22%3E%3C%2Fspan%3E

Pennsylvania Groundwater Information System. https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx

Philadelphia Coke Company, 1982. Letter informing recipient that all production ceased and the plant effluent was plugged near the outfall and rendered out-of-service. June 28, 1982.

United States Army Corps of Engineers (USACE), 1987. Corps of Engineers Wetlands Delineation Manual. The Wetlands Research Program Technical Report Y-87-1. January 1987.

US Bureau of Labor Statistics. Unemployment in the Philadelphia Area by County – September 2019. https://www.bls.gov/regions/mid-atlantic/news-release/unemployment_philadelphia.htm

USACE, 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plan Region (Version 2.0). Wetlands Regulatory Assistance Program. November 2010.

United States Department of Agricultural (USDA), 1975. Soil Survey of Bucks and Philadelphia Counties, Pennsylvania. USDA Soil Conservation Service.

United State Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund (RAGS), Human Health Evaluation Manual, Volume 1, Part A. Interim Final. Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89/002. December.

EPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final. Office of Solid Waste and Emergency Response. EPA 540-R-97-006. June.

EPA. 1998. Guidelines for Ecological Risk Assessment. Federal Register 63(93):26845-26924. May.

URS Corporation, 2002. Delineation of Fuel Oil Contaminated Site at the Former Philadelphia Coke Company Site. January 17, 2002.

Woodward-Clyde Consultants (WCC), 1986. Hydrogeologic and Soils Report. January 29, 1986.

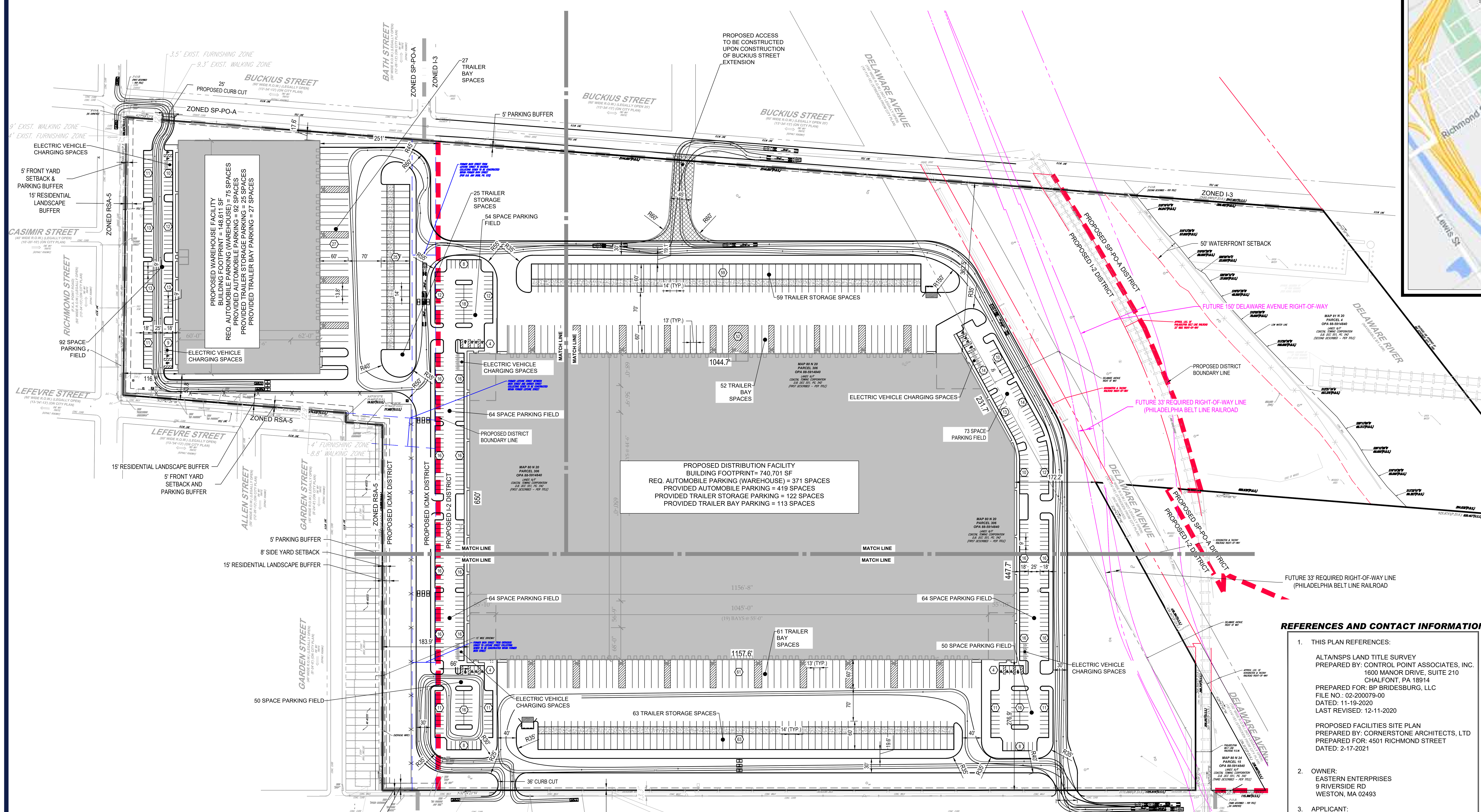
WCC, 1992a. UST Closure Report, June 6, 1992.

WCC, 1992b. Engineer's and Owner's Certification of Closure for Waste Management Units at Philadelphia Coke Company, December 1992.

WCC, 1994. Professional Engineer Certification of Closure, December 28, 1994.

EXHIBIT 1

Site Redevelopment Plan



LOCATION MAP
SCALE: 1" = 1,000'

REFERENCES AND CONTACT INFORMATION

1. THIS PLAN REFERENCES:

   ALTA/NSPS LAND TITLE SURVEY
   PREPARED BY: CONTROL POINT ASSOCIATES, INC.
   1600 MANOR DRIVE, SUITE 210
   CHALFONT, PA 18914
   PREPARED FOR: BP BRIDESBURG, LLC
   FILE NO.: 02-200079-00
   DATED: 11-19-2020
   LAST REVISED: 12-11-2020

   PROPOSED FACILITIES SITE PLAN
   PREPARED BY: CORNERSTONE ARCHITECTS, LTD
   PREPARED FOR: 4501 RICHMOND STREET
   DATED: 2-17-2021

2. OWNER:
   EASTERN ENTERPRISES
   9 RIVERSIDE RD
   WESTON, MA 02493

3. APPLICANT:

   BRIDGE DEVELOPMENT PARTNERS, LLC
   ONE GATEHALL DRIVE, SUITE 201
   PARSIPPANY, NJ 07054
   ATTN: JIM MARSHALL
   EMAIL: JMARSHALL@BRIDGEDEV.COM
   PHONE: (267)-346-0556

GENERAL NOTES

1. SITE DATA:
   4501 RICHMOND STREET
   PHILADELPHIA, PA 19137
   AREA (U.S.S.) = 2,884,248.9 S.F. (66.21 AC)
2. ZONING DATA:

   EXISTING ZONING: RMX-2 (RESIDENTIAL MIXED-USE)
   PROPOSED ZONING: ICMX (INDUSTRIAL MIXED-USE) & I-2 (INDUSTRIAL) & SP-PO-A (PARKS AND OPEN SPACE)

   PREVIOUS USE: OPEN SPACE
   PROPOSED USE: RETAIL & WAREHOUSE DISTRIBUTION
3. BOHLER ENGINEERING BUSINESS PRIVILEGE NUMBER IS 650139
4. PWD #: FY21-RICH-6344-01
5. ALL IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF PHILADELPHIA AND PHILADELPHIA WATER AND SEWER DEPARTMENT, AND ZONING REQUIREMENTS IN THE PHILADELPHIA CODE.
6. ELEVATIONS ARE BASED ON CITY OF PHILADELPHIA DATUM. LOT DIMENSIONS & EASEMENT DIMENSIONS ARE BASED ON PHILADELPHIA DISTRICT STANDARDS UNLESS OTHERWISE NOTED.
7. WATERSHED DISTRICT: DELWARE DIRECT WATERSHED NON-CONTRIBUTING, FLOOD MANAGEMENT DISTRICT C.
8. PLAN PREPARED AS PER INSTRUCTIONS OF THE OWNER.
9. STORMWATER SHALL DISCHARGE DIRECTLY TO THE DELAWARE RIVER.
10. ALL PLANTINGS SHALL BE IN ACCORDANCE WITH P.C.P.C. GUIDELINES.
11. ALL CURB RADII SHALL BE 5.0 FEET UNLESS OTHERWISE NOTED.
12. ELEVATIONS OF PROPOSED CONCRETE CURB TO BE DETERMINED BY THE CITY SURVEY DISTRICT. FACE OF CURB TO MATCH EXISTING CURB/EDGE OF PAVEMENT.
13. DEVELOPMENT TO BE SERVICED BY PUBLIC WATER AND SEWER IN ACCORDANCE WITH CITY OF PHILADELPHIA REQUIREMENTS.
14. BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS LOCATED IN FLOOD HAZARD ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) & FLOOD HAZARD ZONE AE (WITH BFE OR DEPTH).
15. TRASH PICK-UP WILL BE VIA A PRIVATE HAULER.

ZONING

EXISTING ZONING: RMX-2 (RESIDENTIAL MIXED-USE)
PROPOSED ZONING: ICMX (INDUSTRIAL MIXED-USE), I-2 (INDUSTRIAL), SP-PO-A (OPEN SPACE & PARK)
EXISTING USE: OPEN SPACE
PROPOSED USE: WAREHOUSE AND DISTRIBUTION FACILITIES

SITE CALCULATION

SITE AREA: 2,896,321 SF (66.50 AC)
ICMX-2 DISTRICT: 488,499.54 SF (11.21 AC)
I-2 DISTRICT: 2,019,365.62 SF (46.37 AC)
SP-PO-A DISTRICT: 388,455.98 SF (8.92 AC)

ZONING DISTRICT REQUIREMENTS

	REQUIRED (ICMX)	EXISTING	PROPOSED	REQUIRED (I-2)	EXISTING	PROPOSED
MAX. OCCUPIED AREA	100%	N/A	30.42%	100%	N/A	36.68%
MIN. YARD SETBACKS						
FRONT	0'*	N/A	17.6'	0'*	N/A	276.9'
SIDE YARD (EA)	8'*	N/A	N/A	6'*	N/A	66'
REAR	8'*	N/A	251'	8'*	N/A	172.2'
WATERFRONT SETBACK	50'	N/A	N/A	50'	N/A	50'
LANDSCAPE BUFFER	15'	>15'	15'	15'	>15'	15'
MAX. BUILDING HEIGHT	60'	N/A	60'	60'	N/A	60'
MAX. FLOOR AREA RATIO	500%	N/A	30.42%	500%	N/A	36.68%

* WHERE A LOT ABUTS A RESIDENTIAL DISTRIC, FRONT YARDS, SIDE YARDS, AND REAR YARDS SHALL BE PROVIDED ON THE LOT ON THE SIDES ABUTTING THE RESIDENTIAL DISTRICT. THE MINIMUM REQUIREMENTS FOR THOSE YARDS SHALL BE EITHER THOSE FOR THE INDUSTRIAL DISTRICT OR THOSE FOR THE RESIDENTIAL DISTRICT ON THE ABUTTING SIDE, WHICHEVER IS LARGER

PARKING REQUIREMENTS

	REQUIRED (ICMX)	PROVIDED	REQUIRED (I-2)	PROVIDED
PARKING SPACES (WAREHOUSE & DISTRIBUTION)	1 / 2000 SF (75 SPACES)	92 SPACES	1 /2000 SF (371 SPACES)	419 SPACES
ADA PARKING SPACES	4 SPACES	4 SPACES	8 SPACES	16 SPACES
PARKING SETBACK	5' ALONG STREET FRONTAGE	5'	5' ALONG STREET FRONTAGE	5'

LEGEND
PROPOSED

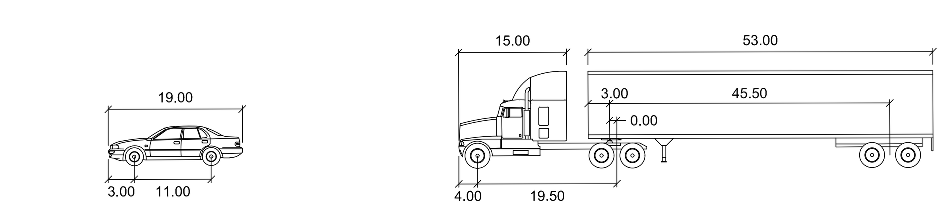
- RETAINING WALL
- CONCRETE CURB
- FLUSH CURB
- FENCE
- GUIDE RAIL
- TREELINE
- ACCESSIBLE SYMBOL
- CROSSWALK
- SIDEWALK
- SIGN
- BOLLARD
- PARKING COUNT
- AREA LIGHT
- DRAINAGE INLET
- MANHOLE
- ENDWALL
- RIPRAP
- CLEANOUT
- ROOFDRAIN
- FIRE HYDRANT
- UTILITY POLE
- LANDSCAPE AREA

LEGEND
EXISTING

- RETAINING WALL
- CONCRETE CURB
- FLUSH CURB
- FENCE
- GUIDE RAIL
- TREELINE
- PROPERTY LINE
- R.O.W. LINE
- ADJACENT PROPERTY LINE
- TITLE LINE
- EASEMENT LINE
- SETBACK LINE
- 50' WATERFRONT SETBACK
- EX. RAILROAD RIGHT-OF-WAY
- EX. EASEMENT
- EX. DELAWARE AVENUE RIGHT-OF-WAY (STRICKEN FROM CITY PLAN)
- FUTURE RIGHT-OF-WAY

LEGEND
EXISTING

- CONCRETE MONUMENT/ IRON PIN
- SIGN
- AREA LIGHT
- TREE
- DRAINAGE INLET
- STORM/SANITARY MANHOLE
- WATER/GAS VALVES
- ROOF DRAIN/CLEANOUT
- FIRE HYDRANT
- UTILITY POLE W/ LIGHT
- UTILITY POLE

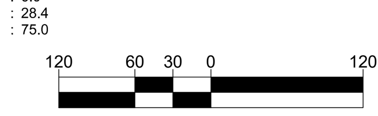


P

	feet
Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.6

WB-67

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		



1"= 120'

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PROJECT No.:	PP203056
DRAWN BY:	GB
CHECKED BY:	KM
DATE:	2/1/2021
CAD I.D.:	PP203056-SPP-2

PROJECT:

ZONING PLAN

FOR
BRIDGE ACQUISITIONS, LLC

PROPOSED DEVELOPMENT

4501 RICHMOND STREET
PHILADELPHIA, PA 19137

BOHLER//
1515 MARKET STREET, SUITE 920
PHILADELPHIA, PA 19102
Phone: (267) 402-3400
Fax: (267) 402-3401
www.BohlerEngineering.com

C. BROWN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE075317
DELAWARE LICENSE No. 18093
NEW JERSEY LICENSE No. 24GE05041400

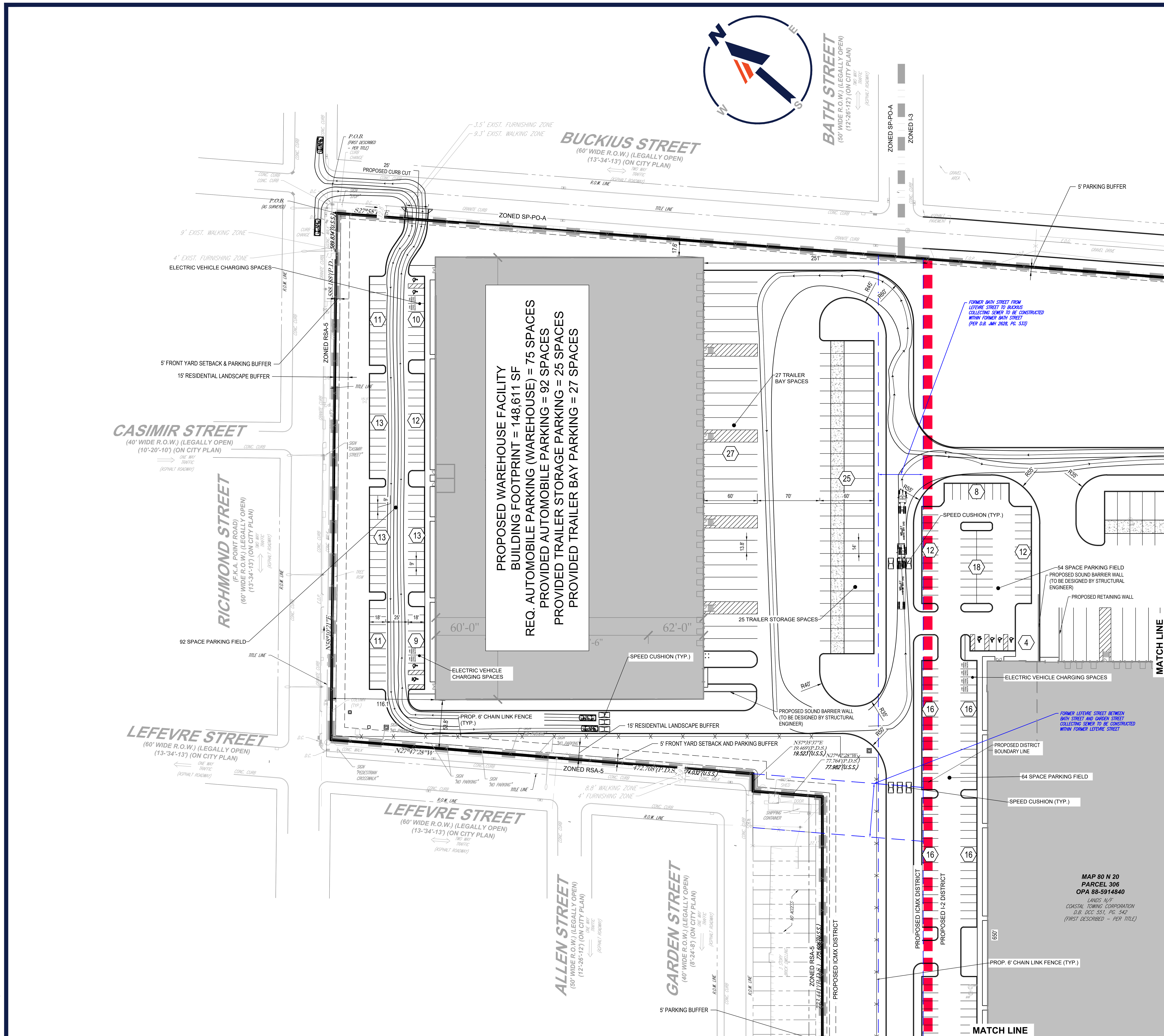
SHEET TITLE:

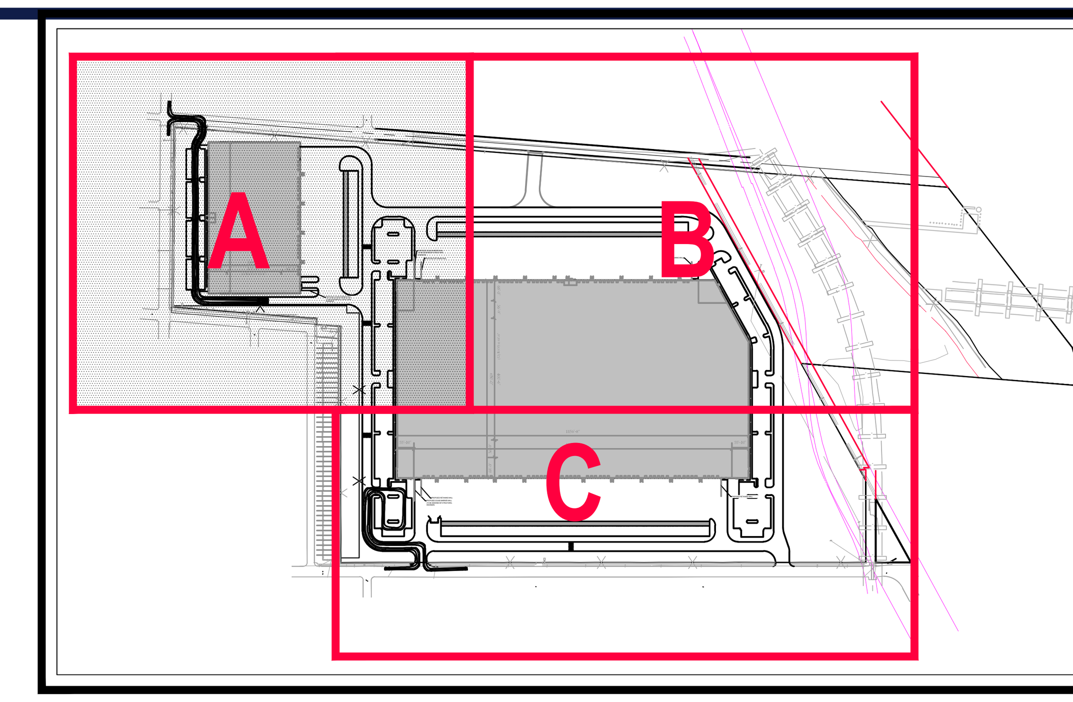
OVERALL ZONING PLAN

SHEET NUMBER:
1A

ORG. DATE - 2/1/2021

R:\20\PP203056\DRAWINGS\PLAN SETS\PERMITTING DOCS\REV-2 (ZONING CHECKLIST #1)\PP203056-SPP-2----->LAYOUT: Z1-A OVRL ZONING
GB





KEY MAP
SCALE: 1" = 500'

LEGEND
PROPOSED

RETAINING WALL
CONCRETE CURB
FLUSH CURB
FENCE
GUIDE RAIL
TREELINE
ACCESSIBLE SYMBOL
CROSSWALK
SIDEWALK
SIGN
BOLLARD
PARKING COUNT
AREA LIGHT
DRAINAGE INLET
MANHOLE
ENDWALL
RIPRAP
CLEANOUT
ROOFDRAIN
FIRE HYDRANT
UTILITY POLE
LANDSCAPE AREA

LEGEND
EXISTING

RETAINING WALL
CONCRETE CURB
FLUSH CURB
FENCE
GUIDE RAIL
TREELINE
PROPERTY LINE
R.O.W. LINE
ADJACENT PROPERTY LINE
TITLE LINE
EASEMENT LINE
SETBACK LINE
50' WATERFRONT SETBACK
EX. RAILROAD RIGHT-OF-WAY
EX. EASEMENT
EX. DELAWARE AVENUE RIGHT-OF-WAY (STRICKEN FROM CITY PLAN)
FUTURE RIGHT-OF-WAY

LEGEND
EXISTING

CONCRETE MONUMENT/ IRON PIN
SIGN
AREA LIGHT
TREE
DRAINAGE INLET
STORM/SANITARY MANHOLE
WATER/GAS VALVES
ROOF DRAIN/CLEANOUT
FIRE HYDRANT
UTILITY POLE W/ LIGHT
UTILITY POLE

60 30 15 0 60
1"= 60'

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SHEET TITLE:
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SHEET NUMBER:
1B

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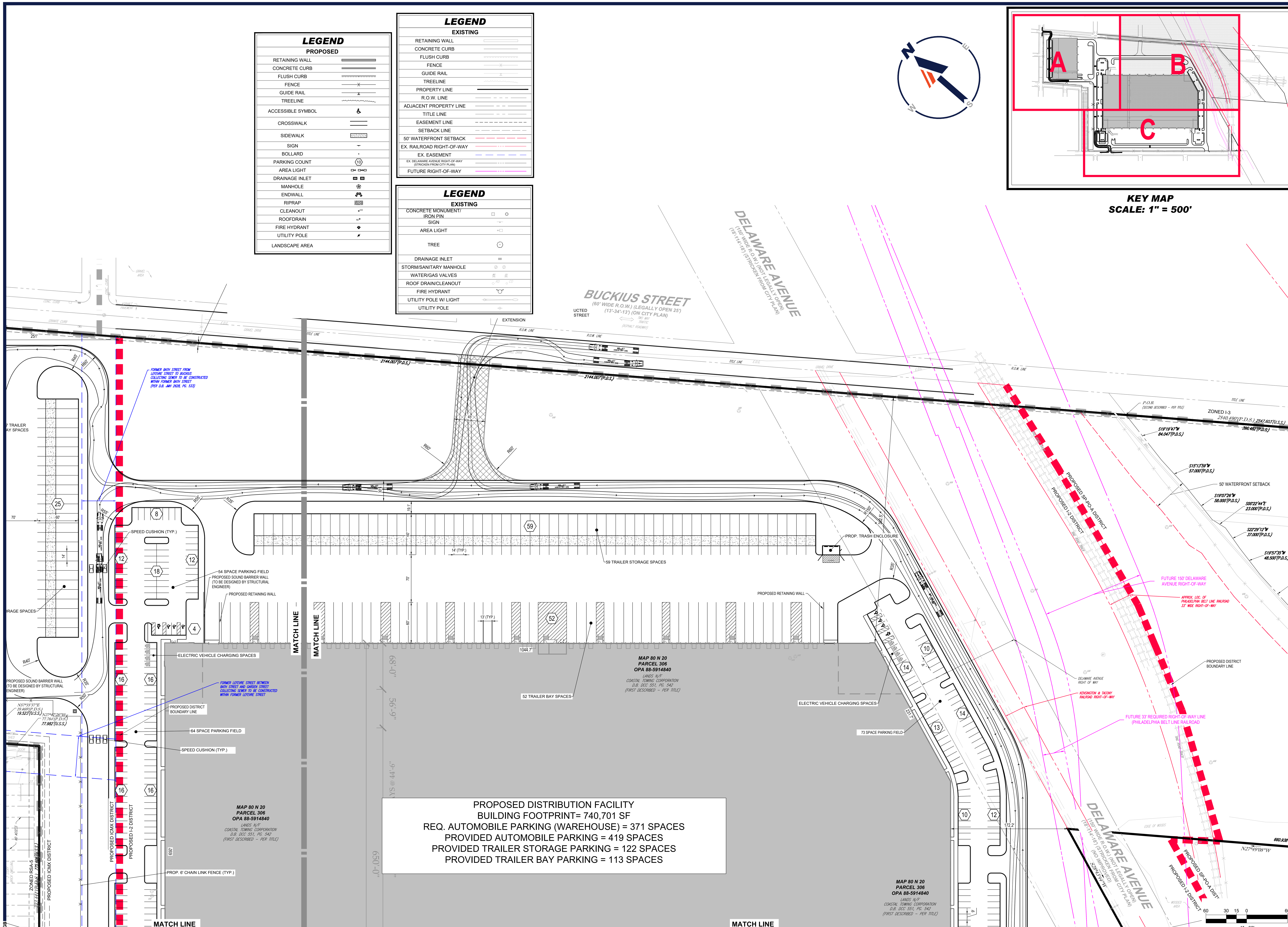

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SHEET TITLE:

ZONING PLAN

SHEET NUMBER:
1C

ORG. DATE - 2/1/2021

LEGEND

PROPOSED

RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
FENCE	
GUIDE RAIL	
TREELINE	
ACCESSIBLE SYMBOL	
CROSSWALK	
SIDEWALK	
SIGN	
BOLLARD	
PARKING COUNT	
AREA LIGHT	
DRAINAGE INLET	
MANHOLE	
ENDWALL	
RIPRAP	
CLEANOUT	
ROOFDRAIN	
FIRE HYDRANT	
UTILITY POLE	
LANDSCAPE AREA	

LEGEND

EXISTING

RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
FENCE	
GUIDE RAIL	
TREELINE	
PROPERTY LINE	
R.O.W. LINE	
ADJACENT PROPERTY LINE	
TITLE LINE	
EASEMENT LINE	
SETBACK LINE	
50' WATERFRONT SETBACK	
EX. RAILROAD RIGHT-OF-WAY	
EX. EASEMENT	
EX. DELAWARE AVENUE RIGHT-OF-WAY (STRICKEN FROM CITY PLAN)	
FUTURE RIGHT-OF-WAY	

LEGEND

EXISTING

CONCRETE MONUMENT/ IRON PIN	
SIGN	
AREA LIGHT	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
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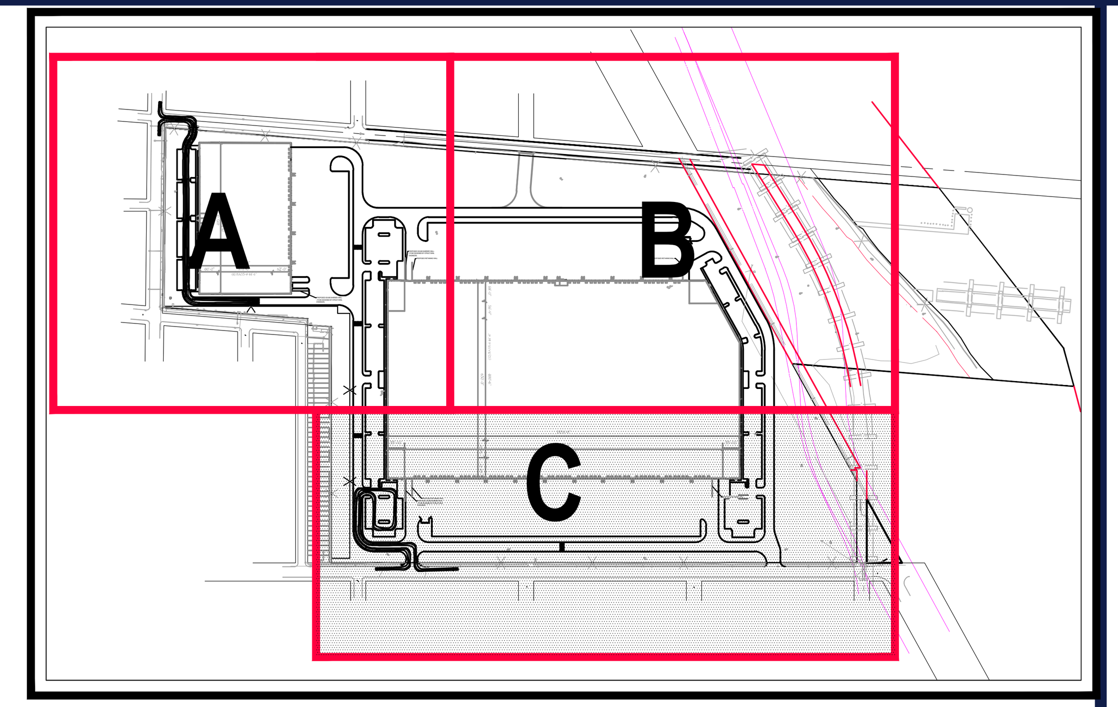
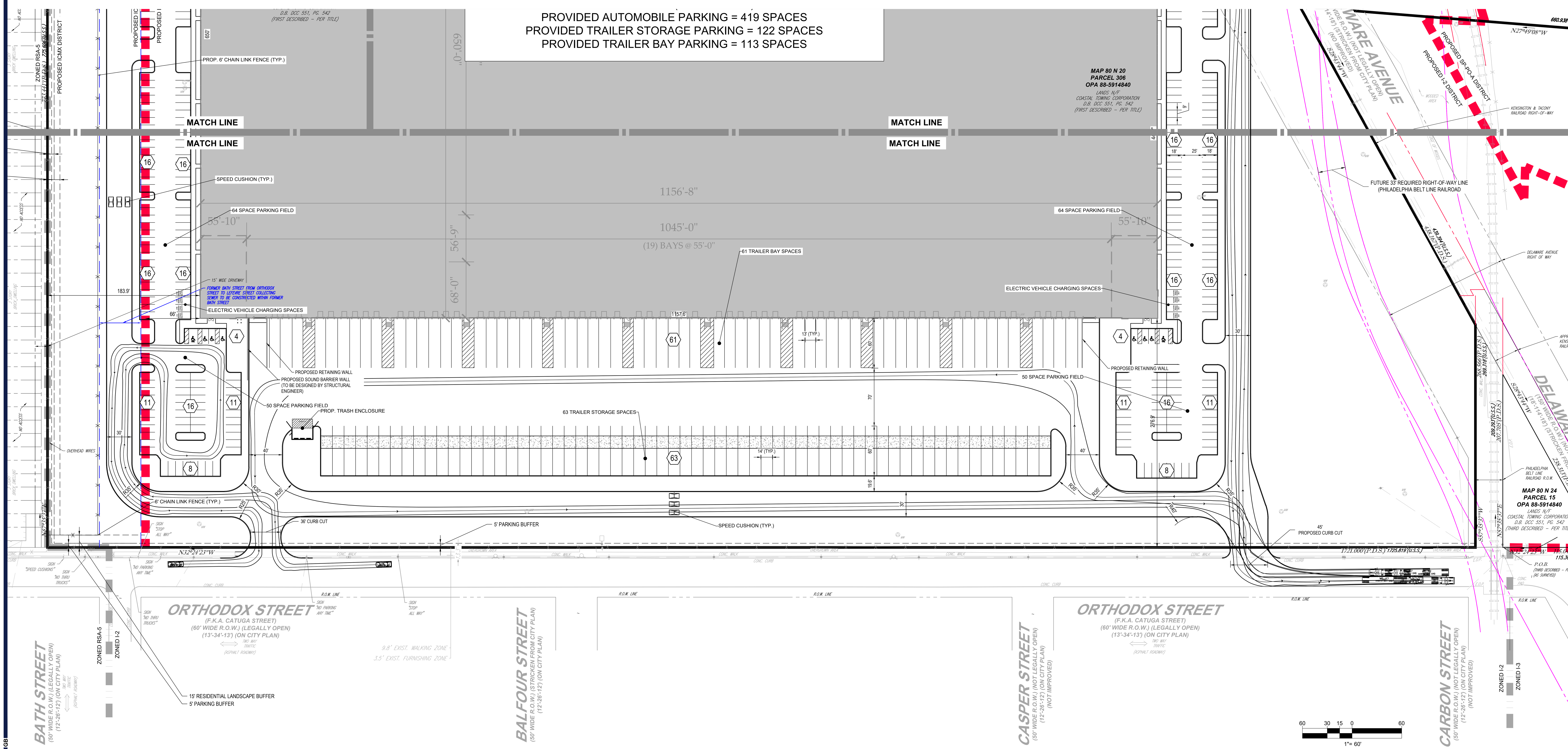
ROOF DRAIN/CLEANOUT	
FIRE HYDRANT	
UTILITY POLE W/ LIGHT	
UTILITY POLE	



KEY MAP
SCALE: 1" = 500'



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SHEET NUMBER:

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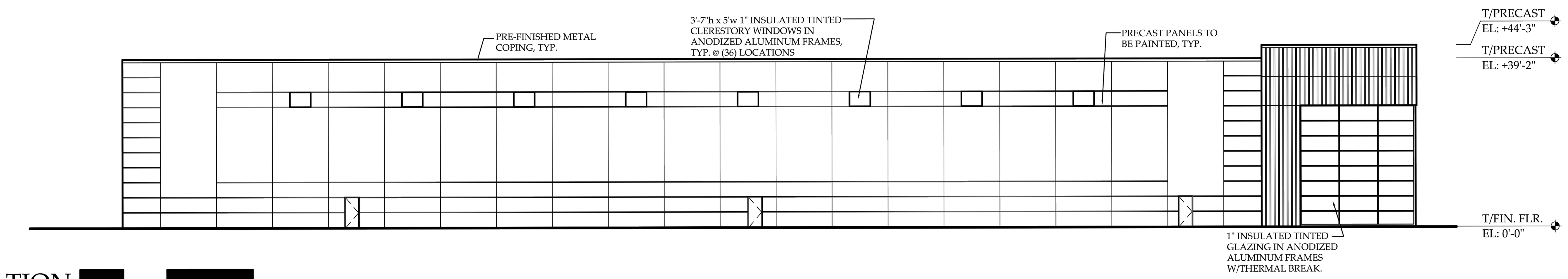
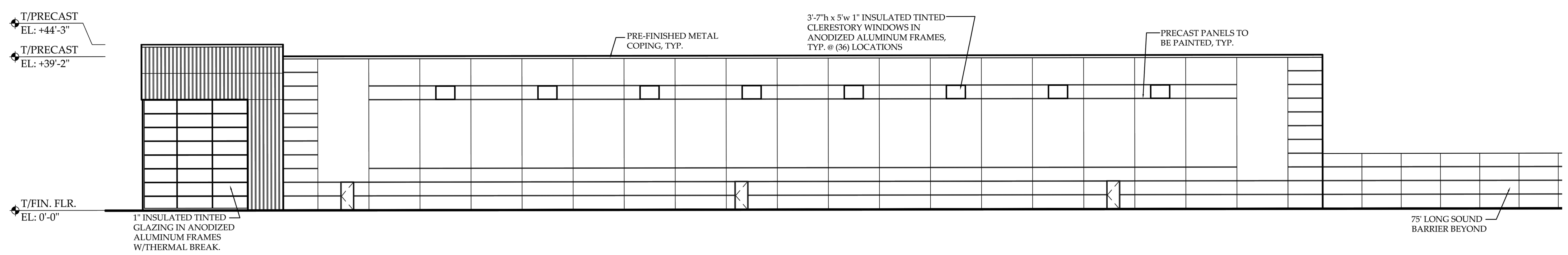
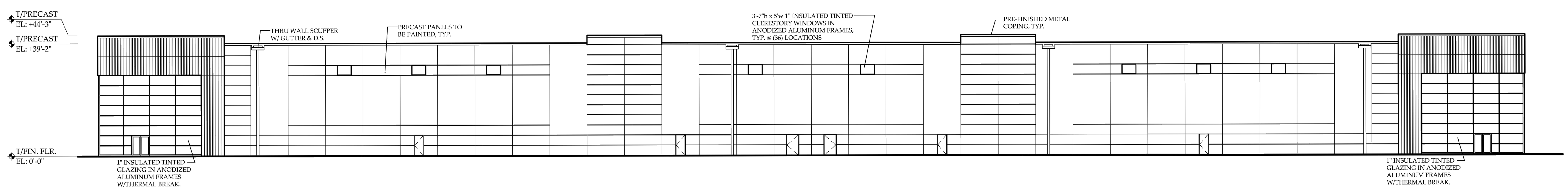


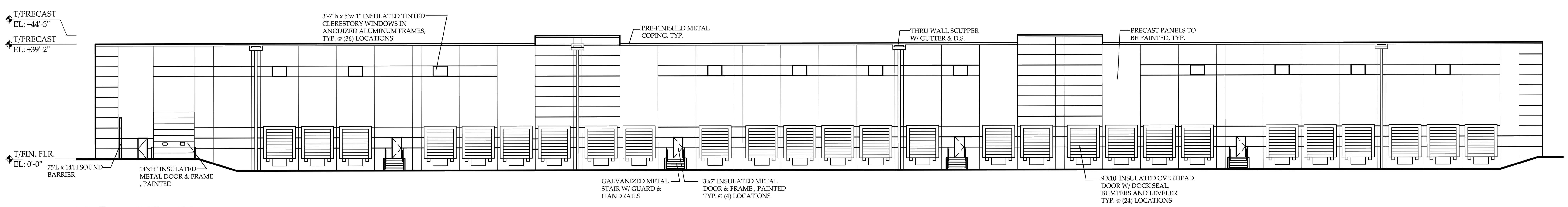
EAST ELEVATION:



WEST ELEVATION:



NORTH ELEVATION:



SOUTH ELEVATION:

LOCATION MAP
SCALE: 1" = 1,000'

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Phone: (267) 402-3400
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www.BohlerEngineering.com

C. BROWN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE075317
DELAWARE LICENSE No. 18093
NEW JERSEY LICENSE No. 24GE05041400

SHEET TITLE:

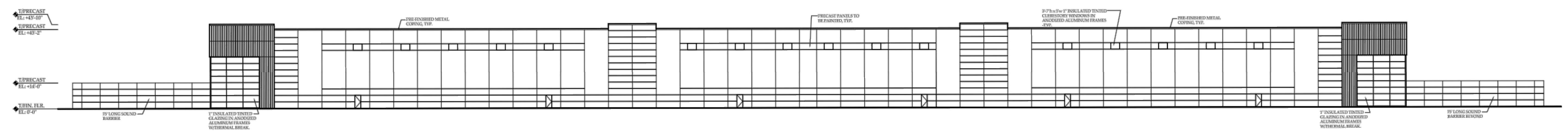
ELEVATION PLANS

SHEET NUMBER:

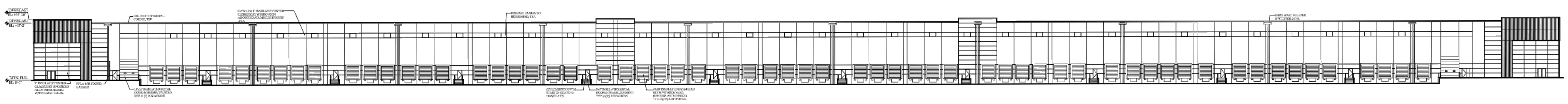
2A

ORG. DATE - 2/1/2021

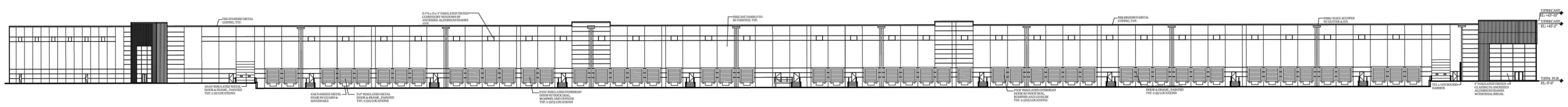
LOCATION MAP
SCALE: 1" = 1,000'



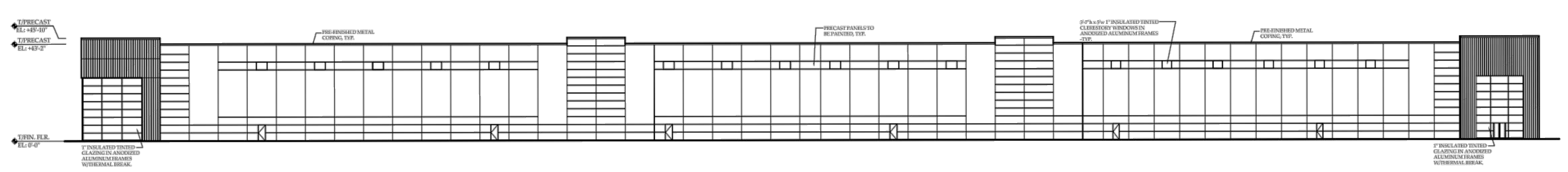
NORTH ELEVATION:
0 15 30 60 FEET



WEST ELEVATION:
0 15 30 60 FEET



EAST ELEVATION:
0 15 30 60 FEET



SOUTH ELEVATION:
0 10 20 40 FEET

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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PROJECT No.:	PP203056
DRAWN BY:	GB
CHECKED BY:	KM
DATE:	2/1/2021
CAD I.D.:	PP203056-SPP-2

PROJECT:

ZONING PLAN

FOR
BRIDGE ACQUISITIONS, LLC

PROPOSED DEVELOPMENT

4501 RICHMOND STREET
PHILADELPHIA, PA 19137

BOHLER//
1515 MARKET STREET, SUITE 920
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C. BROWN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE075317
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NEW JERSEY LICENSE No. 24GE05041400

SHEET TITLE:

ELEVATION PLANS

SHEET NUMBER:

2B

ORG. DATE - 2/1/2021

EXHIBIT 2

RICP Newspaper Notice and Proof of Publication

NOTICE IN THE PHILADELPHIA DAILY NEWS

The Philadelphia Inquirer

801 MARKET STREET, SUITE 300, PHILADELPHIA, PA 19107

Affidavit of Publication

On Behalf of:
ARCADIS
One Lincoln Center
110 West Fayette Street, Suite 300
Syracuse, NY 13202

STATE OF PENNSYLVANIA COUNTY OF PHILADELPHIA:

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

1. The Philadelphia Inquirer, LLC is the publisher of the Philadelphia Daily News, with its headquarters at 801 Market Street, Suite 300, Philadelphia, Pennsylvania 19107.
2. The Philadelphia Daily News is an edition of The Philadelphia Inquirer. The Philadelphia Daily News is continuously published and distributed Sunday-Friday in the City of Philadelphia, count and state aforesaid.
3. The printed notice or publication attached hereto set forth on attached hereto was published in all regular print editions of the Philadelphia Daily News on

Legal Notices

as published in **Daily News Legals** in the issue(s) of:

7/12/2021

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

Helene Sweeney

Kath V. Harley
Notary Public

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal
KATHERINE V. HARLEY, Notary Public
Philadelphia County
My Commission Expires May 25, 2025
Commission Number 1312829

Ad No: 72808
Customer No: 105030

COPY OF ADVERTISEMENT

Notification of Receipt
of a Plan or Report (for site-specific standard)
(Section 304(n)(2)(I))

Notice is hereby given that on behalf of Philadelphia Coke Co., Inc. (PCC), a Remedial Investigation and Cleanup Plan (RICP) has been submitted to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, for a site located at 4501 Richmond Street in Philadelphia, Pennsylvania. This report provides: (1) site background and a summary of historical site cleanup activities; (2) a summary of the remedial investigation activities and findings delineating the nature and extent of site-related chemical constituents remaining in soil and groundwater at the site; and (3) a cleanup plan to prevent potential future exposure to remaining site-related chemical constituents. The remediation measures are proposed to achieve non-residential site-specific cleanup standards established under the Land Recycling and Environmental Remediation Standards Act, the Act of May 19, 1995, P.L., #4, No. 2. This notice is made under the provision of the Act.

NOTICE IN THE NORTHEAST TIMES

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Legal Notices

Notification of Receipt of a Plan or Report (for site-specific standard) (Section 304(n)(2)(i))

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NM-00466780

Legal Notices

Notice of Initiation of the Section 106 Process: Public Participation

T-Mobile proposes the upgrade of a rooftop telecommunications facility at 542 Forbes Ave, Pittsburgh, Allegheny County, PA. Members of the public interested in submitting comments on the possible effects on historic properties included in or eligible for inclusion in the National Register of Historic Places may send their comments to Andrew Smith, RESCOM Environmental Corp., PO Box 361 Petoskey, MI 49770 or call 260-385-6999.

Legal Notices

NOTICE OF STORAGE UNITS PUBLIC SALE

The following public sale shall take place online on or after July 15, 2021: at www.storagetreasures.com to satisfy the liens of Frank Leone, PO Box 296, Abington, PA 19001, 215-658-0123, on Occupant's stored property. 6352-6360 Morton St (Rear), 19144: Michael OBrien #22 1839-47 E. Orleans St, 19134: Maximino Pagan-Pedraza #15 3410-32 Weymouth St, 19134: Nelson Burgos #76

Legal Notices

NOTICE OF PUBLIC SALE: The following self-storage Cube contents containing household and other goods will be sold for cash by CubeSmart, 4391 Aramingo Avenue Philadelphia PA 19124, to satisfy a lien on July 20, 2021, at approximately 7:45pm at: www.storagetreasures.com

Unit # 1121
Ajennaeh Brooks
Unit # 131
Robert Curry
Unit # 218
Susan Blatch
Unit # 1602
Hannah Lilley-Vanderpool
Unit # 1311
Jeffery Hischfeld
Unit # 203
Rhim Dang
Unit # 710
Nicholas Reyes
Unit # 1906
Terell Douglas
Unit # 1333
Lasha Brown

TABLES

Table 1
Soil Sample Locations and Laboratory Analysis Summary

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location	Sample Date	Sample Depth	Saturation	TCL VOCs	TCL SVOCs	Metals	Cyanide	Pesticides	PCBs
MW-102	5/16/2018	12-13	Saturated	X	X	X	X	X	X
MW-103	5/16/2018	6-7	Unsaturated	X	X	X	X	X	X
		15-16	Saturated	X	X	X	X	X	X
MW-108	9/24/2019	5-7	Unsaturated	X	X	X	X		
		10-12	Unsaturated	X	X	X	X		
MW-111	9/23/2019	11-13	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
PC-B8	2/9/2005	15.5-16	Saturated	X	X	X			
PC-B13	2/10/2005	15-17	Saturated	X	X	X			
PC-B14	2/11/2005	15-17	Saturated	X	X	X			
PCSB-01	2/18/2005	14.5-15	Saturated	X	X	X			
		18.5-19	Saturated	X	X	X			
PCSB-01R	4/5/2019	14-16	Saturated	X	X	X	X		
		18-20	Saturated	X	X	X	X		
PCSB-02	3/4/2005	16	Saturated	X	X	X	X		
PCSB-03	3/4/2005	14	Saturated	X	X	X	X		
		25	Saturated	X	X	X	X		
PCSB-04	3/7/2005	4	Saturated	X	X	X	X		
		12	Saturated	X	X	X	X		
		25	Saturated	X	X	X	X		
PCSB-06	3/7/2005	13	Saturated	X	X	X	X		
		18	Saturated	X	X	X	X		
		23.5	Saturated	X	X	X	X		
PCSB-07	3/8/2005	14	Saturated	X	X	X	X		
		21.5	Saturated	X	X	X	X		
PCSB-08	3/9/2005	10.5	Saturated	X	X	X	X		
		19	Saturated	X	X	X	X		
PCSB-09	3/9/2005	10	Saturated	X	X	X	X		
		15.5	Saturated	X	X	X	X		
	3/10/2005	27.5	Saturated	X	X	X	X		
PCSB-10	3/22/2005	16.5	Saturated	X	X	X			
		20	Saturated	X	X	X			
PCSB-11	3/10/2005	17.5	Saturated	X	X	X	X		
		23.5	Saturated	X	X	X	X		
PCSB-12	3/16/2005	9	Saturated	X	X	X	X		
		21.5	Saturated	X	X	X	X		
PCSB-13	3/15/2005	17.5	Saturated	X	X	X	X		
PCSB-14	3/16/2005	11	Saturated	X	X	X			
	3/17/2005	25	Saturated	X	X	X			
PCSB-15	3/11/2005	4-5	Saturated	X	X	X	X		
PCSB-17	3/17/2005	4	Unsaturated	X	X	X			
		18	Saturated	X	X	X			
PCSB-18	3/14/2005	13	Saturated	X	X	X	X		
PCSB-19	3/21/2005	19	Saturated	X	X	X			
		26.5	Saturated	X	X	X			
PCSB-20	3/22/2005	17	Saturated	X	X	X			
		22	Saturated	X	X	X			
PCSB-21	3/11/2005	10-11	Saturated	X	X	X	X		
		14-15	Saturated	X	X	X			
		38-40	Saturated	X	X	X			
PCSB-22	3/15/2005	8.5	Saturated	X	X	X	X		
		23	Saturated	X	X	X	X		
PCSB-23	3/14/2005	8.5	Saturated	X	X	X	X		
		21	Saturated	X	X	X	X		
PCSB-24	3/18/2005	9	Saturated	X	X	X			
		15	Saturated	X	X	X			
		26.5	Saturated	X	X	X			
PCSB-25	3/18/2005	8	Saturated	X	X	X			
		13	Saturated	X	X	X			

Location	Sample Date	Sample Depth	Saturation	TCL VOCs	TCL SVOCs	Metals	Cyanide	Pesticides	PCBs
PCSB-26	7/26/2005	0.5	Unsaturated	X	X	X		X	X
		6	Saturated	X	X	X		X	X
		8	Saturated	X	X	X		X	X
PCSB-26R	4/19/2019	0.5-2	Unsaturated	X	X	X	X	X	X
PCSB-27	7/26/2005	0.5	Unsaturated	X	X	X		X	X
		1.5	Unsaturated	X	X	X		X	X
		10.5	Saturated	X	X	X		X	X
PCSB-28	7/26/2005	0.5	Unsaturated	X	X	X		X	X
		2	Saturated	X	X	X		X	X
		15	Saturated	X	X	X		X	X
PCSB-29	7/26/2005	0.5	Unsaturated	X	X	X		X	X
		2	Saturated	X	X	X		X	X
		11.5	Saturated	X	X	X		X	X
PCSB-30	7/26/2005	0.5	Unsaturated	X	X	X		X	X
		2	Unsaturated	X	X	X		X	X
		15	Saturated	X	X	X		X	X
PCSB-30R	4/19/2019	0.5-2	Unsaturated	X	X	X	X	X	X
PCSB-31	7/28/2005	0.5	Unsaturated	X	X	X		X	X
		3.5	Saturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-32	7/28/2005	0.5	Unsaturated		X	X		X	X
		3.5	Saturated	X	X	X			
		11.5	Saturated	X	X	X			
	8/1/2005	0.5	Unsaturated	X					
PCSB-33	7/28/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		11.5	Saturated	X	X	X			
PCSB-34	7/27/2005	0.5	Unsaturated	X	X	X		X	X
		5	Saturated	X	X	X		X	X
		16.5	Saturated	X	X	X		X	X
PCSB-35	8/2/2005	0.5	Unsaturated	X	X	X		X	X
		2.5	Saturated	X	X	X			
		15.5	Saturated	X	X	X			
PCSB-36	7/27/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X		X	X
		16	Saturated	X	X	X		X	X
PCSB-37	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-38	7/27/2005	0.5	Unsaturated	X	X	X		X	X
		3.5	Saturated	X	X	X		X	X
		9.5	Saturated	X	X	X		X	X
PCSB-39	7/27/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		11	Saturated	X	X	X			
PCSB-40	7/28/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-41	7/28/2005	0.5	Unsaturated	X	X	X		X	X
		3.5	Saturated	X	X	X			
		9.5	Saturated	X	X	X			
PCSB-41R	4/22/2019	0.5-2	Unsaturated	X	X	X	X	X	X
		9-11	Saturated	X	X	X	X		
PCSB-42	8/1/2005	0.5	Unsaturated	X	X	X		X	X
		2.5	Saturated	X	X	X			
		13	Saturated	X	X	X			

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PCSB-43	8/1/2005	0.5	Unsaturated	X	X	X		X	X
		3.5	Saturated	X	X	X			
		9	Saturated	X	X	X			
PCSB-44	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4.5	Saturated	X	X	X			
		11.5	Saturated	X	X	X			
PCSB-45	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		3	Saturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-46	7/27/2005	0.5	Unsaturated	X	X	X		X	X
		4	Unsaturated	X	X	X			
		13	Saturated	X	X	X			
PCSB-47	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4	Unsaturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-48	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4	Unsaturated	X	X	X			
		11	Saturated	X	X	X			
PCSB-49	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		11	Saturated	X	X	X			
PCSB-49R	4/19/2019	3-5	Saturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
PCSB-50	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		12.5	Saturated	X	X	X			
PCSB-51	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		3	Unsaturated	X	X	X			
PCSB-52	8/2/2005	0.5	Unsaturated	X	X	X		X	X
		5.5	Saturated	X	X	X			
		15.5	Saturated	X	X	X			
PCSB-53	8/1/2005	0.5	Unsaturated	X	X	X			
		3.5	Unsaturated	X	X	X			
		16.5	Saturated	X	X	X			
PCSB-54	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		4.5	Saturated	X	X	X			
		11.5	Saturated	X	X	X			
PCSB-55	8/3/2005	0.5	Unsaturated	X	X	X		X	X
		3.5	Saturated	X	X	X			
		11	Saturated	X	X	X			
PCSB-56	8/15/2005	0.5	Unsaturated	X	X	X		X	X
		2	Unsaturated	X	X	X			
		6.5	Saturated	X	X	X			
PCSB-57	8/15/2005	0.5	Unsaturated	X	X	X		X	X
		2.5	Unsaturated	X	X	X			
		5.5	Saturated	X	X	X			
PCSB-58	8/15/2005	0.5	Unsaturated	X	X	X		X	X
		5	Unsaturated	X	X	X			
		11	Saturated	X	X	X			
PCSB-59	8/15/2005	0.5	Unsaturated	X	X	X		X	X
		5.5	Saturated	X	X	X			
		10.5	Saturated	X	X	X			
PCSB-60	8/15/2005	0.5	Unsaturated	X	X	X		X	X
		4	Saturated	X	X	X			
		11	Saturated	X	X	X			
PCTP-01	2/8/2005	6	Unsaturated	X	X	X			
PCTP-01R	4/5/2019	5-7	Unsaturated	X	X	X	X		
PCTP-02	2/8/2005	5	Unsaturated	X	X	X			
PCTP-02R	4/5/2019	4-6	Unsaturated	X	X	X	X		
PCTP-03	2/15/2005	11.5	Saturated	X	X	X	X		

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PCTP-04	2/15/2005	12	Saturated	X	X	X	X		
PCTP-05	2/15/2005	11.5	Saturated	X	X	X	X		
PCTP-06	2/16/2005	16	Saturated	X	X	X	X		
PCTP-07	2/17/2005	12	Saturated	X	X	X			
		14	Saturated	X	X	X			
PCTP-07R	9/20/2019	10-12	Saturated	X	X	X	X		
PCTP-08	2/15/2005	10.5	Saturated	X	X	X	X		
PCTP-08R	4/9/2019	10-12	Saturated	X	X	X	X		
PCTP-09	2/9/2005	7	Saturated	X	X	X			
PCTP-10	2/9/2005	8	Saturated	X	X	X			
PCTP-10R	4/9/2019	7-9	Saturated	X	X	X	X		
PCTP-11	2/9/2005	4	Saturated	X	X	X			
PCTP-12	2/9/2005	3	Unsaturated	X	X	X	X		
PCTP-12R	4/12/2019	2-4	Unsaturated	X	X	X	X		
		9-11	Saturated	X	X	X	X		
PCTP-13	2/10/2005	8	Saturated	X	X	X	X		
PCTP-14	3/3/2005	2.5	Unsaturated	X	X	X	X		
PCTP-214	3/3/2005	7.5	NA	X	X	X	X		
PCTP-15	3/3/2005	3.5	Saturated	X	X	X	X		
PCTP-16	2/10/2005	2	Unsaturated	X	X	X			
PCTP-17	2/10/2005	8	Saturated	X	X	X	X		
PCTP-17R	4/15/2019	5-6	Unsaturated	X	X	X	X		
		7-9	Saturated	X	X	X	X		
		9-11	Saturated	X	X	X	X		
		18-20	Saturated	X	X	X	X		
		24-25	Saturated	X	X	X	X		
PCTP-18	2/16/2005	6	Unsaturated	X	X	X			
PCTP-19	2/18/2005	6	Saturated	X	X	X	X		
		11	Saturated	X	X	X	X		
PCTP-20	3/2/2005	20	Saturated	X	X	X	X		
PCTP-21	2/11/2005	4	Saturated	X	X	X			
PCTP-22	3/2/2005	4.5	Saturated	X	X	X	X		
PCTP-23	3/2/2005	7	Saturated	X	X	X	X		
		10	Saturated	X	X	X	X		
PCTP-24	2/11/2005	19.5	Saturated	X	X	X			
PCTP-25	2/18/2005	5	Saturated	X	X	X	X		
PCTP-26	2/18/2005	12	Saturated	X	X	X	X		
PCTP-27	2/16/2005	11	Saturated	X	X	X			
PCTP-28	2/17/2005	7	Saturated	X	X	X			
PCTP-28R	4/11/2019	6-8	Saturated	X	X	X	X		
		11-12	Saturated	X	X	X	X		
PCTP-29	2/18/2005	13	Saturated	X	X	X			
PCTP-30	2/22/2005	7	Saturated	X	X	X	X		
PCTP-31	2/11/2005	11	Saturated	X	X	X			
PCTP-32	3/2/2005	7	Saturated	X	X	X	X		
PCTP-32R	4/9/2019	6-8	Saturated	X	X	X	X		
PCTP-33	3/2/2005	12	Saturated	X	X	X	X		
PCTP-34	2/28/2005	10	Saturated	X	X	X	X		
		14	Saturated	X	X	X	X		
PCTP-35	2/16/2005	6	Saturated	X	X	X			
PCTP-36	2/18/2005	6	Unsaturated	X	X	X	X		
PCTP-236	2/18/2005	7	NA	X	X	X	X		
PCTP-37	2/17/2005	3	Unsaturated	X	X	X			
PCTP-38	2/22/2005	10	Saturated	X	X	X	X		
		12	Saturated	X	X	X	X		
PCTP-39	2/24/2005	8	Saturated	X	X	X	X		
PCTP-40	2/14/2005	9	Saturated	X	X	X	X		
		10	Saturated	X	X	X			
PCTP-41	2/24/2005	6.5	Saturated	X	X	X	X		
PCTP-42	2/23/2005	13.5	Saturated	X	X	X	X		

Table 1
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Location	Sample Date	Sample Depth	Saturation	TCL VOCs	TCL SVOCs	Metals	Cyanide	Pesticides	PCBs
PCTP-43	2/23/2005	7	Saturated	X	X	X	X		
PCTP-44	2/14/2005	4	Saturated	X	X	X	X		
		9	Saturated	X	X	X	X		
PCTP-45	2/14/2005	10	Saturated	X	X	X	X		
PCTP-46	2/22/2005	9	Saturated	X	X	X	X		
		10.5	Saturated	X	X	X	X		
PCTP-47	2/17/2005	6	Unsaturated	X	X	X			
PCTP-47R	4/9/2019	5-7	Unsaturated	X	X	X	X		
PCTP-49	2/23/2005	9	Saturated	X	X	X	X		
PCTP-49R	4/16/2019	8-10	Saturated	X	X	X	X		
		10-11	Saturated	X	X	X	X		
PCTP-50	2/23/2005	11	Saturated	X	X	X	X		
PCTP-51	2/22/2005	11	Saturated	X	X	X	X		
PCTP-51R	4/18/2019	10-12	Saturated	X	X	X	X		
PCTP-52	2/22/2005	7	Saturated	X	X	X			
PCTP-53	2/22/2005	10	Saturated	X	X	X			
PCTP-54	2/28/2005	8	Saturated	X	X	X	X		
PCTP-55	2/28/2005	7	Saturated	X	X	X	X		
PCTP-56	2/28/2005	8	Saturated	X	X	X			
PCTP-57	2/25/2005	12	Saturated	X	X	X	X		
PCTP-58	2/24/2005	2	Unsaturated	X	X	X	X		
PCTP-59	2/25/2005	5	Saturated	X	X	X	X		
		7	Saturated	X	X	X	X		
PCTP-60	2/25/2005	2	Saturated	X	X	X	X		
PCTP-61	9/8/2005	0.5	Unsaturated	X	X	X		X	X
		7.5	Unsaturated	X	X	X		X	X
PCTP-62	9/8/2005	0.5	Unsaturated	X	X	X			X
		10.5	Saturated	X	X	X		X	X
PCTP-63	9/8/2005	0.5	Unsaturated	X	X	X		X	X
		10.5	Saturated	X	X	X		X	X
PCTP-64	9/8/2005	0.5	Unsaturated	X	X	X		X	X
		7	Unsaturated	X	X	X		X	X
PCTP-65	9/8/2005	0.5	Unsaturated	X	X	X		X	X
		7.5	Unsaturated	X	X	X		X	X
PCTP-66	9/8/2005	0.5	Unsaturated	X	X	X		X	X
		7.5	Saturated	X	X	X		X	X
PCTP-66R	4/24/2019	0-0.5	Unsaturated	X	X	X	X	X	X
		0.5-2	Unsaturated	X	X	X	X	X	X
		8-10	Saturated	X	X	X	X	X	X
PCTP-66R-HC	4/4/2019	0-2	Unsaturated	X	X	X	X	X	X
		2-4	Unsaturated	X	X	X	X	X	X
PCTP-67	9/12/2005	0.5	Unsaturated	X	X	X		X	X
		8	Saturated	X	X	X		X	X
PCTP-68	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		6	Saturated	X	X	X		X	X
PCTP-69	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		17.5	Saturated	X	X	X		X	X
PCTP-70	9/9/2005	0.5	Unsaturated	X	X	X			X
		18	Saturated	X	X	X		X	X
PCTP-71	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		17.5	Saturated	X	X	X		X	X
PCTP-72	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		12	Saturated	X	X	X		X	X

Location	Sample Date	Sample Depth	Saturation	TCL VOCs	TCL SVOCs	Metals	Cyanide	Pesticides	PCBs
PCTP-73	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		9.5	Saturated	X	X	X		X	X
PCTP-73R	4/10/2019	0-0.5	Unsaturated	X	X	X	X	X	X
PCTP-74	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		12.5	Saturated	X	X	X		X	X
PCTP-75	9/9/2005	0.5	Unsaturated	X	X	X		X	X
		11	Unsaturated	X	X	X		X	X
PCTP-75R	4/11/2019	10-12	Unsaturated	X	X	X	X		
		14-16	Saturated	X	X	X	X		
PCTP-76	9/12/2005	0.5	Unsaturated	X	X	X		X	X
		6.5	Unsaturated	X	X	X		X	X
PCTP-77	9/12/2005	0.5	Unsaturated	X	X	X		X	X
		10.5	Saturated	X	X	X		X	X
PCTP-78	9/12/2005	0.5	Unsaturated	X	X	X		X	X
		9.5	Saturated	X	X	X		X	X
PCTP-79	9/12/2005	0.5	Unsaturated	X	X	X		X	X
		10	Saturated	X	X	X		X	X
PCTP-80	9/12/2005	8	Unsaturated	X	X	X		X	X
PSSTP-01A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-01B	3/11/2003	5-6	Unsaturated	X	X	X		X	X
PSSTP-01R	4/10/2019	5-6	Unsaturated	X	X	X	X	X	X
PSSTP-02A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-02B	3/11/2003	5-6	Unsaturated	X	X	X		X	X
PSSTP-03A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-03B	3/11/2003	8-9	Saturated	X	X	X		X	X
PSSTP-04A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-04B	3/11/2003	8-9	Saturated	X	X	X		X	X
PSSTP-04R	4/11/2019	1-2	Unsaturated	X	X	X	X	X	X
		7-8	Unsaturated	X	X	X	X	X	X
		8-9	Saturated	X	X	X	X	X	X
		16-17	Saturated	X	X	X	X	X	X
PSSTP-05A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-05B	3/11/2003	5-6	Saturated	X	X	X		X	X
PSSTP-06A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-06B	3/11/2003	5-6	Saturated	X	X	X		X	X
PSSTP-07A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-07B	3/11/2003	8-9	Saturated	X	X	X		X	X
PSSTP-07R	4/18/2019	0.5-2	Unsaturated	X	X	X	X	X	X
		8-9	Saturated	X	X	X	X	X	X
		20-22	Saturated	X	X	X	X		
PSSTP-08A	3/11/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-08B	3/11/2003	6-7	Unsaturated	X	X	X		X	X
PSSTP-09A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-09B	3/12/2003	6-7	Unsaturated	X	X	X		X	X
PSSTP-10A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-10B	3/12/2003	8-9	Saturated	X	X	X		X	X
PSSTP-10R	4/16/2019	1-2	Unsaturated	X	X	X	X	X	X
		8-9	Saturated	X	X	X	X	X	X
PSSTP-11A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-11B	3/12/2003	8-9	Saturated	X	X	X		X	X
PSSTP-12A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-12B	3/12/2003	7-8	Saturated	X	X	X		X	X
PSSTP-13A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-13B	3/12/2003	7-8	Saturated	X	X	X		X	X
PSSTP-14A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-14B	3/12/2003	7-8	Saturated	X	X	X		X	X
PSSTP-15A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-15B	3/12/2003	8-9	Saturated	X	X	X		X	X
PSSTP-16A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-16B	3/12/2003	5-6	Saturated	X	X	X		X	X

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PSSTP-17A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-17B	3/12/2003	8-9	Saturated	X	X	X		X	X
PSSTP-18A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-18B	3/12/2003	6-7	Saturated	X	X	X		X	X
PSSTP-19A	3/12/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-19B	3/12/2003	7-8	Saturated	X	X	X		X	X
PSSTP-20A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-20B	3/13/2003	8-9	Saturated	X	X	X		X	X
PSSTP-21A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-21B	3/13/2003	8-9	Saturated	X	X	X		X	X
PSSTP-22A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-22B	3/13/2003	6-7	Saturated	X	X	X		X	X
PSSTP-22R	4/24/2019	0.5-2	Unsaturated	X	X	X	X	X	X
		4-6	Unsaturated	X	X	X	X		
PSSTP-23A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-23B	3/13/2003	7-8	Unsaturated	X	X	X		X	X
PSSTP-24A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-24B	3/13/2003	7-8	Saturated	X	X	X		X	X
PSSTP-25A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-25B	3/13/2003	7-8	Unsaturated	X	X	X		X	X
PSSTP-26A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-26B	3/13/2003	7-8	Saturated	X	X	X		X	X
PSSTP-27A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-27B	3/13/2003	5-6	Saturated	X	X	X		X	X
PSSTP-28A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-28B	3/13/2003	5-6	Saturated	X	X	X		X	X
PSSTP-29A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-29B	3/13/2003	5-6	Saturated	X	X	X		X	X
PSSTP-30A	3/13/2003	1-2	Unsaturated	X	X	X		X	X
PSSTP-30B	3/13/2003	5-6	Saturated	X	X	X		X	X
S-101	4/10/2019	10-12	Saturated	X	X				
		14.5-16.5	Saturated	X	X				
S-102	4/10/2019	10-12	Saturated	X	X				
		13.5-15.5	Saturated	X	X				
S-103	4/11/2019	10-12	Saturated	X	X				
		13-15	Saturated	X	X				
S-104	4/10/2019	10-12	Saturated	X	X				
		15.5-17.5	Saturated	X	X				
S-105	4/12/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-106	4/12/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-107	4/23/2019	2-4	Unsaturated	X	X	X	X		
		4-5.5	Saturated	X	X	X	X		
S-108	4/15/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
		15-17	Saturated	X	X	X	X		
S-109	4/15/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-110	4/12/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-111	4/23/2019	2-4	Unsaturated	X	X	X	X		
		4.5-6.5	Saturated	X	X	X	X		
S-112	4/12/2019	2-4	Saturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		

Location	Sample Date	Sample Depth	Saturation	TCL VOCs	TCL SVOCs	Metals	Cyanide	Pesticides	PCBs
S-113	4/23/2019	0-1	Unsaturated	X	X	X	X		
S-113B	4/24/2019	1-3	Unsaturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
		15-17	Saturated	X	X	X	X		
S-114	4/15/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
		14-15	Saturated	X	X	X	X		
		23-25	Saturated	X	X	X	X		
S-115	4/16/2019	4-6	Saturated	X	X	X	X		
S-116	4/16/2019	4-6	Saturated	X	X	X	X		
S-117	4/16/2019	4-6	Saturated	X	X	X	X		
S-118	4/16/2019	4-6	Saturated	X	X	X	X		
S-119	4/12/2019	0-1	Unsaturated	X	X	X	X		
S-120	4/24/2019	0-1	Unsaturated	X	X	X	X		
S-121	4/12/2019	0-1	Unsaturated	X	X	X	X		
S-122	4/12/2019	0-1	Unsaturated	X	X	X	X		
	4/9/2019	10-12	Saturated	X	X	X	X		
S-123	4/18/2019	7-9	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-124	4/18/2019	7-9	Saturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
S-125	4/18/2019	7-9	Saturated	X	X	X	X		
		11-13	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-126	4/17/2019	7-9	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-127	4/17/2019	2-4	Unsaturated	X	X	X	X		
		6-8	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-128	4/18/2019	2-4	Unsaturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-129	4/18/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
S-130	4/17/2019	2-4	Unsaturated	X	X	X	X		
		7-8	Saturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-131	4/17/2019	2-4	Saturated	X	X	X	X		
		7-9	Saturated	X	X	X	X		
S-132	4/17/2019	2-4	Unsaturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-133	4/17/2019	2-4	Unsaturated	X	X	X	X		
		7-9	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-135	4/22/2019	4-6	Saturated	X	X	X	X		
		8-10	Saturated	X	X	X	X		
S-136	4/22/2019	4-6	Saturated	X	X	X	X		
		7-9	Saturated	X	X	X	X		
S-138	4/5/2019	0-0.5	Unsaturated						X
		0.5-2	Unsaturated						X
S-139	4/10/2019	0-0.5	Unsaturated						X
		0.5-2	Unsaturated						X
S-140	4/10/2019	0-0.5	Unsaturated						X
		0.5-2	Unsaturated						X

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S-142	4/25/2019	6-6.5	Saturated				X		
		7-8	Saturated	X	X	X	X		
S-144	4/24/2019	15-17	Saturated	X	X	X	X		
		22-24	Saturated	X	X	X	X		
S-146	4/25/2019	14-16	Unsaturated	X	X	X	X		
		17-19	Saturated	X	X	X	X		
S-147	4/25/2019	12-14	Saturated	X	X	X	X		
		18-20	Saturated	X	X	X	X		
S-148	4/25/2019	8-10	Unsaturated	X	X	X	X		
		16-18	Saturated	X	X	X	X		
S-149	4/25/2019	8-10	Unsaturated	X	X	X	X		
		18.5-20.5	Saturated	X	X	X	X		
S-151	4/25/2019	0.5-2	Unsaturated	X	X	X	X		
		3-5	Saturated	X	X	X	X		
S-153	4/26/2019	7-9	Saturated	X	X	X	X		
		13.5-15	Saturated	X	X	X	X		
S-154	4/26/2019	9-11	Saturated	X	X	X	X		
		12-14	Saturated	X	X	X	X		
S-155	4/26/2019	10-12	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-156	5/3/2019	3-5	Unsaturated	X	X	X	X		
		7.5-9.5	Unsaturated	X	X	X	X		
		14-16	Saturated	X	X	X	X		
S-157	5/3/2019	7-9	Saturated	X	X	X	X		
		23-25	Saturated	X	X	X	X		
S-158	4/26/2019	11-13	Saturated	X	X	X	X		
		18-20	Saturated	X	X	X	X		
S-159	4/26/2019	11-13	Saturated	X	X	X	X		
		18-20	Saturated	X	X	X	X		
S-160	5/3/2019	10-12	Saturated	X	X	X	X		
		13-15	Saturated	X	X	X	X		
S-161	5/3/2019	5-7	Unsaturated	X	X	X	X		
		10-12	Saturated	X	X	X	X		
S-162	5/3/2019	5-7	Saturated	X	X	X	X		
		15-17	Saturated	X	X	X	X		
S-163	9/19/2019	0.5-2	Unsaturated	X	X	X	X		
		2-4	Saturated	X	X	X	X		
S-164	9/19/2019	4-6	Saturated	X	X	X	X		
S-167	9/20/2019	7-9	Unsaturated	X	X	X	X		
S-168	9/19/2019	6-8	Unsaturated	X	X	X	X		
S-171	9/19/2019	5-7	Unsaturated	X	X	X	X		
S-172	9/19/2019	5-7	Unsaturated	X	X	X	X		
S-173	9/19/2019	5-7	Unsaturated	X	X	X	X		
TP-11	3/7/2005	14	Saturated	X	X	X	X		
TP-13	3/8/2005	14	Saturated	X	X	X	X		
TP-14	3/8/2005	18	Saturated	X	X	X	X		
TP-15	3/8/2005	5.5	Saturated	X	X	X	X		
TP-15R	4/16/2019	5-7	Saturated	X	X	X	X		
		10.5-12.5	Saturated	X	X	X	X		
TP-16	3/9/2005	6	Saturated	X	X	X	X		
TP-21	3/10/2005	8	Saturated	X	X	X	X		
TP-23	3/10/2005	7	Saturated	X	X	X	X		
TP-25	3/11/2005	5	Saturated	X	X	X			
TP-30	3/14/2005	2	Unsaturated	X	X	X	X		
		12	Saturated	X	X	X	X		
TP-32	3/14/2005	6.5	Saturated	X	X	X	X		
TP-33	3/14/2005	9	Saturated	X	X	X	X		
TP-34	3/14/2005	4	Saturated	X	X	X	X		
TP-35	3/15/2005	4	Unsaturated	X	X	X	X		
TP-36	3/15/2005	7	Saturated	X	X	X	X		

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TP-37	3/15/2005	8	Saturated	X	X	X	X		
		9	Saturated	X	X	X	X		
TP-39	3/16/2005	9	Saturated	X	X	X	X		
TP-44	3/16/2005	4	Unsaturated	X	X	X			
TP-44R	4/22/2019	3-5	Unsaturated	X	X	X	X		
		5-7	Saturated	X	X	X	X		
		7-9	Saturated	X	X	X	X		
TP-58	3/18/2005	11	Saturated	X	X	X			
TP-59	3/18/2005	12	Saturated	X	X	X			
TP-60	3/18/2005	18	Saturated	X	X	X			
TP-63	3/21/2005	8	Saturated	X	X	X	X		
TP-63R	4/18/2019	7-9	Saturated	X	X	X	X		
		11-13	Saturated	X	X	X	X		
TP-64	3/21/2005	3	Unsaturated	X	X	X	X		
		7	Saturated	X	X	X	X		
TP-68A	3/21/2005	9	Saturated	X	X	X	X		
TP-70	3/22/2005	12	Saturated	X	X	X	X		
TP-71	3/22/2005	10	Saturated	X	X	X			
TP-75	3/23/2005	7	Saturated	X	X	X			
TP-78	3/23/2005	7	Saturated	X	X	X			
TP-278	3/23/2005	9	NA	X	X	X			

Notes:

1. The consultant responsible for collecting each sample can be identified by series as follows:
   "PSSTP-" Series in 2003 - Samples were collected by Paulus Sokolowski and Sartor Engineering, PC (PS&S).
   "PC-B" Series in 2005 - Soil borings were advanced by Earth Engineering Incorporated (EEI) and samples were collected by PS&S.
   "PCSB-" Series in 2005 - Samples were collected by PS&S.
   "PCTP-" Series in 2005 - Samples were collected by PS&S.
   "TP-" Series in 2005 - Test pits were excavated by EEI and samples were collected by PS&S.
   "MW-" Series in 2018 and 2019 - Samples were collected by Arcadis U.S., Inc. (Arcadis).
   "S-" Series in 2019 - Samples were collected by Arcadis.
   "..R" Revisited Locations in 2019 - Samples were collected by Arcadis.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
4. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS).
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 6010 and 7471.
   - Cyanide using USEPA SW-846 Method 9010 (Veritech) or 9012B (SGS).
   - Pesticides using USEPA SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
6. An **X** indicates analysis was conducted.
7. Saturated indicates that the soil sample is underneath the water table or within the bounds of the capillary fringe area.
8. A soil sample was considered saturated if its elevation was below the higher of either: (1) the groundwater elevation encountered in the soil boring/test pit or (2) the groundwater surface elevation from the highest potentiometric surface map (January 30, 2006 for remedial investigation samples and March 2018 for supplemental samples).
9. NA = Saturation could not be determine because the parent sample for this duplicate sample is not available.
10. Revisited sampling locations were renamed with the suffix "R", and represent the same location as the historical sampling locations without the suffix "R".

Table 2
Groundwater Sample Locations and Laboratory Analysis Summary

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location	Sample Date	TCL VOCs	TCL SVOCs	Total Metals	Dissolved Metals	Cyanide, Total	Cyanide, Free	Total Dissolved Solids	Pesticides	PCBs
MW-102	5/31/2018	X	X	X		X			X	X
MW-103	5/31/2018	X	X	X		X			X	X
MW-104	5/30/2018	X	X	X		X			X	X
MW-107	5/30/2018	X	X	X		X			X	X
	3/28/2019				X			X		
MW-108	10/4/2019	X	X	X	X	X		X		
MW-109	10/4/2019	X	X	X	X	X				
MW-110	10/4/2019	X	X	X	X	X				
MW-111	10/4/2019	X	X	X	X	X		X		
MW-112	10/4/2019	X	X	X	X	X				
MW-113	10/4/2019	X	X	X	X	X				
MW-5	3/19/2018	X	X	X		X			X	X
MW-6	3/22/2018	X	X	X		X			X	X
PCHP-01	3/24/2005	X	X	X						
PCHP-02	3/25/2005	X	X	X						
PCHP-03	3/24/2005	X	X	X						
PCHP-04	3/25/2005	X	X	X						
PCHP-05	3/25/2005	X	X	X						
PCHP-06	3/25/2005	X	X	X						
PCHP-07	3/25/2005	X	X	X						
PCMW-01	11/1/2005	X	X	X	X				X	X
	1/30/2006	X	X	X	X				X	X
	3/19/2018	X	X	X		X			X	X
PCMW-02 / MW-106*	11/1/2005	X	X	X	X				X	X
	1/30/2006	X	X	X	X				X	X
	5/29/2018	X	X	X		X			X	X
PCMW-03	11/2/2005	X	X	X	X				X	X
	1/30/2006	X	X	X	X				X	X
PCMW-04	11/2/2005	X	X	X	X				X	X
	1/30/2006	X	X	X	X				X	X
	3/19/2018	X	X	X		X			X	X
	5/30/2018			X						
PCMW-05	11/2/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
	3/23/2018	X	X	X		X			X	X
	5/30/2018			X						
	3/28/2019				X			X		
PCMW-06	11/3/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
	3/23/2018	X	X	X		X			X	X
	5/30/2018			X						
PCMW-07	11/3/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
PCMW-08S	11/3/2005	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
	5/31/2018			X						
PCMW-08D	11/4/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-09S	11/4/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
	3/19/2018	X	X	X		X			X	X
	5/31/2018			X						

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PCMW-09D	11/7/2005	X	X	X	X				X	X
	1/31/2006	X	X	X	X				X	X
PCMW-10S	11/7/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-10D	11/7/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
	7/27/2018						X			
PCMW-11S	11/7/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
	3/23/2018	X	X	X		X			X	X
PCMW-11D	11/8/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
PCMW-211	2/2/2006	X	X	X	X				X	X
PCMW-12S	11/8/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
PCMW-12D	11/8/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
PCMW-212	2/1/2006	X	X	X	X				X	X
PCMW-13S	11/9/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
PCMW-13D	11/9/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
PCMW-14S / MW-101*	11/9/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
	5/30/2018	X	X	X		X			X	X
PCMW-14D	11/9/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
PCMW-15S	11/10/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
	3/20/2018	X	X	X		X			X	X
	7/27/2018						X			
PCMW-15D	11/10/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
	3/20/2018	X	X	X		X			X	X
PCMW-16S / MW-105*	11/10/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	5/30/2018	X	X	X		X			X	X
PCMW-16D	11/10/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	3/19/2018	X	X	X		X			X	X
	5/30/2018						X			
	3/28/2019				X			X		
PCMW-17S	11/11/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-17D	11/11/2005	X	X	X	X				X	X
	2/3/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-18S	11/11/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
	3/23/2018	X	X	X		X			X	X
PCMW-18D	11/11/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
	3/23/2018	X	X	X		X			X	X

Table 2
Groundwater Sample Locations and Laboratory Analysis Summary

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location	Sample Date	TCL VOCs	TCL SVOCs	Total Metals	Dissolved Metals	Cyanide, Total	Cyanide, Free	Total Dissolved Solids	Pesticides	PCBs
PCMW-19S	11/14/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
	5/29/2018			X						
PCMW-19D	11/14/2005	X	X	X	X				X	X
	2/2/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-20S	11/14/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X
PCMW-20D	11/14/2005	X	X	X	X				X	X
	2/1/2006	X	X	X	X				X	X
	3/22/2018	X	X	X		X			X	X

Notes:

1. Samples from 2005 and 2006 were collected by Paulus Sokolowski and Sartor Engineering, PC. Samples from 2018 and 2019 were collected by Arcadis U.S., Inc.
2. 2005 and 2006 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
3. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS), except free cyanide samples which were analyzed by TestAmerica of Amherst, New York.
4. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 200.7 (Veritech), 245.1 (Veritech), 6010 (SGS), and 7470 (SGS). Dissolved metals were analyzed using the same methodology but were filtered prior to analysis.
   - Total cyanide using USEPA Method 335.1 (Veritech) or 335.4 (SGS).
   - Free cyanide using USEPA SW-846 Method 9016.
   - Total dissolved solids using American Society for Testing and Materials Method SM2540 C-11.
   - Pesticides using USEPA SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
5. An **X** indicates analysis was conducted.
6. * indicates that the groundwater monitoring well was installed to replace the missing historical well also listed in the monitoring well ID.

Table 3
Soil Boring and Test Pit Summary Table

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
B-1	10/15/86	SB	0-2	Oily sheen, strong odor	31	NA	4.3	9	12	Central Site
			2-4	Oily sheen, strong odor	36	NA				
			4-6	Oily sheen, strong odor	60	NA				
			6-9	Oily sheen, strong odor	37	NA				
B-2	10/15/86	SB	0-2	-- No visual impacts or coal tar-like odors --	15	NA	6.5	8	12	Central Site
			2-4	-- No visual impacts or coal tar-like odors --	14	NA				
			4-8	Oily sheen	27	NA				
			8-12	-- No visual impacts or coal tar-like odors --	32	NA				
B-3	10/16/86	SB	0-3	-- No visual impacts or coal tar-like odors --	1.0	NA	6	6	9	RCRA Area
			3-6	-- No visual impacts or coal tar-like odors --	1.0	NA				
B-5	10/16/86	SB	7-9	Strong odor	N/A	NA	5.5	12	14	RCRA Area
			9-11	Oily sheen	N/A	NA				
			11-12	Viscous, tar-like material	N/A	NA				
B-6	10/16/86	SB	6-8	Oily sheen, strong odor	N/A	NA	4.5	8	10	RCRA Area
B-7	10/16/86	SB	3-7	Strong odor	N/A	NA	5.5	9	12	Central Site
B-8	10/17/86	SB	0-2	-- No visual impacts or coal tar-like odors --	2.0	NA	6.5	9	12	RCRA Area
			2-4	-- No visual impacts or coal tar-like odors --	2.0	NA				
			4-7	-- No visual impacts or coal tar-like odors --	70	NA				
			7-9	Oily sheen, odor	70	NA				
B-9	10/17/86	SB	0-2	-- No visual impacts or coal tar-like odors --	3.0	NA	5.5	--	10	RCRA Area
			2-4	-- No visual impacts or coal tar-like odors --	11	NA				
			4-9	-- No visual impacts or coal tar-like odors --	4.0	NA				
			9-10	Very strong odor	4.0	NA				
PC-B4	2/15/05	SB	6-6.5	Burnt petroleum-like odor (slight)	4.5	NA	12	16	57	Central Site
PC-B7	2/8/05	SB	0-6	Slight petroleum-like odor	0.0	NA	6	20	37	Central Site
PC-B8	2/9/05	SB	6-10	-- No visual impacts or coal tar-like odors --	0.4, 0.8	NA	5	15	41	Central Site
			15-17	Possible burnt petroleum-like odor mixed with organics odor; sample collected 15.5-16'	0.7	17.5				
			20-22	-- No visual impacts or coal tar-like odors --	0.8	NA				
PC-B9	2/9/05	SB	15-17	Sheen; petroleum-like odor	1.9	NA	inconclusive	20	50.5	Central Site
			20-22	-- No visual impacts or coal tar-like odors --	2.9	NA				
PC-B10	2/17/05	SB	2-4	4" hardened tar lens; petroleum-like odor	6.9	NA	6	16	47	FBA
PC-B13	2/10/05	SB	15-17	Sheen; moderate petroleum-like odor	0.0	210	5.5	15	52	Area 2 / Misc.
PC-B14	2/11/05	SB	8-10	-- No visual impacts or coal tar-like odors --	3.4	NA	5.5	20	87	Misc.
			15-17	Light petroleum-like odor	0.0	20.9				
MW-101	5/14/18	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	4	14	16	Central Site
MW-102	5/16/18	SB	12-13	-- No visual impacts or coal tar-like odors --	0.0	2.91	10.5	11	20	Misc.
MW-103	5/16/18	SB	6-7	-- No visual impacts or coal tar-like odors --	0.0	17.3	7	16	20	Area 1A
			15-16	-- No visual impacts or coal tar-like odors --	0.0	0.177				
MW-104	5/15/18	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	5	11	15	Perimeter
MW-105	5/15/18	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	5.5	13.2	15	Perimeter
MW-106	5/15/18	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	5	8.6	15	FBA: Perimeter
MW-107	5/15/18	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	5	--	15	FBA: Perimeter
MW-108	9/24/19	SB	5-6	-- No visual impacts or coal tar-like odors --	0.0	27,700	11	16.4	20	Area 1B
			6-7	Tacky coal tar-like material; purifier material (at 6.1'); strong petroleum-like odor	88.7					
			7-8	Tacky coal tar-like material; purifier material (at 6.1'); strong petroleum-like odor	120.8	NA				
			8-9	Petroleum-like odor	69.9	NA				
			10-12	Petroleum-like odor	0.9, 1.1	3.20				
			12-13	-- No visual impacts or coal tar-like odors --	3.3	NA				
MW-109	9/25/19	SB	0-3	Slight petroleum-like odor	1.8, 2.1, 0.9	NA	10	13	19	Area 1B
			5-8	-- No visual impacts or coal tar-like odors --	0.1, 24.1, 11	NA				
MW-110	9/25/19	SB	0-3	-- No visual impacts or coal tar-like odors --	38.1, 29.7, 24.3	NA	6.9	15.6	22	Area 1B
MW-111	9/23/19	SB	0-3	-- No visual impacts or coal tar-like odors --	0.4, 9.9, 5.7	NA	15.8	12.5	22	Area 4
			5-8	-- No visual impacts or coal tar-like odors --	2.8, 1.6, 1.1	NA				
			10-11	-- No visual impacts or coal tar-like odors --	1.9	NA				
			11-13	Soil lightly "coated" with coal tar-like material (at 12.2'); sheen (at 12.2'); naphthalene-like odor (from 12.2-12.4')	83.7, 183.8	14,300				
			13-15	-- No visual impacts or coal tar-like odors --	19.3	37.9				
			15-19	-- No visual impacts or coal tar-like odors --	2.9 - 5.9	NA				
MW-112	9/24/19	SB	2-3	-- No visual impacts or coal tar-like odors --	1.5	NA	5	12.8	22	Area 4

Table 3
Soil Boring and Test Pit Summary Table

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
MW-113	9/23/19	SB	All depths	-- No visual impacts or coal tar-like odors --	0 - 7.1	NA	8	11	22	Area 4
OB-1	3/15/90	SB	0-1.5	Possible hardened product	N/A	NA	5	11	12	Unknown
			1.5-4	Brown to black oil staining	N/A	NA				
OB-2	3/15/90	SB	2-4	Possible product	N/A	NA	5	--	14	Unknown
PCSB-01	2/18/05	SB	12-14.5	Oil-like material throughout, moderate petroleum-like odor	244	NA	14	18	44	Northern Corner
			14.5-15	Strong petroleum-like odor	1,050	5.30				
			15-18	Strong petroleum-like odor	308	NA				
			18.5-19	-- No visual impacts or coal tar-like odors --	0.0	< 0.059				
PCSB-01R	4/5/19	SB	14-15	Heavy staining (14.5-15'); petroleum-like odor(14.5-15')	111.8	0.887	11.5	16	20	Northern Corner
			15-16	Heavy staining; petroleum-like odor	440.8					
			16-17	-- No visual impacts or coal tar-like odors --	>15,000	NA				
			17-18	-- No visual impacts or coal tar-like odors --	23.1	NA				
			18-20	-- No visual impacts or coal tar-like odors --	6.6, 5.9	<0.037				
PCSB-02	3/4/05	SB	15-16	-- No visual impacts or coal tar-like odors --	0.0	16.6	5	16	50	Misc.
			16-17	Strong hydrogen sulfide odor	0.0					
			17-26	Strong hydrogen sulfide odor	0.0	NA				
PCSB-03	3/4/05	SB	13-14	-- No visual impacts or coal tar-like odors --	0.0	56.1	6	14	50	Misc.
			14-15	Moderate petroleum-like odor	4.1					
			15-16	Moderate petroleum-like odor	4.1	NA				
			16-20	Moderate petroleum-like odor	4.1	NA				
			22-24	-- No visual impacts or coal tar-like odors --	3.4	NA				
			24-26	-- No visual impacts or coal tar-like odors --	0.0	0.666				
PCSB-04	3/7/05	SB	3-4	-- No visual impacts or coal tar-like odors --	0.0	1,160	3	22	50	Area 2
			4-5	Blue-green coloration of soil	0.0					
			5-8	Blue-green coloration of soil	0.0	NA				
			12-14	Slight petroleum-like odor	1.4	1,110				
			14-24	Slight petroleum-like odor	2.1	NA				
			24-26	Slight petroleum-like odor	0.0	24.1				
PCSB-06	3/7/05	SB	12-14	Moderate petroleum-like odor	2.9	360	2	16	50	Area 2
			14-16	Moderate petroleum-like odor	2.9	NA				
			17-19	-- No visual impacts or coal tar-like odors --	0.7	31.8				
			22.5-24.5	-- No visual impacts or coal tar-like odors --	0.0	1.80				
PCSB-07	3/8/05	SB	13-14	-- No visual impacts or coal tar-like odors --	0.0	121	4	--	34	Central Site
			14-15	Sheen, slight petroleum-like odor	0.0					
			15-16	Sheen, slight petroleum-like odor	0.0	NA				
			20.5-22.5	-- No visual impacts or coal tar-like odors --	0.0	1.49				
PCSB-08	3/9/05	SB	9.5-11.5	-- No visual impacts or coal tar-like odors --	5.9	23.2	8	16	40	Central Site
			18-20	-- No visual impacts or coal tar-like odors --	0.0	1.88				
PCSB-09	3/9/05	SB	9-11	-- No visual impacts or coal tar-like odors --	0.0	10.1	6	12	40	Area 2
			14-14.5	Slight naphthalene-like odor	8.4	NA				
			14.5-16.5	Slight naphthalene-like odor	8.4	2,200				
			16.5-24	Slight naphthalene-like odor	3.1	NA				
			26.5-28.5	-- No visual impacts or coal tar-like odors --	0.0	4.12				
PCSB-10	3/22/05	SB	13-14	Slight naphthalene-like odor	2.5	NA	4	--	38	Area 2
			15.5-17.5	Slight naphthalene-like odor	4.0	459				
			19-21	-- No visual impacts or coal tar-like odors --	0.0	14.9				
PCSB-11	3/10/05	SB	14-16.5	Slight petroleum-like odor	0.6	NA	8.5	12	39.3	RCRA Area
			16.5-18.5	Slight petroleum-like odor	9.0	40.2				
			18.5-22	Slight petroleum-like odor	0.0	NA				
			22.5-24.5	-- No visual impacts or coal tar-like odors --	0.0	0.182				
PCSB-12	3/16/05	SB	6-8	-- No visual impacts or coal tar-like odors --	1.0	NA	6	18	40	RCRA Area
			8-10	-- No visual impacts or coal tar-like odors --	13	38.2				
			10-12	-- No visual impacts or coal tar-like odors --	9.0	NA				
			20.5-22.5	-- No visual impacts or coal tar-like odors --	0.0	< 0.098				
PCSB-13	3/15/05	SB	10-12	-- No visual impacts or coal tar-like odors --	1.0	NA	6	18	40	RCRA Area
			16.5-18.5	-- No visual impacts or coal tar-like odors --	0.0	0.395				
PCSB-14	3/16/05	SB	10-12	Tar-like material throughout, strong petroleum-like odor	9.0	45.2	6	21	38	Misc.
			12-14	Tar-like material throughout, strong petroleum-like odor	41	NA				
			14-16	Sheen, moderate petroleum-like odor	0.0	NA				
			16-18	Moderate petroleum-like odor	2.1	NA				
			18-22	Slight petroleum-like odor	2.7	NA				
			24-26	-- No visual impacts or coal tar-like odors --	0.0	0.310				

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PCSB-15 (A/B/C/D)	3/11/05	SB	4-5	Tar-like material, moderate naphthalene-like odor	1.4	3,470	6	--	6	Misc.
			5-6	Tar-like material, moderate naphthalene-like odor	1.4	NA				
PCSB-17	3/17/05	SB	0-3	Slight petroleum-like odor	7.4	NA	6	14	36	Central Site
			3-5	Slight petroleum-like odor	12.5	8,010				
			5-10	Slight petroleum-like odor	0.3	NA				
			17-19	-- No visual impacts or coal tar-like odors --	0.0	3.27				
PCSB-18	3/14/05	SB	12-14	-- No visual impacts or coal tar-like odors --	0.4	26.8	7	14	40	Central Site
PCSB-19	3/21/05	SB	12-18	Slight petroleum-like odor	1.6	NA	6	19	40	RCRA Area
			18-19	Slight petroleum-like odor	4.8	65.5				
			19-20	-- No visual impacts or coal tar-like odors --	4.8					
			25.5-27.5	-- No visual impacts or coal tar-like odors --	0.0	0.698				
PCSB-20	3/22/05	SB	16-18	Slight petroleum-like odor	7.0	29.5	10	18	40	Central Site
			21-23	-- No visual impacts or coal tar-like odors --	0.0	0.150				
PCSB-21	3/11/05	SB	6-8	-- No visual impacts or coal tar-like odors --	0.4	NA	6	10	40	Central Site
			14-15	Slight petroleum-like odor	4.5	48.4				
			15-17	Slight petroleum-like odor	4.5	NA				
			27-29	-- No visual impacts or coal tar-like odors --	0.5	NA				
			38-40	-- No visual impacts or coal tar-like odors --	0.0	0.146				
PCSB-22	3/15/05	SB	6-7.5	Moderate petroleum-like odor	12.1	NA	7	12	40	Area 4
			7.5-8	Moderate petroleum-like odor	12.1	286				
			8.5-9.5	Petroleum-like sheen, moderate petroleum-like odor	5.1					
			9.5-12	Petroleum-like sheen, moderate petroleum-like odor	4.9	NA				
			12-16	Moderate petroleum-like odor	9.7	NA				
			16-20	-- No visual impacts or coal tar-like odors --	1.7	NA				
			22-24	-- No visual impacts or coal tar-like odors --	0.0	2.89				
PCSB-23	3/14/05	SB	6-7.5	-- No visual impacts or coal tar-like odors --	2.2	NA	4	16	40	RCRA Area
			7.5-9.5	-- No visual impacts or coal tar-like odors --	50.2	40.4				
			9.5-12	-- No visual impacts or coal tar-like odors --	25	NA				
			12-16	-- No visual impacts or coal tar-like odors --	3.5	NA				
			16-17	-- No visual impacts or coal tar-like odors --	0.6	NA				
			20-22	-- No visual impacts or coal tar-like odors --	0.0	< 0.110				
PCSB-24	3/18/05	SB	8-10	Moderate petroleum-like odor, staining	14	21.0	8	14	36	Central Site
			10-14	Sheen, slight petroleum-like odor	0.0	NA				
			14-16	Sheen, moderate petroleum-like odor	0.4	107				
			16-18	Sheen, slight petroleum-like odor	0.7	NA				
			18-20	Slight petroleum-like odor	0.3	NA				
			20-22	-- No visual impacts or coal tar-like odors --	0.3	NA				
			25.5-27.5	-- No visual impacts or coal tar-like odors --	0.0	0.680				
PCSB-25	3/18/05	SB	6-6.5	Sheen, strong petroleum-like odor	0.0	NA	5	14	40	Area 4
			6.5-7	Tar-like material throughout, strong petroleum-like odor	0.0	NA				
			7-9	Tar-like material throughout, strong petroleum-like odor	0.0	28.5				
			9-10	Sheen, strong petroleum-like odor	0.0	NA				
			12-14	-- No visual impacts or coal tar-like odors --	0.0	26.9				
PCSB-26	7/26/05	SB	0-1	-- No visual impacts or coal tar-like odors --	7.8	32.8	7	4	12	FBA: Perimeter
			5-7	-- No visual impacts or coal tar-like odors --	0.0	0.480				
			7-9	-- No visual impacts or coal tar-like odors --	0.0	0.430				
PCSB-26R	4/19/19	TP	0.5-2	-- No visual impacts or coal tar-like odors --	0.0	1.53	4	5	10	FBA: perimeter
PCSB-27	7/26/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	101	2	10	12	FBA: Perimeter
			1-2	-- No visual impacts or coal tar-like odors --	0.0	0.465				
			9.5-11.5	-- No visual impacts or coal tar-like odors --	0.0	1.12				
PCSB-28	7/26/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	28.4	2	14.5	16	FBA: Perimeter
			1-3	-- No visual impacts or coal tar-like odors --	0.0	< 0.061				
			14-16	-- No visual impacts or coal tar-like odors --	0.0	0.110				
PCSB-29	7/26/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	0.852	2.5	11	12	FBA: Perimeter
			1-3	-- No visual impacts or coal tar-like odors --	0.0	0.682				
			10.5-12.5	-- No visual impacts or coal tar-like odors --	0.0	0.116				
PCSB-30	7/26/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	8.14	2.5	14	16	FBA: Perimeter
			1-3	-- No visual impacts or coal tar-like odors --	0.0	< 0.086				
			14-16	-- No visual impacts or coal tar-like odors --	0.0	0.144				
PCSB-30R	4/19/19	SB	0.5-2	-- No visual impacts or coal tar-like odors --	0.0	0.302	4	11	15	FBA: Perimeter

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PCSB-31	7/28/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	0.236	4	10	12	FBA
			2.5-4.5	-- No visual impacts or coal tar-like odors --	0.0	41.9				
			9.5-11.5	-- No visual impacts or coal tar-like odors --	0.0	0.772				
PCSB-32	7/28/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	0.466	4	11	12	FBA
			2.5-4.5	-- No visual impacts or coal tar-like odors --	0.0	< 0.061				
			11-12	-- No visual impacts or coal tar-like odors --	0.0	13.9				
PCSB-33	7/28/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	3.25	4.5	11	12	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	0.463				
			11-12	-- No visual impacts or coal tar-like odors --	0.0	0.942				
PCSB-34	7/27/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	181	5.5	16	20	FBA
			4-6	-- No visual impacts or coal tar-like odors --	0.0	0.240				
			15.5-17.5	-- No visual impacts or coal tar-like odors --	0.0	1.05				
PCSB-35	8/2/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	6.78	3	15	20	FBA: RR
			1.5-3	-- No visual impacts or coal tar-like odors --	0.0	4.82				
			3-3.5	Slight petroleum-like odor	12.4					
			3.5-12	Slight petroleum-like odor	22.9	NA				
			12-12.5	-- No visual impacts or coal tar-like odors --	41.5	NA				
			14.5-16.5	-- No visual impacts or coal tar-like odors --	0.0	0.360				
			17-20	-- No visual impacts or coal tar-like odors --	3.4	NA				
PCSB-36	7/27/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	125	4.5	16	17.5	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	4.38				
			15-17	-- No visual impacts or coal tar-like odors --	0.0	0.180				
PCSB-37	8/2/05	SB	0-1	-- No visual impacts or coal tar-like odors --	1.2	25.9	5	10	11	FBA: RR
			3-5	-- No visual impacts or coal tar-like odors --	0.0	0.056				
			10-11	-- No visual impacts or coal tar-like odors --	0.0	0.093				
PCSB-38	7/27/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	5.27	4	9	10	FBA
			2.5-4.5	-- No visual impacts or coal tar-like odors --	0.0	< 0.065				
			9-10	-- No visual impacts or coal tar-like odors --	0.0	2.91				
PCSB-39	7/27/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	3.91	4.5	10	12	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	< 0.064				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.330				
PCSB-40	7/28/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	0.105	4.5	10	12	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	59.0 [37.1]				
			9.5-11.5	-- No visual impacts or coal tar-like odors --	0.0	0.205				
PCSB-41	7/28/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	84.9	4	9	12	FBA: RR
			2.5-4.5	-- No visual impacts or coal tar-like odors --	0.0	3.83				
			8.5-10.5	-- No visual impacts or coal tar-like odors --	0.0	0.820				
PCSB-41R	4/22/19	SB	0.5-2	Little tar; rainbow sheen	244.7, 349.2	595	3	8	15	FBA: RR
			2-7	Rainbow sheen	0.0 - 176	NA				
			9-11	-- No visual impacts or coal tar-like odors --	0.0	<0.046				
PCSB-42	8/1/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	16.5 [2.83]	3	8.5	16	FBA
			1.5-2	-- No visual impacts or coal tar-like odors --	0.0	45.1				
			2-3.5	Slight petroleum-like odor	0.0					
			3.5-4.5	Slight petroleum-like odor	260	NA				
			4.5-8	Slight petroleum-like odor	0.0	NA				
			8-8.5	Slight petroleum-like odor	29	NA				
			12-14	-- No visual impacts or coal tar-like odors --	10	0.130				
PCSB-43	8/1/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	24.6	4	8.5	12	FBA
			1.5-2.5	Slight petroleum-like odor	0.0	NA				
			2.5-4.5	Slight petroleum-like odor	275	55.9				
			4.5-8	Slight petroleum-like odor	0.0	NA				
			8-8.5	Slight petroleum-like odor	9.2	0.370				
			8.5-10	-- No visual impacts or coal tar-like odors --	0.0					
PCSB-44	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	16.8	5	9	15	FBA
			1-3.5	Slight petroleum-like odor	0.0	NA				
			3.5-5.5	Slight petroleum-like odor	117	24.7				
			5.5-10	Slight petroleum-like odor	0.0	NA				
			10.5-12.5	-- No visual impacts or coal tar-like odors --	0.0	0.400				
PCSB-45	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	11.6 [20.4]	3.5	9.5	15	FBA
			1-2	Slight petroleum-like odor	0.0	NA				
			2-4	Slight petroleum-like odor	45	41.8				
			4-9.5	Slight petroleum-like odor	370	NA				
			9.5-11.5	-- No visual impacts or coal tar-like odors --	0.3	0.850				
PCSB-46	7/27/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	8.38	4.5	13	16	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	< 0.064				
			12-14	-- No visual impacts or coal tar-like odors --	0.0	< 0.097				

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PCSB-47	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	6.91	4.5	9	15	FBA
			1-3	Moderate petroleum-like odor	0.0	NA				
			3-5	Moderate petroleum-like odor	102	26.6				
			5-9.5	Moderate petroleum-like odor	0.0	NA				
			9.5-10	Moderate petroleum-like odor	0.0	0.710				
			10-11.5	-- No visual impacts or coal tar-like odors --	0.0					
PCSB-48	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	0.632	5	10	15	FBA
			1-3	Moderate petroleum-like odor	0.0	NA				
			3-5	Moderate petroleum-like odor	186	43.5				
			5-10	Moderate petroleum-like odor	46	NA				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.190				
PCSB-49	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	1.79	5	10	15	FBA
			1-3	Moderate petroleum-like odor	0.0	NA				
			3-4	Tar-like material throughout, moderate petroleum-like odor	102	127				
			4-5	-- No visual impacts or coal tar-like odors --	0.0					
			5-10	Moderate petroleum-like odor	34	NA				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.480				
PCSB-49R	4/19/19	SB	3-5	-- No visual impacts or coal tar-like odors --	0.0	1.99	4	13	15	FBA
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.223				
PCSB-50	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	34.2	5	11	15	FBA
			1-3	Slight petroleum-like odor	100.7	NA				
			3-5	Slight petroleum-like odor	0.0	28.8				
			5-10	Slight petroleum-like odor	128	NA				
			10-11	Tar-like material throughout, moderate petroleum-like odor	55	NA				
			11.5-13.5	-- No visual impacts or coal tar-like odors --	0.0	0.380				
PCSB-51	8/2/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	25.7	3.5	--	20	FBA: RR
			2-4	-- No visual impacts or coal tar-like odors --	1.8	5.02				
			5-10	Sheen, moderate petroleum-like odor	51	NA				
			11-15	Moderate petroleum-like odor	74	NA				
PCSB-52	8/2/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	75.8	6	15	20	FBA
			2-2.5	-- No visual impacts or coal tar-like odors --	1.3	NA				
			4.5-6.5	-- No visual impacts or coal tar-like odors --	0.0	16.5				
			14.5-16.5	-- No visual impacts or coal tar-like odors --	0.0	< 0.062				
PCSB-53	8/1/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	18.3	4	12	20	FBA
			2-2.5	Strong petroleum-like odor	0.0	NA				
			2.5-4.5	Strong petroleum-like odor	107	16.7				
			4.5-6	Strong petroleum-like odor	0.0	NA				
			7.5-8	-- No visual impacts or coal tar-like odors --	58	NA				
			6-6.5	Petroleum-like sheen and staining, strong petroleum-like odor	0.0	NA				
			8-9	Strong petroleum-like odor	0.0	NA				
			15.5-17.5	-- No visual impacts or coal tar-like odors --	1.3	0.25				
PCSB-54	8/2/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	56.8	5	10.5	15	FBA
			3.5-5.5	-- No visual impacts or coal tar-like odors --	0.0	0.970				
			10.5-12.5	-- No visual impacts or coal tar-like odors --	0.0	2.58				
PCSB-55	8/3/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	42.2	4	10	15	FBA
			2-2.5	Moderate petroleum-like odor	0.0	NA				
			2.5-4.5	Moderate petroleum-like odor	127	47.4				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.872				
PCSB-56	8/15/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	5.47	5	5.5	10	FBA
			1-3	-- No visual impacts or coal tar-like odors --	0.0	33.1				
			5.5-7.5	-- No visual impacts or coal tar-like odors --	0.0	18.5				
PCSB-57	8/15/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	78.4	3	5	10	FBA
			1.5-3.5	-- No visual impacts or coal tar-like odors --	0.0	54.3				
			4.5-6.5	-- No visual impacts or coal tar-like odors --	0.0	21.2				
PCSB-58	8/15/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	14.6	5.5	10	15	FBA
			4-6	-- No visual impacts or coal tar-like odors --	0.0	15.0				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	0.318				
PCSB-59	8/15/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	16.2	6	10	15	FBA
			4.5-5	-- No visual impacts or coal tar-like odors --	0.0	29.3				
			5-6.5	Slight petroleum-like odor	2.8					
			6.5-10	Slight petroleum-like odor	0.0	NA				
			10-11	-- No visual impacts or coal tar-like odors --	0.0	2.91				

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PCSB-60	8/15/05	SB	0-1	-- No visual impacts or coal tar-like odors --	0.0	19.7 [16.9]	5	7	15	FBA
			3-5	-- No visual impacts or coal tar-like odors --	0.0	17.1				
			10-12	-- No visual impacts or coal tar-like odors --	0.0	2.23				
PCTP-01	2/8/05	TP	5-7	-- No visual impacts or coal tar-like odors --	0.0	596	--	--	15	Northern Corner
PCTP-01R	4/5/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.0	54.8	17.5	15	20	Northern Corner
			14-15	-- No visual impacts or coal tar-like odors --	0.2	NA				
PCTP-02	2/8/05	TP	4-6	-- No visual impacts or coal tar-like odors --	0.0	41.8	6	--	12	Misc.
PCTP-02R	4/5/19	SB	4-6	-- No visual impacts or coal tar-like odors --	0.0	<0.036	10	14.5	20	Misc.
			10-11	-- No visual impacts or coal tar-like odors --	0.8	NA				
PCTP-03	2/15/05	TP	6-8	-- No visual impacts or coal tar-like odors --	2.4	NA	6	12	12	Misc.
			11-12	-- No visual impacts or coal tar-like odors --	3.8	3.45				
PCTP-04	2/15/05	TP	4-6	-- No visual impacts or coal tar-like odors --	2.4	NA	--	12.5	13	Perimeter
			11-13	-- No visual impacts or coal tar-like odors --	3.8	< 0.053				
PCTP-05	2/15/05	TP	10.5-12.5	-- No visual impacts or coal tar-like odors --	0.0	8.06	10	13	13	Misc.
PCTP-06	2/16/05	TP	5-7	-- No visual impacts or coal tar-like odors --	1.1	NA	10	22	22	Area 1A
			10-11	Sheen on groundwater	1.1	NA				
			11-15	Moderate petroleum-like odor and slight tar-like odor	24	NA				
			15-17	Moderate petroleum-like odor and slight tar-like odor	24	65.2				
			17-20	Moderate petroleum-like odor and slight tar-like odor	0.0	NA				
PCTP-07	2/17/05	TP	3-5	Slight combusted petroleum-like odor	0.0	NA	8	13	14	Area 1B
			8-10	Sheen, strong petroleum odor	0.0	NA				
			10-11	Layer of solidified tar, sheen, strong petroleum odor	0.0	NA				
			11-13	Sheen, strong petroleum odor	28.1	29.5				
			13-14	-- No visual impacts or coal tar-like odors --	0.0	82.9				
PCTP-07R	9/20/19	SB	5-10	-- No visual impacts or coal tar-like odors --	2.9 - 12.9	NA	5	11.6	20	Area 1B
			10-12	-- No visual impacts or coal tar-like odors --	39.5, 20.1	8.00				
			12-14	-- No visual impacts or coal tar-like odors --	23.7, 10.6	NA				
PCTP-08	2/15/05	TP	9.5-11.5	-- No visual impacts or coal tar-like odors --	0.0	3.36	5	11	12	Misc.
PCTP-08R	4/9/19	SB	10-12	-- No visual impacts or coal tar-like odors --	0.0	0.771	8	13.5	15	Misc.
PCTP-09	2/9/05	TP	0.5-3	Combusted petroleum-like odor	0.0	NA	6	--	10	Misc.
			6-8	Combusted petroleum-like odor	0.0	32.3				
PCTP-10	2/9/05	TP	0-2	Slight petroleum-like odor	0.0	NA	8	10	11	Central Site
			8-9	Slight petroleum-like odor	0.0	227				
			9-10	Sheen on groundwater	0.0	NA				
PCTP-10R	4/9/19	SB	5-7	Black staining	0.7, 0.2	NA	7	18	20	Central Site
			7-8	Black staining	0.2	11.5				
			8-9	-- No visual impacts or coal tar-like odors --	0.1					
			17-18	-- No visual impacts or coal tar-like odors --	1.1	NA				
PCTP-11	2/9/05	TP	3-5	-- No visual impacts or coal tar-like odors --	0.0	4.67	2.5	6	12	Misc.
PCTP-12C	2/9/05	TP	2-4	Black viscous tar, moderate naphthalene-like odor	7.9	83,600	7	--	8	Area 2
			4-8	Slight naphthalene-like odor	1.4	NA				
PCTP-12R	4/12/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0	607	5	11	15	Area 2
			9-11	-- No visual impacts or coal tar-like odors --	0.0	5.67				
PCTP-13	2/10/05	TP	1-3	Slight combusted petroleum-like odor	0.0	NA	8	--	13	Area 2
			7-9	Sheen on groundwater	0.0	10.6				
			9-12	Slight combusted petroleum-like odor	0.0	NA				
PCTP-14	3/3/05	TP	0.5-1	Hardened tar layer	0.0	NA	5	11	11	Area 2
			1.5-3.5	-- No visual impacts or coal tar-like odors --	0.0	216				
PCTP-14A	2/10/05	TP	0-1	Hardened tar layer, strong tar-like odor, strong naphthalene-like odor	24	NA	--	--	1	Area 2
PCTP-15	3/3/05	TP	3.5-5	Bluish-green Soil	0.0	17.5	6	14	15	Area 2
PCTP-16	2/10/05	TP	1-3	-- No visual impacts or coal tar-like odors --	0.0	53.1	8	--	12	Area 2 / RCRA Area
PCTP-17	2/10/05	TP	6-7	Slight petroleum-like odor	0.0	NA	8	--	10	Area 2
			7-9	Tar with a strong tar-like odor, strong naphthalene-like odor	4.2	132,000				
			9-10	Slight petroleum-like odor	4.2	NA				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
PCTP-17R	4/15/19	SB	5-6	Coal tar (5.25-5.5'); strong coal tar-like odor (5-6')	37.4	1,100	6	11	25	Area 2
			7-8	-- No visual impacts or coal tar-like odors --	0.7	0.318				
			8-9	-- No visual impacts or coal tar-like odors --	0.0					
			9-11	-- No visual impacts or coal tar-like odors --	0.3, 0.7	7.39				
			11-15	Faint petroleum-like odor	3.2 - 22.1	NA				
			15-17	Coal-tar like odor	22.3, 72.9	NA				
			17-18	Liquid coal tar-like material; coal-tar like odor	21.3	NA				
			18-19	Liquid coal tar-like material; coal-tar like odor	26.4	17.9				
			19-20	Coal-tar like odor	83.4					
			24-25	-- No visual impacts or coal tar-like odors --	1.0	0.890				
PCTP-18	2/16/05	TP	1-5	Slight combusted petroleum-like odor	0.0	NA	10	21	22	Central Site
			5-7	Slight combusted petroleum-like odor	0.0	29.3				
			7-8	Slight combusted petroleum-like odor	0.0	NA				
			8-9	Water entering test pit exhibits a sheen	0.0	NA				
			10-19	Slight combusted petroleum-like odor	0.0	NA				
PCTP-19	2/18/05	TP	5-7	Moderate petroleum-like odor	1.3	14.0	6	21	22	Central Site
			7-8	Slight combusted petroleum-like odor	1.3	NA				
			8-9	Sheen on groundwater	0.0	NA				
			10-12	-- No visual impacts or coal tar-like odors --	0.6	9.96				
PCTP-20	2/2/05	TP	4-6	-- No visual impacts or coal tar-like odors --	0.5	NA	10	20	22	Area 2
			10-11	Slight petroleum-like odor	0.5	NA				
			11-12	Sheen on groundwater	1.1	NA				
			19-21	Moderate petroleum-like odor	6.0	69.3				
			21-22	Moderate petroleum-like odor	6.0	NA				
PCTP-21	2/11/05	TP	3-5	-- No visual impacts or coal tar-like odors --	0.0	9.83	3	--	6.5	Misc.
PCTP-22	2/2/05	TP	4-5	Moderate petroleum-like odor	3.3	792	7	--	16	RCRA Area
			10-12	-- No visual impacts or coal tar-like odors --	0.4	NA				
PCTP-23	2/2/05	TP	5-6	-- No visual impacts or coal tar-like odors --	1.1	NA	7	20	21	Area 2
			6-8	-- No visual impacts or coal tar-like odors --	3.8	898				
			9-11	-- No visual impacts or coal tar-like odors --	1.7	20.5				
PCTP-24	2/11/05	TP	7-8	Sheen on groundwater	0.0	NA	7	19.5	20	Area 2
			8-9	Soils stained, slight petroleum-like odor	0.0	NA				
			9-11	Slight combusted petroleum-like odor	0.0	NA				
			19-20	-- No visual impacts or coal tar-like odors --	0.0	1,240				
PCTP-25	2/18/05	TP	2-3	Solid tar fragments	0.0	NA	4	--	9	Area 2
			4-5	Sheen on groundwater	0.0	107				
			5-6	Solid tar fragments	0.0					
			6-8	Solid tar fragments	0.0	NA				
PCTP-26	2/18/05	TP	9-11	-- No visual impacts or coal tar-like odors --	1.7	NA	8	12	13	Central Site
			11-13	-- No visual impacts or coal tar-like odors --	20.7	102				
PCTP-27	2/16/05	TP	10-12	Woody debris with creosote-like odor	0.0	35.3	7	21	22	Central Site
			12-21	Woody debris with creosote-like odor	0.0	NA				
PCTP-28	2/17/05	TP	0.5-1	Strong tar-like odor	0.0	NA	5	14	16	Central Site
			6-8	-- No visual impacts or coal tar-like odors --	0.0	34.2				
PCTP-28R	4/11/19	SB	6-8	Possible purifier waste (6.5-8')	0.1	96.6	6	17.5	20	Central Site
			8-8.5	Possible purifier waste	0.1	NA				
			11-12	Light rainbow sheens; petroleum-like odor	75.8	1.40				
			12-12.5	Light rainbow sheens; petroleum-like odor	33.2	NA				
			15-16	Very light rainbow sheen	4.3	NA				
PCTP-29	2/18/05	TP	3-5	-- No visual impacts or coal tar-like odors --	0.3	NA	10	--	15	Central Site
			10-11	-- No visual impacts or coal tar-like odors --	1.2	NA				
			11-12	Sheen	16.9	NA				
			12-14	Sheen, moderate petroleum-like odor	16.9	46.5				
			14-15	Moderate petroleum-like odor	28.5	NA				
PCTP-30	2/22/05	TP	4.5-6	Sheen, staining, strong petroleum-like odor	0.0	NA	6	--	8	RCRA Area
			6-8	Slight tar-like odor, slight naphthalene-like odor	0.0	52.1				
PCTP-31	2/11/05	TP	10.5-11.5	Soils stained, moderate petroleum-like odor	0.0	32.0	6	--	11.5	RCRA Area
PCTP-32	2/2/05	TP	6-8	Sheen, strong petroleum-like odor	29.5	1,680	8	18	19	Central Site
			11-13	-- No visual impacts or coal tar-like odors --	0.6	NA				
PCTP-32R	4/9/19	SB	2-3	-- No visual impacts or coal tar-like odors --	14.4	NA	5	7.5	15	Central Site
			3-4	Petroleum like odor	1.6	NA				
			5-6	Light rainbow sheen, strong petroleum-like odor (at 5.5')	1.1	NA				
			6-8	Faint petroleum-like odor	0.9, 0.6	8.31				
			8-10	Faint petroleum-like odor	0.4, 0.5	NA				
			10-11	Light rainbow sheen (at 10.5'); faint petroleum-like	1.1	NA				
			11-15	Faint petroleum-like odor	1.6 - 3.7	NA				

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PCTP-33	2/2/05	TP	3-6	Slight petroleum-like odor	0.0	NA	6	16	17	Central Site
			6-11	Slight petroleum-like odor	0.0	NA				
			11-13	Moderate petroleum-like odor	0.0	961				
PCTP-34	2/28/05	TP	9-11	-- No visual impacts or coal tar-like odors --	1.7	1.34	7	17	18	Misc.
			11-13	Slight petroleum-like odor	1.7	NA				
			13-15	Slight petroleum-like odor	2.4	884				
PCTP-35	2/16/05	TP	5-7	-- No visual impacts or coal tar-like odors --	0.0	35.1	6	--	9	Central Site
PCTP-36	2/18/05	TP	5-7	-- No visual impacts or coal tar-like odors --	0.0	0.149	7	14	16	Central Site
			9-11	-- No visual impacts or coal tar-like odors --	0.5	NA				
PCTP-37	2/17/05	TP	1-2	Combusted petroleum-like odor	0.0	NA	6	6	12	Central Site
			2-4	Combusted petroleum-like odor	0.0	5.79				
PCTP-38	2/22/05	TP	3-5	-- No visual impacts or coal tar-like odors --	0.5	NA	8	--	13	Central Site
			9-11	-- No visual impacts or coal tar-like odors --	1.0	8.55				
			11-13	-- No visual impacts or coal tar-like odors --	0.8	10.8				
PCTP-39	2/24/05	TP	5-7	Sheen, slight petroleum-like odor	1.7	NA	8	10	11	Area 4
			7-8	Sheen, slight petroleum-like odor	1.7	176				
			8-9	-- No visual impacts or coal tar-like odors --	0.0					
PCTP-40	2/14/05	TP	2-5	Combusted petroleum-like odor	1.7	NA	5.5	--	12	RCRA Area
			5-8.5	Sheen, combusted petroleum-like odor	1.7	NA				
			8.5-9	Sheen, combusted petroleum-like odor	3.7	22.7				
			9-9.5	-- No visual impacts or coal tar-like odors --	3.7					
			9.5-10.5	-- No visual impacts or coal tar-like odors --	13.9	26.4				
PCTP-41	2/24/05	TP	5.5-7.5	-- No visual impacts or coal tar-like odors --	0.7	3.04	8	11	12	Central Site
PCTP-42	2/23/05	TP	8-10	-- No visual impacts or coal tar-like odors --	0.2	NA	6	13.5	14	Area 4
			11-13.5	Lenses of viscous tar-like material, moderate Naphthalene-like odor	75.5	NA				
			13.5-14	-- No visual impacts or coal tar-like odors --	0.0	7,540				
PCTP-43	2/23/05	TP	4-6	-- No visual impacts or coal tar-like odors --	1.4	NA	4	12	13	Misc.
			6-7	-- No visual impacts or coal tar-like odors --	2.2	5.20				
			7-8	Slight petroleum-like odor	2.2					
			8-12	Slight petroleum-like odor	2.2	NA				
			12-13	-- No visual impacts or coal tar-like odors --	2.4	NA				
PCTP-44	2/14/05	TP	3-5	Spent iron oxide material	0.0	0.079	5	--	12	Misc.
			5-7	Spent iron oxide material	1.3	NA				
			7-8	Slight petroleum-like odor	1.7	NA				
			8-10	Slight petroleum-like odor	1.7	10.5				
			10-12	Slight petroleum-like odor	1.7	NA				
PCTP-45	2/14/05	TP	4-5	Solidified tar layer, strong tar-like odor	0.0	NA	9	--	12	Area 4
			9-11	-- No visual impacts or coal tar-like odors --	0.0	0.593				
PCTP-46	2/22/05	TP	4-7	Tar-like material throughout, sheen, strong petroleum-like odor, soils stained	0.0	NA	8	10	12	Area 4
			7-8	Tar-like material throughout, sheen, strong petroleum-like odor, soils stained	5.4	NA				
			8-10	Sheen on groundwater	5.4	605				
			10-11	Tar-like material, strong tar-like odor, strong naphthalene-like odor	21.5	96,000				
PCTP-47	2/17/05	TP	5-7	-- No visual impacts or coal tar-like odors --	0.0	7.97	6	--	12.5	Central Site
PCTP-47R	4/9/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.0, 0.3	16.6	7	12	15	Central Site
			12-13	-- No visual impacts or coal tar-like odors --	0.7	NA				
PCTP-49	2/23/05	TP	8-10	Moderate petroleum-like odor	1.1	1,140	8	--	10	RCRA Area
PCTP-49R	4/16/19	SB	8-10	-- No visual impacts or coal tar-like odors --	0.0	5.97	7	11	15	RCRA Area
			10-11	Moderately strong petroleum-like odor	47.9	NA				
			11-14	Faint petroleum-like odor	1.8, 3.2, 1.5	31.7				
PCTP-50	2/23/05	TP	5-7	-- No visual impacts or coal tar-like odors --	0.3	NA	8	12	12	Perimeter
			8-10	-- No visual impacts or coal tar-like odors --	1.7	NA				
			10-12	-- No visual impacts or coal tar-like odors --	8.1	12.1				
PCTP-51	2/22/05	TP	8-10	-- No visual impacts or coal tar-like odors --	1.1	NA	4	12	13	RCRA Area
			10-12	Slight petroleum-like odor	5.2	8.02				
PCTP-51R	4/18/19	SB	10-12	-- No visual impacts or coal tar-like odors --	0.0	10.9	4	13	15	RCRA Area
PCTP-52	2/22/05	TP	6-8	-- No visual impacts or coal tar-like odors --	0.1	129	7	14	15	RCRA Area
PCTP-53	2/22/05	TP	3-5	-- No visual impacts or coal tar-like odors --	0.5	NA	8	12	13	Area 4
			7-9	-- No visual impacts or coal tar-like odors --	0.9	NA				
			9-11	Sheen, stained soil, slight petroleum-like odor	0.8	28.8				
PCTP-54	2/28/05	TP	5.5-7	Sheen, slight petroleum-like odor	2.1	NA	5	9.5	10.5	FBA
			7-9	Sheen, slight petroleum-like odor	2.1	110				

Table 3
Soil Boring and Test Pit Summary Table

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

ARCADIS Design & Consultancy for natural and built assets

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
PCTP-55	2/28/05	TP	0-6	Sheen, strong petroleum-like odor	50.6	NA	3	9	10	FBA
			6-8	Sheen, strong petroleum-like odor	66.1	16.6				
			8-9	Moderate petroleum-like odor	16.4	NA				
PCTP-56	2/28/05	TP	2-3	Sheen on groundwater	0.0	NA	2	12	13	FBA: RR
			5-7	-- No visual impacts or coal tar-like odors --	2.1	NA				
			7-9	Sheen, moderate creosote-like odor	0.0	28.4				
			9-10	Sheen, moderate creosote-like odor	0.0	NA				
PCTP-57	2/25/05	TP	11-13	-- No visual impacts or coal tar-like odors --	0.0	11.7	2	13	14	FBA
PCTP-58	2/24/05	TP	1-3	-- No visual impacts or coal tar-like odors --	3.6	46.3	4	7	8	FBA
PCTP-59	2/25/05	TP	3-4	Sheen, moderate petroleum-like odor	10.4	NA	6	8	9	FBA
			4-6	Sheen, moderate petroleum-like odor	10.4	12.4				
			6-8	Sheen, moderate petroleum-like odor	6.3	13.7				
PCTP-60	2/25/05	TP	1-3	-- No visual impacts or coal tar-like odors --	0.0	6.06	5	7.5	9	FBA: Perimeter
PCTP-61	9/8/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	12.0 [12.0]	8	--	8	Perimeter
			7-8	-- No visual impacts or coal tar-like odors --	0.0	0.085				
PCTP-62	9/8/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	666	11	--	12	Perimeter
			9.5-11.5	-- No visual impacts or coal tar-like odors --	0.0	13.6				
PCTP-63	9/8/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	217	11	--	11	RCRA Area
			10-11	-- No visual impacts or coal tar-like odors --	0.0	22.3				
PCTP-64	9/8/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	124	7.5	--	10	Perimeter
			6-8	-- No visual impacts or coal tar-like odors --	0.0	6.12				
PCTP-65	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	88.7	8	--	9	Perimeter
			6.5-8.5	-- No visual impacts or coal tar-like odors --	0.0	20.4				
PCTP-66	9/9/05	TP	0-1	Liquid tar-like material entering into test pit	0.0	38,500	8	--	8	Area 3B
			7-8	-- No visual impacts or coal tar-like odors --	0.0	9.61				
PCTP-66R	4/24/19	TP	0-0.5	Trace coal tar	3.6	120 [1,230]	10	8	10	Area 3B
			0.5-2.0	-- No visual impacts or coal tar-like odors --		5.24				
			8-10	Moderately strong petroleum-like odor	21.6	2,730				
PCTP-66R-HC	4/5/19	HA	0-2	Tar on cobble	N/A	112	--	--	5	Area 3B
			2-4	-- No visual impacts or coal tar-like odors --	N/A	187				
PCTP-67	9/12/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	16.3 [11.4]	8.5	--	8.5	Perimeter
			7.5-8.5	-- No visual impacts or coal tar-like odors --	0.0	9.69				
PCTP-68	9/9/05	TP	0-1	Semi-solidified tar-like material	79	6,160	6.5	--	6.5	Central Site
			5.5-6.5	-- No visual impacts or coal tar-like odors --	0.0	42.1				
PCTP-69	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	26.1	18	12	18	Misc.
			17-18	-- No visual impacts or coal tar-like odors --	0.0	< 0.066				
PCTP-70	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	11.3	18.5	--	18.5	Perimeter
			17.5-18.5	-- No visual impacts or coal tar-like odors --	0.0	< 0.061				
PCTP-71	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	17.1	18	--	18	Perimeter
			17-18	-- No visual impacts or coal tar-like odors --	0.0	0.364				
PCTP-72	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	27.7	12.5	--	13	Perimeter
			11-13	-- No visual impacts or coal tar-like odors --	0.0	19.0				
PCTP-73	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	13.2	10	--	10	Perimeter
			9-10	-- No visual impacts or coal tar-like odors --	0.0	11.6				
PCTP-73R	4/10/19	SB	0-0.5	-- No visual impacts or coal tar-like odors --	0.0	8.61	9	15	20	Perimeter
PCTP-74	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	32.9	13	--	13	Perimeter
			12-13	-- No visual impacts or coal tar-like odors --	0.0	1.90				
PCTP-75	9/9/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	8.16	12	--	13	Area 1A
			10-11.5	Slight to moderate yellow-brown oil-like material throughout	12.1	3,080				
			11.5-12	Slight to moderate yellow-brown oil-like material throughout	0.0					
PCTP-75R	4/11/19	SB	6.0-7.0	Possible purifier waste	1.9	NA	11	16	20	Area 1A
			10-11	Light rainbow sheen; faint petroleum-like odor	0.5	6.05				
			11-12	Faint petroleum-like odor	0.2					
			12-14	Faint petroleum-like odor	0.0	NA				
			14-15	Faint petroleum-like odor	0.0	0.918				
			15-16	-- No visual impacts or coal tar-like odors --	0.0					
PCTP-76	9/12/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	12.8	--	--	6.5	Central Site
			5.5-6.5	-- No visual impacts or coal tar-like odors --	0.0	552				
PCTP-77	9/12/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	100	11	--	11	Misc.
			10-11	-- No visual impacts or coal tar-like odors --	0.0	8.88				
PCTP-78	9/12/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	20.2	10	--	10	Misc.
			9-10	-- No visual impacts or coal tar-like odors --	0.0	77.4				
PCTP-79	9/12/05	TP	0-1	-- No visual impacts or coal tar-like odors --	0.0	31.8	10.5	--	10.5	Misc.
			9.5-10.5	-- No visual impacts or coal tar-like odors --	0.0	8.03				

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PCTP-80	9/12/05	TP	7.5-8.5	-- No visual impacts or coal tar-like odors --	0.0	40.9	8.5	--	8.5	Misc.
PSSTP-01	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	31.1	--	--	6	Northern Corner
			2-6	Black staining, slight petroleum-like odor	0.0	NA				
			5-6	-- No visual impacts or coal tar-like odors --	0.0	87.6				
PSSTP-01R	4/10/19	SB	5-6	Bluish-gray sand; green stained textile	21.5	141	13	13	15	Northern Corner
			6-7		38.4	NA				
			8-9	Possible purifier waste	38.4	NA				
PSSTP-02	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	50.6	--	--	6	Misc.
			4-6	Black staining	0.0	NA				
			5-6	Black staining	0.0	43.8				
PSSTP-03	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	87.1	9	--	9	Misc.
			2-9	Black staining	0.0	NA				
			8-9	Black staining	0.0	61.6				
PSSTP-04	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	542	--	--	9	Area 1B
			2-9	Black staining, coal and hardened tar fragments	0.0	NA				
			8-9	-- No visual impacts or coal tar-like odors --	5.3	1,480				
PSSTP-04R	4/11/19	SB	1-2	-- No visual impacts or coal tar-like odors --	0.1	30.8	10	17	20	Area 1B
			7-8	Viscous coal tar-like material; moderately strong coal tar-like material	58.7	27,200				
			8-9	Moderately strong coal tar-like odor	7.5	4,290				
			9-10	Moderately strong coal tar-like odor	12.5	NA				
			10-11	Sheen	0.9	NA				
			11-14	Very faint petroleum-like odor (11.5-13.5')	4.3, 1.0, 1.2	NA				
			16-17	Trace liquid coal tar stringers; sheen	4.2	5.17				
PSSTP-05	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	266	6	--	6	Area 3A
			2-5	Black staining	0.0	NA				
			5-6	-- No visual impacts or coal tar-like odors --	0.0	2.55				
PSSTP-06	3/11/03	TP	0-1	Black staining	0.0	NA	6	--	6	Misc. / RCRA Area
			1-2	Black staining	0.0	18.1				
			5-6	-- No visual impacts or coal tar-like odors --	0.0	0.788				
PSSTP-07	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	77.9	9	--	9	Misc.
			8-9	-- No visual impacts or coal tar-like odors --	0.0	5.50				
PSSTP-07R	4/18/19	SB	0.5-2	-- No visual impacts or coal tar-like odors --	NA	11.1 [11.2]	10	22	25	Misc.
			8-9	-- No visual impacts or coal tar-like odors --	0.0	0.372				
			20-22	Sheen	0.0	1.86				
PSSTP-08	3/11/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	157	7	--	7	RCRA Area
			8-9	-- No visual impacts or coal tar-like odors --	0.0	34.5				
PSSTP-09	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	5.33	7	--	7	RCRA Area
			6-7	-- No visual impacts or coal tar-like odors --	0.0	60.7				
PSSTP-10	3/12/03	TP	0-1	-- No visual impacts or coal tar-like odors --	0.2	NA	9	--	10	Misc.
			1-2	-- No visual impacts or coal tar-like odors --	0.4	19.1				
			2-3	-- No visual impacts or coal tar-like odors --	0.4	NA				
			8-9	-- No visual impacts or coal tar-like odors --	0.0	38.4				
PSSTP-10R	4/16/19	SB	1-2	-- No visual impacts or coal tar-like odors --	0.0	19.1	8	15	20	Misc.
			8-9	-- No visual impacts or coal tar-like odors --	0.0	1.66				
PSSTP-11	3/12/03	TP	1-2	Coal and hardened tar fragments	0.1	31.8	9	--	9	Misc.
			2-3	Coal and hardened tar fragments	0.3	NA				
			8-9	-- No visual impacts or coal tar-like odors --	0.0	0.044				
PSSTP-12	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	609	4	--	8	Misc.
			7-8	-- No visual impacts or coal tar-like odors --	0.0	2.04				
PSSTP-13	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.3	15.9	8	--	8	Misc.
			7-8	-- No visual impacts or coal tar-like odors --	0.0	9.37				
PSSTP-14	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	17.0	8	--	8	Area 2
			7-8	-- No visual impacts or coal tar-like odors --	0.0	8.25				
PSSTP-15	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	33.7	9	--	9	Area 2
			8-9	-- No visual impacts or coal tar-like odors --	4.0	45.8				
PSSTP-16	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	17.2	2	--	6	RCRA Area
			2-3	Sheen on groundwater and strong tar-like odor	0.0	NA				
			3-5	Black staining	0.0	NA				
			5-6	Black staining	0.0	6.17				
PSSTP-17	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	15.3	8	--	11	Misc.
			8-9	-- No visual impacts or coal tar-like odors --	0.0	28.8				
PSSTP-18	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	20.9	3	--	7	RCRA Area
			6-7	Black staining	0.0	24.2				
PSSTP-19	3/12/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	3.63	5	--	9	Area 4 / Misc.
			5-7	Black staining	0.0	NA				
			7-8	Black staining	120	64.5				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
PSSTP-20	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	18.4	9	--	9	Misc.
			8-9	-- No visual impacts or coal tar-like odors --	0.0	< 0.39				
PSSTP-21	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	48.0	9	--	9	Central Site
			8-9	-- No visual impacts or coal tar-like odors --	0.0	16.4				
PSSTP-22	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	935	4	--	8	Central Site
			6-6.2	Layer of tar	0.0	425				
			6.2-7	-- No visual impacts or coal tar-like odors --	0.0					
PSSTP-22R	4/24/19	SB	0.5-1	Faint tar-like odor	0.0	NA	4	20	25	Central Site
			1-2	-- No visual impacts or coal tar-like odors --	0.0	777				
			2-4	Faint tar-like odor	0.0, 32.9	NA				
			4-6	Faint tar-like odor	1.0, 0.0	805				
PSSTP-23	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	1.68	8	--	9	Central Site
			7-8	-- No visual impacts or coal tar-like odors --	0.0	105.3				
PSSTP-24	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	94.1	8	--	8	Central Site
			7-8	Black staining	0.0	29.1				
PSSTP-25	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	185	8	--	8	Central Site
			7-8	-- No visual impacts or coal tar-like odors --	0.0	37.4				
PSSTP-26	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	69.9	8	--	8	Area 4
			6-7	Hardened tar fragments	0.0	NA				
			7-8	Hardened tar fragments	0.0	58.4				
PSSTP-27	3/13/03	TP	1-2	-- No visual impacts or coal tar-like odors --	0.0	670	6	--	8	FBA
			5-6	Sheen, strong petroleum-like odor	0.0	5.77				
			6-8	Sheen, strong petroleum-like odor	0.0	NA				
PSSTP-28	3/13/03	TP	1-2	Sheen, slight petroleum-like odor	0.0	118	4	--	6	FBA
			2-5	Sheen, slight petroleum-like odor	0.0	NA				
			5-6	Sheen, slight petroleum-like odor	0.0	13.2				
PSSTP-29	3/13/03	TP	0-1	Sheen, slight petroleum-like odor	0.0	NA	4	--	6	FBA
			1-2	Sheen, slight petroleum-like odor	0.0	56.8				
			2-5	Sheen, slight petroleum-like odor	0.0	NA				
			5-6	Sheen, slight petroleum-like odor	0.0	93.8				
PSSTP-30	3/13/03	TP	0-1	Sheen, slight petroleum-like odor	0.0	NA	4	--	6	FBA
			1-2	Sheen, slight petroleum-like odor	0.0	24.4				
			2-5	Sheen, slight petroleum-like odor	0.0	NA				
			5-6	Sheen, slight petroleum-like odor	0.0	10.8				
S-101	4/10/19	SB	10-12	-- No visual impacts or coal tar-like odors --	1.0, 0.0	4.76	10	16.5	20	Area 1A
			14.5-16.5	-- No visual impacts or coal tar-like odors --	0.0	1.92				
S-102	4/10/19	SB	5-6	Moderately strong petroleum-like odor	4.1	NA	7	15.5	20	Area 1A
			6-7	Moderately strong petroleum-like odor	66.7	NA				
			7-8	Moderately strong petroleum-like odor	0.9	NA				
			10-12	-- No visual impacts or coal tar-like odors --	1.0, 0.5	55.6				
			13.5-15.5	-- No visual impacts or coal tar-like odors --	0.0	43.3				
S-103	4/11/19	SB	10-12	Light rainbow sheen; faint petroleum-like odor	0.8, 0.5	3.39	9	15	20	Area 1A
			12-13	Faint petroleum-like odor	0.0	NA				
			13-15	Faint petroleum-like odor	0.0	0.808				
S-104	4/10/19	SB	3.5-8	Possible purifier waste	0.0	NA	10	17.5	20	Area 1A
			10-12	-- No visual impacts or coal tar-like odors --	1.0, 0.0	8.61				
			15.5-17.5	-- No visual impacts or coal tar-like odors --	0.0	0.334				
S-105	4/12/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0	86.7	6	11	15	Area 2
			8-10	-- No visual impacts or coal tar-like odors --	0.0	0.678				
S-106	4/12/19	SB	1-2	Coal tar-like material; coal-tar like odor	282.6	NA	4	11.5	15	Area 2
			2-3	Coal tar-like odor	16.9	31,200				
			3-4	-- No visual impacts or coal tar-like odors --	9.4					
			8-10	-- No visual impacts or coal tar-like odors --	1.6, 0.6	5.34				
S-107	4/23/19	TP	2-3	-- No visual impacts or coal tar-like odors --	18.8	81.0	3.5	--	5.5	Area 2
			3-4	Coal tar and strong coal-tar like odor						
			4-5.5	-- No visual impacts or coal tar-like odors --	0.4	43.3				
S-108	4/15/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0	64.8 [54.8]	5	13.5	20	Area 2
			8-10	-- No visual impacts or coal tar-like odors --	0.4, 0.9	8.93				
			10-12	Faint petroleum-like odor; light black staining	1.2, 4.4	NA				
			12-13.5	Faint petroleum-like odor; light black staining; light rainbow sheen (at 12.5')	2.1, 2.0	NA				
			15-17	Light staining; faint petroleum-type odor	71.4, 129.6	1,120				
			17-18	Light staining; faint petroleum-type odor	20.1	NA				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
S-109	4/15/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	460	8	12	15	Area 2
			8-10	Trace liquid coal tar; faint coal tar-like odor	0.8, 1.0	21.2				
			11-12	Light rainbow sheen (at 11.5')	1.4	NA				
S-110	4/12/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	11.0	5	--	15	Area 2
			8-10	*-- No visual impacts or coal tar-like odors --*	0.0	4.96				
S-111	4/23/19	TP	2-4	*-- No visual impacts or coal tar-like odors --*	0.2	64.3	5	--	6.5	Area 2
			4.5-6.5	*-- No visual impacts or coal tar-like odors --*	0.1	1.63				
S-112	4/12/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	0.816	3	13	15	Area 2
			8-10	*-- No visual impacts or coal tar-like odors --*	0.0	0.685				
S-113	4/23/19	TP	0-1	*-- No visual impacts or coal tar-like odors --*	0.0	1,300	1.5	--	1.67	Area 2
S-113B	4/24/19	SB	1-3	*-- No visual impacts or coal tar-like odors --*	0.3, 0.0	785	3	11	20	Area 2
			3-4	Green-blue soil (potential purifier waste)	0.0	NA				
			10-12	*-- No visual impacts or coal tar-like odors --*	9.3, 20	1,210				
			12-13	Coal tar-like material; strong coal tar-like odor	8.6	NA				
			13-15	*-- No visual impacts or coal tar-like odors --*	8.8, 9.6	88.3				
			15-17	*-- No visual impacts or coal tar-like odors --*	0.1, 0.1	0.312				
S-114	4/15/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	6.81	5	15	25	Area 2
			7-8	Trace liquid coal tar stringers (at 7.5')	1.0	NA				
			8-10	*-- No visual impacts or coal tar-like odors --*	0.4, 0.0	384				
			10-14	Coal tar like odor	0.4 - 2.8	NA				
			14-15	Viscous liquid coal tar blebs	166.7	12,300				
			15-22	Coal tar like odor	7.8 - 63.2	NA				
			23-25	*-- No visual impacts or coal tar-like odors --*	0.9, 0.6	0.324				
S-115	4/16/19	SB	4-6	*-- No visual impacts or coal tar-like odors --*	0.0	27.0 [44.0]	5	12.5	15	Area 3A
			8-9	*-- No visual impacts or coal tar-like odors --*	4.6	NA				
S-116	4/16/19	SB	2-3	Solidified coal tar-like material (at 2.5')	42.5	NA	5	12	15	Area 3A
			4-6	*-- No visual impacts or coal tar-like odors --*	9.2, 3.1	56.8				
S-117	4/16/19	SB	4-6	*-- No visual impacts or coal tar-like odors --*	0.0	69.2	6	13	15	Area 3A
			13-14	*-- No visual impacts or coal tar-like odors --*	4.1	NA				
S-118	4/16/19	SB	4-6	*-- No visual impacts or coal tar-like odors --*	0.0	660	6	13	15	Area 3A
			13-14	Faint petroleum-like odor (at 13')	4.6	NA				
S-119	4/12/19	SB	0-1	*-- No visual impacts or coal tar-like odors --*	0.3	22.9	8	9.5	15	Area 3B
S-120	4/24/19	TP	0-1	*-- No visual impacts or coal tar-like odors --*	0.2	5.70	9.5	7.5	10	Area 3B
			7.5-10	Faint petroleum-like odor	3.0	NA				
S-121	4/12/19	SB	0-1	*-- No visual impacts or coal tar-like odors --*	0.0	6.31	7.5	16.5	20	Area 3B
S-122	4/9/19 4/12/19	SB	0-1	*-- No visual impacts or coal tar-like odors --*	0.0	7.73	8	9	15	Area 3B
			10-12	Light rainbow sheen (at 10.5'); faint petroleum-like odor throughout	10.8, 2.7	454				
			13-15	Faint petroleum-like odor	2.3, 1.5	NA				
S-123	4/18/19	SB	7-9	*-- No visual impacts or coal tar-like odors --*	0.0	6.25	7	13	15	Area 4
			13-15	*-- No visual impacts or coal tar-like odors --*	0.0	0.374				
S-124	4/18/19	SB	6-7	Light rainbow sheen	0.0	NA	5	9.5	15	Area 4
			7-9	Light rainbow sheen	0.0	0.689				
			9-9.5	Light rainbow sheen	0.0	NA				
			10-12	*-- No visual impacts or coal tar-like odors --*	0.0	2.23				
S-125	4/18/19	SB	7-9	Light rainbow sheen	0.0	142	8	12	15	Area 4
			10-11	Light rainbow sheen	2.6	NA				
			11-12	Light rainbow sheen	150.6	1,320				
			12-13	Moderately heavy rainbow sheen	115					
			13-15	*-- No visual impacts or coal tar-like odors --*	0.0	3.00				
S-126	4/17/19	SB	7-9	*-- No visual impacts or coal tar-like odors --*	0.0	1.38	6	10	15	Area 4
			13-15	*-- No visual impacts or coal tar-like odors --*	0.1	48.1				
S-127	4/17/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.7, 0.1	1,000 [1,640]	4	8	15	Area 4
			6-8	Rainbow sheen; coal tar-like material	9.7, 1.1	923				
			11-12	Rainbow sheen	0.7	NA				
			13-15	*-- No visual impacts or coal tar-like odors --*	0.7, 0.1	20.2				
S-128	4/18/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	64.8	6	13	15	Area 4
			9-10	Potential purifier waste; light rainbow sheen	2.0	NA				
			10-12	Light rainbow sheen	2.5, 0.2	3,210				
			13-15	*-- No visual impacts or coal tar-like odors --*	0.0	17.1				
S-129	4/18/19	SB	2-4	*-- No visual impacts or coal tar-like odors --*	0.0	39.7	7	10	15	Area 4
			8 - 9	*-- No visual impacts or coal tar-like odors --*	5.9	9,440				
			9-10	Coal tar-like substance	3.2					
			10-12	*-- No visual impacts or coal tar-like odors --*	0.0	7.60				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
S-130	4/17/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0	8.01	5	8	15	Area 4
			7-8	-- No visual impacts or coal tar-like odors --	0.0	13.2				
			8-10	Coal tar-like odor	0.6, 0.9	NA				
			10-12	Blebs of coal tar-like material	0.2, 0.4	39.6				
			13-15	-- No visual impacts or coal tar-like odors --	0.0	9.70				
S-131	4/17/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0	0.0576	5	7	10	Area 4
			7-9	-- No visual impacts or coal tar-like odors --	0.0	56.4				
S-132	4/17/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.1	417	6	8	10	Area 4
			8-10	-- No visual impacts or coal tar-like odors --	0.0	3.45				
S-133	4/17/19	SB	2-4	-- No visual impacts or coal tar-like odors --	0.0, 0.1	21.5	6	8	15	Area 4
			7-8	Sheen	0.0	3.99				
			8-9	-- No visual impacts or coal tar-like odors --	0.0					
			13-15	-- No visual impacts or coal tar-like odors --	0.0	11.6				
S-134	4/9/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	7	14	15	Perimeter
S-135	4/22/19	SB	4-5	Moderately strong petroleum-like odor	108.9	2.43	4	6	10	Misc.
			5-6	Faint petroleum-like odor	7.4					
			8-10	-- No visual impacts or coal tar-like odors --	0.0	0.412				
S-136	4/22/19	SB	4-6	Blue/rainbow sheen (at 4.5')	7.5, 0.0	1.53	5	4.5	10	Perimeter
			7-9	-- No visual impacts or coal tar-like odors --	0.0	<0.04				
S-137	4/19/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	8	12.5	15	Perimeter
S-138	4/5/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0 - 0.3	NA	11	11	15	Perimeter
S-139	4/10/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	11.5	18	20	Perimeter
S-140	4/10/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	5	16	20	Perimeter
S-141	4/25/19	TP	All Depths	-- No visual impacts or coal tar-like odors --	0 - 0.2	NA	2.5	6	7	Area 2
S-142	4/25/19	TP	4-6	Wood debris & chips; potential purifier waste (5.5-6.0')	0.3	NA	7.5	8	11	Area 2
			6-7	Wood debris & chips; potential purifier waste (6.0-6.5')	0.4	(1.3 cyanide)				
			7-8	-- No visual impacts or coal tar-like odors --		2.65				
S-144	4/24/19	SB	14-15	-- No visual impacts or coal tar-like odors --	458.9	NA	14	18	25	Northern Corner
			15-17	Purple/black staining; petroleum-like odor	13.8, 69	0.166				
			17-18	Purple/black staining; petroleum-like odor	4.8	NA				
			22-24	-- No visual impacts or coal tar-like odors --	0.0	<0.036				
S-145	4/25/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0 - 0.5	NA	14	17	25	Northern Corner
S-146	4/25/19	SB	14-16	Light black staining; faint petroleum-like odor	7.8, 5.1	<0.039	15	16	25	Northern Corner
			17-19	-- No visual impacts or coal tar-like odors --	0.0	<0.039				
S-147	4/25/19	SB	9-10	Dense coal-tar like material	38.5	NA	9	18	20	Area 1B
			12-14	Light rainbow sheen (at 12.5')	2.9, 56.9	5.88				
			15-18	Light rainbow sheen	1.0, 0.1, 0.0	NA				
			18-20	-- No visual impacts or coal tar-like odors --	0.0	0.657				
S-148	4/25/19	SB	6-8	Black coal tar-like material, strong coal tar-like odor	22.9, 63	NA	11	15	20	Area 1B
			8-9	Black coal tar-like material, strong coal tar-like odor	61.8	14,800				
			9-10	Black coal tar-like material, strong coal tar-like odor	101.9					
			12-14	Rainbow sheen	1.8, 2.3	NA				
			16-18	-- No visual impacts or coal tar-like odors --	0.0	0.204				
S-149	4/25/19	SB	4-5	Potential purifier waste; faint burnt odor	0.2	NA	10	18.5	25	Area 1B
			7-8	-- No visual impacts or coal tar-like odors --	14.8	3,070				
			8-10	Dense coal tar-like material (at 8.5')	11.3, 9.9	NA				
			18.5-20.5	-- No visual impacts or coal tar-like odors --	0.2, 0.2, 0.1	0.095				
S-150	4/24/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	4	--	5	FBA: RR
S-151	4/24/19	SB	0.5-2	Liquid coal-tar like material (1-1.5')	284	1,760	4	--	5	FBA: RR
			3-5	-- No visual impacts or coal tar-like odors --	0.1, 0.0	1.59 [0.132]				
S-152	4/25/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	4	--	5	FBA: RR
S-153	4/26/19	SB	7-9	Coal tar-like odor	4.0, 6.1	17.4	6.5	9	15	Area 4
			9-10	Moderately fluid tar-like material	0.8	NA				
			10-11	Faint coal tar-like odor	6.8	NA				
			11-12	Blebs of liquid coal tar-like material; faint coal tar-like odor	4.9	NA				
			12-13	Faint coal tar-like odor	2.8	NA				
			13-13.5	Blebs of liquid coal tar-like material; faint coal tar-like odor	2.8	NA				
			13.5-15	-- No visual impacts or coal tar-like odors --	2.8, 0.8	9.18 [16.3]				
S-154	4/26/19	SB	9-11	Light rainbow sheen (9.75-11')	1.1, 0.7	31.8	5	11	15	Area 4
			12-14	-- No visual impacts or coal tar-like odors --	0.0	20.4 [18.1]				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
S-155	4/26/19	SB	10-11	Blebs of viscous liquid coal tar-like material; light rainbow sheen; coal tar-like odor	3.4	2,390	10	10	15	Area 4
			11-12	-- No visual impacts or coal tar-like odors --	33.6					
			13-15	-- No visual impacts or coal tar-like odors --	0.0	9.09				
S-156	5/3/19	SB	3-5	Black coal tar-like material; strong coal tar-like	40.8, 80.7	8,000	7.5	13.5	20	Area 1B
			5-5.5	Black coal tar-like material; strong coal tar-like	83.2	NA				
			5.5-7	Black staining; light petroleum-like odor	83.2, 8.3	NA				
			7.5-9.5	Light rainbow sheen; light black staining; faint petroleum-like odor	84.3, 60.9, 6.0	11.5				
			9.5-10	Light rainbow sheen; light black staining; faint petroleum-like odor	6.0	NA				
			14-16	-- No visual impacts or coal tar-like odors --	0.1, 0.4	0.386 [0.240]				
S-157	5/3/19	SB	4.5-7	Rainbow sheen; petroleum-like odor (5-7')	14.7, 11, 80	NA	4.5	11	25	Area 1B
			7-9	Rainbow sheen; petroleum-like odor	29.9, 82.6	0.977				
			9-11	Rainbow sheen; petroleum-like odor	32.6, 66.2	NA				
			11-19	Petroleum-like odor; black staining	1.5 - 7.1	NA				
			23-25	-- No visual impacts or coal tar-like odors --	0.0	<0.036				
S-158	4/26/19	SB	10-11	Low viscosity tar-like material; strong coal-tar like	0.9	NA	10	14	20	Area 1B
			11-12	Light blue and rainbow sheen	38.6	769				
			12-13	-- No visual impacts or coal tar-like odors --	1.7					
			18-20	-- No visual impacts or coal tar-like odors --	0.0	0.572				
S-159	4/26/19	SB	11-13	Light rainbow sheen	0.3, 4.9	35.5	5	18	20	Area 1B
			13-14	-- No visual impacts or coal tar-like odors --	38.6	NA				
			18-20	-- No visual impacts or coal tar-like odors --	0.0	<0.047				
S-160	5/3/19	SB	10-11	Liquid coal tar-like material	27.5	29,500	8	11	15	Area 4
			11-12	-- No visual impacts or coal tar-like odors --	3.5					
			13-15	-- No visual impacts or coal tar-like odors --	0.1	2.25				
S-161	5/3/19	SB	5-6	Low viscosity coal tar-like material	23.3	4,480	7	11	15	Area 4
			6-7	-- No visual impacts or coal tar-like odors --	1.0					
			10-12	-- No visual impacts or coal tar-like odors --	0.0	22.5				
S-162	5/3/19	SB	5-6	Black coal tar-like material; potential purifier waste; strong coal tar-like odor	8.9	106	9	15	20	Area 4
			6-7		4.1					
			15-17	-- No visual impacts or coal tar-like odors --	0.0	12.2				
S-163	9/19/19	SB	0.5-2	-- No visual impacts or coal tar-like odors --	0.0	2,410	5	11.4	15	Area 2
			2-4	-- No visual impacts or coal tar-like odors --	0.0	23.6				
S-164	9/19/19	SB	2-4	Petroleum-like odor (3.1-4')	0.0, 96.4	NA	6	--	10	FBA: RR
			4-6	Petroleum-like odor	98.1, 4.6	3.69				
			6-9	-- No visual impacts or coal tar-like odors --	2.0, 0.1	NA				
S-165	9/19/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	Inconclusive	--	2	FBA: RR
S-166	9/19/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	8	13	15	Area 1B
S-167	9/20/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.8, 2.2	NA	10	15	20	Area 1B
			7-9	-- No visual impacts or coal tar-like odors --	13.4, 8.3	29.3				
			9-13	-- No visual impacts or coal tar-like odors --	0.2 - 0.8	NA				
S-168	9/19/19	SB	6-8	-- No visual impacts or coal tar-like odors --	284.7, 1.6	29.3	10	10.8	15	Area 4
			8-13	-- No visual impacts or coal tar-like odors --	0.4 - 4.4	NA				
S-169	9/19/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	10	12.2	15	Area 4
S-170	9/19/19	SB	All Depths	-- No visual impacts or coal tar-like odors --	0.0	NA	12.7	12.7	15	Area 4
S-171	9/19/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.0	22.4	10	12	15	Area 4
S-172	9/19/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.0	47.5	10	13	15	Area 4
S-173	9/19/19	SB	5-7	-- No visual impacts or coal tar-like odors --	0.0	65.4	Inconclusive	11.5	15	Area 4
TP-10	3/7/05	TP	16-19	Slight petroleum-like odor	0.0	NA	5	16	19	Misc.
TP-11	3/7/05	TP	3-7	-- No visual impacts or coal tar-like odors --	0.7	NA	12	--	20	Central Site
			13-15	Coal-tar like blebs; sheen; naphthalene-like odor	24.7	49.6				
TP-12	3/8/05	TP	2-19	Sheen on water, slight petroleum-like odor	0.0	NA	10	--	20	Central Site
TP-13	3/8/05	TP	11-13	Sheen on water	N/A	NA	12	19	20	Central Site
			13-15	Slight sheen; Petroleum-like odor	N/A	19.6				
TP-14	3/8/05	TP	0-2	Slight petroleum-like odor	N/A	NA	--	9	20	Misc.
			17-19	Sheen on soil; moderate petroleum-like odor	N/A	834				
TP-15	3/8/05	TP	4.5-6.5	-- No visual impacts or coal tar-like odors --	N/A	43,500	--	15	20	Area 3A
TP-15R	4/16/19	SB	5-6	Coal tar-like odor	0.2	1,510	5	12.5	15	Area 3A
			6-7	Solidified coal tar-like material (at 7'); coal tar-like odor	86.2					
			10.5-12.5	-- No visual impacts or coal tar-like odors --	0.0	5.86				
TP-16	3/9/05	TP	5-6.5	-- No visual impacts or coal tar-like odors --	9.5	1,800	3	6.5	20	Misc.
TP-18	3/9/05	TP	2-7	Slight sheen	0.1	NA	--	11	20	Misc.

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
TP-21	3/10/05	TP	7-9	Sheen on water; creosote-like odor	N/A	24.9 [25.3]	8	11	20	Central Site
TP-23	3/10/05	TP	6-8	-- No visual impacts or coal tar-like odors --	43.7	57.8	5	10	13	FBA
TP-24	3/11/05	TP	6-12	Slight creosote-like odor	N/A	NA	6	8	12	FBA
TP-25	3/11/05	TP	2-3	Tar, staining	N/A	NA	5	9	14	FBA
			3-5	Strong petroleum-like odor	N/A	43.6				
TP-30	3/14/05	TP	1-2	-- No visual impacts or coal tar-like odors --	N/A	17.9	--	4	17	Area 2
			11-13	-- No visual impacts or coal tar-like odors --	N/A	26.1				
TP-32	3/14/05	TP	5.5-7.5	Light sheen; petroleum-like odor	N/A	89.2	--	15	20	Misc.
TP-33	3/14/05	TP	8-10	Strong petroleum-like odor	109	3,680	--	12	20	Misc.
TP-34	3/14/05	TP	3-5	Sheen; slight petroleum-like odor	N/A	55.7	3	8	17	Area 4
TP-35	3/15/05	TP	3-5	Sheen; petroleum-like odor	N/A	467	--	--	6	RCRA Area
TP-36	3/15/05	TP	6-8	Sheen; slight petroleum-like odor	N/A	104	--	--	8	RCRA Area
TP-37	3/15/05	TP	4-5	2" Hardened tar above slag	N/A	NA	--	12	20	Area 2
			8-9	Sheen, tar-like odor	N/A	402				
			9-10	Sheen, tar-like odor	N/A	288				
TP-37A	3/15/05	TP	12	Tar; structures	N/A	NA	10	10	12	Area 2
TP-39	3/16/05	TP	8-10	Tar-like material; strong tar-like odor; strong petroleum-like odor; staining	7.4	410	6	10	18	Central Site
TP-42/ TP-42A	3/16/05	TP	1-5	Sheen; three 2" steel pipes	N/A	NA	--	9	20	Central Site
TP-44	3/16/05	TP	2-3	Tar	1.5	NA	3	--	9	FBA
			3-5	3" PVC pipe wrapped in fabric	35	87.9				
			5-8	-- No visual impacts or coal tar-like odors --	7.5	NA				
TP-44R	4/22/19 4/24/19	TP	3.0-4.5	-- No visual impacts or coal tar-like odors --	1.6	6.28	4	8	10	FBA
			4.5-5.0	Petroleum-like odor	62.1					
			5-7	Rainbow sheen	31.8	2.75				
			7-9	-- No visual impacts or coal tar-like odors --	0.0	0.044				
TP-57	3/19/05	TP	7-9	Slight odor	N/A	NA	9	17	20	Central Site
TP-58	3/18/05	TP	10-12	Free product	N/A	58.1	11	17	20	Central Site
TP-59	3/18/05	TP	11-13	Sheen	N/A	7.96	8	12	20	Central Site
TP-60	3/18/05	TP	5-8	Sheen, slight petroleum-like odor	N/A	NA	6	21	22	Area 1A
			17-19	Product, sheen	N/A	233				
TP-63	3/21/05	TP	4-8	-- No visual impacts or coal tar-like odors --	9.4	NA	7	11	20	Area 4
			8-8.5	Tar, sheen, strong tar-like odor	47.2	95,000				
TP-63R	4/18/19	SB	7-9	-- No visual impacts or coal tar-like odors --	0.0	292	4	11	15	Area 4
			11-13	-- No visual impacts or coal tar-like odors --	0.0	0.201				
TP-64	3/21/05	TP	2-4	Tar	1.8	3,520	6	15	20	Area 4
			6-7	Sheen; moderate petroleum-like odor	0.0	NA				
			7-10	Sheen; moderate petroleum-like odor	4.5	6.27				
TP-67	3/21/05	TP	5-7	Slight sheen	N/A	NA	5	7	19	Central Site
TP-68/68A	3/21/05	TP	0-5	Very hard tar; moderate tar-like odor; 12' cast-iron pipe containing tar	N/A	NA	--	14	14	Central Site
			8-10	Sheen; moderate tar-like odor	N/A	71.4				
TP-69	3/22/05	TP	5-12	Slight petroleum-like odor	N/A	NA	5	18	22	RCRA Area
TP-70	3/22/05	TP	11-13	-- No visual impacts or coal tar-like odors --	N/A	956 [2,380]	6	9	20	Area 2
TP-71	3/22/05	TP	9-11	Moderate petroleum-like odor	N/A	1,200	6	9	20	Area 2
TP-75	3/23/05	TP	3-7	Sheen; PVC pipes in gravel bed	11.4	NA	5	7	14	FBA
			7-14	Heavy sheen; strong petroleum-like odors	12.9	1.14				FBA
TP-78	3/23/05	TP	6-8	Slight petroleum-like odor	N/A	35.3	5	15	20	FBA
W-3	3/26/85	TP	7-8	Bad odor	18	NA	3.5	7	14	Central Site
			8-10	Bad odor	880	NA				
			10-12	Bad odor	>1000	NA				
			12-14	-- No visual impacts or coal tar-like odors --	220	NA				
W-4	3/25/85	TP	6-8	-- No visual impacts or coal tar-like odors --	350	NA	6	14.5	16	Perimeter
			8-11	-- No visual impacts or coal tar-like odors --	520	NA				
			11-13	-- No visual impacts or coal tar-like odors --	680	NA				
			13-15	-- No visual impacts or coal tar-like odors --	220	NA				
			15-16	-- No visual impacts or coal tar-like odors --	160	NA				
W-5	10/15/86	TP	2-4	-- No visual impacts or coal tar-like odors --	1.0	NA	6.5	10	16	Misc.
			8-10	-- No visual impacts or coal tar-like odors --	2.0	NA				
			12-14	-- No visual impacts or coal tar-like odors --	16	NA				
			14-16	-- No visual impacts or coal tar-like odors --	1.0	NA				

Sample ID	Sample Date	Location Type	Depth Interval (ft bgs)	Observations of Staining, Sheens, Coal Tar, Purifier Waste, and/or Odors	PID Reading (ppm)	Total PAH (ppm)	Depth to Saturated Interval (ft bgs)	Top of Clay (ft bgs)	Boring/ Test Pit Depth (ft bgs)	Site Location
W-6	10/15/86	TP	0-2	*-- No visual impacts or coal tar-like odors --*	198	NA	5	10	14	Area 2
			2-4	*-- No visual impacts or coal tar-like odors --*	59	NA				
			4-6	*-- No visual impacts or coal tar-like odors --*	180	NA				
			6-8	*-- No visual impacts or coal tar-like odors --*	20	NA				
			8-10	*-- No visual impacts or coal tar-like odors --*	16	NA				
			10-12	*-- No visual impacts or coal tar-like odors --*	12	NA				
			12-14	*-- No visual impacts or coal tar-like odors --*	14	NA				

Notes:

1. Table presents sample intervals where visual impacts and coal tar-like odors were observed. Table also presents the sample intervals with photoionization detector (PID) headspace readings above 0.0 parts per million (ppm) and sample intervals analyzed for polycyclic aromatic hydrocarbons (PAHs). Even if there are no visual impacts, soil samples analyzed for PAHs, or elevated PID readings, 2018 and 2019 soil borings and test pits are summarized within to document the observed saturation depth and silty-clay layer contact depth.
2. The consultant responsible for performing soil borings and test pits can be identified by series as follows:
   "W-" Series in 1985 and 1986 - Monitoring wells were installed and logged by Woodward-Clyde Consultants (WCC).
   "B-" Series in 1986 - Soil borings advanced and logged by WCC.
   "PSSTP-" Series in 2003 - Test pits excavated and logged by Paulus Sokolowski and Sartor Engineering, PC (PS&S).
   "PC-B" Series in 2005 - Soil borings were advanced by Earth Engineering Incorporated (EEI) and logged by PS&S.
   "PCSB-" Series in 2005 - Soil borings were advanced and logged by PS&S.
   "PCTP-" Series in 2005 - Test pits were excavated and logged by PS&S.
   "TP-" Series in 2005 - Test pits were excavated by EEI and logged by PS&S.
   "MW-" Series in 2018 and 2019 - Monitoring wells were installed and logged by Arcadis U.S., Inc. (Arcadis).
   "S-" Series in 2019 - Soil borings and test pits were performed by Arcadis.
   "..R" Revisited Locations in 2019 - Soil borings and test pits were performed by Arcadis.
3. Depths are measured in feet below ground surface (ft bgs).
4. Gray shading and black borders indicate that the test pit or soil boring was performed in 2018 or 2019.
5. PID headspace screening results are reported in ppm.
6. If the presented sample interval had more than three PID readings, the range of PID readings is presented from minimum to maximum for that interval.
7. Total PAH is the sum of the 16 priority pollutant PAHs identified by the United States Environmental Protection Agency (USEPA) and 2-methylnaphthalene.
8. Duplicate values are presented in brackets [ ].
9. SB = Soil boring.
10. TP = Test pit.
11. HA = Hand auger.
12. N/A = Not available.
13. NA = Not analyzed for PAHs.
14. -- = Not encountered.
15. Revisited sampling locations were renamed with the suffix "R", and represent the same location as the historical sampling locations without the suffix "R".
16. Site locations are further described below:
   Area 1A = Eastern part of former coal storage area (around PCTP-75R).
   Area 1B = East of former coal storage area (around PSSTP-04R).
   Area 2 = North/Northwest of former tar storage area.
   Area 3A = South of former tar storage area (around TP-15).
   Area 3B = South of former tar storage area (around PCTP-66).
   Area 4 = East of former byproducts building.
   Central Site = General region between Areas 1, 2, and 3.
   FBA = Fuel blending area.
   FBA: Perimeter = Perimeter location within the fuel blending area.
   FBA: RR = Fuel blending area: near inactive railroad track (around PCSB-41R).
   Northern Corner = Northern corner of the Site near intersection of Buckius and Richmond Streets (around PCSB-01R).
   Perimeter = Perimeter location outside of the fuel blending area.
   RCRA Area = 1990's Resource Conservation and Recovery Act soil removal area.
   Misc. = Sample location that is outside the above mentioned areas.

Table 4
Monitoring Well Construction Details

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID	Date Completed	Top of Outer Casing Elevation (feet NAVD 88)	Top of PVC Pipe Elevation (feet NAVD 88)	Ground Surface Elevations (feet NAVD 88)	Inner Casing Diameter (inches)	Stickup Length (feet ags)	Screened Interval (feet bgs)	
							Top	Bottom
PCMW-01	8/4/2005	10.56	10.19	7.37	4	3.19	1	9
PCMW-04	8/5/2005	12.65	11.89	8.32	4	4.33	1	9
PCMW-05	8/5/2005	12.08	11.70	7.50	4	4.58	1	10
PCMW-06	8/5/2005	12.28	11.20	8.11	4	4.17	2	10
PCMW-07	8/18/2005	12.24	11.34	9.55	4	2.69	1	10
PCMW - 08S	8/30/2005	19.00	18.49	15.77	2	3.23	5	15
PCMW - 08D	10/26/2005	17.83	17.21	15.79	2	2.04	26	36
PCMW - 09S	8/31/2005	19.43	18.80	16.09	2	3.34	4	14
PCMW - 10S	8/23/2005	15.85	15.22	12.85	2	3.00	5	15
PCMW - 10D	9/28/2005	14.54	13.80	12.73	2	1.81	23	33
PCMW - 11S	8/30/2005	19.51	18.89	16.45	2	3.06	5	15
PCMW - 12S	8/19/2005	14.60	13.82	11.27	2	3.32	2	10
PCMW - 15S	8/25/2005	18.68	18.08	15.19	2	3.49	5	15
PCMW - 15D	10/14/2005	17.24	16.82	15.00	2	2.24	31	41
PCMW - 16D	10/24/2005	13.42	12.92	11.39	2	2.03	23	33
PCMW - 17S	8/29/2005	14.98	14.44	11.75	2	3.23	4	14
PCMW - 17D	10/20/2005	14.89	14.27	11.33	2	3.56	30	40
PCMW - 18S	8/29/2005	21.26	20.61	18.84	2	2.42	5	20
PCMW - 18D	10/10/2005	19.95	19.00	18.22	2	1.73	27	37
PCMW - 19S	8/24/2005	15.25	14.75	11.83	2	3.42	3	13
PCMW - 19D	10/11/2005	14.18	13.24	11.56	2	2.62	27	37
PCMW - 20S	8/23/2005	15.68	15.18	12.73	2	2.95	3	13
PCMW - 20D	10/7/2005	14.54	14.27	12.85	2	1.69	18	28
MW - 5	10/23/1986	13.95	13.77	11.86	2	2.09	4	14
MW - 6	10/23/1986	13.43	13.21	11.95	2	1.48	3	13
MW-101	5/14/2018	15.19	14.84	12.84	2	2.35	4	14
MW-102	5/16/2018	17.20	16.92	14.83	2	2.37	8	18
MW-103	5/16/2018	16.36	16.09	13.83	2	2.53	6	16
MW-104	5/15/2018	14.06	13.93	11.64	2	2.42	4	11
MW-105	5/15/2018	14.35	13.99	12.14	2	2.22	4	14
MW-106	5/15/2018	9.22	9.03	6.81	2	2.41	4	10
MW-107	5/15/2018	10.35	10.11	7.98	2	2.38	4	10
MW-108	9/24/2019	17.46	16.96	14.65	2	2.81	9	19
MW-109	9/25/2019	13.35	13.19	10.88	2	2.48	9	19
MW-110	9/25/2019	11.22	10.86	8.38	2	2.84	4	14
MW-111	9/25/2019	19.73	19.32	16.71	2	3.02	9	19
MW-112	9/24/2019	12.63	12.08	9.48	2	3.14	4	14
MW-113	9/25/2019	18.41	18.37	16.13	2	2.29	7	17

Notes:

1. NAVD 88 = North American Vertical Datum of 1988.
2. ags = above ground surface.
3. bgs = below ground surface.
4. Monitoring wells were completed with steel stick-up protective casings.
5. Monitoring wells were constructed with polyvinyl chloride inner casings.
6. Monitoring wells were not installed with a sump (i.e., well depths are equal to screen depths), except MW-111 which has a 1-foot sump underneath the screened interval and MW-5 which has a 2-foot sump underneath the screened interval.
7. Each deep well (well ID contains suffix D) has a steel casing extending through the fill layer.
8. The following wells are destroyed or could not be found during any of the 2018 groundwater sampling events:

- PCMW-02	- PCMW-13D
- PCMW-03	- PCMW-13S
- PCMW-09D	- PCMW-14D
- PCMW-11D	- PCMW-14S
- PCMW-12D	- PCMW-16S

9. The screen intervals for both MW-5 and MW-6 were estimated based on the downhole camera footage.

Table 5
Groundwater Elevation Data

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location	Reference Point Elevation (NAVD 88, except as shaded)	Depth to Groundwater (feet bmp)							
		10/31/05	12/30/05	1/30/06	3/14/06 at high tide	3/14/06 at low tide	3/19/18 between 0830-1000 EDT	5/29/18 between 0900-1100 EST	10/3/19 between 0900-1100 EST
PCMW-01	10.19	5.81	5.71	5.42	6.00	6.00	6.02	NM	7.21
PCMW-02	10.11	5.82	5.73	5.46	5.98	5.99	MISSING/DESTROYED		
MW-106	9.03	--	--	--	--	--	--	4.19	5.87
PCMW-03	6.75	2.61	2.52	2.24	2.66	2.67	MISSING/DESTROYED		
PCMW-04	11.89	7.12	6.81	6.35	7.18	7.14	6.64	6.80	8.96
PCMW-05	11.70	6.60	6.16	5.71	6.55	6.53	5.98	6.12	8.73
PCMW-06	11.20	6.26	5.86	5.32	6.25	6.25	5.54	6.73	8.24
PCMW-07	11.34	6.40	5.88	5.09	6.17	6.16	MISSING/DESTROYED		
PCMW-08S	18.49	12.06	11.06	9.94	11.28	11.21	9.83	10.45	13.45
PCMW-08D	17.21	17.90	16.32	17.55	16.25	17.55	16.77	16.43	17.35
PCMW-09S	18.80	12.05	10.67	9.74	10.80	10.78	9.72	10.31	12.96
PCMW-09D	17.52	16.99	17.25	18.18	16.61	NM	MISSING/DESTROYED		
PCMW-10S	15.22	10.55	9.97	9.12	10.27	10.25	8.97	9.39	12.26
PCMW-10D	13.80	12.90	12.92	13.74	13.00	13.93	13.00	12.91	NM
PCMW-11S	18.89	12.07	10.65	9.78	10.70	10.71	9.82	10.41	12.50
PCMW-11D	17.74	17.16	16.78	17.59	16.81	17.75	MISSING/DESTROYED		
PCMW-12S	13.82	5.23	4.00	3.25	4.32	4.31	3.40	3.37	Obstructed
PCMW-12D	13.29	12.44	12.38	12.78	12.43	12.98	MISSING/DESTROYED		
PCMW-13S	15.75	10.57	10.17	9.1	10.28	10.22	MISSING/DESTROYED		
PCMW-13D	13.94	12.31	12.26	11.49	12.19	12.4	MISSING/DESTROYED		
PCMW-14S	15.39	8.47	7.76	6.88	7.21	7.77	MISSING/DESTROYED		
MW-101	14.84	--	--	--	--	--	--	6.83	9.61
PCMW-14D	13.83	12.81	12.29	12.81	12.48	13.2	MISSING/DESTROYED		
PCMW-15S	18.08	9.86	9.21	8.34	9.29	9.26	8.63	9.15	11.70
PCMW-15D	16.82	16.10	15.78	15.90	15.90	16.21	15.32	15.13	15.91
PCMW-16S	14.35	9.87	8.92	7.49	8.48	8.51	MISSING/DESTROYED		
MW-105	13.99	--	--	--	--	--	--	8.40	Obstructed
PCMW-16D	12.92	12.11	12.20	12.31	12.35	12.29	11.77	11.11	12.06
PCMW-17S	14.44	6.70	5.98	4.75	5.98	6.03	4.20	5.27	9.69
PCMW-17D	14.27	13.29	13.25	13.18	13.36	13.39	12.62	12.58	13.10
PCMW-18S	20.61	18.38	18.50	17.61	18.03	18.10	16.75	18.55	17.67
PCMW-18D	19.00	17.30	17.46	16.61	17.20	17.19	15.95	17.27	16.90
PCMW-19S	14.75	6.99	7.05	6.49	7.41	7.41	6.63	7.80	9.03
PCMW-19D	13.24	11.97	12.03	11.61	11.99	11.95	11.02	11.66	11.43
PCMW-20S	15.18	8.19	8.04	7.47	8.45	8.43	7.75	NM	10.36
PCMW-20D	14.27	13.05	13.22	12.91	13.26	13.20	12.30	12.79	12.72
MW-5	13.77	--	--	--	--	--	6.47	NM	8.72
MW-6	13.21	--	--	--	--	--	3.95	NM	NM
MW-102	16.92	--	--	--	--	--	--	10.60	12.27
MW-103	16.09	--	--	--	--	--	--	10.49	12.88
MW-104	13.93	--	--	--	--	--	--	6.55	9.39
MW-107	10.11	--	--	--	--	--	--	5.15	7.20
MW-108	16.96	--	--	--	--	--	--	--	13.27
MW-109	13.19	--	--	--	--	--	--	--	9.52
MW-110	10.86	--	--	--	--	--	--	--	7.43
MW-111	19.32	--	--	--	--	--	--	--	12.84
MW-112	12.08	--	--	--	--	--	--	--	7.90
MW-113	18.41	--	--	--	--	--	--	--	12.34

Table 5
Groundwater Elevation Data

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location	Reference Point Elevation (NAVD 88, except as shaded)	Water Level Elevation (feet NAVD 88, except as shaded)							
		10/31/05	12/30/05	1/30/06	3/14/2006 at high tide	3/14/2006 at low tide	3/19/18 between 0830-1000 EDT	5/29/18 between 0900-1100 EST	10/3/19 between 0900-1100 EST
PCMW-01	10.19	4.38	4.48	4.77	4.19	4.19	4.17	NM	2.98
PCMW-02	10.11	4.29	4.38	4.65	4.13	4.12	MISSING/DESTROYED		
MW-106	9.03	--	--	--	--	--	--	4.84	3.16
PCMW-03	6.75	4.14	4.23	4.51	4.09	4.08	MISSING/DESTROYED		
PCMW-04	11.89	4.77	5.08	5.54	4.71	4.75	5.25	5.09	2.93
PCMW-05	11.70	5.10	5.54	5.99	5.15	5.17	5.72	5.58	2.97
PCMW-06	11.20	4.94	5.34	5.88	4.95	4.95	5.66	4.47	2.96
PCMW-07	11.34	4.94	5.46	6.25	5.17	5.18	MISSING/DESTROYED		
PCMW-08S	18.49	6.43	7.43	8.55	7.21	7.28	8.66	8.04	5.04
PCMW-08D	17.21	-0.69	0.89	-0.34	0.96	-0.34	0.44	0.78	-0.14
PCMW-09S	18.80	6.75	8.13	9.06	8.00	8.02	9.08	8.49	5.84
PCMW-09D	17.52	0.53	0.27	-0.66	0.91	NM	MISSING/DESTROYED		
PCMW-10S	15.22	4.67	5.25	6.10	4.95	4.97	6.25	5.83	2.96
PCMW-10D	13.80	0.90	0.88	0.06	0.80	-0.13	0.80	0.89	NM
PCMW-11S	18.89	6.82	8.24	9.11	8.19	8.18	9.07	8.48	6.39
PCMW-11D	17.74	0.58	0.96	0.15	0.93	-0.01	MISSING/DESTROYED		
PCMW-12S	13.82	8.59	9.82	10.57	9.50	9.51	10.42	10.45	Obstructed
PCMW-12D	13.29	0.85	0.91	0.51	0.86	0.31	MISSING/DESTROYED		
PCMW-13S	15.75	5.18	5.58	6.65	5.47	5.53	MISSING/DESTROYED		
PCMW-13D	13.94	1.63	1.68	2.45	1.75	1.54	MISSING/DESTROYED		
PCMW-14S	15.39	6.92	7.63	8.51	8.18	7.62	MISSING/DESTROYED		
MW-101	14.84	--	--	--	--	--	--	8.01	5.23
PCMW-14D	13.83	1.02	1.54	1.02	1.35	0.63	MISSING/DESTROYED		
PCMW-15S	18.08	8.22	8.87	9.74	8.79	8.82	9.45	8.93	6.38
PCMW-15D	16.82	0.72	1.04	0.92	0.92	0.61	1.50	1.69	0.91
PCMW-16S	14.35	4.48	5.43	6.86	5.87	5.84	MISSING/DESTROYED		
MW-105	13.99	--	--	--	--	--	--	5.59	Obstructed
PCMW-16D	12.92	0.81	0.72	0.61	0.57	0.63	1.15	1.81	0.86
PCMW-17S	14.44	7.74	8.46	9.69	8.46	8.41	10.24	9.17	4.75
PCMW-17D	14.27	0.98	1.02	1.09	0.91	0.88	1.65	1.69	1.17
PCMW-18S	20.61	2.23	2.11	3.00	2.58	2.51	3.86	2.06	2.94
PCMW-18D	19.00	1.70	1.54	2.39	1.80	1.81	3.05	1.73	2.10
PCMW-19S	14.75	7.76	7.70	8.26	7.34	7.34	8.12	6.95	5.72
PCMW-19D	13.24	1.27	1.21	1.63	1.25	1.29	2.22	1.58	1.81
PCMW-20S	15.18	6.99	7.14	7.71	6.73	6.75	7.43	NM	4.82
PCMW-20D	14.27	1.22	1.05	1.36	1.01	1.07	1.97	1.48	1.55
MW-5	13.77	--	--	--	--	--	7.30	NM	5.05
MW-6	13.21	--	--	--	--	--	9.26	NM	NM
MW-102	16.92	--	--	--	--	--	--	6.32	4.65
MW-103	16.09	--	--	--	--	--	--	5.60	3.21
MW-104	13.93	--	--	--	--	--	--	7.38	4.54
MW-107	10.11	--	--	--	--	--	--	4.96	2.91
MW-108	16.96	--	--	--	--	--	--	--	3.69
MW-109	13.19	--	--	--	--	--	--	--	3.67
MW-110	10.86	--	--	--	--	--	--	--	3.43
MW-111	19.32	--	--	--	--	--	--	--	6.48
MW-112	12.08	--	--	--	--	--	--	--	4.18
MW-113	18.41	--	--	--	--	--	--	--	6.07

Notes:

1. Gray shading indicates that the elevations is referenced to feel above mean sea level. For these locations, the vertical datum is unknown because the wells were not resurveyed during the supplemental investigation. The reference point elevation used for these wells is the elevation reporting during the initial investigation, and the vertical datum was not indicated in the initial investigatio
2. NAVD 88 = North American Vertical Datum of 1988.
3. MW = monitoring well.
4. bmp = below measuring point.
5. MISSING/DESTROYED = monitoring well was unable to be found, destroyed, or inaccessible.
6. Obstructed = monitoring well was obstructed.
7. DRY = monitoring well was void of water except on the surface of the base of the well.
8. -- = Not applicable. Well wasn't installed.
9. NM = Not measured.

Table 6
Supplemental Investigation Survey Data

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID	Northing	Easting	Elevation
Monitoring Wells			
MW-101	252827.23	2719591.58	12.84
MW-102	253136.11	2719717.00	14.83
MW-103	252910.10	2720099.58	13.83
MW-104	252335.78	2719009.41	11.64
MW-105	251956.05	2719250.38	12.14
MW-106	251683.60	2720437.09	6.81
MW-107	252078.66	2720497.81	7.98
MW-108	252645.00	2720170.13	14.65
MW-109	252689.06	2720267.00	10.88
MW-110	252610.93	2720324.17	8.38
MW-111	251899.94	2719793.69	16.71
MW-112	251769.62	2719952.29	9.48
MW-113	251714.62	2719797.94	16.13
Soil Borings			
PCSB-01R	253971.60	2719455.73	18.20
PCSB-26R	252024.52	2720514.31	6.40
PCSB-30R	251555.74	2720384.85	6.16
PCSB-41R	252342.54	2720479.81	6.60
PCSB-49R	251905.00	2720226.12	8.20
PCTP-01R	253846.11	2719304.52	19.40
PCTP-02R	253544.74	2719225.22	13.60
PCTP-07R	252570.87	2720182.98	15.43
PCTP-08R	253248.40	2719480.63	12.30
PCTP-10R	252937.01	2719331.86	11.70
PCTP-12R	252733.41	2719180.85	10.47
PCTP-17R	252632.81	2719340.24	15.50
PCTP-28R	252748.92	2719804.49	16.90
PCTP-32R	252335.44	2719414.99	12.06
PCTP-47R	252251.58	2719972.35	16.75
PCTP-49R	252309.92	2719106.31	12.00
PCTP-51R	251732.63	2719602.76	15.72
PCTP-73R	253343.04	2719870.71	10.53
PCTP-75R	252910.91	2720140.44	11.91
PSSTP-01R	253854.17	2719541.79	17.46
PSSTP-04R	252671.14	2720191.55	13.60
PSSTP-07R	251966.78	2719374.33	12.93
PSSTP-10R	252849.69	2718912.52	11.10
PSSTP-22R	252669.10	2719644.65	13.00
S-101	252928.37	2720126.29	12.32
S-102	252920.43	2720154.80	11.53
S-103	252883.47	2720152.72	12.55
S-104	252897.78	2720119.40	13.07
S-105	252873.56	2719221.60	11.83
S-106	252786.56	2719274.61	11.55
S-108	252671.78	2719388.25	15.00
S-109	252593.44	2719444.95	14.40
S-110	252774.87	2719155.17	11.22
S-112	252707.17	2719145.13	9.13
S-113B	252631.18	2719223.82	10.50
S-114	252583.33	2719328.47	16.71
S-115	252567.82	2719016.27	11.90
S-116	252562.04	2719049.41	11.52
S-117	252536.11	2719009.37	12.21
S-118	252528.55	2719045.01	11.60
S-119	252707.32	2718720.72	12.96
S-121	252675.80	2718720.66	13.99
S-122	252666.86	2718748.63	12.92
S-123	252189.01	2719742.16	15.25
S-124	252103.95	2719788.02	15.36
S-125	252033.99	2719772.34	15.10
S-126	252209.32	2719572.37	15.70
S-127	252071.41	2719629.06	14.80
S-128	252010.70	2719731.31	14.11
S-129	251986.50	2719691.70	14.54
S-130	252137.45	2719550.64	12.80

Location ID	Northing	Easting	Elevation
Soil Borings			
S-131	252040.34	2719592.18	11.43
S-132	251996.03	2719614.36	13.00
S-133	251960.68	2719644.74	15.20
S-134	253007.61	2718965.40	14.69
S-135	252356.76	2720186.16	9.38
S-136	251591.03	2719840.54	8.10
S-137	251505.65	2719571.15	9.73
S-138	253728.59	2719645.19	16.69
S-139	253603.37	2719720.02	14.60
S-140	253290.84	2719920.43	11.72
S-144	253980.81	2719432.91	18.25
S-145	253992.72	2719462.63	18.04
S-146	253953.28	2719470.60	18.29
S-147	252690.27	2720204.08	13.74
S-148	252648.54	2720196.18	14.30
S-149	252668.42	2720168.16	14.00
S-150	252338.70	2720459.97	7.00
S-151	252337.23	2720498.02	7.00
S-152	252360.18	2720468.29	7.20
S-153	251954.43	2719678.23	14.34
S-154	251965.09	2719707.52	14.62
S-155	251986.66	2719755.27	15.07
S-156	252703.97	2720281.99	15.81
S-157	252624.28	2720252.45	14.88
S-158	252608.44	2720098.04	16.29
S-159	252751.01	2720148.79	14.00
S-163	252797.48	2719336.70	10.99
S-164	252313.50	2720528.29	6.74
S-165	252295.43	2720502.78	6.54
S-166	252682.90	2720115.39	15.57
S-167	252762.09	2720248.62	10.05
S-168	251954.16	2719839.39	16.99
S-169	251902.70	2719877.12	19.65
S-170	251876.84	2719818.66	19.72
S-171	251848.49	2719745.96	16.96
S-172	251823.86	2719691.72	17.55
S-173	251870.67	2719657.29	17.60
TP-15R	252547.94	2719031.29	11.41
TP-63R	252076.87	2719747.86	14.88
Test Pits			
PCTP-66R	252684.90	2718734.42	13.32
S-107	252712.27	2719326.97	11.96
S-111	252763.19	2719235.19	11.54
S-113	252632.51	2719225.09	10.50
S-120	252697.55	2718757.32	12.34
S-141	252617.92	2719194.75	10.63
S-142	252843.78	2719300.54	11.27
TP-44R	252287.87	2720365.63	11.00
Subsurface Utilities			
MH-4	253149.45	2719309.57	13.29
PIPE-12-1	252638.81	2719221.94	10.60
PIPE-12-1	252629.45	2719227.59	10.50
PIPE-12-1	252616.03	2719204.74	10.30
PIPE-12-1	252726.87	2719169.00	10.70
PIPE-24-1	252618.84	2719216.97	10.40
PIPE-24-1	252626.53	2719232.06	10.50
PIPE-24-1	252642.17	2719223.63	10.60
PIPE-24-1	252741.28	2719171.98	10.80
PIPE-24-1	252768.68	2719198.95	10.61

Notes:

1. Northing and Eastings are in feet referenced to the North American Datum of 1983, State Plane of Pennsylvania-South.
2. Elevations are in feet referenced to the North American Vertical Datum of 1988.
3. Revisited sampling locations were renamed with the suffix "R", and represent the same location as the historical sampling locations without the suffix "R".
4. Reported monitoring well, soil boring, and test pit elevations are the ground surface. Reported subsurface utility elevations are the top of pipe, except for MH-4 where the reported elevation is the ground surface.

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-26	PCSB-26R	PCSB-27		PCSB-28	PCSB-29	PCSB-30	PCSB-30R	PCSB-31	PCSB-32	PCSB-33	PCSB-34
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	0.5	0.5-2	0.5	1.5	0.5	0.5	0.5	0.5-2	0.5	0.5	0.5	0.5
Date Collected:	CAS Number			7/26/05	4/19/19	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05	4/19/19	7/28/05	7/28/05 / 8/1/05	7/28/05	7/27/05
Volatile Organic Compounds															
Acetone	67-64-1	10,000	10,000	0.034	0.0087 J	< 0.013	< 0.006	< 0.013	< 0.0059	< 0.006	0.0252	< 0.0074	< 0.0072	< 0.0066	< 0.0064
Benzene	71-43-2	0.5	290	< 0.00083	< 0.00058	< 0.0013	< 0.00058	< 0.0012	< 0.00057	< 0.00057	< 0.00092	< 0.00071	< 0.00069	< 0.00064	< 0.00061
Carbon Disulfide	75-15-0	620	10,000	< 0.0011	< 0.0023	< 0.0016	< 0.00074	< 0.0015	< 0.00072	< 0.00073	< 0.0037 J	< 0.0009	< 0.00088	< 0.00081	< 0.00078
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0023	NA	NA	NA	NA	NA	< 0.0037	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.018 B	< 0.0058	0.021 B	0.013 B	0.017 B	0.013 B	0.0058 B	< 0.0092	0.038 B	0.021 B	0.028 B	0.0093 B
Ethylbenzene	100-41-4	70	890	< 0.0012	< 0.0012	< 0.0019	< 0.00085	< 0.0018	< 0.00083	< 0.00084	< 0.0018	< 0.001	< 0.001	< 0.00093	< 0.0009
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0023	NA	NA	NA	NA	NA	< 0.0037	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0018	< 0.0012	< 0.0028	< 0.0013	< 0.0026	< 0.0012	< 0.0012	< 0.0018	< 0.0015	< 0.0015	< 0.0014	< 0.0013
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.0058	NA	NA	NA	NA	NA	< 0.0092	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0023	NA	NA	NA	NA	NA	< 0.0037	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00076	NA	< 0.0012	< 0.00053	< 0.0011	< 0.00052	< 0.00053	NA	< 0.00065	< 0.00063	< 0.00058	< 0.00056
o-Xylene	95-47-6	- -	- -	NA	< 0.0012	NA	NA	NA	NA	NA	< 0.0018	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.001	< 0.0023	< 0.0016	< 0.0007	< 0.0015	< 0.00069	< 0.0007	< 0.0037	< 0.00086	< 0.00084	< 0.00078	< 0.00075
Toluene	108-88-3	100	10,000	< 0.0012	< 0.0012	< 0.0019	< 0.00086	< 0.0018	< 0.00084	< 0.00085	< 0.0018	< 0.001	< 0.001	< 0.00094	< 0.00091
Total Xylenes	1330-20-7	1,000	8,000	NA	< 0.0012	NA	NA	NA	NA	NA	< 0.0018	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	11,000	NA	< 0.077	NA	NA	NA	NA	NA	< 0.089	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.052	< 0.19	< 0.27	< 0.032	< 0.055	< 0.031	< 0.052	< 0.22	< 0.039	< 0.038	< 0.035	< 0.28
2-Methylnaphthalene	91-57-6	1,900	13,000	0.12	< 0.038	0.73	< 0.065	0.78	0.072	0.36	< 0.045	< 0.079	< 0.076	0.14	0.74
2-Methylphenol	95-48-7	580	160,000	< 0.18	< 0.077	< 0.92	< 0.14	< 0.19	< 0.14	< 0.18	< 0.089	< 0.17	< 0.17	< 0.16	< 0.96
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	< 0.077	NA	NA	NA	NA	NA	< 0.089	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	16,000	< 0.2	NA	< 1	< 0.14	< 0.21	< 0.14	< 0.2	NA	< 0.17	< 0.16	< 0.15	< 1.1
4-Nitroaniline	100-01-6	17	4,600	NA	< 0.19	NA	NA	NA	NA	NA	< 0.22	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.16	< 0.038	< 0.081	< 0.0062	0.079	< 0.0061	< 0.016	< 0.045	< 0.0076	< 0.0073	< 0.0069	< 0.084
Acenaphthylene	208-96-8	8,000	190,000	0.23	< 0.038	1.7	< 0.0057	0.35	< 0.0056	0.1	< 0.045	< 0.007	< 0.0067	0.072	2.3
Acetophenone	98-86-2	1,200	10,000	NA	< 0.19	NA	NA	NA	NA	NA	< 0.22	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.61	< 0.038	1.6	< 0.0075	0.47	< 0.0073	0.22	< 0.045	< 0.0092	< 0.0088	< 0.0082	4.2
Benz(a)anthracene	56-55-3	430	130	3.8	0.134	9.2	0.046	2.4	0.067	0.68	0.0283 J	< 0.0065	0.052	0.23	16
Benzaldehyde	100-52-7	- -	- -	NA	< 0.19	NA	NA	NA	NA	NA	< 0.22	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	3.1	0.154	8.8	0.042	2.1	0.055	0.41	0.0339 J	< 0.0077	0.051	0.24	14
Benzo(b)fluoranthene	205-99-2	170	76	4.8	0.211	11	0.13	4	0.12	0.97	0.0478	0.07	0.087	0.45	19
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.3	0.102	7.3	< 0.0054	2	0.045	0.39	0.0281 J	< 0.0067	< 0.0064	0.23	13
Benzo(k)fluoranthene	207-08-9	610	76	1.8	0.0702	4.1	0.046	0.94	< 0.013	0.24	< 0.045	< 0.016	< 0.016	0.12	7.4
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	0.11	< 0.077	< 0.17	< 0.024	0.27	0.1	0.55	< 0.089	0.077	0.1	0.18	0.23
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.015	< 0.077	< 0.078	< 0.01	< 0.016	< 0.01	0.13	< 0.089	< 0.013	< 0.012	< 0.011	< 0.081
Carbazole	86-74-8	110	4,600	0.18	0.0116 J	0.46	< 0.0073	0.19	< 0.0071	< 0.011	< 0.089	< 0.0089	< 0.0085	< 0.008	0.75
Chrysene	218-01-9	230	760	3.9	0.142	9.6	0.085	3	0.099	0.99	0.0272 J	0.053	0.065	0.36	16
Dibenz(a,h)anthracene	53-70-3	270	22	0.8	0.0326 J	2.5	< 0.0069	0.85	< 0.0068	0.16	< 0.045	< 0.0085	< 0.0081	0.062	4.3
Dibenzofuran	132-64-9	310	3,200	0.16	< 0.077	0.44	< 0.049	0.35	< 0.048	0.22	< 0.089	< 0.06	< 0.057	0.056	0.83
Diethyl phthalate	84-66-2	9,300	10,000	< 0.01	< 0.077	< 0.053	< 0.0089	< 0.011	< 0.0087	< 0.01	< 0.089	< 0.011	< 0.01	< 0.0098	< 0.055
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.0085	< 0.077	< 0.043	0.039 B	0.054 B	< 0.0075	< 0.0084	< 0.089	< 0.0094	< 0.009	0.045	< 0.045
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.0089	< 0.077	< 0.046	< 0.013	< 0.0094	< 0.013	< 0.0088	< 0.089	< 0.016	< 0.015	< 0.014	< 0.047

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-26 0.5 7/26/05	PCSB-26R 0.5-2 4/19/19	PCSB-27 0.5 7/26/05	PCSB-27 1.5 7/26/05	PCSB-28 0.5 7/26/05	PCSB-29 0.5 7/26/05	PCSB-30 0.5 7/26/05	PCSB-30R 0.5-2 4/19/19	PCSB-31 0.5 7/28/05	PCSB-32 0.5 7/28/05 / 8/1/05	PCSB-33 0.5 7/28/05	PCSB-34 0.5 7/27/05
Semi-Volatile Organic Compounds (cont'd)															
Fluoranthene	206-44-0	3,200	130,000	3.7	0.243	17	0.049	3.9	0.12	1.1	0.0452	0.058	0.084	0.41	30
Fluorene	86-73-7	3,800	130,000	0.17	< 0.038	0.41	< 0.0091	0.12	< 0.0089	< 0.0095	< 0.045	< 0.011	< 0.011	< 0.01	1.3
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	2.1	0.107	6.2	< 0.0064	1.8	< 0.0063	0.39	0.0286 J	< 0.0078	< 0.0075	0.19	11
Naphthalene	91-20-3	25	760	0.16	< 0.038	1.2	< 0.0037	0.69	0.054	0.42	< 0.045	< 0.0045	< 0.0043	0.067	1
Phenanthrene	85-01-8	10,000	190,000	1.8	0.121	5.6	< 0.0084	1.7	0.11	0.93	0.0215 J	< 0.01	0.048	0.29	15
Phenol	108-95-2	200	16,000	< 0.058	< 0.077	< 0.3	< 0.063	< 0.06	< 0.061	< 0.057	< 0.089	< 0.077	< 0.073	< 0.069	< 0.31
Pyrene	129-00-0	2,200	96,000	3.2	0.21	14	0.067	3.2	0.11	0.78	0.0413 J	0.055	0.079	0.39	26
Total PAHs and 2-Methylnaphthalene	-	- -	- -	32.8	1.53	101	0.465	28.4	0.852	8.14	0.302	0.236	0.466	3.25	181
Metals															
Aluminum	7429-90-5	- -	190,000	NA	10,800	NA	NA	NA	NA	NA	1,140	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	8	< 12 J	2.6	< 2.3	9.6	< 2.2	< 2.2	< 2.6	< 2.8	< 2.7	< 2.5	3.4
Arsenic	7440-38-2	29	61	***64***	15.2	27	< 2.3	***99***	2.4	4.3	5.2	3	< 2.7	< 2.5	7
Barium	7440-39-3	8,200	190,000	390	116	110	39	640	20	28	7.1 J	< 14	< 13	< 12	80
Beryllium	7440-41-7	320	6,400	1.4	0.27	0.81	< 0.68	1.1	< 0.67	0.8	< 0.26	< 0.83	< 0.8	< 0.75	6.3
Cadmium	7440-43-9	38	1,600	2.6	3.7	< 0.7	< 0.68	< 0.71	< 0.67	< 0.67	< 0.65	< 0.83	< 0.8	< 0.75	< 0.72
Calcium	7440-70-2	- -	- -	NA	785	NA	NA	NA	NA	NA	430 J	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	34	162	8.7	21	15	< 5.6	11	1.6	< 6.9	< 6.7	< 6.2	50
Cobalt	7440-48-4	160	960	NA	56.7	NA	NA	NA	NA	NA	0.60 J	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	200	250	82	26	260	22	20	6.7	< 6.9	9.3	11	690
Cyanide	57-12-5	200	1,900	NA	1.1 J	NA	NA	NA	NA	NA	< 0.36	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	93,300	NA	NA	NA	NA	NA	3,720	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	***3,000***	***768 J***	440	13	***3,200***	29	21	15.4	7.6	7	< 6.2	***1,200***
Magnesium	7439-95-4	- -	- -	NA	522 J	NA	NA	NA	NA	NA	297 J	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	536 J	NA	NA	NA	NA	NA	11.1	NA	NA	NA	NA
Mercury	7439-97-6	10	510	***17***	0.44 J	< 0.097	< 0.095	1.8	< 0.093	< 0.094	0.037 J	< 0.12	< 0.11	< 0.1	< 0.1
Nickel	7440-02-0	650	64,000	42	243	14	14	22	< 5.6	11	1.6 J	< 6.9	< 6.7	< 6.2	39
Potassium	7440-09-7	- -	- -	NA	682 J	NA	NA	NA	NA	NA	462 J	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	4	5.7 J	4.2	< 2	4.3	< 2	2.1	< 2.6	< 2.5	< 2.4	< 2.2	2.9
Silver	7440-22-4	84	16,000	< 2.8	2.4 J	< 2.9	< 2.8	< 3	< 2.8	< 2.8	< 0.65	< 3.5	< 3.3	< 3.1	< 3
Sodium	7440-23-5	- -	- -	NA	< 1,200	NA	NA	NA	NA	NA	665 J	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	26.1	NA	NA	NA	NA	NA	4.1 J	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	730	2,300	130	73	340	19	24	7.9	< 14	22	14	1,200

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Volatile Organic Compounds														
Acetone	67-64-1	10,000	10,000	0.018	< 0.0062	< 0.0059	< 0.0065	< 0.0069	< 0.0071	< 0.0058	< 1.4	< 0.0055 [< 0.0056]	< 0.0056	0.028
Benzene	71-43-2	0.5	290	< 0.00053	< 0.00059	< 0.00057	< 0.00062	< 0.00066	< 0.00068	< 0.00055	***6.32***	< 0.00053 [< 0.00054]	< 0.00054	< 0.00053
Carbon Disulfide	75-15-0	620	10,000	< 0.00068	< 0.00076	< 0.00072	< 0.00079	< 0.00084	< 0.00087	< 0.00071	< 0.28	< 0.00067 [< 0.00068]	< 0.00069	< 0.00068
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	4.89	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.011 B	0.0067 B	0.0023 B	0.009 B	0.018 B	0.036 B	0.011 B	< 0.7	0.014 B [0.014 B]	0.014 B	0.01 B
Ethylbenzene	100-41-4	70	890	< 0.00078	< 0.00087	< 0.00083	< 0.00091	< 0.00097	< 0.00099	< 0.00081	12.3	< 0.00077 [< 0.00079]	< 0.00079	< 0.00078
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	0.943	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0011	< 0.0013	< 0.0012	< 0.0013	< 0.0014	< 0.0015	< 0.0012	51.9	< 0.0011 [< 0.0012]	< 0.0012	< 0.0011
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	< 0.7	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	8.78	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00049	< 0.00054	< 0.00052	< 0.00057	< 0.00061	< 0.00062	< 0.00051	NA	< 0.00048 [< 0.00049]	< 0.0005	< 0.00049
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	19.1	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00065	< 0.00072	< 0.00069	< 0.00076	< 0.00081	< 0.00083	< 0.00067	< 0.28	< 0.00064 [< 0.00065]	< 0.00066	< 0.00065
Toluene	108-88-3	100	10,000	< 0.00079	< 0.00088	< 0.00084	< 0.00092	< 0.00098	< 0.001	< 0.00082	53.4 D	< 0.00078 [< 0.00079]	< 0.0008	< 0.00079
Total Xylenes	1330-20-7	1,000	8,000	NA	NA	NA	NA	NA	NA	NA	71	NA	NA	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	11,000	NA	NA	NA	NA	NA	NA	NA	6.43 D	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.14	< 0.27	< 0.15	< 0.034	< 0.037	< 0.038	< 0.25	< 0.2	< 0.04 [< 0.041]	< 0.15	< 0.029
2-Methylnaphthalene	91-57-6	1,900	13,000	0.11 J	1.3	3.8	0.13	0.56	< 0.076	0.47	22.8 D	0.11 [< 0.036]	1.4	0.093
2-Methylphenol	95-48-7	580	160,000	< 0.5	< 0.92	< 0.53	< 0.15	< 0.16	< 0.17	< 0.86	< 0.081	< 0.077 [< 0.078]	< 0.51	< 0.13
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	< 0.081	NA	NA	NA
4-Methylphenol	106-44-5	58	16,000	< 0.55	< 1	< 0.59	< 0.15	< 0.16	< 0.16	< 0.96	NA	< 0.094 [< 0.095]	< 0.56	< 0.13
4-Nitroaniline	100-01-6	17	4,600	NA	NA	NA	NA	NA	NA	NA	< 0.2	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	< 0.043	0.47	0.81	< 0.0067	< 0.0071	< 0.0073	0.3	66.2 DJ	< 0.012 [< 0.013]	0.13	0.059
Acenaphthylene	208-96-8	8,000	190,000	< 0.024	1.9	< 0.026	0.072	0.068	< 0.0067	1.3	1.15	0.17 [0.052]	< 0.025	0.075
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	< 0.2	NA	NA	NA
Anthracene	120-12-7	350	190,000	< 0.027	3.5	0.58	0.079	< 0.0086	< 0.0088	1.3	28.1 D	0.4 [0.052]	0.48	0.37
Benz(a)anthracene	56-55-3	430	130	0.58	11	1.2	0.37	0.23	< 0.0062	7.6	19.4 D	1.2 [0.29]	2.2	1.6
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	< 0.2	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	0.61	9.4	1.4	0.39	0.24	< 0.0074	7.5	14.4 D	1.3 [0.26]	2.2	1.6
Benzo(b)fluoranthene	205-99-2	170	76	0.88	13	1.7	0.71	0.42	0.056	10	17.8 D	1.8 [0.36]	2.8	2.1
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.53	8.1	1.8	0.32	0.2	< 0.0064	7.1	8.46 D	1.1 [0.2]	2.1	1.1
Benzo(k)fluoranthene	207-08-9	610	76	0.25	3.5	0.67	0.21	0.13	< 0.016	2.5	6.97 D	0.5 [0.1]	0.86	0.83
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	0.12	0.41	0.55	0.22	0.39	0.1	0.26	< 0.081	0.17 [0.22]	< 0.096	0.06
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.042	< 0.078	< 0.045	< 0.011	< 0.012	< 0.012	< 0.073	< 0.081	< 0.014 [< 0.014]	< 0.043	< 0.0094
Carbazole	86-74-8	110	4,600	< 0.031	0.91	< 0.033	0.049	< 0.0083	< 0.0085	< 0.054	9.89 D	0.081 [< 0.012]	< 0.032	0.12
Chrysene	218-01-9	230	760	0.7	11	1.8	0.59	0.36	< 0.013	7.1	17.7 D	1.3 [0.27]	1.9	1.6
Dibenz(a,h)anthracene	53-70-3	270	22	0.17	2.9	0.55	0.11	0.076	< 0.0081	2.3	2.69	0.3 [0.036]	0.56	0.39
Dibenzofuran	132-64-9	310	3,200	< 0.13	0.99	0.84	0.064	0.18	< 0.057	0.22 J	32.5 D	0.13 [< 0.061]	0.28	0.075
Diethyl phthalate	84-66-2	9,300	10,000	< 0.029	< 0.053	< 0.031	< 0.0096	< 0.01	< 0.01	< 0.05	< 0.081	< 0.0082 [< 0.0084]	< 0.029	< 0.0082
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.023	< 0.043	0.31	< 0.0082	< 0.0088	< 0.009	< 0.041	< 0.081	< 0.0077 [< 0.0079]	< 0.024	0.042
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.025	< 0.046	< 0.026	< 0.014	< 0.015	< 0.015	< 0.043	< 0.081	< 0.0081 [< 0.0083]	< 0.025	< 0.012

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-35 0.5 8/2/05	PCSB-36 0.5 7/27/05	PCSB-37 0.5 8/3/05	PCSB-38 0.5 7/27/05	PCSB-39 0.5 7/27/05	PCSB-40 0.5 7/28/05	PCSB-41 0.5 7/28/05	PCSB-41R 0.5-2 4/22/19	PCSB-42 0.5 8/1/05	PCSB-43 0.5 8/1/05	PCSB-44 0.5 8/3/05
Semi-Volatile Organic Compounds (cont'd)														
Fluoranthene	206-44-0	3,200	130,000	1.2	20	2	0.67	0.31	0.049	15	97.9 D	2.7 [0.43]	3.3	2.3
Fluorene	86-73-7	3,800	130,000	< 0.026	1.4	1.4	< 0.0097	< 0.01	< 0.011	0.23	48.5 D	0.18 [< 0.0075]	0.16	0.062
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	0.45	7	1.2	0.28	0.18	< 0.0075	6.2	9.14 D	0.87 [0.15]	1.6	0.98
Naphthalene	91-20-3	25	760	< 0.024	1.8	2.1	0.13	0.27	< 0.0043	0.59	14.1 D	0.08 [< 0.0067]	0.59	0.1
Phenanthrene	85-01-8	10,000	190,000	0.54	12	2.9	0.54	0.56	< 0.0099	4.4	158 D	1.9 [0.22]	1.8	1.4
Phenol	108-95-2	200	16,000	< 0.16	< 0.3	< 0.17	< 0.067	< 0.072	< 0.073	< 0.28	< 0.081	< 0.034 [< 0.035]	< 0.16	< 0.057
Pyrene	129-00-0	2,200	96,000	0.76	17	2	0.67	0.31	< 0.01	11	61.6 D	2.6 [0.41]	2.5	2.1
Total PAHs and 2-Methylnaphthalene	-	- -	- -	6.78	125	25.9	5.27	3.91	0.105	84.9	595	16.5 [2.83]	24.6	16.8
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	7,590	NA	NA	NA
Antimony	7440-36-0	27	1,300	< 2.1	17	8.7	< 2.4	< 2.6	< 2.7	14	20.6	< 2.1 [< 2.1]	< 2.1	2.5
Arsenic	7440-38-2	29	61	13	20	20	***41***	< 2.6	3.2	13	19.5	5.2 [10]	***57***	23
Barium	7440-39-3	8,200	190,000	63	780	74	75	16	< 13	88	175	37 [49]	390	750
Beryllium	7440-41-7	320	6,400	< 0.62	1.1	< 0.67	< 0.73	< 0.78	< 0.8	0.68	0.91	< 0.62 [< 0.63]	< 0.64	< 0.62
Cadmium	7440-43-9	38	1,600	0.92	3.7	3.6	< 0.73	< 0.78	< 0.8	2.5	1.4	< 0.62 [< 0.63]	1.4	3.3
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	11,500	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	24	16	110	9.5	< 6.5	< 6.7	59	26.0	16 [22]	25	21
Cobalt	7440-48-4	160	960	NA	NA	NA	NA	NA	NA	NA	7.8	NA	NA	NA
Copper	7440-50-8	43,000	120,000	51	840	610	66	17	15	120	193	21 [25]	100	220
Cyanide	57-12-5	200	1,900	NA	NA	NA	NA	NA	NA	NA	0.53	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	28,300	NA	NA	NA
Lead	7439-92-1	450	1,000	130	***14,000***	420	230	11	< 6.7	***930***	***986***	160 [88]	***1,900***	***5,400***
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	4,570	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	NA	NA	NA	NA	NA	NA	552	NA	NA	NA
Mercury	7439-97-6	10	510	0.27	1.2	0.47	0.13	< 0.11	< 0.11	1.6	0.34 J	0.15 [0.14]	0.64	3.3
Nickel	7440-02-0	650	64,000	18	26	97	18	< 6.5	< 6.7	39	38.4	16 [18]	87	28
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	1,120 J	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 1.9	3.6	2.4	2.7	< 2.3	< 2.4	3.3	< 4.8	< 1.9 [< 1.9]	2.1	2.3
Silver	7440-22-4	84	16,000	< 2.6	< 2.9	< 2.8	< 3	< 3.2	< 3.3	< 2.7	< 1.2	< 2.6 [< 2.6]	< 2.7	< 2.6
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	208 J	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	NA	NA	NA	NA	NA	NA	32.1	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	140	6,300	540	100	25	14	290	530	85 [95]	1,300	2,900

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-45 0.5 8/3/05	PCSB-46 0.5 7/27/05	PCSB-47 0.5 8/3/05	PCSB-48 0.5 8/3/05	PCSB-49 0.5 8/3/05	PCSB-50 0.5 8/3/05	PCSB-51 0.5 8/3/05	PCSB-52 0.5 8/2/05	PCSB-53 0.5 8/1/05	PCSB-54 0.5 8/3/05	PCSB-55 0.5 8/3/05
Volatile Organic Compounds														
Acetone	67-64-1	10,000	10,000	0.036 [0.022]	< 0.006	0.036	0.3	0.019	< 0.41	< 0.0056	< 0.0057	< 0.0057	< 0.0062	0.024
Benzene	71-43-2	0.5	290	< 0.00054 [< 0.00054]	< 0.00058	< 0.00055	< 0.0027	< 0.00053	< 0.031	< 0.00054	< 0.00055	< 0.00055	< 0.0006	< 0.00055
Carbon Disulfide	75-15-0	620	10,000	< 0.00068 [< 0.00069]	< 0.00074	< 0.00071	< 0.0034	< 0.00068	< 0.049	< 0.00068	< 0.0007	< 0.0007	< 0.00076	< 0.00071
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.012 B [0.009 B]	0.015 B	0.008 B	0.07 B	0.01 B	0.22 B	0.0026 B	0.013 B	0.017 B	0.0024 B	0.014 B
Ethylbenzene	100-41-4	70	890	< 0.00079 [< 0.00079]	< 0.00085	< 0.00081	< 0.0039	< 0.00078	< 0.06	< 0.00079	< 0.0008	< 0.0008	< 0.00088	< 0.00081
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0012 [< 0.0012]	< 0.0013	< 0.0012	< 0.0058	< 0.0011	< 0.063	< 0.0012	< 0.0012	< 0.0012	< 0.0013	< 0.0012
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00049 [< 0.0005]	< 0.00053	< 0.00051	< 0.0025	< 0.00049	< 0.039	< 0.00049	< 0.0005	< 0.0005	< 0.00055	< 0.00051
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00065 [< 0.00066]	< 0.0007	< 0.00067	< 0.0033	< 0.00065	< 0.013	< 0.00065	< 0.00067	< 0.00067	< 0.00073	< 0.00067
Toluene	108-88-3	100	10,000	< 0.00079 [< 0.0008]	< 0.00086	< 0.00082	< 0.004	< 0.00079	< 0.02	< 0.00079	< 0.00081	< 0.00081	< 0.00089	< 0.00082
Total Xylenes	1330-20-7	1,000	8,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.048 [< 0.049]	< 0.052	< 0.031	< 0.03	< 0.029	< 0.049	< 0.15	< 0.15	< 0.15	< 0.16	< 0.05
2-Methylnaphthalene	91-57-6	1,900	13,000	0.68 [0.52]	1.3	0.18	< 0.06	< 0.059	1.4	0.33	0.35	1.5	1.3	0.46
2-Methylphenol	95-48-7	580	160,000	< 0.17 [< 0.17]	< 0.18	< 0.14	< 0.13	< 0.13	< 0.17	< 0.5	< 0.51	< 0.51	< 0.56	< 0.17
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	16,000	< 0.19 [< 0.19]	< 0.2	< 0.13	< 0.13	< 0.13	< 0.19	< 0.56	< 0.57	< 0.57	< 0.62	< 0.19
4-Nitroaniline	100-01-6	17	4,600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.079 [0.14]	0.082	0.057	< 0.0058	< 0.0057	1.9	< 0.044	0.35	< 0.045	0.28	0.48
Acenaphthylene	208-96-8	8,000	190,000	0.077 [0.13]	0.14	0.087	< 0.0053	0.035	0.32	0.4	0.21	< 0.025	0.61	0.09
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.28 [0.5]	0.13	0.13	< 0.0069	0.044	1.5	0.59	1.7	0.39	1.5	1.5
Benz(a)anthracene	56-55-3	430	130	0.9 [1.8]	0.48	0.54	0.052	0.14	2.1	2.2	7.5	1.3	4.9	3.8
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	0.89 [1.6]	0.3	0.53	0.059	0.15	2.1	2	6.7	1.4	3.6	3.2
Benzo(b)fluoranthene	205-99-2	170	76	1.2 [2]	0.67	0.79	0.069	0.2	2.8	2.9	9.5	1.6	5.8	4.2
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.74 [1.1]	0.33	0.43	0.055	0.19	1.6	2	4.1	1.4	2.7	2.1
Benzo(k)fluoranthene	207-08-9	610	76	0.43 [0.9]	0.21	0.27	< 0.012	0.066	1.1	1	2	0.73	1.6	1.6
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	0.039 [0.038]	0.23	0.059	< 0.022	0.039	0.12	0.15	< 0.097	0.18	1.1	< 0.033
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.014 [< 0.014]	< 0.015	< 0.0098	< 0.0095	< 0.0094	< 0.014	< 0.042	< 0.043	< 0.043	0.31	< 0.015
Carbazole	86-74-8	110	4,600	0.098 [0.18]	0.085	0.068	< 0.0067	0.035	< 0.011	0.13	0.4	0.14	0.52	0.75
Chrysene	218-01-9	230	760	0.95 [1.6]	0.76	0.6	0.065	0.16	2.1	2.2	7.3	1.6	4.5	3.9
Dibenz(a,h)anthracene	53-70-3	270	22	0.29 [0.47]	0.15	0.13	< 0.0064	< 0.0064	0.55	0.63	1.9	0.33	1.1	0.76
Dibenzofuran	132-64-9	310	3,200	0.098 [0.17]	0.55	0.074	< 0.045	< 0.045	0.92	0.25	0.27	0.27	0.81	0.48
Diethyl phthalate	84-66-2	9,300	10,000	< 0.0096 [< 0.0097]	< 0.01	< 0.0085	< 0.0083	< 0.0082	< 0.0097	< 0.029	< 0.03	< 0.03	< 0.032	< 0.0099
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.042 [< 0.0079]	0.079	< 0.0073	< 0.0071	< 0.007	< 0.0079	0.14 B	< 0.024	< 0.024	0.19 B	0.054
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.0083 [< 0.0084]	< 0.0089	< 0.012	< 0.012	< 0.012	< 0.0084	< 0.025	< 0.025	< 0.025	< 0.028	< 0.0086

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-45 0.5 8/3/05	PCSB-46 0.5 7/27/05	PCSB-47 0.5 8/3/05	PCSB-48 0.5 8/3/05	PCSB-49 0.5 8/3/05	PCSB-50 0.5 8/3/05	PCSB-51 0.5 8/3/05	PCSB-52 0.5 8/2/05	PCSB-53 0.5 8/1/05	PCSB-54 0.5 8/3/05	PCSB-55 0.5 8/3/05
Semi-Volatile Organic Compounds (cont'd)														
Fluoranthene	206-44-0	3,200	130,000	1.7 [3.7]	0.74	1	0.098	0.26	4.5	4.1	13	2.4	9.4	6.4
Fluorene	86-73-7	3,800	130,000	0.096 [0.22]	< 0.0096	0.053	< 0.0084	< 0.0083	1.9	< 0.027	0.48	0.2	0.78	0.43
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	0.67 [1]	0.29	0.36	0.037	0.11	1.5	1.6	3.9	1	2.5	2
Naphthalene	91-20-3	25	760	0.25 [0.25]	0.86	0.17	< 0.0034	< 0.0034	0.98	0.36	0.22	0.8	1.3	0.54
Phenanthrene	85-01-8	10,000	190,000	1.1 [2.1]	1.4	0.63	0.067	0.17	4.5	2.1	5.6	1.6	7.3	5.2
Phenol	108-95-2	200	16,000	< 0.053 [< 0.054]	< 0.058	< 0.06	< 0.058	< 0.057	< 0.054	< 0.16	< 0.16	< 0.16	< 0.18	< 0.055
Pyrene	129-00-0	2,200	96,000	1.3 [2.4]	0.54	0.95	0.13	0.26	3.3	3.3	11	2	7.6	5.5
Total PAHs and 2-Methylnaphthalene	-	- -	- -	11.6 [20.4]	8.38	6.91	0.632	1.79	34.2	25.7	75.8	18.3	56.8	42.2
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	< 2.1 [3.3]	< 2.3	2.6	< 2.1	< 2.1	< 2.1	3.8	< 2.2	< 2.2	3	3.9
Arsenic	7440-38-2	29	61	***33 [79]***	7.3	***100***	4.2	7.2	27	8.2	18	22	27	***75***
Barium	7440-39-3	8,200	190,000	140 [130]	31	73	31	46	100	73	140	130	83	770
Beryllium	7440-41-7	320	6,400	< 0.63 [< 0.64]	< 0.68	< 0.65	< 0.63	< 0.62	< 0.64	< 0.63	< 0.65	< 0.65	< 0.71	< 0.65
Cadmium	7440-43-9	38	1,600	< 0.63 [0.78]	< 0.68	< 0.65	< 0.63	< 0.62	< 0.64	1.1	0.71	< 0.65	0.83	3.7
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	21 [31]	< 5.7	26	16	18	15	43	39	25	22	18
Cobalt	7440-48-4	160	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	73 [110]	14	76	20	23	62	150	73	58	90	250
Cyanide	57-12-5	200	1,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	***670 [670]***	6.9	260	110	50	***490***	180	***470***	***650***	240	***6,200***
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	0.37 [0.37]	< 0.095	0.25	0.12	0.19	0.44	0.24	0.69	0.28	< 0.098	< 0.091
Nickel	7440-02-0	650	64,000	20 [33]	7.6	26	13	26	17	25	23	22	19	27
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 1.9 [2.6]	2.3	2	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 2.1	2.1
Silver	7440-22-4	84	16,000	< 2.6 [< 2.7]	< 2.8	< 2.7	< 2.6	< 2.6	< 2.7	< 2.6	< 2.7	< 2.7	< 2.9	< 2.7
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	450 [420]	15	220	51	93	390	260	420	340	260	2,700

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-56 0.5 8/15/05	PCSB-57 0.5 8/15/05	PCSB-58 0.5 8/15/05	PCSB-59 0.5 8/15/05	PCSB-60 0.5 8/15/05	PCTP-61 0.5 9/8/05	PCTP-62 0.5 9/8/05	PCTP-63 0.5 9/8/05	PCTP-64 0.5 9/8/05	PCTP-65 0.5 9/8/05
Volatile Organic Compounds													
Acetone	67-64-1	10,000	10,000	< 0.006	< 0.006	< 0.0058	< 0.0058	0.02 [0.019]	< 0.0038 [< 0.006]	< 0.0038	< 0.0036	< 0.0059	< 0.0059
Benzene	71-43-2	0.5	290	< 0.00057	< 0.00058	< 0.00056	< 0.00056	< 0.00055 [< 0.00055]	< 0.00027 [< 0.00057]	< 0.00027	< 0.00026	< 0.00057	< 0.00057
Carbon Disulfide	75-15-0	620	10,000	< 0.00073	< 0.00074	< 0.00071	< 0.00071	< 0.00071 [< 0.00071]	< 0.00057 [< 0.00073]	< 0.00057	< 0.00054	< 0.00072	< 0.00072
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.041 B	0.034 B	0.018 B	0.019 B	0.018 B [0.017 B]	0.011 B [0.019 B]	0.0095 B	0.0078 B	0.0087 B	0.011 B
Ethylbenzene	100-41-4	70	890	< 0.00084	< 0.00085	< 0.00082	< 0.00082	< 0.00081 [< 0.00081]	< 0.00076 [< 0.00084]	< 0.00075	< 0.00071	< 0.00083	< 0.00083
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0012	< 0.0013	< 0.0012	< 0.0012	< 0.0012 [< 0.0012]	< 0.00091 [< 0.0012]	< 0.0009	< 0.00085	< 0.0012	< 0.0012
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00053	< 0.00053	< 0.00051	< 0.00051	< 0.00051 [< 0.00051]	< 0.0002 [< 0.00053]	< 0.00019	< 0.00018	< 0.00052	< 0.00052
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0007	< 0.0007	< 0.00068	< 0.00068	< 0.00067 [< 0.00067]	< 0.00017 [< 0.0007]	< 0.00017	< 0.00016	< 0.00069	< 0.00069
Toluene	108-88-3	100	10,000	< 0.00085	< 0.00086	< 0.00083	< 0.00083	< 0.00082 [< 0.00082]	< 0.00021 [< 0.00085]	< 0.0002	< 0.00019	< 0.00084	< 0.00084
Total Xylenes	1330-20-7	1,000	8,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.052	< 0.16	< 0.051	< 0.051	< 0.05 [< 0.05]	< 0.052 [< 0.052]	< 1.5	< 0.48	< 0.51	< 0.15
2-Methylnaphthalene	91-57-6	1,900	13,000	0.11	0.38	0.68	0.43	0.55 [0.49]	0.13 [0.09]	5.8	< 0.45	< 0.48	< 0.14
2-Methylphenol	95-48-7	580	160,000	< 0.18	< 0.54	< 0.17	< 0.17	< 0.17 [< 0.17]	< 0.18 [< 0.18]	< 5.3	< 1.7	< 1.8	< 0.53
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	16,000	< 0.2	< 0.6	< 0.19	< 0.19	< 0.19 [< 0.19]	< 0.2 [< 0.2]	< 5.9	< 1.9	< 2	< 0.59
4-Nitroaniline	100-01-6	17	4,600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	< 0.016	0.16	0.13	0.23	0.18 [0.23]	0.16 [0.13]	2.2	1.8	0.41	< 0.046
Acenaphthylene	208-96-8	8,000	190,000	0.039	0.8	0.074	0.1	0.15 [0.13]	0.048 [0.042]	4.5	0.51	1.2	0.54
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.11	1.6	0.33	0.39	0.4 [0.4]	0.38 [0.34]	32	8.7	2.6	1.2
Benz(a)anthracene	56-55-3	430	130	0.43	7.7	1.1	1.3	1.6 [1.5]	0.93 [0.95]	53	18	10	8.4
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	0.43	7.2	0.92	1.3	1.6 [1.4]	0.89 [0.95]	34	14	10	9.8
Benzo(b)fluoranthene	205-99-2	170	76	0.75	12	1.8	1.8	2.3 [1.8]	1.2 [1.3]	41	20	15	12
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.37	3.6	0.59	0.94	1.1 [1]	0.66 [0.73]	19	9.8	8.3	8.5
Benzo(k)fluoranthene	207-08-9	610	76	0.27	2.8	0.47	0.66	0.71 [0.75]	0.47 [0.52]	18	5.1	5.3	2.9
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	0.59	0.48	0.61	0.19	0.34 [0.34]	0.15 [0.1]	< 1	1.1	0.85	< 0.1
Butyl benzyl phthalate	85-68-7	10,000	10,000	0.34	0.39	0.1	< 0.015	0.12 [0.16]	< 0.015 [< 0.015]	< 0.45	< 0.14	0.7	< 0.045
Carbazole	86-74-8	110	4,600	0.037	0.78	0.12	0.17	0.19 [0.15]	0.14 [0.12]	12	3.2	0.87	0.19
Chrysene	218-01-9	230	760	0.57	6.8	1.3	1.3	1.6 [1.2]	0.97 [0.98]	41	16	10	7.8
Dibenz(a,h)anthracene	53-70-3	270	22	0.099	1.4	0.3	0.4	0.44 [0.43]	0.21 [0.28]	7.5	4	2.7	2.5
Dibenzofuran	132-64-9	310	3,200	0.053	0.36	0.3	0.17	0.2 [0.19]	0.22 [0.16]	14	2.1	0.46 J	0.11 J
Diethyl phthalate	84-66-2	9,300	10,000	0.043	< 0.031	< 0.01	0.041	< 0.0099 [0.064]	< 0.01 [< 0.01]	< 0.31	< 0.096	< 0.1	< 0.031
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.074 B	< 0.025	0.046 B	< 0.0082	0.067 B [0.11 B]	0.045 [< 0.0084]	< 0.25	< 0.079	< 0.083	< 0.025
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.0088	< 0.027	< 0.0087	< 0.0087	< 0.0086 [< 0.0086]	< 0.0088 [< 0.0088]	< 0.26	< 0.083	< 0.087	< 0.026

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCSB-56 0.5 8/15/05	PCSB-57 0.5 8/15/05	PCSB-58 0.5 8/15/05	PCSB-59 0.5 8/15/05	PCSB-60 0.5 8/15/05	PCTP-61 0.5 9/8/05	PCTP-62 0.5 9/8/05	PCTP-63 0.5 9/8/05	PCTP-64 0.5 9/8/05	PCTP-65 0.5 9/8/05
Semi-Volatile Organic Compounds (cont'd)													
Fluoranthene	206-44-0	3,200	130,000	0.5	11	1.5	1.4	1.9 [1.6]	1.8 [1.7]	97	31	18	9.9
Fluorene	86-73-7	3,800	130,000	0.038	0.51	0.16	0.23	0.25 [0.25]	0.12 [0.099]	31	4.4	0.97	0.24
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	0.33	3.2	0.56	0.85	0.98 [0.87]	0.57 [0.63]	18	9.1	7	6.8
Naphthalene	91-20-3	25	760	0.13	0.88	0.8	0.24	0.3 [0.27]	0.12 [0.1]	12	< 0.083	0.43	0.28
Phenanthrene	85-01-8	10,000	190,000	0.43	5.4	1.7	1.7	1.6 [1.5]	1.5 [1.2]	140	33	10	4.8
Phenol	108-95-2	200	16,000	< 0.057	< 0.17	< 0.056	< 0.056	< 0.055 [< 0.055]	< 0.057 [< 0.057]	< 1.7	< 0.53	< 0.56	< 0.17
Pyrene	129-00-0	2,200	96,000	0.86	13	2.2	2.9	4 [3.1]	1.8 [2]	110	42	22	13
Total PAHs and 2-Methylnaphthalene	-	- -	- -	5.47	78.4	14.6	16.2	19.7 [16.9]	12.0 [12.0]	666	217	124	88.7
Metals													
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	3.5	4	5.2	3.3	2.7 [3]	< 2.2 [< 2.2]	2.3	5.4	2.5	< 2.2
Arsenic	7440-38-2	29	61	13	19	28	***39***	***35 [32]***	12 [11]	13	9.5	17	6.7
Barium	7440-39-3	8,200	190,000	63	250	61	190	140 [130]	96 [90]	140	180	140	58
Beryllium	7440-41-7	320	6,400	< 0.67	< 0.68	< 0.66	< 0.66	< 0.65 [< 0.65]	0.86 [0.79]	< 0.67	0.74	0.76	< 0.67
Cadmium	7440-43-9	38	1,600	0.76	1.7	< 0.66	1.5	2.5 [2.2]	< 0.67 [< 0.67]	< 0.67	1.4	2.2	< 0.67
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	55	29	53	31	24 [23]	25 [21]	16	24	25	9.7
Cobalt	7440-48-4	160	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	100	210	94	130	85 [75]	83 [73]	65	170	170	58
Cyanide	57-12-5	200	1,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	130	***1,600***	180	***960***	***710 [600]***	***680 [1,100]***	400	***810***	230	150
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	0.36	1.3	0.24	0.66	0.46 [0.52]	0.99 [4.8]	0.55	1.2	0.27	0.38
Nickel	7440-02-0	650	64,000	49	33	35	27	21 [25]	21 [19]	12	21	26	20
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	4	4.8	6.4	3.1	2.8 [2.9]	2.7 [2.7]	< 2	2	4	< 2
Silver	7440-22-4	84	16,000	< 2.8	< 2.8	< 2.7	< 2.7	< 2.7 [< 2.7]	< 2.8 [< 2.8]	< 2.8	< 2.6	< 2.8	< 2.8
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	190	960	51	1,300	3,700 [2500]	290 [240]	160	650	430	220

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCTP-66 0.5 9/8/05	PCTP-66R 0-0.5 4/24/19	PCTP-66R 0.5-2 4/24/19	PCTP-66R-HC 0-2 4/4/19	PCTP-67 0.5 9/12/05	PCTP-68 0.5 9/9/05	PCTP-69 0.5 9/9/05	PCTP-70 0.5 9/9/05	PCTP-71 0.5 9/9/05	PCTP-72 0.5 9/9/05
Volatile Organic Compounds													
Acetone	67-64-1	10,000	10,000	< 0.79	< 0.02 [0.0199]	< 0.012	R	< 0.0059 [< 0.0058]	< 0.028	< 0.0056	< 0.0059	< 0.0055	< 0.0039
Benzene	71-43-2	0.5	290	***29***	< 0.0010 [< 0.00095]	< 0.00062	R	< 0.00057 [< 0.00056]	0.006	< 0.00054	< 0.00057	< 0.00053	< 0.00028
Carbon Disulfide	75-15-0	620	10,000	< 0.095	< 0.0041 [< 0.0038]	< 0.0025	R	< 0.00072 [< 0.00071]	< 0.0034	< 0.00068	< 0.00072	< 0.00067	< 0.00058
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0041 [< 0.0038]	< 0.0025	R	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	< 0.22	< 0.01 [< 0.0095]	< 0.0062	R	0.0048 B [0.0065 B]	0.03 B	0.0075 B	0.013 B	0.0058 B	0.0091 B
Ethylbenzene	100-41-4	70	890	< 0.12	< 0.0020 [< 0.0019]	< 0.0012	R	< 0.00083 [< 0.00082]	0.0083	< 0.00079	< 0.00083	< 0.00077	< 0.00077
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0041 [< 0.0038]	< 0.0025	R	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	8.2	< 0.0020 [< 0.0019]	< 0.0012	R	< 0.0012 [< 0.0012]	0.19	< 0.0012	< 0.0012	< 0.0011	< 0.00092
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.01 [< 0.0095]	< 0.0062	R	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0041 [< 0.0038]	< 0.0025	R	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	2.2	NA	NA	NA	< 0.00052 [< 0.00051]	0.1	< 0.00049	< 0.00052	< 0.00048	< 0.0002
o-Xylene	95-47-6	- -	- -	NA	< 0.0020 [< 0.0019]	< 0.0012	R	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	2.4	< 0.0041 [< 0.0038]	< 0.0025	R	< 0.00069 [< 0.00068]	< 0.0033	< 0.00065	< 0.00069	< 0.00064	< 0.00017
Toluene	108-88-3	100	10,000	22	< 0.0020 [< 0.0019]	< 0.0012	R	< 0.00084 [< 0.00083]	0.022	< 0.00079	< 0.00084	< 0.00078	< 0.00021
Total Xylenes	1330-20-7	1,000	8,000	NA	< 0.0020 [< 0.0019]	< 0.0012	R	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	NA	0.226 J [4.33 J]	0.0185 J	0.211	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 94	< 0.21 [< 1]	< 0.17	< 0.2	< 0.15 [< 0.062]	< 12	< 0.03	< 0.051	< 0.047	< 0.052
2-Methylnaphthalene	91-57-6	1,900	13,000	1,300	0.486 J [10.5 J]	0.106	0.502	0.13 J [0.16]	230	0.16	< 0.048	0.057	0.075
2-Methylphenol	95-48-7	580	160,000	< 320	< 0.083 [< 0.42]	< 0.07	< 0.079	< 0.53 [< 0.27]	< 52	< 0.13	< 0.18	< 0.16	< 0.18
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	0.0370 J [< 0.42]	< 0.07	< 0.079	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	16,000	***180 J***	NA	NA	NA	< 0.59 [< 0.27]	< 52	< 0.13	< 0.2	< 0.18	< 0.2
4-Nitroaniline	100-01-6	17	4,600	NA	< 0.21 [< 1]	< 0.17	< 0.2	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	180	0.244 J [4.39 J]	0.0787	0.234	0.11 [< 0.012]	22	0.14	0.079	0.23	0.31
Acenaphthylene	208-96-8	8,000	190,000	2,000	2.64 J [45.6 DJ]	0.116	2.9	< 0.026 [0.18]	85	0.62	0.068	< 0.0079	0.064
Acetophenone	98-86-2	1,200	10,000	NA	0.0329 J [< 1]	< 0.17	< 0.2	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	***1,800***	4.16 J [70.9 DJ]	0.143	5.81 DJ	0.26 [0.15]	250	0.99	0.17	0.52	0.73
Benz(a)anthracene	56-55-3	430	130	***1,800***	8.88 DJ [77.6 DJ]	0.393	8.24 D	1.5 [0.89]	220	2.3	1	1.5	2.3
Benzaldehyde	100-52-7	- -	- -	NA	0.0297 J [< 1]	< 0.17	< 0.2	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	***1,300***	9.2 DJ ***[67.8 DJ]***	0.515	8.36 D	1.5 [1]	***190***	1.9	0.99	1.3	2.1
Benzo(b)fluoranthene	205-99-2	170	76	***1,600***	11.7 DJ [85.6 DJ]	0.681	10.4 D	1.8 [1.6]	***250***	3.6	1.5	1.5	2.7
Benzo(g,h,i)perylene	191-24-2	180	190,000	***850***	5.99 DJ [38.1 DJ]	0.421	5.36 DJ	1.3 [0.77]	91	1	0.72	0.97	1.5
Benzo(k)fluoranthene	207-08-9	610	76	***690***	2.66 J [27 DJ]	0.251	4.16 D	0.8 [0.49]	79	1.2	0.54	0.62	1.1
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	< 61	0.172 J [< 0.42]	< 0.07	0.149	< 0.1 [0.092]	< 8.9	0.092	0.08	0.074	0.3
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 27	< 0.083 [< 0.42]	< 0.07	< 0.079	< 0.045 [< 0.02]	< 3.8	< 0.0095	< 0.015	0.13	< 0.015
Carbazole	86-74-8	110	4,600	***970***	1.44 J [19.7]	0.0300 J	1.59	0.12 [< 0.014]	***140***	0.19	0.11	0.28	0.29
Chrysene	218-01-9	230	760	***1,500***	8.37 DJ [65.7 DJ]	0.373	8.31 D	1.4 [1.2]	210	2.6	1.1	1.4	2.4
Dibenz(a,h)anthracene	53-70-3	270	22	270	1.45 J [10.1]	0.105	1.66	0.37 [0.24]	31	0.39	0.28	0.38	0.59
Dibenzofuran	132-64-9	310	3,200	***1,600***	1.56 J [39.8 DJ]	0.0495 J	1.39	0.13 J [0.078 J]	230	0.18	0.038 J	0.13	0.16
Diethyl phthalate	84-66-2	9,300	10,000	< 19	< 0.083 [< 0.42]	< 0.07	< 0.079	< 0.031 [< 0.017]	< 3.3	< 0.0083	< 0.01	< 0.0094	< 0.01
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 15	< 0.083 [< 0.42]	< 0.07	< 0.079	< 0.025 [< 0.015]	< 2.8	< 0.0071	0.04 B	< 0.0077	0.068
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 16	< 0.083 [< 0.42]	< 0.07	< 0.079	< 0.026 [< 0.025]	< 4.8	< 0.012	< 0.0087	< 0.0081	< 0.0089

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCTP-66 0.5 9/8/05	PCTP-66R 0-0.5 4/24/19	PCTP-66R 0.5-2 4/24/19	PCTP-66R-HC 0-2 4/4/19	PCTP-67 0.5 9/12/05	PCTP-68 0.5 9/9/05	PCTP-69 0.5 9/9/05	PCTP-70 0.5 9/9/05	PCTP-71 0.5 9/9/05	PCTP-72 0.5 9/9/05
Semi-Volatile Organic Compounds (cont'd)													
Fluoranthene	206-44-0	3,200	130,000	***3,800***	19.8 DJ [200 DJ]	0.624	17.3 D	2 [1.6]	700	3.8	1.5	2.1	3.4
Fluorene	86-73-7	3,800	130,000	2,600	3.11 [76.2 DJ]	0.0866	2.79 J	< 0.028 [< 0.018]	320	0.14	0.079	0.25	0.28
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	750	6.39 DJ [42.9 DJ]	0.444	5.97 DJ	1 [0.66]	88	1.1	0.64	0.81	1.3
Naphthalene	91-20-3	25	760	***6,000***	0.782 J [11.2]	0.0294 J	0.643	0.21 [0.15]	***1,900***	0.56	0.043	0.18	0.14
Phenanthrene	85-01-8	10,000	190,000	7,700	18.3 DJ [296 DJ]	0.348	15 D	1.4 [0.73]	1,000	1.4	0.77	2.2	3
Phenol	108-95-2	200	16,000	***210***	0.0364 J [0.111 J]	< 0.07	< 0.079	< 0.17 [< 0.12]	< 23	< 0.058	< 0.056	< 0.052	< 0.058
Pyrene	129-00-0	2,200	96,000	***4,400***	15.7 DJ [147 DJ]	0.523	14.6 D	2.5 [1.6]	490	4.2	1.8	3.1	5.7
Total PAHs and 2-Methylnaphthalene	-	- -	- -	38,500	120 [1,280]	5.24	112	16.3 [11.4]	6,160	26.1	11.3	17.1	27.7
Metals													
Aluminum	7429-90-5	- -	190,000	NA	7,560 J [6,890 J]	8,310 J	6,260	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	< 2	2.8 J [3.0 J]	< 2.2 J	2.6	9.9 [6.9]	< 2.1	< 2.1	< 2.2	< 2.1	< 2.3
Arsenic	7440-38-2	29	61	2.8	***66.6 [60.7]***	6.7	***35.7***	27 ***[31]***	5.8	***44***	***120***	***100***	7.9
Barium	7440-39-3	8,200	190,000	15	204 J [99.0 J]	42.9 J	79.4	150 [150]	51	71	88	70	87
Beryllium	7440-41-7	320	6,400	< 0.61	1.1 [0.90]	0.60	0.68	< 0.67 [< 0.66]	< 0.63	0.76	< 0.67	0.77	0.8
Cadmium	7440-43-9	38	1,600	< 0.61	3.0 [2.8]	0.10 J	1.9	4.8 [3.4]	< 0.63	0.69	< 0.67	< 0.62	< 0.68
Calcium	7440-70-2	- -	- -	NA	8,670 J [5,280 J]	527 J	3,170	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	< 5.1	23.2 [23.9]	19.2	19.8	40 [48]	12	17	15	14	25
Cobalt	7440-48-4	160	960	NA	6.0 J [6.4]	7.5	5.8	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	12	217 [217]	17.2	127	480 [200]	110	110	33	46	75
Cyanide	57-12-5	200	1,900	NA	0.54 J [1.1 J]	1.2 J	0.14 J	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	12,400 [13,600]	24,400	18,900	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	30	392 [386]	26.8	323	***470 [500]***	58	290	71	370	280
Magnesium	7439-95-4	- -	- -	NA	3,560 J [2,390 J]	1,430 J	1,640	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	595 [375]	209	279	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	< 0.085	0.20 J [0.34 J]	0.030 J	0.23	< 0.093 [< 0.092]	< 0.088	0.29	0.27	0.14	0.93
Nickel	7440-02-0	650	64,000	< 5.1	32.1 [32.3]	12.1	23.8	54 [41]	13	21	18	13	18
Potassium	7440-09-7	- -	- -	NA	890 J [858 J]	1,430	740 J	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 1.8	0.88 J [< 2.6]	< 4.4	< 2.3	7 [4.9]	3	2.6	< 2	< 1.9	< 2
Silver	7440-22-4	84	16,000	< 2.6	0.22 J [0.22 J]	< 1.1	0.33 J	< 2.8 [< 2.7]	< 2.6	< 2.6	< 2.8	< 2.6	< 2.8
Sodium	7440-23-5	- -	- -	NA	180 J [375 J]	< 1,100	130 J	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	27.1 [28.4]	22.9	20.5	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	20	490 J [501 J]	60.0 J	339	860 [970]	72	220	270	180	190

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCTP-73 0.5 9/9/05	PCTP-73R 0-0.5 4/10/19	PCTP-74 0.5 9/9/05	PCTP-75 0.5 9/9/05	PCTP-76 0.5 9/12/05	PCTP-77 0.5 9/12/05	PCTP-78 0.5 9/12/05	PCTP-79 0.5 9/12/05	PSSTP-01A 1-2 3/11/03	PSSTP-02A 1-2 3/11/03	PSSTP-03A 1-2 3/11/03
Volatile Organic Compounds														
Acetone	67-64-1	10,000	10,000	< 0.0038	< 0.012	< 0.0058	< 0.0055	< 0.0057	< 0.0037	< 0.0036	< 0.0036	< 0.022	< 0.023	< 0.024
Benzene	71-43-2	0.5	290	< 0.00027	< 0.00061	< 0.00055	< 0.00053	< 0.00055	< 0.00026	< 0.00026	< 0.00026	0.0059	0.0082 B	< 0.0012
Carbon Disulfide	75-15-0	620	10,000	< 0.00057	< 0.0025	< 0.00071	< 0.00067	< 0.0007	< 0.00055	< 0.00054	< 0.00054	< 0.056	< 0.0057	< 0.006
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.01 B	< 0.0061	0.0048 B	0.0034 B	0.013 B	0.01 B	0.011 B	0.009 B	0.0072 B	0.0082 B	0.0097 B
Ethylbenzene	100-41-4	70	890	< 0.00075	< 0.0012	< 0.00081	< 0.00077	< 0.0008	< 0.00073	< 0.00072	< 0.00072	< 11	< 0.0011	< 0.0012
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0009	< 0.0012	< 0.0012	< 0.0011	< 0.0012	< 0.00087	< 0.00086	< 0.00086	NA	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.0061	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00019	NA	< 0.00051	< 0.00048	< 0.0005	< 0.00019	< 0.00019	< 0.00019	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	< 0.0012	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00017	< 0.0025	< 0.00067	< 0.00064	< 0.00067	< 0.00016	< 0.00016	< 0.00016	NA	NA	NA
Toluene	108-88-3	100	10,000	< 0.0002	< 0.0012	< 0.00082	< 0.00078	< 0.00081	< 0.0002	< 0.00019	< 0.00019	0.0015	< 0.0011	< 0.0012
Total Xylenes	1330-20-7	1,000	8,000	NA	< 0.0012	NA	NA	NA	NA	NA	NA	0	0	0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	11,000	NA	0.0131 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.051	< 0.21	< 0.031	< 0.029	< 0.03	< 0.3	< 0.03	< 0.15	< 0.37	< 1.9	< 2
2-Methylnaphthalene	91-57-6	1,900	13,000	0.06	0.0404 J	< 0.062	0.12	0.097	0.91	0.044 J	< 0.14	0.22 J	< 1.9	0.35 J
2-Methylphenol	95-48-7	580	160,000	< 0.18	< 0.085	< 0.14	< 0.13	< 0.13	< 1.3	< 0.13	< 0.51	NA	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	< 0.085	NA	NA	NA	NA	NA	NA	< 0.37	< 1.9	< 2
4-Methylphenol	106-44-5	58	16,000	< 0.2	NA	< 0.13	< 0.13	< 0.13	< 1.3	< 0.13	< 0.56	NA	NA	NA
4-Nitroaniline	100-01-6	17	4,600	NA	< 0.21	NA	NA	NA	NA	NA	NA	< 0.37	< 1.9	< 2
Acenaphthene	83-32-9	4,700	190,000	0.077	0.0445	0.27	0.058	0.26	2	0.24	0.29	0.47	< 1.9	1.2 J
Acenaphthylene	208-96-8	8,000	190,000	0.079	0.137	0.082	0.12	< 0.0054	0.8	0.086	0.12	0.17 J	< 1.9	1.48 J
Acetophenone	98-86-2	1,200	10,000	NA	< 0.21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.31	0.226	1.2	0.16	0.55	4.3	0.51	0.69	1.2	0.7 J	3.3
Benz(a)anthracene	56-55-3	430	130	1.1	0.742	2.9	0.66	1.1	7.8	1.7	2.5	2.8	5.9	7.6
Benzaldehyde	100-52-7	- -	- -	NA	0.0489 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	1.1	0.742	2.4	0.61	0.77	6.7	1.7	2.6	2.3	4.6	5.9
Benzo(b)fluoranthene	205-99-2	170	76	1.5	0.981	3.4	1.2	0.94	8.9	2.2	3.3	3.8	7.4	7.3
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.87	0.507	1.3	0.41	0.38	3.6	1	2.1	0.52	1.4 J	3.3
Benzo(k)fluoranthene	207-08-9	610	76	0.62	0.341	1	0.36	0.27	3.2	0.73	1	1.2	2.6	2.9
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	1.2	0.182	0.13	0.13	< 0.023	< 0.23	0.13	< 0.096	< 0.37	< 1.9	0.79 J
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.015	0.0846 J	< 0.0098	< 0.0093	< 0.0097	< 0.097	0.19	< 0.043	< 0.37	< 1.9	< 2
Carbazole	86-74-8	110	4,600	0.11	0.0768 J	0.18	0.06	0.17	1.3	0.23	0.36	0.47	0.45 J	1.2
Chrysene	218-01-9	230	760	1.1	0.741	2.7	0.76	1.1	7.5	1.7	2.7	2.8	5.6	5.6
Dibenz(a,h)anthracene	53-70-3	270	22	0.33	0.137	0.42	0.14	0.14	1.2	0.31	0.57	0.23 J	0.56 J	1 J
Dibenzofuran	132-64-9	310	3,200	0.089	0.0403 J	0.12	0.088	0.13	1.7	0.1	0.18	0.38	< 1.9	0.75 J
Diethyl phthalate	84-66-2	9,300	10,000	< 0.01	< 0.085	< 0.0085	< 0.0081	< 0.0084	< 0.084	< 0.0083	< 0.029	NA	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.0083	< 0.085	< 0.0073	< 0.007	< 0.0073	< 0.073	0.041	< 0.024	0.18 J	< 1.9	< 2
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.0087	< 0.085	< 0.012	< 0.012	< 0.012	< 0.12	< 0.012	< 0.025	< 0.37	< 1.9	< 2

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PCTP-73 0.5 9/9/05	PCTP-73R 0-0.5 4/10/19	PCTP-74 0.5 9/9/05	PCTP-75 0.5 9/9/05	PCTP-76 0.5 9/12/05	PCTP-77 0.5 9/12/05	PCTP-78 0.5 9/12/05	PCTP-79 0.5 9/12/05	PSSTP-01A 1-2 3/11/03	PSSTP-02A 1-2 3/11/03	PSSTP-03A 1-2 3/11/03
Semi-Volatile Organic Compounds (cont'd)														
Fluoranthene	206-44-0	3,200	130,000	1.7	1.34	6.7	1.1	1.8	17	3.1	4.8	4.7	9.6	16
Fluorene	86-73-7	3,800	130,000	0.094	0.0577	0.31	0.07	0.2	2.3	0.2	0.26	0.69	< 1.9	1.3 J
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	0.73	0.525	1.2	0.38	0.34	3.3	0.92	1.7	0.61	1.7 J	3.4
Naphthalene	91-20-3	25	760	0.14	0.0552	0.071	0.27	0.084	1.6	0.064	< 0.025	0.36 J	< 1.9	0.5 J
Phenanthrene	85-01-8	10,000	190,000	1.2	0.732	3.5	0.54	2.5	16	2.2	3.7	3.8	2.3	12
Phenol	108-95-2	200	16,000	< 0.056	< 0.085	< 0.06	< 0.057	< 0.059	< 0.59	< 0.059	< 0.16	1.5	< 1.9	< 2
Pyrene	129-00-0	2,200	96,000	2.2	1.26	5.4	1.2	2.3	13	3.5	5.5	5.2	8.2	14
Total PAHs and 2-Methylnaphthalene	-	- -	- -	13.2	8.61	32.9	8.16	12.8	100	20.2	31.8	31.1	50.6	87.1
Metals														
Aluminum	7429-90-5	- -	190,000	NA	8,940	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	< 2.2	1.4 J	< 2.2	< 2.1	< 2.2	< 2.2	< 2.1	3.2	< 2.2	3.2	< 7.4
Arsenic	7440-38-2	29	61	4.2	5.3	4.4	2.8	4.8	5.6	9	5.5	5.3	6.2	3.6
Barium	7440-39-3	8,200	190,000	70	83.1	69	45	69	110	280	120	120	110	220
Beryllium	7440-41-7	320	6,400	< 0.67	0.42	< 0.65	< 0.62	< 0.65	< 0.65	< 0.64	< 0.64	< 0.67	< 0.69	< 0.72
Cadmium	7440-43-9	38	1,600	< 0.67	1.2	< 0.65	< 0.62	< 0.65	< 0.65	0.7	< 0.64	< 0.67	< 0.69	< 0.72
Calcium	7440-70-2	- -	- -	NA	26,700	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	14	19.8	19	9.6	23	25	23	23	23	26	21
Cobalt	7440-48-4	160	960	NA	5.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	1,400	75.1	31	34	28	41	52	55	38	190	22
Cyanide	57-12-5	200	1,900	NA	0.45	NA	NA	NA	NA	NA	NA	< 0.28	< 0.29	0.9
Iron	7439-89-6	- -	190,000	NA	14,400	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	130	248	250	73	150	220	***1,100***	430	230	***970***	250
Magnesium	7439-95-4	- -	- -	NA	7,550	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	0.5	0.48	0.8	0.13	< 0.09	0.47	0.36	0.2	0.58	1.2	0.71
Nickel	7440-02-0	650	64,000	12	19.7	14	14	17	17	15	17	18	19	10
Potassium	7440-09-7	- -	- -	NA	1,230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 2	< 2.5	2.6	2.3	2.6	2.2	< 1.9	2.6	< 2	< 2.1	< 2.2
Silver	7440-22-4	84	16,000	< 2.8	< 0.62	< 2.7	< 2.6	< 2.7	< 2.7	< 2.7	< 2.7	< 2.8	< 2.9	< 3
Sodium	7440-23-5	- -	- -	NA	187 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	37.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	130	234	86	63	89	180	510	380	130	190	250

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-04A 1-2 3/11/03	PSSTP-04R 1-2 4/11/19	PSSTP-05A 1-2 3/11/03	PSSTP-06A 1-2 3/11/03	PSSTP-07A 1-2 3/11/03	PSSTP-07R 0.5-2 4/18/19	PSSTP-08A 1-2 3/11/03	PSSTP-09A 1-2 3/12/03	PSSTP-10A 1-2 3/12/03	PSSTP-10R 1-2 4/16/19
Volatile Organic Compounds													
Acetone	67-64-1	10,000	10,000	< 0.023	0.0232	< 0.024	< 0.025	< 0.025	< 0.01 [0.0095 J]	< 0.025	< 0.026	< 0.023	0.394
Benzene	71-43-2	0.5	290	< 0.0011 B	< 0.00052	< 0.12	< 0.0013	< 0.0012	0.00089 J [0.0034 J]	< 0.0012	< 0.0013	< 0.0011	< 0.00063
Carbon Disulfide	75-15-0	620	10,000	< 0.0057	< 0.0021	0.0061	< 0.0063	< 0.0062	< 0.0021 [< 0.0023]	< 0.0062	< 0.0065	< 0.0057	< 0.0025
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0021	NA	NA	NA	< 0.0021 [< 0.0023]	NA	NA	NA	< 0.0025
Dichloromethane	75-09-2	0.5	10,000	0.0076 B	< 0.0052	0.067 B	0.0046 JB	0.0099 B	< 0.0052 [< 0.0057]	0.0057 JB	0.0041 JB	0.0036 JB	< 0.0063
Ethylbenzene	100-41-4	70	890	< 0.0011	< 0.0010	< 0.0012	< 0.0013	< 0.0012	< 0.0010 [< 0.0011]	< 0.012	< 0.0013	< 0.0011	< 0.0013
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0021	NA	NA	NA	< 0.0021 [< 0.0023]	NA	NA	NA	< 0.0025
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	< 0.0010	NA	NA	NA	< 0.0010 [< 0.0011]	NA	NA	NA	< 0.0013
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.0052	NA	NA	NA	< 0.0052 [< 0.0057]	NA	NA	NA	0.0061 J
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0021	NA	NA	NA	< 0.0021 [< 0.0023]	NA	NA	NA	< 0.0025
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	< 0.0010	NA	NA	NA	< 0.0010 [< 0.0011]	NA	NA	NA	< 0.0013
Styrene (Monomer)	100-42-5	24	10,000	NA	< 0.0021	NA	NA	NA	< 0.0021 [< 0.0023]	NA	NA	NA	< 0.0025
Toluene	108-88-3	100	10,000	< 0.0011	< 0.0010	0.0013	< 0.0013	< 0.0012	< 0.0010 [< 0.0011]	< 0.0012	< 0.0013	< 0.0011	< 0.0013
Total Xylenes	1330-20-7	1,000	8,000	0	< 0.0010	0.0067 B	0	0	< 0.0010 [< 0.0011]	0	0	0	< 0.0013
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	NA	0.0462 J	NA	NA	NA	0.0107 J [0.0085 J]	NA	NA	NA	0.0132 J
2,4-Dimethylphenol	105-67-9	230	10,000	< 19	< 0.19	< 7.8	< 1.9	< 4.2	< 0.21 [< 0.19]	< 4.1	< 0.43	< 0.38	< 0.18
2-Methylnaphthalene	91-57-6	1,900	13,000	3.7 J	0.0951	1.4	0.054 J	< 4.2	0.0195 J [0.0151 J]	0.86 J	< 0.43	< 0.38	0.0273 J
2-Methylphenol	95-48-7	580	160,000	NA	< 0.075	NA	NA	NA	< 0.083 [< 0.075]	NA	NA	NA	< 0.074
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 19	< 0.075	< 7.8	< 0.42	< 4.2	< 0.083 [< 0.075]	< 4.1	< 0.43	< 0.38	< 0.074
4-Methylphenol	106-44-5	58	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	100-01-6	17	4,600	< 19	< 0.19	< 7.8	< 1.9	< 4.2	< 0.21 [< 0.19]	< 4.1	0.17 J	< 0.38	< 0.18
Acenaphthene	83-32-9	4,700	190,000	12 J	0.348	< 7.8	< 0.42	1.2 J	0.125 [0.0906]	1.1 J	0.56 J	< 0.38	0.0284 J
Acenaphthylene	208-96-8	8,000	190,000	< 19	0.229	8.1	0.28 J	< 4.2	0.0720 [0.0886]	6.6	< 0.43	< 0.38	0.266
Acetophenone	98-86-2	1,200	10,000	NA	< 0.19	NA	NA	NA	< 0.21 [< 0.19]	NA	NA	NA	< 0.18
Anthracene	120-12-7	350	190,000	23	0.871	9.9	0.33 J	3.6 J	0.321 [0.346]	7.4	0.16 J	< 0.38	0.608
Benz(a)anthracene	56-55-3	430	130	45	2.79	21	1.8	6.4	0.939 [0.983]	15	0.41 J	0.17 J	1.76
Benzaldehyde	100-52-7	- -	- -	NA	< 0.19	NA	NA	NA	0.0221 J [0.0177 J]	NA	NA	NA	< 0.18
Benzo(a)pyrene	50-32-8	46	12	35	2.37	18	1.5	5	0.979 [0.987]	10	0.37 J	0.14 J	1.31
Benzo(b)fluoranthene	205-99-2	170	76	42	2.85	23	2.7	7	1.21 [1.21]	15	0.6	0.22 J	1.97
Benzo(g,h,i)perylene	191-24-2	180	190,000	12 J	1.35 J	7.8 J	0.08 J	1.8 J	0.626 [0.558]	3.9 J	0.1 J	0.1 J	0.909
Benzo(k)fluoranthene	207-08-9	610	76	18 J	1.01	11	0.95	2.1 J	0.481 [0.401]	3.8 J	0.26 J	0.089 J	0.781
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	< 19	< 0.075	< 7.8	0.082 J	0.64 J	0.191 [0.11]	< 4.1	1.7 B	< 0.38	< 0.074
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 19	< 0.075	< 7.8	< 0.42	0.46 J	< 0.083 [< 0.075]	< 4.1	< 0.43	< 0.38	< 0.074
Carbazole	86-74-8	110	4,600	10 J	0.344	3.1 J	0.087 J	1.8 J	0.139 [0.102]	2.4 J	0.061 J	< 0.38	0.218
Chrysene	218-01-9	230	760	37	2.59	20	1.5	6.6	0.847 [0.907]	10	0.37 J	0.21 J	1.72
Dibenz(a,h)anthracene	53-70-3	270	22	6 J	0.421	2.6 J	0.36 J	0.66 J	0.132 [0.135]	1.7 J	< 0.43	< 0.38	0.354
Dibenzofuran	132-64-9	310	3,200	7.6 J	0.316	3.4 J	0.057 J	0.8 J	0.0676 J [0.0596 J]	6.1	< 0.43	< 0.38	0.115
Diethyl phthalate	84-66-2	9,300	10,000	NA	< 0.075	NA	NA	NA	< 0.083 [< 0.075]	NA	NA	NA	< 0.074
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 19	< 0.075	< 7.8	0.053 JB	0.42 JB	0.343 [0.294]	< 4.1	0.044 JB	< 0.38	< 0.074
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 19	< 0.075	< 7.8	< 0.42	< 4.2	< 0.083 [< 0.075]	< 4.1	< 0.43	< 0.38	< 0.074

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-04A 1-2 3/11/03	PSSTP-04R 1-2 4/11/19	PSSTP-05A 1-2 3/11/03	PSSTP-06A 1-2 3/11/03	PSSTP-07A 1-2 3/11/03	PSSTP-07R 0.5-2 4/18/19	PSSTP-08A 1-2 3/11/03	PSSTP-09A 1-2 3/12/03	PSSTP-10A 1-2 3/12/03	PSSTP-10R 1-2 4/16/19
Semi-Volatile Organic Compounds (cont'd)													
Fluoranthene	206-44-0	3,200	130,000	86	5.45 D	49	2.8	15	1.71 [1.82]	27	0.76	0.31 J	3.21
Fluorene	86-73-7	3,800	130,000	13 J	0.472	5.5 J	0.069 J	1.4 J	0.136 [0.128]	8.8	0.048 J	< 0.38	0.203
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	16 J	1.27 J	7.5 J	1	1.7 J	0.66 [0.633]	3.7 J	0.093 J	0.095 J	1.03
Naphthalene	91-20-3	25	760	9 J	0.16	2.5 J	0.23 J	0.48 J	0.0321 J [0.0192 J]	4.7	< 0.43	< 0.38	0.0813
Phenanthrene	85-01-8	10,000	190,000	85	4.19 D	38	1.2	12	1.2 [1.21]	14	0.61	0.15 J	2.25
Phenol	108-95-2	200	16,000	1.7	< 0.075	< 1.5	< 0.42	< 1.6	< 0.083 [< 0.075]	< 4.1	< 0.43	< 0.38	< 0.074
Pyrene	129-00-0	2,200	96,000	99	4.33 D	41	3.2	13	1.59 [1.68]	23	0.99	0.26 J	2.56
Total PAHs and 2-Methylnaphthalene	-	- -	- -	542	30.8	266	18.1	77.9	11.1 [11.2]	157	5.33	1.74	19.1
Metals													
Aluminum	7429-90-5	- -	190,000	NA	13,500	NA	NA	NA	11,100 [7,460]	NA	NA	NA	5,430 J
Antimony	7440-36-0	27	1,300	< 2.3	< 2.3	4.3	< 2.5	< 2.5	< 2.6 J [< 2.4 J]	6.6	2.7	< 2.3	0.56 J
Arsenic	7440-38-2	29	61	5.2	5.8	15	4	4.4	6.6 [6.9]	12	6.7	10	7.9
Barium	7440-39-3	8,200	190,000	100	80.1	55	36	320	110 [146]	230	95	68	42.5
Beryllium	7440-41-7	320	6,400	< 0.69	0.64	< 0.71	< 0.76	< 0.75	0.52 [0.37]	0.78	0.96	< 0.68	0.40
Cadmium	7440-43-9	38	1,600	< 0.69	0.38 J	< 0.71	< 0.76	0.95	0.39 J [0.74]	2.4	< 0.78	< 0.68	0.32 J
Calcium	7440-70-2	- -	- -	NA	21,200	NA	NA	NA	22,400 [27,600]	NA	NA	NA	519 J
Chromium	7440-47-3	190,000	190,000	28	23.8	15	< 6.3	11	18.0 [20.0]	32	68	12	19.5 J
Cobalt	7440-48-4	160	960	NA	7.2	NA	NA	NA	5.3 J [5.0 J]	NA	NA	NA	5.2 J
Copper	7440-50-8	43,000	120,000	43	49.3	99	32	20	17.7 [28.1]	250	51	54	63.1
Cyanide	57-12-5	200	1,900	0.72	0.23 J	13	4.1	0.35	0.33 J [0.37 J]	2	0.85	< 0.28	< 0.27 J
Iron	7439-89-6	- -	190,000	NA	19,700	NA	NA	NA	17,000 [16,000]	NA	NA	NA	13,300
Lead	7439-92-1	450	1,000	170	***523***	150	41	340	158 J [201 J]	***930***	85	100	153
Magnesium	7439-95-4	- -	- -	NA	9,490	NA	NA	NA	4,540 J [4,260 J]	NA	NA	NA	1,540
Manganese	7439-96-5	2,000	150,000	NA	286	NA	NA	NA	316 J [297 J]	NA	NA	NA	202 J
Mercury	7439-97-6	10	510	0.41	0.71	0.4	0.15	0.37	0.19 J [0.23 J]	2.1	0.24	0.18	0.24 J
Nickel	7440-02-0	650	64,000	15	14.9	27	6.6	< 6.2	11.1 [11.6]	25	14	12	10
Potassium	7440-09-7	- -	- -	NA	1,560	NA	NA	NA	978 J [895 J]	NA	NA	NA	798 J
Selenium	7782-49-2	26	16,000	< 2.1	< 2.3	< 2.1	< 2.3	< 2.2	< 2.6 [< 2.4]	< 2.2	< 2.3	< 2	< 2.3
Silver	7440-22-4	84	16,000	< 2.9	< 0.57	< 2.9	< 3.2	< 3.1	< 0.65 [< 0.60]	< 3.1	< 3.2	< 2.8	< 0.58
Sodium	7440-23-5	- -	- -	NA	121 J	NA	NA	NA	121 J [118 J]	NA	NA	NA	< 1,200
Vanadium	7440-62-2	820	220	NA	32.9	NA	NA	NA	18.0 [15.3]	NA	NA	NA	12.5
Zinc	7440-66-6	12,000	190,000	130	126	200	39	380	127 [164]	820	310	120	99.8 J

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

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Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-11A 1-2 3/12/03	PSSTP-12A 1-2 3/12/03	PSSTP-13A 1-2 3/12/03	PSSTP-14A 1-2 3/12/03	PSSTP-15A 1-2 3/12/03	PSSTP-16A 1-2 3/12/03	PSSTP-17A 1-2 3/12/03	PSSTP-18A 1-2 3/12/03	PSSTP-19A 1-2 3/12/03	PSSTP-20A 1-2 3/13/03
Volatile Organic Compounds													
Acetone	67-64-1	10,000	10,000	< 0.023	< 0.024	< 0.022	< 0.029	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.023
Benzene	71-43-2	0.5	290	< 0.0011	< 0.0012	< 0.0011	< 0.0014	< 0.0012	< 0.0012	< 0.012	< 0.0012	< 0.0012	< 0.0012
Carbon Disulfide	75-15-0	620	10,000	< 0.0057	< 0.006	0.0012 J	< 0.0071	< 0.0061	< 0.0061	< 0.006	< 0.0059	< 0.006	< 0.0058
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.0046 JB	< 0.006	0.0035 JB	< 0.0071	0.002 JB	0.0021 JB	0.0021 JB	< 0.0059	< 0.006	0.0072 B
Ethylbenzene	100-41-4	70	890	< 0.0011	< 0.0012	<	< 0.0014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	100	10,000	< 0.0011	< 0.0012	< 0.0011	< 0.0014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
Total Xylenes	1330-20-7	1,000	8,000	0	0	0	0	0	0	0	JB	0	0
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.38	< 8	< 0.37	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39
2-Methylnaphthalene	91-57-6	1,900	13,000	0.06 J	1.9 J	< 0.37	< 0.48	0.35 J	0.051 J	0.14 J	0.076 J	< 0.4	0.092 J
2-Methylphenol	95-48-7	580	160,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.38	< 8	< 0.37	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39
4-Methylphenol	106-44-5	58	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	100-01-6	17	4,600	< 0.38	< 8	< 0.37	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39
Acenaphthene	83-32-9	4,700	190,000	< 0.38	1.8 J	0.045 J	< 0.48	0.64	0.2 J	0.24 J	0.21 J	0.1 J	0.16 J
Acenaphthylene	208-96-8	8,000	190,000	0.51	11	< 0.37	0.11 J	0.075 J	0.073 J	0.074 J	0.21 J	< 0.4	0.18 J
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.83	12	0.27 J	0.079 J	1.2	0.53	0.54 J	0.8	0.35 J	0.46
Benz(a)anthracene	56-55-3	430	130	3.7	50	1.4	1.5	2.8	1.5	1.3	1.9	0.31 J	1.7
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	2.3	41	1.2	1.9	2.4	1.3	1	1.5	0.5	1.5
Benzo(b)fluoranthene	205-99-2	170	76	3.5	67	1.5	4.3	4	2.1	1.7	2.6	0.099 J	2.4
Benzo(g,h,i)perylene	191-24-2	180	190,000	1	13	0.73	1.3	0.75	0.39 J	0.36 J	0.42	0.14 J	0.55
Benzo(k)fluoranthene	207-08-9	610	76	1.6	20	0.54	1.3	1.6	0.62	0.58	0.77	< 0.4	0.83
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	< 0.38	< 8	< 0.37	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.38	< 8	< 0.37	< 0.48	< 0.41	< 0.41	0.045 J	0.053 J	< 0.4	< 0.39
Carbazole	86-74-8	110	4,600	0.17 J	3.6 J	0.12 J	< 0.48	0.7	0.25 J	0.23 J	0.37 J	0.043 J	0.24 J
Chrysene	218-01-9	230	760	3.4	56	1.6	2	2.9	1.6	1.3	1.8	0.38 J	1.8
Dibenz(a,h)anthracene	53-70-3	270	22	0.46	5.1 J	0.21 J	0.5	0.3 J	0.15 J	0.14 J	0.17 J	< 0.4	0.23 J
Dibenzofuran	132-64-9	310	3,200	0.25 J	2.9 J	0.1 J	< 0.48	0.48	0.12 J	0.19 J	0.17 J	< 0.4	0.11 J
Diethyl phthalate	84-66-2	9,300	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.38	< 8	< 0.37	< 0.48	0.06 J	< 0.41	0.11 J	0.049 J	< 0.4	0.045 J
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.38	< 8	< 0.37	< 0.48	0.076 J	< 0.41	0.047 J	< 0.39	< 0.4	< 0.39

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Semi-Volatile Organic Compounds (cont'd)													
Fluoranthene	206-44-0	3,200	130,000	5.6	100	3.3	1.2	4.8	3	2.4	3.6	0.66	3
Fluorene	86-73-7	3,800	130,000	0.31 J	8.1	0.19 J	< 0.48	0.59	0.22 J	0.23 J	0.32 J	< 0.4	0.18 J
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	1.1	13	0.66	1.4	0.83	0.44	0.41	0.48	0.12 J	0.61
Naphthalene	91-20-3	25	760	0.11 J	3.5 J	< 0.37	0.11 J	1.9	0.08 J	0.77	0.17 J	< 0.4	0.16 J
Phenanthrene	85-01-8	10,000	190,000	2.6	86	1.2	0.31 J	4	2.2	1.9	2.6	0.39 J	1.8
Phenol	108-95-2	200	16,000	1.7	< 1.5	< 0.37	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39
Pyrene	129-00-0	2,200	96,000	4.7	120	3.1	0.99	4.6	2.7	2.2	3.3	0.58	2.7
Total PAHs and 2-Methylnaphthalene	-	- -	- -	31.8	609	15.9	17.0	33.7	17.2	15.3	20.9	3.63	18.4
Metals													
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	< 2.3	5.4	< 2.2	< 2.9	< 2.4	< 2.4	2.7	< 2.4	< 2.4	< 2.3
Arsenic	7440-38-2	29	61	< 2.3	***100***	3.6	< 2.9	6.1	6	7.4	6.3	6.8	***47***
Barium	7440-39-3	8,200	190,000	96	88	17	36	180	120	150	97	72	65
Beryllium	7440-41-7	320	6,400	< 0.68	0.76	< 0.67	< 0.86	< 0.73	< 0.73	1.7	< 0.71	< 0.72	< 0.7
Cadmium	7440-43-9	38	1,600	< 0.68	1.2	< 0.67	< 0.86	< 0.73	< 0.73	< 0.72	< 0.71	< 0.72	< 0.7
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	< 5.7	20	9.2	< 7.1	24	23	24	24	19	9.8
Cobalt	7440-48-4	160	960	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	20	150	7.6	25	34	55	100	31	48	57
Cyanide	57-12-5	200	1,900	0.53	2.8	< 0.28	< 0.36	< 0.3	0.68	< 0.3	0.29	< 0.3	2.3
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	52	310	13	58	380	280	270	180	200	240
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	0.13	0.6	< 0.94	0.17	0.7	0.63	0.53	0.54	0.6	0.41
Nickel	7440-02-0	650	64,000	5.8	30	7.5	< 7.1	13	18	17	14	14	14
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 2	< 2.2	< 2	< 2.6	< 2.2	< 2.2	< 2.2	< 2.1	< 2.2	< 2.1
Silver	7440-22-4	84	16,000	< 2.8	< 3	< 2.8	< 3.6	< 3	< 3	< 3	< 2.9	< 3	< 2.9
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	31	430	32	< 14	200	260	570	130	110	240

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Volatile Organic Compounds													
Acetone	67-64-1	10,000	10,000	< 0.025	< 2.9	< 0.013	< 0.024	< 0.024	< 0.024	< 0.024	< 0.023	< 0.11	< 0.022
Benzene	71-43-2	0.5	290	< 0.0013	***0.68***	0.0010	< 0.0012	< 0.0012	< 0.0012	< 0.012	< 0.0012	< 0.0057	< 0.0011
Carbon Disulfide	75-15-0	620	10,000	< 0.0063	< 0.73	0.0012 J	< 0.006	< 0.006	< 0.0061	< 0.0061	< 0.0058	< 0.029	< 0.0056
Cyclohexane	110-82-7	6,900	10,000	NA	NA	< 0.0026	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.0052 JB	0.28 J	< 0.0064	0.0095 B	0.0053 JB	0.0056 JB	0.0091 B	0.0035 JB	0.035 B	0.0043 JB
Ethylbenzene	100-41-4	70	890	< 0.0013	< 0.15	< 0.0013	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	0.0095	< 0.0011
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	< 0.0026	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	NA	0.0029	NA	NA	NA	NA	NA	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	< 0.0064 J	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	< 0.0026	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	0.00085 J	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	NA	NA	< 0.0026	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	100	10,000	< 0.0013	0.9	0.0016	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	0.012	< 0.0011
Total Xylenes	1330-20-7	1,000	8,000	0	1.22	0.0038	0	0	0	0	0	0.048	0
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	NA	NA	1.99	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.42	< 19	0.181 J	< 0.4	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1
2-Methylnaphthalene	91-57-6	1,900	13,000	0.82	11 J	10.9 D	< 0.4	0.24 J	< 8.1	0.35 J	2 J	17	0.5 J
2-Methylphenol	95-48-7	580	160,000	NA	NA	0.0797 J	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.42	< 19	0.304	< 0.4	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1
4-Methylphenol	106-44-5	58	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	100-01-6	17	4,600	< 0.42	< 19	< 0.4	< 0.4	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1
Acenaphthene	83-32-9	4,700	190,000	0.25 J	2.7 J	1.98	< 0.4	< 1.2	< 8.1	1.1 J	8.8 J	8.7	1.1
Acenaphthylene	208-96-8	8,000	190,000	0.93	8.5 J	17.7 D	< 0.4	0.83 J	1.3 J	0.32 J	3.2 J	< 7.7	0.35 J
Acetophenone	98-86-2	1,200	10,000	NA	NA	0.0245 J	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	1.1	39	31.1 D	< 0.4	4.7	3.4 J	2.5	31	7 J	2.8
Benz(a)anthracene	56-55-3	430	130	4.3	81	58 D	0.19 J	11	18	6	51	7 J	4.7
Benzaldehyde	100-52-7	- -	- -	NA	NA	< 0.4	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	12	3.7	***53***	***48.6 D***	0.16 J	6.6	14	5.4	42	3.4 J	3.4
Benzo(b)fluoranthene	205-99-2	170	76	7.1	82	71.4 D	0.24 J	11	29	8.3	67	3.4 J	5.2
Benzo(g,h,i)perylene	191-24-2	180	190,000	1.3	27	31 D	0.099 J	2.5	< 8.1	1.7	11 J	1.4 J	0.95 J
Benzo(k)fluoranthene	207-08-9	610	76	2.9	35	6.68	0.074 J	4.4	8 J	2.7	21	0.97 J	1.2
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	< 0.42	< 19	< 0.16	< 0.4	< 1.2	< 8.1	0.87 J	< 19	< 7.7	0.13 J
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.42	< 19	< 0.16	< 0.4	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1
Carbazole	86-74-8	110	4,600	0.5	11 J	9.74 D	< 0.4	1.3	1.5 J	1.2	4.5 J	< 7.7	1.1 J
Chrysene	218-01-9	230	760	4.8	75	52.3 D	0.18 J	12	23	5.7	47	6.7 J	4.1
Dibenz(a,h)anthracene	53-70-3	270	22	0.53	11 J	6.44	< 0.4	1.1 J	3.4 J	0.6 J	3.2 J	< 7.7	0.35 J
Dibenzofuran	132-64-9	310	3,200	0.54	22	18.1 D	< 0.4	0.42 J	0.97 J	0.65 J	5.8 J	3.4 J	1 J
Diethyl phthalate	84-66-2	9,300	10,000	NA	NA	< 0.16	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.14 J	< 19	< 0.16	0.063 J	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.42	< 19	< 0.16	< 0.4	< 1.2	< 8.1	< 1.2	< 19	< 7.7	< 1.1

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-21A 1-2 3/13/03	PSSTP-22A 1-2 3/13/03	PSSTP-22R 0.5-2 4/24/19	PSSTP-23A 1-2 3/13/03	PSSTP-24A 1-2 3/13/03	PSSTP-25A 1-2 3/13/03	PSSTP-26A 1-2 3/13/03	PSSTP-27A 1-2 3/13/03	PSSTP-28A 1-2 3/13/03	PSSTP-29A 1-2 3/13/03
Semi-Volatile Organic Compounds (cont'd)													
Fluoranthene	206-44-0	3,200	130,000	6.2	160	139 D	0.33 J	16	34	11	120	4 J	9.1
Fluorene	86-73-7	3,800	130,000	0.43	30	18.9 D	< 0.4	0.71 J	< 8.1	1.2 J	12 J	11	1.5
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	1.5	29	35.3 D	0.09 J	2.7	8.5	1.7	11 J	0.87 J	1 J
Naphthalene	91-20-3	25	760	1.7	21	18.5 D	< 0.4	0.66 J	1.8 J	0.77 J	< 19	7.9	0.63 J
Phenanthrene	85-01-8	10,000	190,000	4.1	140	122 D	0.047 J	6.7	16	8.6	110	13	11
Phenol	108-95-2	200	16,000	1.6	1.7	0.212	1.6	< 1.2	2	< 1.2	< 1.5	2.5	< 1.1
Pyrene	129-00-0	2,200	96,000	6.3	130	107 D	0.27 J	13	25	12	130	26	8.9
Total PAHs and 2-Methylnaphthalene	-	- -	- -	48.0	935	777	1.68	94.1	185	69.9	670	118	56.8
Metals													
Aluminum	7429-90-5	- -	190,000	NA	NA	12,300 J	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	1,300	2.7	2.7	2.2 J	< 2.4	3.7	2.8	< 2.4	2.8	3.3	2.3
Arsenic	7440-38-2	29	61	5.5	16	13.5	10	13	12	5.2	11	***54***	20
Barium	7440-39-3	8,200	190,000	60	120	286 J	66	53	43	380	97	260	120
Beryllium	7440-41-7	320	6,400	< 0.76	0.88	0.91	8.1	< 0.72	< 0.73	< 0.73	< 0.7	< 0.69	< 0.67
Cadmium	7440-43-9	38	1,600	< 0.76	< 0.7	1.0	< 0.71	< 0.72	1.4	< 0.73	< 0.7	< 0.69	< 0.67
Calcium	7440-70-2	- -	- -	NA	NA	15,800 J	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	12	22	28.4	25	10	31	15	26	11	27
Cobalt	7440-48-4	160	960	NA	NA	10.6	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	120,000	70	61	549	24	55	96	27	62	57	56
Cyanide	57-12-5	200	1,900	2.2	5.5	8.1 J	< 0.3	1.3	2.6	0.46	< 0.29	0.91	< 0.28
Iron	7439-89-6	- -	190,000	NA	NA	34,900	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	1,000	130	190	***1,130***	21	69	91	***1,000***	150	***960***	***560***
Magnesium	7439-95-4	- -	- -	NA	NA	6,530 J	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	150,000	NA	NA	1,050	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	510	0.37	8.1	0.17 J	0.17	< 0.1	0.19	0.9	0.22	0.35	0.44
Nickel	7440-02-0	650	64,000	14	13	35.2	39	11	33	9.4	16	30	18
Potassium	7440-09-7	- -	- -	NA	NA	2,550	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	16,000	< 2.3	< 2.1	< 4.9	< 2.1	2.7	< 2.2	< 2.2	< 2.1	< 2.1	< 2
Silver	7440-22-4	84	16,000	< 3.2	< 2.9	0.73 J	< 3	< 3	< 3	< 2.3	< 2.9	< 2.9	< 2.8
Sodium	7440-23-5	- -	- -	NA	NA	229 J	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	220	NA	NA	38.7	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	170	95	438 J	61	37	540	560	180	370	260

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-30A 1-2 3/13/03	S-113 0-1 4/23/19	S-113B 1-3 4/24/19	S-119 0-1 4/12/19	S-120 0-1 4/24/19	S-121 0-1 4/12/19	S-122 0-1 4/12/19	S-151 0.5-2 4/25/19	S-163 0.5-2 9/19/19
Volatile Organic Compounds												
Acetone	67-64-1	10,000	10,000	< 0.026	< 0.016	< 2.5	0.0428	< 0.028	< 0.023	< 0.011	< 2.8	< 1.7
Benzene	71-43-2	0.5	290	< 0.0013	< 0.00082	***0.935***	< 0.00097	< 0.0014	< 0.0012	< 0.00055	< 0.14	< 0.087
Carbon Disulfide	75-15-0	620	10,000	< 0.0066	< 0.0033	< 0.5	< 0.0039	< 0.0055	< 0.0047	< 0.0022	< 0.57	< 0.35
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0033	< 0.5	< 0.0039	< 0.0055	< 0.0047	< 0.0022	< 0.57	0.158 J
Dichloromethane	75-09-2	0.5	10,000	< 0.0046 JB	< 0.0082	< 1.3	< 0.0097	< 0.014	< 0.012	< 0.0055	< 1.4	< 0.87
Ethylbenzene	100-41-4	70	890	< 0.0013	< 0.0016	< 0.25	< 0.0019	< 0.0028	< 0.0023	< 0.0011	< 0.28	< 0.17
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0033	< 0.5	< 0.0039	< 0.0055	< 0.0047	< 0.0022	< 0.57	< 0.35
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	< 0.0016	0.29	< 0.0019	< 0.0028	< 0.0023	< 0.0011	< 0.28	0.286
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.0082	< 1.3	0.0039 J	< 0.014	< 0.012	< 0.0055	< 1.4	< 0.87
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0033	< 0.5	< 0.0039	< 0.0055	< 0.0047	< 0.0022	< 0.57	0.409
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	< 0.0016	< 0.25	< 0.0019	< 0.0028	< 0.0023	< 0.0011	< 0.28	0.161 J
Styrene (Monomer)	100-42-5	24	10,000	NA	< 0.0033	< 0.5	< 0.0039	< 0.0055	< 0.0047	< 0.0022	< 0.57	< 0.35
Toluene	108-88-3	100	10,000	< 0.0013	< 0.0016	0.546	< 0.0019	< 0.0028	< 0.0023	< 0.0011	< 0.28	0.311
Total Xylenes	1330-20-7	1,000	8,000	0	< 0.0016	0.29	< 0.0019	< 0.0028	< 0.0023	< 0.0011	< 0.28	0.447
Semi-Volatile Organic Compounds												
1,1-Biphenyl	92-52-4	190	11,000	NA	1.2	0.177 J	0.0202 J	0.0109 J	0.0090 J	0.0088 J	NA	3.19
2,4-Dimethylphenol	105-67-9	230	10,000	< 1.3	0.158 J	< 0.4	< 0.21	< 0.19	< 0.22	< 0.2	< 0.37	< 0.94
2-Methylnaphthalene	91-57-6	1,900	13,000	4.8	2.99	0.522 J	0.0629	0.0360 J	0.0209 J	0.0226 J	22.1 D	15.3
2-Methylphenol	95-48-7	580	160,000	NA	0.195	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	< 0.15	0.131 J
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 1.3	0.61	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	0.119 J	0.485
4-Methylphenol	106-44-5	58	16,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	100-01-6	17	4,600	< 1.3	< 0.41	< 0.4	< 0.21	< 0.19	< 0.22	< 0.2	< 0.37	< 0.94
Acenaphthene	83-32-9	4,700	190,000	0.29 J	1.98	0.817 J	0.0451	0.0228 J	< 0.044	0.0155 J	5.08	2.96
Acenaphthylene	208-96-8	8,000	190,000	0.4 J	32.3 D	16.9 D	0.494	0.115	0.0828	0.109	40.3 D	36 D
Acetophenone	98-86-2	1,200	10,000	NA	0.128 J	< 0.4	< 0.21	< 0.19	< 0.22	< 0.2	NA	< 0.94
Anthracene	120-12-7	350	190,000	0.44 J	52.7 D	24 D	0.63	0.122	0.102	0.126	78.8 D	85.4 D
Benz(a)anthracene	56-55-3	430	130	1.1 J	101 D	65.9 D	1.96	0.417 J	0.484	0.631	93.1 D	201 D
Benzaldehyde	100-52-7	- -	- -	NA	< 0.41	< 0.4	0.212	0.0111 J	0.0123 J	0.0206 J	NA	< 0.94
Benzo(a)pyrene	50-32-8	46	12	1.1 J	***82.9 D***	***55.2 D***	2.26	0.516 J	0.821	0.848	***86.4 D***	***156 D***
Benzo(b)fluoranthene	205-99-2	170	76	2.6	107 D	76.6 D	2.81	0.638	0.821	1.01	101 D	***218 D***
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.59 J	53.1 D	31.1 D	1.48	0.407 J	0.663	0.598	64.7 D	79.6 D
Benzo(k)fluoranthene	207-08-9	610	76	0.68 J	43 D	23.1 D	0.891	0.253	0.29	0.307	40.3 D	66.1 D
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	< 1.3	< 0.16	< 0.16	0.181	0.0397 J	0.0786 J	0.0546 J	< 0.15	< 0.37
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 1.3	< 0.16	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	< 0.15	< 0.37
Carbazole	86-74-8	110	4,600	0.3 J	9.79 D	1.82 J	0.14	0.0420 J	0.0282 J	0.0396 J	29.4 D	10.2
Chrysene	218-01-9	230	760	2.2	90.9 D	57 D	1.81	0.443	0.507	0.663	77 D	174 D
Dibenz(a,h)anthracene	53-70-3	270	22	0.17 J	17.1 D	9.6 D	0.349	0.0964	0.117	0.137	16.4 D	23.8 D
Dibenzofuran	132-64-9	310	3,200	0.59 J	10.2 D	2.81 J	0.0873	0.0364 J	< 0.089	0.0199 J	52.6 D	42 D
Diethyl phthalate	84-66-2	9,300	10,000	NA	< 0.16	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	< 0.15	< 0.37
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.15 J	< 0.16	< 0.16	0.0187 J	< 0.074	< 0.089	< 0.079	< 0.15	< 0.37
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 1.3	< 0.16	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	< 0.15	< 0.37

Table 7
Surface Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

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National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	PSSTP-30A 1-2 3/13/03	S-113 0-1 4/23/19	S-113B 1-3 4/24/19	S-119 0-1 4/12/19	S-120 0-1 4/24/19	S-121 0-1 4/12/19	S-122 0-1 4/12/19	S-151 0.5-2 4/25/19	S-163 0.5-2 9/19/19
Semi-Volatile Organic Compounds (cont'd)												
Fluoranthene	206-44-0	3,200	130,000	1.8	266 D	179 D	3.36	0.772 J	0.616	1.01	305 D	477 D
Fluorene	86-73-7	3,800	130,000	0.55 J	22.3 D	11 D	0.187	0.0544	0.0204 J	0.0275 J	91.9 D	69.3 D
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	0.56 J	49.6 D	36.4 D	1.41	0.406 J	0.604	0.557	56.9 D	95.1 D
Naphthalene	91-20-3	25	760	2.4	7.76	1.08 J	0.127	0.114	0.0591	0.0505	***100 D***	***37.2 D***
Phenanthrene	85-01-8	10,000	190,000	2.5	183 D	63.4 D	1.74	0.574 J	0.312	0.468	354 D	324 D
Phenol	108-95-2	200	16,000	< 1.3	0.646	< 0.16	< 0.086	< 0.074	< 0.089	< 0.079	0.0928 J	0.404
Pyrene	129-00-0	2,200	96,000	2.2	187 D	133 D	3.26	0.713 J	0.789	1.15	227 D	353 D
Total PAHs and 2-Methylnaphthalene	-	- -	- -	24.4	1,300	785	22.9	5.70	6.31	7.73	1,760	2,410
Metals												
Aluminum	7429-90-5	- -	190,000	NA	3,340 J	8,490 J	6,540	5,780 J	5,600	4,670	6,750	11,400
Antimony	7440-36-0	27	1,300	16	4.9 J	2.5 J	< 2.7	2.3 J	< 2.7	< 2.3	0.87 J	< 2.2
Arsenic	7440-38-2	29	61	***170***	10.7	10.9	***57.4***	***105***	***69.3***	***75.0***	6.9	7.6
Barium	7440-39-3	8,200	190,000	340	154 J	275 J	92.8	249 J	106	67.5	84.3	217
Beryllium	7440-41-7	320	6,400	0.79	0.24	0.65	0.68	0.59	0.88	0.52	0.75	1.2
Cadmium	7440-43-9	38	1,600	< 0.79	0.40 J	0.40 J	1.8	2.7	1.8	1.1	0.31 J	< 0.54
Calcium	7440-70-2	- -	- -	NA	1,620 J	6,740 J	4,320	2,650 J	9,920	2,290	17,500 J	41,400
Chromium	7440-47-3	190,000	190,000	31	27.1	38.6	19.3	15.2	21.0	16.1	16.7	17.4
Cobalt	7440-48-4	160	960	NA	2.9 J	4.6 J	6.8	5.6 J	< 6.9	< 5.8	3.3 J	< 5.4
Copper	7440-50-8	43,000	120,000	190	80.2	183	132	134	135	102	25.5	20.7
Cyanide	57-12-5	200	1,900	0.64	125 J	9.8 J	1.6	1.4 J	0.68	0.95	0.72 J	0.96
Iron	7439-89-6	- -	190,000	NA	19,500	21,700	14,600	17,200	11,300	14,200	11,600	10,300
Lead	7439-92-1	450	1,000	***1,600***	***460***	445	253	329	241	359	102 J	34.5
Magnesium	7439-95-4	- -	- -	NA	602 J	2,050 J	1,730	1,100 J	2,760	1,120	3,890	15,400
Manganese	7439-96-5	2,000	150,000	NA	112	147	303	229	266	245	350 J	1,710
Mercury	7439-97-6	10	510	1.2	0.50 J	0.30 J	0.21	0.29 J	0.12	0.24	0.12 J	< 0.035
Nickel	7440-02-0	650	64,000	33	8.3	18.8	23.4	18.7	25.2	13.8	9.4	8.6
Potassium	7440-09-7	- -	- -	NA	1,010 J	857 J	< 1,300	651 J	< 1,400	< 1,200	853 J	1,980
Selenium	7782-49-2	26	16,000	< 2.4	2.1 J	1.8 J	< 2.7	< 2.4	< 2.7	< 2.3	0.74 J	< 2.2
Silver	7440-22-4	84	16,000	< 3.3	< 0.60	< 0.65	< 0.67	< 0.60	< 0.69	< 0.58	< 0.55	< 0.54
Sodium	7440-23-5	- -	- -	NA	244 J	< 1,300	< 1,300	< 1,200	< 1,400	< 1,200	273 J	< 1,100
Vanadium	7440-62-2	820	220	NA	13.7	32.6	22.5	19.5	24.7	21.6	13.7	41.3
Zinc	7440-66-6	12,000	190,000	590	98.4 J	173 J	362	774	355	247	49.0	25.2

Notes:

1. Samples prior to 2019 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
4. 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS).
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 6010 and 7471.
   - Cyanide using USEPA SW-846 Method 9010 (Veritech) or 9012B (SGS).
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for surface soil.
11. Shading indicates that the result exceeds the PADEP non-residential direct contact MSC (for surface soil).
12. Italics and bolding indicates that the result exceeds the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
13. - - = No PADEP MSC.
14. - = No actual Chemical Abstracts Service (CAS) number is available.
15. Brackets indicate the reported concentration of a duplicate sample.
16. The MSCs reported for chromium is for trivalent chromium. The reported chromium results are for total chromium.
17. The MSCs reported for cyanide are for free cyanide. The reported cyanide results are for total cyanide.
18. Total polycyclic aromatic hydrocarbons (PAHs) are the sum of the 16 priority pollutant PAHs identified by the USEPA and 2-methylnaphthalene.
19. Qualifier Definitions:
    B = Analyte is an estimated value between the instrument detection limit and the Reporting Limit.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
    R = Data rejected during validation.
20. Data from 2019 have undergone a Tier II validation. Data prior to 2019 have not been validated.

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Surf Soil (No Exceedances)	PCSB-26	PCSB-26R	PCSB-27	PCSB-27	PCSB-28	PCSB-29	PCSB-30	PCSB-30R	PCSB-31	PCSB-32	PCSB-33	PCSB-34	PCSB-35
Sample Depth (ft):				0.5	0.5-2	0.5	1.5	0.5	0.5	0.5	0.5-2	0.5	0.5	0.5	0.5	0.5
Date Collected:				7/26/05	4/19/19	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05	4/19/19	7/28/05	7/28/05	7/28/05	7/27/05	8/2/05
Pesticides																
4,4-DDD	72-54-8	150	380	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	0.0037	< 0.0069	< 0.0067	< 0.0063	< 0.006	0.012
4,4-DDE	72-55-9	220	270	< 0.0057	< 0.00075	< 0.0058	< 0.0057	0.0074	< 0.0056	< 0.0056	0.0029	< 0.0069	< 0.0067	< 0.0063	< 0.006	0.017
4,4-DDT	50-29-3	330	270	0.029	< 0.00075	0.056	< 0.0057	0.066	< 0.0056	0.022	0.0155	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Aldrin	309-00-2	2.4	5.4	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Beta-BHC	319-85-7	1.1	51	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Chlordane	57-74-9	49	260	< 0.011	NA	< 0.012	< 0.011	< 0.012	< 0.011	< 0.011	NA	< 0.014	< 0.013	< 0.013	< 0.012	< 0.01
Dieldrin	60-57-1	0.58	- -	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endosulfan I	959-98-8	260	19,000	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endosulfan II	33213-65-9	260	19,000	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endosulfan sulfate	1031-07-8	70	19,000	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endrin	72-20-8	5.5	960	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endrin aldehyde	7421-93-4	- -	- -	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Endrin ketone	53494-70-5	- -	- -	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Heptachlor epoxide	1024-57-3	1.1	10	< 0.0057	< 0.00075	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.00083	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Methoxychlor	72-43-5	630	16,000	< 0.0057	< 0.0015	< 0.0058	< 0.0057	< 0.006	< 0.0056	< 0.0056	< 0.0017	< 0.0069	< 0.0067	< 0.0063	< 0.006	< 0.0052
Toxaphene	8001-35-2	1.2	83	< 0.028	< 0.019	< 0.029	< 0.028	< 0.03	< 0.028	< 0.028	< 0.021	< 0.035	< 0.033	< 0.031	< 0.03	< 0.026
trans-chlordane	5103-74-2	- -	- -	NA	< 0.00075	NA	NA	NA	NA	NA	0.00059 J	NA	NA	NA	NA	NA
Polychlorinated Biphenyls																
Aroclor 1242	53469-21-9	20	46	< 0.028	< 0.038	< 0.029	< 0.028	< 0.03	< 0.028	< 0.028	< 0.042	< 0.035	< 0.033	< 0.031	< 0.03	< 0.026
Aroclor 1248	12672-29-6	81	46	< 0.028	< 0.038	< 0.029	< 0.028	< 0.03	< 0.028	< 0.028	< 0.042	< 0.035	< 0.033	< 0.031	< 0.03	< 0.026
Aroclor 1254	11097-69-1	340	46	< 0.028	< 0.038	< 0.029	< 0.028	< 0.03	< 0.028	< 0.028	< 0.042	< 0.035	< 0.033	< 0.031	< 0.03	< 0.026
Aroclor 1260	11096-82-5	770	46	< 0.028	< 0.038	< 0.029	< 0.028	< 0.03	< 0.028	< 0.028	< 0.042	< 0.035	< 0.033	< 0.031	0.084	0.066
Aroclor 1262	37324-23-5	- -	- -	NA	< 0.038	NA	NA	NA	NA	NA	< 0.042	NA	NA	NA	NA	NA
Total PCBs	-	- -	- -	<0.028	<0.038	<0.029	<0.028	<0.03	<0.028	<0.028	<0.042	<0.035	<0.033	<0.031	0.084	0.066

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-36	PCSB-37	PCSB-38	PCSB-39	PCSB-40	PCSB-41	PCSB-41R	PCSB-42	PCSB-43	PCSB-44	PCSB-45
Sample Depth (ft): Date Collected:	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	0.5 7/27/05	0.5 8/3/05	0.5 7/27/05	0.5 7/27/05	0.5 7/28/05	0.5 7/28/05	0.5-2 4/22/19	0.5 8/1/05	0.5 8/1/05	0.5 8/3/05	0.5 8/3/05
Pesticides														
4,4-DDD	72-54-8	150	380	< 0.0058	< 0.0056	0.02	< 0.0065	< 0.0067	0.085	0.0044 JN	0.0091 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
4,4-DDE	72-55-9	220	270	< 0.0058	0.026	0.022	< 0.0065	< 0.0067	0.15	0.0054	0.015 [< 0.0053]	0.012	< 0.0052	< 0.0053 [< 0.0053]
4,4-DDT	50-29-3	330	270	< 0.0058	0.17	0.058	< 0.0065	< 0.0067	0.1	0.0056	< 0.0052 [< 0.0053]	< 0.0053	0.016	0.039 [0.03]
Aldrin	309-00-2	2.4	5.4	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079 J	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Beta-BHC	319-85-7	1.1	51	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Chlordane	57-74-9	49	260	< 0.012	< 0.011	< 0.012	< 0.013	< 0.013	< 0.011	NA	< 0.01 [< 0.011]	< 0.011	< 0.01	< 0.011 [< 0.011]
Dieldrin	60-57-1	0.58	- -	< 0.0058	0.095	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endosulfan I	959-98-8	260	19,000	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endosulfan II	33213-65-9	260	19,000	< 0.0058	0.016	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endosulfan sulfate	1031-07-8	70	19,000	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endrin	72-20-8	5.5	960	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endrin aldehyde	7421-93-4	- -	- -	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Endrin ketone	53494-70-5	- -	- -	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Heptachlor epoxide	1024-57-3	1.1	10	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.00079	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Methoxychlor	72-43-5	630	16,000	< 0.0058	< 0.0056	< 0.0061	< 0.0065	< 0.0067	< 0.0054	< 0.0016	< 0.0052 [< 0.0053]	< 0.0053	< 0.0052	< 0.0053 [< 0.0053]
Toxaphene	8001-35-2	1.2	83	< 0.029	< 0.028	< 0.03	< 0.032	< 0.033	< 0.027	< 0.02	< 0.026 [< 0.026]	< 0.027	< 0.026	< 0.026 [< 0.027]
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	< 0.00079	NA	NA	NA	NA
Polychlorinated Biphenyls														
Aroclor 1242	53469-21-9	20	46	< 0.029	< 0.028	< 0.03	< 0.032	< 0.033	< 0.027	< 0.039	< 0.026 [< 0.026]	< 0.027	< 0.026	< 0.026 [< 0.027]
Aroclor 1248	12672-29-6	81	46	< 0.029	< 0.028	< 0.03	< 0.032	< 0.033	0.1	< 0.039	< 0.026 [< 0.026]	< 0.027	< 0.026	< 0.026 [< 0.027]
Aroclor 1254	11097-69-1	340	46	< 0.029	< 0.028	< 0.03	< 0.032	< 0.033	< 0.027	< 0.039	< 0.026 [< 0.026]	< 0.027	< 0.026	< 0.026 [< 0.027]
Aroclor 1260	11096-82-5	770	46	0.18	1	0.11	< 0.032	0.053	0.33	< 0.039	0.051 [< 0.026]	0.16	0.12	0.13 [0.13]
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	NA	< 0.039	NA	NA	NA	NA
Total PCBs	-	- -	- -	0.18	1	0.11	<0.032	0.053	0.43	<0.039	0.051 [< 0.026]	0.16	0.12	0.13 [0.13]

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs		PCSB-46	PCSB-47	PCSB-48	PCSB-49	PCSB-50	PCSB-51	PCSB-52	PCSB-54	PCSB-55	PCSB-56	PCSB-57	PCSB-58	PCSB-59
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Date Collected:				7/27/05	8/3/05	8/3/05	8/3/05	8/3/05	8/3/05	8/2/05	8/3/05	8/3/05	8/15/05	8/15/05	8/15/05	8/15/05
Pesticides																
4,4-DDD	72-54-8	150	380	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	0.04	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
4,4-DDE	72-55-9	220	270	0.014	< 0.0054	< 0.0053	< 0.0052	< 0.0053	0.02	< 0.0054	0.027	< 0.0054	0.013	< 0.0057	0.013	< 0.0055
4,4-DDT	50-29-3	330	270	< 0.0057	< 0.0054	< 0.0053	0.011	0.078	0.05	< 0.0054	0.059	< 0.0054	< 0.0056	0.043	0.057	0.029
Aldrin	309-00-2	2.4	5.4	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Beta-BHC	319-85-7	1.1	51	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Chlordane	57-74-9	49	260	< 0.011	< 0.011	< 0.011	< 0.01	< 0.011	0.047	< 0.011	0.12	< 0.011	< 0.011	0.056	< 0.011	0.041
Dieldrin	60-57-1	0.58	- -	< 0.0057	< 0.0054	< 0.0053	< 0.0052	0.024	< 0.0053	< 0.0054	< 0.0059	< 0.0054	0.032	< 0.0057	< 0.0055	< 0.0055
Endosulfan I	959-98-8	260	19,000	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Endosulfan II	33213-65-9	260	19,000	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Endosulfan sulfate	1031-07-8	70	19,000	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Endrin	72-20-8	5.5	960	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Endrin aldehyde	7421-93-4	- -	- -	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Endrin ketone	53494-70-5	- -	- -	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Heptachlor epoxide	1024-57-3	1.1	10	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Methoxychlor	72-43-5	630	16,000	< 0.0057	< 0.0054	< 0.0053	< 0.0052	< 0.0053	< 0.0053	< 0.0054	< 0.0059	< 0.0054	< 0.0056	< 0.0057	< 0.0055	< 0.0055
Toxaphene	8001-35-2	1.2	83	< 0.028	< 0.027	< 0.026	< 0.026	< 0.027	< 0.026	< 0.027	< 0.029	< 0.027	< 0.028	< 0.028	< 0.027	< 0.027
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls																
Aroclor 1242	53469-21-9	20	46	< 0.028	< 0.027	< 0.026	< 0.026	< 0.027	< 0.026	< 0.027	< 0.029	< 0.027	< 0.028	< 0.028	< 0.027	< 0.027
Aroclor 1248	12672-29-6	81	46	< 0.028	< 0.027	< 0.026	< 0.026	< 0.027	< 0.026	< 0.027	< 0.029	< 0.027	1.7	< 0.028	< 0.027	< 0.027
Aroclor 1254	11097-69-1	340	46	< 0.028	0.34	< 0.026	< 0.026	< 0.027	< 0.026	< 0.027	0.32	< 0.027	< 0.028	0.11	0.13	0.21
Aroclor 1260	11096-82-5	770	46	0.046	< 0.027	< 0.026	0.053	0.14	0.12	0.12	< 0.029	0.069	< 0.028	< 0.028	< 0.027	< 0.027
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	-	- -	- -	0.046	0.34	<0.026	0.053	0.14	0.12	0.12	0.32	0.069	1.7	0.11	0.13	0.21

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	PCSB-60 0.5 8/15/05	PCTP-61 0.5 9/8/05	PCTP-62 0.5 9/8/05	PCTP-63 0.5 9/8/05	PCTP-64 0.5 9/8/05	PCTP-65 0.5 9/8/05	PCTP-66 0.5 9/8/05	PCTP-66R 0-0.5 4/24/19	PCTP-66R 0.5-2 4/24/19	PCTP-66R-HC 0-2 4/4/19
Pesticides													
4,4-DDD	72-54-8	150	380	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
4,4-DDE	72-55-9	220	270	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	0.0047 J [0.0047 J]	< 0.00069	0.0030
4,4-DDT	50-29-3	330	270	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	0.0184 J [0.0222]	< 0.00069	0.0113
Aldrin	309-00-2	2.4	5.4	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Beta-BHC	319-85-7	1.1	51	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Chlordane	57-74-9	49	260	< 0.011 [< 0.011]	0.041 [0.044]	NA	< 0.011	< 0.011	< 0.011	< 0.0068	NA	NA	NA
Dieldrin	60-57-1	0.58	- -	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 J [0.0043 J]	< 0.00069	< 0.00078
Endosulfan I	959-98-8	260	19,000	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Endosulfan II	33213-65-9	260	19,000	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Endosulfan sulfate	1031-07-8	70	19,000	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	0.0136 J [< 0.00078 J]	< 0.00069	< 0.00078
Endrin	72-20-8	5.5	960	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Endrin aldehyde	7421-93-4	- -	- -	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Endrin ketone	53494-70-5	- -	- -	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Heptachlor epoxide	1024-57-3	1.1	10	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.00075 [0.0011 J]	< 0.00069	< 0.00078
Methoxychlor	72-43-5	630	16,000	< 0.0054 [< 0.0054]	< 0.0056 [< 0.0056]	NA	< 0.0053	< 0.0056	< 0.0056	< 0.0034	< 0.0015 [< 0.0016]	< 0.0014	< 0.0016
Toxaphene	8001-35-2	1.2	83	< 0.027 [< 0.027]	< 0.028 [< 0.028]	NA	< 0.026	< 0.028	< 0.028	< 0.017	< 0.019 [< 0.019]	< 0.017	< 0.02
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	< 0.00075 [< 0.00078]	< 0.00069	< 0.00078
Polychlorinated Biphenyls													
Aroclor 1242	53469-21-9	20	46	< 0.027 [< 0.027]	< 0.028 [< 0.028]	< 0.028	< 0.026	< 0.028	< 0.028	< 0.017	< 0.037 [< 0.039]	< 0.035	< 0.2
Aroclor 1248	12672-29-6	81	46	< 0.027 [< 0.027]	< 0.028 [< 0.028]	0.15	0.11	< 0.028	< 0.028	< 0.017	< 0.037 [< 0.039]	< 0.035	< 0.2
Aroclor 1254	11097-69-1	340	46	0.5 [0.25]	< 0.028 [< 0.028]	< 0.028	< 0.026	< 0.028	< 0.028	< 0.017	< 0.037 [< 0.039]	< 0.035	< 0.2
Aroclor 1260	11096-82-5	770	46	< 0.027 [< 0.027]	1.3 [0.54]	0.43	0.12	0.36	< 0.028	< 0.017	< 0.037 [< 0.039]	< 0.035	0.369
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	0.249 [0.336]	< 0.035	< 0.2
Total PCBs	-	- -	- -	0.5 [0.25]	1.3 [0.54]	0.58	0.23	0.36	<0.028	<0.017	0.249 [0.336]	<0.035	0.369

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCTP-67	PCTP-68	PCTP-69	PCTP-70	PCTP-71	PCTP-72	PCTP-73	PCTP-73R	PCTP-74	PCTP-75	PCTP-76	PCTP-77	PCTP-78
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0-0.5	0.5	0.5	0.5	0.5	0.5
Date Collected:	CAS Number			9/12/05	9/9/05	9/9/05	9/9/05	9/9/05	9/9/05	9/9/05	4/10/19	9/9/05	9/9/05	9/12/05	9/12/05	9/12/05
Pesticides																
4,4-DDD	72-54-8	150	380	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
4,4-DDE	72-55-9	220	270	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	0.0081	< 0.0056	0.0165 J	< 0.0054	< 0.0052	< 0.0054	< 0.0054	0.055
4,4-DDT	50-29-3	330	270	< 0.028 [0.073]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	0.0347 JN	0.027	< 0.0052	< 0.0054	0.026	< 0.027
Aldrin	309-00-2	2.4	5.4	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Beta-BHC	319-85-7	1.1	51	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Chlordane	57-74-9	49	260	< 0.056 [< 0.055]	< 0.007	< 0.011	NA	< 0.01	0.056	< 0.011	NA	0.056	0.053	< 0.011	< 0.011	4.5 E
Dieldrin	60-57-1	0.58	- -	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	0.014	< 0.0054	< 0.027
Endosulfan I	959-98-8	260	19,000	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Endosulfan II	33213-65-9	260	19,000	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Endosulfan sulfate	1031-07-8	70	19,000	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Endrin	72-20-8	5.5	960	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.00076	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Endrin aldehyde	7421-93-4	- -	- -	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	0.0388	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Endrin ketone	53494-70-5	- -	- -	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	0.0091	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Heptachlor epoxide	1024-57-3	1.1	10	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	0.0069 JN	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Methoxychlor	72-43-5	630	16,000	< 0.028 [< 0.027]	< 0.0035	< 0.0053	NA	< 0.0052	< 0.0057	< 0.0056	< 0.0015	< 0.0054	< 0.0052	< 0.0054	< 0.0054	< 0.027
Toxaphene	8001-35-2	1.2	83	< 0.14 [< 0.14]	< 0.018	< 0.026	NA	< 0.026	< 0.028	< 0.028	< 0.019	< 0.027	< 0.026	< 0.027	< 0.027	< 0.13
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	< 0.00076	NA	NA	NA	NA	NA
Polychlorinated Biphenyls																
Aroclor 1242	53469-21-9	20	46	< 0.028 [< 0.027]	< 0.018	< 0.026	< 0.028	< 0.026	< 0.028	< 0.56	< 0.038	< 0.027	< 0.026	< 0.027	< 0.027	< 0.027
Aroclor 1248	12672-29-6	81	46	< 0.028 [< 0.027]	< 0.018	< 0.026	< 0.028	< 0.026	< 0.028	< 0.56	< 0.038	< 0.027	< 0.026	< 0.027	0.053	< 0.027
Aroclor 1254	11097-69-1	340	46	< 0.028 [< 0.027]	< 0.018	1.3	< 0.028	0.21	< 0.028	7.9	0.932	< 0.027	< 0.026	< 0.027	< 0.027	< 0.027
Aroclor 1260	11096-82-5	770	46	0.25 [0.2]	< 0.018	< 0.026	< 0.028	< 0.026	0.3	< 0.56	< 0.038	< 0.027	0.055	0.37	0.39	< 0.027
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	< 0.038	NA	NA	NA	NA	NA
Total PCBs	-	- -	- -	0.25 [0.2]	<0.018	1.3	<0.028	0.21	0.3	7.9	0.932	<0.027	0.055	0.37	0.443	<0.027

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCTP-79	PSSTP-01A	PSSTP-02A	PSSTP-03A	PSSTP-04A	PSSTP-04R	PSSTP-05A	PSSTP-06A	PSSTP-07A	PSSTP-07R
Sample Depth (ft): Date Collected:	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	0.5 9/12/05	1-2 3/11/03	1-2 3/11/03	1-2 3/11/03	1-2 3/11/03	1-2 4/11/19	1-2 3/11/03	1-2 3/11/03	1-2 3/11/03	0.5-2 4/18/19
Pesticides													
4,4-DDD	72-54-8	150	380	< 0.027	0.011	0.057	< 0.004	0.047	< 0.00074	< 0.0039	< 0.0042	< 0.0043	0.0025 [0.0016]
4,4-DDE	72-55-9	220	270	< 0.027	0.002	0.012	< 0.004	< 0.0038	< 0.00074	0.027	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
4,4-DDT	50-29-3	330	270	< 0.027	0.0052	0.012	< 0.004	0.073	0.0414 J	0.098	0.021	< 0.0043	0.0076 [0.0049]
Aldrin	309-00-2	2.4	5.4	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	0.0152 JN	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Beta-BHC	319-85-7	1.1	51	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	< 0.00074	0.012	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Chlordane	57-74-9	49	260	0.29	< 0.0075	< 0.0038	< 0.008	< 0.0077	NA	< 0.0078	< 0.0084	0.067	NA
Dieldrin	60-57-1	0.58	- -	< 0.027	< 0.0037	0.01	< 0.004	< 0.0038	0.0176	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endosulfan I	959-98-8	260	19,000	< 0.027	< 0.0037	< 0.0038	< 0.004	0.012	< 0.00074	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endosulfan II	33213-65-9	260	19,000	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	< 0.00074	0.04	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endosulfan sulfate	1031-07-8	70	19,000	< 0.027	< 0.0037	< 0.0038	< 0.004	0.04	< 0.00074	0.0083	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endrin	72-20-8	5.5	960	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	< 0.00074	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endrin aldehyde	7421-93-4	- -	- -	< 0.027	< 0.0037	< 0.0038	0.034	0.058	0.0179 JN	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Endrin ketone	53494-70-5	- -	- -	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	< 0.00074	< 0.0039	< 0.0042	< 0.0043	< 0.00080 [< 0.00072]
Heptachlor epoxide	1024-57-3	1.1	10	< 0.027	< 0.0037	< 0.0038	< 0.004	0.012	0.0111 JN	< 0.0039	< 0.0042	< 0.0043	0.0012 J [0.00099]
Methoxychlor	72-43-5	630	16,000	< 0.027	< 0.0037	< 0.0038	< 0.004	< 0.0038	< 0.0015	< 0.0039	< 0.0042	< 0.0043	< 0.0016 [< 0.0014]
Toxaphene	8001-35-2	1.2	83	< 0.13	< 0.019	< 0.019	< 0.02	< 0.019	< 0.018	0.02 HD	< 0.021	< 0.042	< 0.02 [< 0.018]
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	< 0.00074	NA	NA	NA	0.0015 JN [0.0012 J]
Polychlorinated Biphenyls													
Aroclor 1242	53469-21-9	20	46	< 0.027	< 0.019	< 0.019	0.12	0.12	< 0.037	< 0.02	< 0.021	< 0.021	< 0.04 [< 0.036]
Aroclor 1248	12672-29-6	81	46	< 0.027	< 0.019	< 0.019	< 0.02	< 0.02	< 0.037	< 0.02	< 0.021	< 0.021	< 0.04 [< 0.036]
Aroclor 1254	11097-69-1	340	46	< 0.027	0.08	< 0.019	< 0.02	0.49	1.27 J	< 0.02	< 0.021	< 0.021	< 0.04 [0.0610]
Aroclor 1260	11096-82-5	770	46	0.27	< 0.019	0.43	0.094	< 0.02	< 0.037	0.83	0.11	0.18	< 0.04 [< 0.036]
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	< 0.037	NA	NA	NA	< 0.04 [< 0.036]
Total PCBs	-	- -	- -	0.27	0.08	0.43	0.214	0.61	1.27	0.83	0.11	0.18	< 0.04 [0.0610]

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PSSTP-08A	PSSTP-09A	PSSTP-10A	PSSTP-10R	PSSTP-11A	PSSTP-12A	PSSTP-13A	PSSTP-14A	PSSTP-15A	PSSTP-16A
Sample Depth (ft): Date Collected:	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	1-2 3/11/03	1-2 3/12/03	1-2 3/12/03	1-2 4/16/19	1-2 3/12/03	1-2 3/12/03	1-2 3/12/03	1-2 3/12/03	1-2 3/12/03	1-2 3/12/03
Pesticides													
4,4-DDD	72-54-8	150	380	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
4,4-DDE	72-55-9	220	270	< 0.0041	< 0.0043	< 0.0038	< 0.00073 J	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
4,4-DDT	50-29-3	330	270	0.025	< 0.0043	0.017	< 0.00073	< 0.0038	0.48	< 0.0037	< 0.0048	< 0.0041	< 0.02
Aldrin	309-00-2	2.4	5.4	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	0.0074	< 0.02
Beta-BHC	319-85-7	1.1	51	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Chlordane	57-74-9	49	260	< 0.0082	0.025	< 0.0076	NA	< 0.0076	< 0.08	< 0.0075	< 0.0095	< 0.0081	0.16
Dieldrin	60-57-1	0.58	- -	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	0.046	0.024
Endosulfan I	959-98-8	260	19,000	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Endosulfan II	33213-65-9	260	19,000	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Endosulfan sulfate	1031-07-8	70	19,000	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Endrin	72-20-8	5.5	960	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Endrin aldehyde	7421-93-4	- -	- -	< 0.0041	0.02	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Endrin ketone	53494-70-5	- -	- -	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Heptachlor epoxide	1024-57-3	1.1	10	< 0.0041	< 0.0043	< 0.0038	< 0.00073	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Methoxychlor	72-43-5	630	16,000	< 0.0041	< 0.0043	< 0.0038	< 0.0015	< 0.0038	< 0.04	< 0.0037	< 0.0048	< 0.0041	< 0.02
Toxaphene	8001-35-2	1.2	83	< 0.021	< 0.022	< 0.019	< 0.018	< 0.019	< 0.2	< 0.019	< 0.024	< 0.02	< 0.1
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	< 0.00073 J	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
Aroclor 1242	53469-21-9	20	46	< 0.021	< 0.022	< 0.019	< 0.037	< 0.019	< 0.02	< 0.019	< 0.024	< 0.02	< 0.02
Aroclor 1248	12672-29-6	81	46	< 0.021	< 0.022	< 0.019	< 0.037	< 0.019	0.098	< 0.019	< 0.024	< 0.02	< 0.02
Aroclor 1254	11097-69-1	340	46	< 0.021	< 0.022	< 0.019	< 0.037	< 0.019	< 0.02	< 0.019	< 0.024	0.096	< 0.02
Aroclor 1260	11096-82-5	770	46	0.12	0.05	< 0.019	< 0.037	< 0.019	0.32	< 0.019	< 0.024	< 0.02	0.63
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	< 0.037	NA	NA	NA	NA	NA	NA
Total PCBs	-	- -	- -	0.12	0.05	<0.019	<0.037	<0.019	0.418	<0.019	<0.024	0.096	0.63

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PSSTP-17A	PSSTP-18A	PSSTP-19A	PSSTP-20A	PSSTP-21A	PSSTP-22A	PSSTP-22R	PSSTP-23A	PSSTP-24A	PSSTP-25A
Sample Depth (ft): Date Collected:	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	1-2 3/12/03	1-2 3/12/03	1-2 3/12/03	1-2 3/13/03	1-2 3/13/03	1-2 3/13/03	0.5-2 4/24/19	1-2 3/13/03	1-2 3/13/03	1-2 3/13/03
Pesticides													
4,4-DDD	72-54-8	150	380	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	0.0306 J	< 0.004	< 0.004	< 0.0041
4,4-DDE	72-55-9	220	270	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
4,4-DDT	50-29-3	330	270	< 0.04	0.013	0.018	0.01	0.045	0.053	< 0.00075	< 0.004	< 0.004	< 0.0041
Aldrin	309-00-2	2.4	5.4	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Beta-BHC	319-85-7	1.1	51	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Chlordane	57-74-9	49	260	0.45	0.083	< 0.08	< 0.0078	< 0.0084	< 0.0078	NA	< 0.0079	< 0.008	< 0.0081
Dieldrin	60-57-1	0.58	- -	0.18	0.026	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Endosulfan I	959-98-8	260	19,000	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Endosulfan II	33213-65-9	260	19,000	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	0.016	< 0.00075	< 0.004	< 0.004	< 0.0041
Endosulfan sulfate	1031-07-8	70	19,000	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	0.088	< 0.00075	< 0.004	< 0.004	< 0.0041
Endrin	72-20-8	5.5	960	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Endrin aldehyde	7421-93-4	- -	- -	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	0.0071	< 0.0041
Endrin ketone	53494-70-5	- -	- -	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Heptachlor epoxide	1024-57-3	1.1	10	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.00075	< 0.004	< 0.004	< 0.0041
Methoxychlor	72-43-5	630	16,000	< 0.04	< 0.0039	< 0.004	< 0.0039	< 0.0042	< 0.0039	< 0.0015	< 0.004	< 0.004	< 0.0041
Toxaphene	8001-35-2	1.2	83	< 0.2	< 0.02	< 0.02	< 0.019	< 0.021	< 0.019	< 0.019	< 0.02	< 0.02	< 0.02
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	< 0.00075	NA	NA	NA
Polychlorinated Biphenyls													
Aroclor 1242	53469-21-9	20	46	< 0.02	< 0.02	< 0.02	< 0.019	< 0.021	< 0.019	< 0.037	< 0.02	< 0.02	< 0.02
Aroclor 1248	12672-29-6	81	46	< 0.02	< 0.02	< 0.02	< 0.019	< 0.021	< 0.019	< 0.037	< 0.02	< 0.02	< 0.02
Aroclor 1254	11097-69-1	340	46	0.25	< 0.02	< 0.02	0.11	< 0.021	< 0.019	< 0.037	< 0.02	< 0.02	< 0.02
Aroclor 1260	11096-82-5	770	46	< 0.02	0.12	0.23	< 0.019	0.25	< 0.019	< 0.037	< 0.02	< 0.02	0.081
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	NA	< 0.037	NA	NA	NA
Total PCBs	-	- -	- -	0.25	0.12	0.23	0.11	0.25	<0.019	<0.037	<0.02	<0.02	0.081

Table 8
Surface Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PSSTP-26A	PSSTP-27A	PSSTP-28A	PSSTP-29A	PSSTP-30A	S-138		S-139		S-140	
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Surf Soil (No Exceedances)	1-2	1-2	1-2	1-2	1-2	0-0.5	0.5-2	0-0.5	0.5-2	0-0.5	0.5-2
Date Collected:				3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	4/5/19	4/5/19	4/10/19	4/10/19	4/10/19	4/10/19
Pesticides														
4,4-DDD	72-54-8	150	380	< 0.041	0.067	0.011	< 0.0037	0.086	NA	NA	NA	NA	NA	NA
4,4-DDE	72-55-9	220	270	< 0.041	< 0.0039	< 0.038	< 0.0037	0.021	NA	NA	NA	NA	NA	NA
4,4-DDT	50-29-3	330	270	< 0.041	0.044	< 0.038	0.02	0.098	NA	NA	NA	NA	NA	NA
Aldrin	309-00-2	2.4	5.4	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Beta-BHC	319-85-7	1.1	51	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Chlordane	57-74-9	49	260	0.52	< 0.0078	0.016	< 0.0075	< 0.0088	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	0.58	- -	< 0.041	< 0.0039	< 0.038	< 0.0037	0.016	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	260	19,000	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	260	19,000	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	70	19,000	< 0.041	< 0.0039	0.02	< 0.0037	0.039	NA	NA	NA	NA	NA	NA
Endrin	72-20-8	5.5	960	< 0.041	< 0.0039	0.0057	< 0.0037	0.015	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	- -	- -	0.32	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	- -	- -	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1024-57-3	1.1	10	< 0.041	< 0.0039	< 0.038	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	630	16,000	< 0.041	< 0.0039	0.014	< 0.0037	< 0.0044	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	1.2	83	< 0.2	< 0.019	< 19	< 0.019	< 0.022	NA	NA	NA	NA	NA	NA
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls														
Aroclor 1242	53469-21-9	20	46	< 0.02	< 0.097	< 0.019	< 0.019	< 0.023	< 0.036	< 0.034	< 0.036	< 0.035	< 0.041	< 0.038
Aroclor 1248	12672-29-6	81	46	< 0.02	< 0.097	< 0.019	< 0.019	< 0.023	< 0.036	< 0.034	< 0.036	< 0.035	< 0.041	< 0.038
Aroclor 1254	11097-69-1	340	46	< 0.02	< 0.097	< 0.019	< 0.019	< 0.023	0.159	0.426	0.406	0.171	0.0256 J	< 0.038
Aroclor 1260	11096-82-5	770	46	0.092	0.2	< 0.019	0.077	< 0.023	< 0.036	< 0.034	< 0.036	< 0.035	< 0.041	< 0.038
Aroclor 1262	37324-23-5	- -	- -	NA	NA	NA	NA	NA	< 0.036	< 0.034	< 0.036	< 0.035	< 0.041	< 0.038
Total PCBs	-	- -	- -	0.092	0.2	<0.019	0.077	<0.023	0.159	0.426	0.406	0.171	0.0256	<0.038

Notes:

1. Samples prior to 2019 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
4. 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Pesticides using United States Environmental Protection Agency (USEPA) SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for surface soil.
11. No results exceed the PADEP non-residential direct contact MSC (for surface soil) or the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
12. - - = No PADEP MSC.
13. - = No actual Chemical Abstracts Service (CAS) number is available.
14. Brackets indicate the reported concentration of a duplicate sample.
15. Qualifier Definitions:
    E = Serial dilution results not within 10%. Applicable only if analyte concentration is at least 50X the IDL in original sample.
    HD = Unknown. Potential ND mistranscribed. Laboratory analytical report not available.
    J = Analyte is an estimated value.
    N = There is presumptive evidence to make a tentative identification of this compound.
16. Data from 2019 have undergone a Tier II validation. Data prior to 2019 have not been validated.

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	MW-103 6-7 5/16/18	MW-108 5-7 9/24/19	MW-108 10-12 9/24/19	PCSB-17 4 3/17/05	PCSB-30 2 7/26/05	PCSB-46 4 7/27/05	PCSB-47 4 8/3/05	PCSB-48 4 8/3/05	PCSB-51 3 8/3/05	PCSB-53 3.5 8/1/05	PCSB-56 2 8/15/05	PCSB-57 2.5 8/15/05
Volatile Organic Compounds															
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.0020	< 17	< 0.0047	< 0.0004	< 0.00038	< 0.00028	< 0.0014	< 0.027	< 0.00035	< 0.00028	< 0.00032	< 0.00029
1,1-Dichloroethane	75-34-3	16	1,600	< 0.0010	< 8.5	< 0.0024	< 0.0012	< 0.0011	< 0.00085	< 0.0042	< 0.044	< 0.0011	< 0.00085	< 0.00098	< 0.00087
1,2,3-Trichlorobenzene	87-61-6	- -	- -	< 0.0051	< 43	< 0.012	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	27	10,000	< 0.0051	< 43	< 0.012	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	61	10,000	< 0.0010	< 8.5	R	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	230	< 0.0010	< 8.5	R	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	78-93-3	400	10,000	< 0.01	< 85	< 0.024	< 0.0013	< 0.0012	< 0.00088	< 0.0043	< 0.062	< 0.0011	< 0.00088	< 0.001	< 0.0009
Acetone	67-64-1	10,000	10,000	0.0380 J	< 85	0.0163 J	0.048	< 0.008	< 0.006	0.18	< 0.44	0.05	0.023	< 0.0069	< 0.0061
Benzene	71-43-2	0.5	330	< 0.00051	***9.98***	< 0.0012	0.17	< 0.00077	< 0.00057	< 0.0028	< 0.033	< 0.00072	< 0.00057	< 0.00066	< 0.00059
Carbon Disulfide	75-15-0	620	10,000	< 0.0020	8.42 J	< 0.0047	0.0019	< 0.00098	< 0.00073	< 0.0036	< 0.053	< 0.00092	< 0.00073	< 0.00084	< 0.00075
Carbon Tetrachloride	56-23-5	0.5	430	< 0.0020	< 17	< 0.0047	< 0.0014	< 0.0013	< 0.00095	< 0.0047	< 0.034	< 0.0012	< 0.00095	< 0.0011	< 0.00098
Chloroform	67-66-3	8	110	< 0.0020	< 17	< 0.0047	< 0.00073	< 0.00069	< 0.00051	< 0.0025	< 0.031	< 0.00064	< 0.00051	< 0.00059	< 0.00052
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0010	< 8.5	< 0.0024	< 0.00077	< 0.00072	< 0.00054	< 0.0026	< 0.025	< 0.00067	< 0.00054	< 0.00062	< 0.00055
Cyclohexane	110-82-7	6,900	10,000	< 0.0020	< 17	0.0054	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.0035 J	< 43	< 0.012	0.014 B	0.017 B	0.014 B	0.06 B	0.29 B	0.0038 B	0.016 B	0.048 B	0.035 B
Ethylbenzene	100-41-4	70	1,000	< 0.0010	< 8.5	< 0.0024 J	0.0092	< 0.0011	< 0.00084	< 0.0041	< 0.064	< 0.0011	< 0.00084	< 0.00097	< 0.00086
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0010	36.9	< 0.0024 J	0.23	< 0.0017	< 0.0012	< 0.0061	< 0.067	< 0.0016	0.0026	< 0.0014	< 0.0013
Methyl Acetate	79-20-9	10,000	10,000	< 0.0051	< 43	< 0.012	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	< 0.0020	< 17	0.0148	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	0.095	< 0.00071	< 0.00053	< 0.0026	< 0.042	< 0.00066	0.0016	< 0.00061	< 0.00054
o-Xylene	95-47-6	- -	- -	< 0.0010	14.4	0.0016 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0020	< 17	< 0.0047 J	< 0.001	< 0.00094	< 0.0007	< 0.0034	< 0.014	< 0.00087	< 0.0007	< 0.00081	< 0.00071
Toluene	108-88-3	100	10,000	< 0.0010	12.5	< 0.0024 J	0.16	< 0.0011	< 0.00085	< 0.0042	< 0.021	< 0.0011	< 0.00085	< 0.00098	< 0.00087
Total Xylenes	1330-20-7	1,000	9,100	< 0.0010	51.3	0.0040 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0020	< 17	< 0.0047	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	0.5	180	< 0.0010	< 8.5	< 0.0024	< 0.00098	< 0.00093	< 0.00069	< 0.0034	< 0.029	< 0.00086	< 0.00069	< 0.00079	< 0.0007
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	0.0223 J	***310 D***	0.0439 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	< 0.2	< 5.2	< 0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	< 0.2	< 5.2	< 0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	2	190,000	< 0.2	< 5.2	< 0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.2	94.9	< 0.23	< 19	< 0.043	< 0.032	< 0.16	< 0.64	< 0.065	< 0.16	< 0.06	< 0.16
2-Methylnaphthalene	91-57-6	1,900	190,000	0.0604	1,610 D	0.27	250	< 0.086	< 0.064	14	3.7	0.24	1.8	0.12	0.25
2-Methylphenol	95-48-7	580	190,000	< 0.081	37.3	< 0.09	< 35	< 0.19	< 0.14	< 0.69	< 2.8	< 0.22	< 0.53	< 0.21	< 0.55
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.081	75.8	< 0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	< 43	< 0.19	< 0.14	< 0.69	< 2.8	< 0.25	< 0.6	< 0.23	< 0.61
Acenaphthene	83-32-9	4,700	190,000	0.291	160 D	0.0485	30	< 0.0083	< 0.0062	2.5	8	0.44	< 0.047	0.043	0.61

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		MW-103	MW-108		PCSB-17	PCSB-30	PCSB-46	PCSB-47	PCSB-48	PCSB-51	PCSB-53	PCSB-56	PCSB-57
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	6-7	5-7	10-12	4	2	4	4	4	3	3.5	2	2.5
Date Collected:	CAS Number			5/16/18	9/24/19	9/24/19	3/17/05	7/26/05	7/27/05	8/3/05	8/3/05	8/3/05	8/1/05	8/15/05	8/15/05
Semi-Volatile Organic Compounds (cont'd)															
Acenaphthylene	208-96-8	8,000	190,000	0.0945	305 D	0.0363 J	110	< 0.0076	< 0.0057	< 0.028	< 0.11	< 0.011	< 0.026	0.48	0.12
Acetophenone	98-86-2	1,200	10,000	< 0.2	6.88	< 0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.708	***1,010 D***	0.0766	***540***	< 0.01	< 0.0074	0.75	2.2	0.32	1.2	0.42	2.2
Benz(a)anthracene	56-55-3	430	190,000	1.34	***1,050 D***	0.118	410	< 0.007	< 0.0052	< 0.026	< 0.11	0.34	0.53	3.4	4.7
Benzaldehyde	100-52-7	- -	- -	0.0248 J	< 5.2	< 0.23	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	1.21	***681 D***	0.108	***290***	< 0.0084	< 0.0062	< 0.031	< 0.13	0.31	0.57	3.3	4.1
Benzo(b)fluoranthene	205-99-2	170	190,000	1.45	***903 D***	0.14	***390***	< 0.014	< 0.01	< 0.051	0.81	0.39	0.45	5.1	6
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.776	***321 D***	0.0798	96	< 0.0073	< 0.0054	< 0.027	< 0.11	0.21	0.44	2	1.4
Benzo(k)fluoranthene	207-08-9	610	190,000	0.482	320 D	0.0536	130	< 0.018	< 0.013	< 0.065	< 0.27	0.17	0.14	1.7	1.6
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.081	< 2.1	< 0.09	< 4.3	< 0.032	0.049	< 0.12	< 0.48	0.053	< 0.1	0.37	< 0.1
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.081	< 2.1	< 0.09	< 6.5	< 0.014	< 0.01	< 0.05	< 0.21	< 0.019	< 0.045	< 0.017	< 0.046
Caprolactam	105-60-2	- -	- -	< 0.081	< 2.1	< 0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	86-74-8	110	190,000	0.236	***594 D***	0.0436 J	***200***	< 0.0097	< 0.0072	0.22	< 0.15	< 0.014	< 0.033	0.15	0.99
Chrysene	218-01-9	230	190,000	1.38	***927 D***	0.148	***400***	< 0.014	< 0.011	< 0.053	< 0.22	0.45	0.93	3.1	4.4
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.191	119 D	< 0.045	45	< 0.0092	< 0.0069	< 0.034	< 0.14	0.055	< 0.039	0.78	0.49
Dibenzofuran	132-64-9	310	190,000	0.179	***1,270 D***	0.103	***340***	< 0.065	< 0.048	< 0.24	0.91 J	< 0.06	< 0.14	0.11	0.45
Diethyl phthalate	84-66-2	9,300	10,000	< 0.081	< 2.1	< 0.09	< 3.8	< 0.012	< 0.0088	< 0.044	< 0.18	< 0.013	< 0.031	< 0.012	< 0.032
Dimethyl phthalate	131-11-3	- -	- -	< 0.081	< 2.1	< 0.09	< 8	< 0.0087	< 0.0065	< 0.032	< 0.13	< 0.011	< 0.025	< 0.0098	< 0.026
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.081	< 2.1	< 0.09	< 3.6	< 0.01	< 0.0076	< 0.037	< 0.15	< 0.011	< 0.025	0.14 B	< 0.026
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.081	< 2.1	< 0.09	< 3.7	< 0.017	< 0.013	< 0.063	< 0.26	< 0.011	< 0.027	< 0.01	< 0.027
Fluoranthene	206-44-0	3,200	190,000	2.93	2,470 D	0.241	1,100	< 0.0083	< 0.0062	0.41	1.4	0.5	0.69	3.3	9.5
Fluorene	86-73-7	3,800	190,000	0.342	1,940 D	0.127	500	< 0.012	< 0.009	2.3	8.4	< 0.012	2.7	0.099	0.87
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.836	377 D	0.0718	140	< 0.0086	< 0.0064	< 0.031	< 0.13	0.18	0.21	1.9	1.3
Naphthalene	91-20-3	25	190,000	0.189	***8,500 D***	1.06	***1,200***	< 0.0049	< 0.0036	< 0.018	< 0.074	0.18	2.2	0.35	0.55
Pentachlorophenol	87-86-5	5	190,000	< 0.16	< 4.1	< 0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	2.33	5,220 D	0.363	1,600	< 0.011	< 0.0083	5.9	17	0.53	3	1.4	7.1
Phenol	108-95-2	200	18,000	< 0.081	24.8	< 0.09	< 16	< 0.083	< 0.062	< 0.31	< 1.3	< 0.072	< 0.17	< 0.066	< 0.18
Pyrene	129-00-0	2,200	190,000	2.72	1,760 D	0.254	780	< 0.012	< 0.0086	0.73	2	0.7	1.8	5.6	9.1
Total PAHs and 2-Methylnaphthalene	-	- -	- -	17.3	27,700	3.20	8,010	< 0.086	< 0.064	26.6	43.5	5.02	16.7	33.1	54.3
Metals															
Aluminum	7429-90-5	- -	190,000	9,660	1,100	20,600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.4	2.6	< 2.7	< 2.4	11	< 2.2	< 2.2	< 2.3	< 2.8	< 2.2	4.8	3.2
Arsenic	7440-38-2	29	190,000	5.4	16.0	18.4	8.3	***140***	< 2.2	< 2.2	3.7	3.2	***37***	14	11
Barium	7440-39-3	8,200	190,000	118	194	189	85	450	13	69	220	66	27	100	99
Beryllium	7440-41-7	320	190,000	0.53	< 0.25	1.2	< 0.71	1.4	< 0.67	< 0.67	< 0.68	< 0.85	< 0.67	< 0.78	< 0.69
Cadmium	7440-43-9	38	190,000	< 0.61	< 1.3	< 1.3	< 0.71	15	< 0.67	0.67	< 0.68	< 0.85	< 0.67	1.2	< 0.69
Calcium	7440-70-2	- -	- -	16,100	2,190	3,280	NA	NA	NA	NA	NA	NA	NA	NA	NA

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	MW-103 6-7 5/16/18	MW-108 5-7 9/24/19	MW-108 10-12 9/24/19	PCSB-17 4 3/17/05	PCSB-30 2 7/26/05	PCSB-46 4 7/27/05	PCSB-47 4 8/3/05	PCSB-48 4 8/3/05	PCSB-51 3 8/3/05	PCSB-53 3.5 8/1/05	PCSB-56 2 8/15/05	PCSB-57 2.5 8/15/05
Metals (cont'd)															
Chromium	7440-47-3	190,000	190,000	22.9	185	107	27	28	7.2	12	14	7.5	< 5.6	28	31
Cobalt	7440-48-4	160	190,000	6.2	< 6.3	13.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	36.2	92.4	80.9	66	440	7.5	16	23	66	19	180	170
Cyanide	57-12-5	2000	190,000	0.25	12.8	0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	17,500	28,400	42,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	229	145	150	150	***2,100***	< 5.6	35	***1,100***	160	42	360	310
Magnesium	7439-95-4	- -	- -	4,000	< 630	5,470	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	228	116	640	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.30	3.5	0.50	2	0.53	< 0.094	0.25	0.22	0.2	< 0.094	0.28	0.38
Nickel	7440-02-0	650	190,000	14.3	32.6	33.2	11	48	5.7	25	11	8.3	7.6	44	20
Potassium	7440-09-7	- -	- -	1,260	< 1,300	2,770	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 2.4	< 5.0	< 5.3	3.3	***29***	< 2	< 2	< 2	< 2.5	< 2	3.6	3.7
Silver	7440-22-4	84	190,000	< 0.61	< 1.3	1.4	< 3	6	< 2.8	< 2.8	< 2.8	< 3.5	< 2.8	< 3.2	< 2.9
Sodium	7440-23-5	- -	- -	< 1,200	< 1,300	< 1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.2	< 2.5	< 2.7	< 1.4	< 1.8	< 1.3	< 1.3	< 1.4	< 1.7	< 1.3	< 1.6	< 1.4
Vanadium	7440-62-2	820	190,000	23.3	8.7	37.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	169	94.0	445	190	3,900	13	330	170	< 14	45	500	350

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	 DC Non-Res Subsurf Soil (No Exceedances)	PCSB-58 5 8/15/05	PCTP-01 6 2/8/05	PCTP-01R 5-7 4/5/19	PCTP-02 5 2/8/05	PCTP-02R 4-6 4/5/19	PCTP-12 3 2/9/05	PCTP-12R 2-4 4/12/19	PCTP-14 2.5 3/3/05	PCTP-214 7.5 3/3/05	PCTP-16 2 2/10/05	PCTP-17R 5-6 4/15/19	PCTP-18 6 2/16/05
Volatile Organic Compounds															
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.00032	< 0.00055	R	< 0.00053	R	< 1.1	< 0.0023	< 0.0014	< 0.00082	< 0.00082	< 1.6	< 0.00078
1,1-Dichloroethane	75-34-3	16	1,600	< 0.00098	< 0.00047	R	< 0.00046	R	< 1.6	< 0.0011	< 0.0014	< 0.00084	< 0.00071	< 0.79	< 0.00067
1,2,3-Trichlorobenzene	87-61-6	- -	- -	NA	NA	R	NA	R	NA	< 0.0056	NA	NA	NA	< 3.9	NA
1,2,4-Trichlorobenzene	120-82-1	27	10,000	NA	NA	R	NA	R	NA	< 0.0056	NA	NA	NA	< 3.9	NA
1,3-Dichlorobenzene	541-73-1	61	10,000	NA	NA	R	NA	R	NA	< 0.0011	NA	NA	NA	< 0.79	NA
1,4-Dichlorobenzene	106-46-7	10	230	NA	NA	0.0020 J	NA	R	NA	< 0.0011	NA	NA	NA	< 0.79	NA
2-Butanone (MEK)	78-93-3	400	10,000	< 0.001	< 0.0029	0.0179 J	< 0.0028	R	< 22	< 0.011	< 0.0023	< 0.0013	< 0.0044	< 7.9	< 0.0041
Acetone	67-64-1	10,000	10,000	< 0.0069	0.044	0.142 J	0.068	0.0110 J	< 4.9	0.0672	< 0.01	< 0.0061	< 0.003	< 7.9	< 0.0028
Benzene	71-43-2	0.5	330	< 0.00066	< 0.00019	R	< 0.00018	R	***59***	0.0073	< 0.00074	< 0.00044	< 0.00028	***1.23***	< 0.00026
Carbon Disulfide	75-15-0	620	10,000	< 0.00084	< 0.00034	0.0053 J	< 0.00033	R	< 0.92	< 0.0023	< 0.0015	< 0.00091	< 0.00051	< 1.6	< 0.00048
Carbon Tetrachloride	56-23-5	0.5	430	< 0.0011	< 0.00049	R	< 0.00048	R	< 0.91	< 0.0023	< 0.0027	< 0.0016	< 0.00074	< 1.6	< 0.00069
Chloroform	67-66-3	8	110	< 0.00059	< 0.00098	R	< 0.00095	R	< 2.1	< 0.0023	0.0056	0.0034	< 0.0015	< 1.6	0.0018
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00062	< 0.0003	R	< 0.00029	R	< 1.3	< 0.0011	< 0.0011	< 0.00064	< 0.00045	< 0.79	< 0.00043
Cyclohexane	110-82-7	6,900	10,000	NA	NA	R	NA	R	NA	< 0.0023	NA	NA	NA	< 1.6	NA
Dichloromethane	75-09-2	0.5	10,000	0.03 B	0.016 B	R	0.016 B	R	< 1.8	< 0.0056	0.05 B	0.023 B	0.013 B	< 3.9	0.021 B
Ethylbenzene	100-41-4	70	1,000	< 0.00097	< 0.00066	R	< 0.00065	R	5.8	< 0.0011	< 0.002	< 0.0012	< 0.001	< 0.79	< 0.00094
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0014	< 0.00073	R	< 0.00071	R	86	< 0.0011	< 0.0024	< 0.0014	< 0.0011	3.88	< 0.001
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	R	NA	R	NA	< 0.0056	NA	NA	NA	< 3.9	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	R	NA	R	NA	< 0.0023	NA	NA	NA	< 1.6	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00061	< 0.00024	NA	< 0.00023	NA	23	NA	< 0.00053	< 0.00031	< 0.00036	NA	< 0.00034
o-Xylene	95-47-6	- -	- -	NA	NA	R	NA	R	NA	< 0.0011	NA	NA	NA	1.74	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00081	< 0.00018	R	< 0.00017	R	4.8	< 0.0023	< 0.00046	< 0.00027	< 0.00026	< 1.6	< 0.00025
Toluene	108-88-3	100	10,000	< 0.00098	< 0.00033	0.00072 J	< 0.00032	R	75	0.0016	< 0.00055	< 0.00033	< 0.0005	1.65	< 0.00047
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	R	NA	R	< 1.2	< 0.0011	NA	NA	NA	5.62	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	R	NA	R	248.8	NA	NA	NA	NA	< 1.6	NA
Trichloroethene	79-01-6	0.5	180	< 0.00079	< 0.00032	R	< 0.00031	R	253.6	NA	< 0.0014	< 0.00085	< 0.00048	< 0.79	< 0.00046
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	0.0526 J	NA	< 0.073	NA	0.599	NA	NA	NA	8.64 D	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	NA	NA	< 0.2	NA	< 0.18	NA	< 0.98	NA	NA	NA	< 0.18	NA
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	NA	NA	< 0.2	NA	< 0.18	NA	< 0.98	NA	NA	NA	< 0.18	NA
2,4-Dichlorophenol	120-83-2	2	190,000	NA	NA	< 0.2	NA	< 0.18	NA	< 0.98	NA	NA	NA	< 0.18	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.06	< 5.8	< 0.2	< 0.19	< 0.18	< 890	< 0.98	< 0.28	< 1.2	< 0.93	2.27 D	< 0.2
2-Methylnaphthalene	91-57-6	1,900	190,000	0.58	< 2.1	0.142	0.62	< 0.036	***5,500***	2.41	0.41 J	< 2.9	0.33 J	56.2 D	0.14
2-Methylphenol	95-48-7	580	190,000	< 0.21	< 3.5	< 0.078	< 0.11	< 0.073	< 540	< 0.39	< 1.2	< 4.8	< 0.56	1.65	< 0.12
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 0.078	NA	< 0.073	NA	0.285 J	NA	NA	NA	4.7 D	NA
4-Methylphenol	106-44-5	58	190,000	< 0.23	< 3.7	NA	< 0.12	NA	< 570	NA	< 1.5	< 6	< 0.6	NA	< 0.13
Acenaphthene	83-32-9	4,700	190,000	0.13	< 0.25	1.64	1	< 0.036	1,300	1.66	< 0.11	< 0.45	< 0.04	4.55 D	0.053

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs DC Non-Res Subsurf Soil (No Exceedances)	PCSB-58 5 8/15/05	PCTP-01 6 2/8/05	PCTP-01R 5-7 4/5/19	PCTP-02 5 2/8/05	PCTP-02R 4-6 4/5/19	PCTP-12 3 2/9/05	PCTP-12R 2-4 4/12/19	PCTP-14 2.5 3/3/05	PCTP-214 7.5 3/3/05	PCTP-16 2 2/10/05	PCTP-17R 5-6 4/15/19	PCTP-18 6 2/16/05
Semi-Volatile Organic Compounds (cont'd)															
Acenaphthylene	208-96-8	8,000	190,000	0.062	7.3	0.0873	0.14	< 0.036	1,600	15.2	2.7	7	0.45	29.6 D	0.5
Acetophenone	98-86-2	1,200	10,000	NA	NA	< 0.2	NA	< 0.18	NA	0.0573 J	NA	NA	NA	< 0.18	NA
Anthracene	120-12-7	350	190,000	0.46	16	1.73	1.8	< 0.036	***3,000***	21.8	4	13	1.5	67.8 D	0.78
Benz(a)anthracene	56-55-3	430	190,000	1.2	58	4.39 D	3.1	< 0.036	***2,800***	52.8	23	45	4.7	57.2 D	2.6
Benzaldehyde	100-52-7	- -	- -	NA	NA	0.0406 J	NA	< 0.18	NA	< 0.98	NA	NA	NA	< 0.18	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.94	43	4.61 D	2.4	< 0.036	***1,800***	40	19	39	4.3	41.1 D	2.7
Benzo(b)fluoranthene	205-99-2	170	190,000	1.5	68	5.59 D	3.3	< 0.036	***2,000***	56.5	27	58	6.6	49 D	3.5
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.56	23	2.66	1.2	< 0.036	***620***	21.7	16	28	2.4	20.5 D	1.6
Benzo(k)fluoranthene	207-08-9	610	190,000	0.43	24	2.14 D	1.3	< 0.036	***730***	12.8	11	15	1.5	18.9 D	1.1
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	1.3	< 2.1	0.185	1.4 B	< 0.073	< 320	< 0.39	< 0.23	< 0.97	< 0.34	< 0.073	< 0.073
Butyl benzyl phthalate	85-68-7	10,000	10,000	1.6	< 0.27	< 0.078	< 0.0087	< 0.073	< 41	< 0.39	< 0.12	< 0.5	< 0.043	< 0.073	< 0.0094
Caprolactam	105-60-2	- -	- -	NA	NA	0.125	NA	< 0.073	NA	< 0.39	NA	NA	NA	< 0.073	NA
Carbazole	86-74-8	110	190,000	0.11	5.2	0.962	1	< 0.073	***1,500***	2.35	0.71	2.4	0.62	28.8 D	0.22
Chrysene	218-01-9	230	190,000	1.3	49	4.27 D	2.7	< 0.036	***1,800***	46	22	46	4.2	48 D	2.6
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.28	8.8	0.78	0.42	< 0.036	210	6.72	6.3	12	0.94	6.99 D	0.54
Dibenzofuran	132-64-9	310	190,000	0.21	5	0.489	0.95	< 0.073	***3,700***	3.91	0.76 J	2.5 J	0.24	49.9 D	0.21
Diethyl phthalate	84-66-2	9,300	10,000	< 0.012	< 0.19	< 0.078	0.049	< 0.073	< 30	< 0.39	< 0.13	< 0.52	< 0.031	< 0.073	< 0.0068
Dimethyl phthalate	131-11-3	- -	- -	< 0.0098	< 0.36	0.0206 J	< 0.012	< 0.073	< 55	< 0.39	< 0.1	< 0.43	< 0.057	< 0.073	< 0.013
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.045 B	< 0.15	< 0.078	0.083	< 0.073	< 23	< 0.39	0.68	< 0.47	< 0.024	< 0.073	0.058
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.01	< 0.25	0.33	0.048	< 0.073	< 38	< 0.39	< 0.11	< 0.47	< 0.04	< 0.073	< 0.0086
Fluoranthene	206-44-0	3,200	190,000	2	110	8.81 D	7.5	< 0.036	***7,500***	141	29	63	10	138 D	4.6
Fluorene	86-73-7	3,800	190,000	0.22	7.3	1.02	1.7	< 0.036	***5,200***	9.78	1.4	4	0.29	77.2 D	0.23
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.52	25	2.97	1.3	< 0.036	620	19.5	14	26	2.6	22 D	1.7
Naphthalene	91-20-3	25	190,000	0.49	6.6	0.266	0.74	< 0.036	***29,000***	9.89	1.4	3.2	0.43	***146 D***	0.25
Pentachlorophenol	87-86-5	5	190,000	NA	NA	< 0.16	NA	< 0.15	NA	< 0.78	NA	NA	NA	< 0.15	NA
Phenanthrene	85-01-8	10,000	190,000	1.9	54	6.49 D	7.2	< 0.036	***14,000***	54.6	9	37	5.1	219 D	2.3
Phenol	108-95-2	200	18,000	< 0.066	< 3.4	< 0.078	< 0.11	< 0.073	< 520	0.257 J	< 0.28	< 1.2	< 0.55	2.79	< 0.12
Pyrene	129-00-0	2,200	190,000	2.4	96	7.25 D	5.4	< 0.036	***5,900***	94.7	30	77	7.8	95.6 D	4.1
Total PAHs and 2-Methylnaphthalene	-	- -	- -	15.0	596	54.8	41.8	< 0.036	83,600	607	216	473	53.1	1,100	29.3
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	6,460	NA	9,610	NA	6,840	NA	NA	NA	7,830 J	NA
Antimony	7440-36-0	27	190,000	3.5	< 2.4	1.3 J	< 2.4	< 2.2	***33***	< 2.3	< 2.4	3.4	5.7	< 2.3	< 2.6
Arsenic	7440-38-2	29	190,000	20	4.8	4.7	4.9	2.7	***33***	7.8	4.2	7.1	20	5.8	17
Barium	7440-39-3	8,200	190,000	120	160	125	130	28.6	70	81.1	530	720	87	23.5	79
Beryllium	7440-41-7	320	190,000	< 0.78	< 0.73	0.32	< 0.71	0.31	1.3	0.49	< 0.72	< 0.75	< 0.71	0.31	< 0.77
Cadmium	7440-43-9	38	190,000	< 0.78	< 0.73	0.84	< 0.71	< 0.55	14	< 0.59	< 0.72	< 0.75	1.1	< 1.1	< 0.77
Calcium	7440-70-2	- -	- -	NA	NA	47,500	NA	475 J	NA	939	NA	NA	NA	176 J	NA

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-58 5 8/15/05	PCTP-01 6 2/8/05	PCTP-01R 5-7 4/5/19	PCTP-02 5 2/8/05	PCTP-02R 4-6 4/5/19	PCTP-12 3 2/9/05	PCTP-12R 2-4 4/12/19	PCTP-14 2.5 3/3/05	PCTP-214 7.5 3/3/05	PCTP-16 2 2/10/05	PCTP-17R 5-6 4/15/19	PCTP-18 6 2/16/05
Metals (cont'd)															
Chromium	7440-47-3	190,000	190,000	28	8.6	15.1	11	9.7	71	21.6	12	29	24	17.3 J	7.8
Cobalt	7440-48-4	160	190,000	NA	NA	4.0 J	NA	3.6 J	NA	< 5.9	NA	NA	NA	4.2 J	NA
Copper	7440-50-8	43,000	190,000	270	40	19.9	17	4.9	3,200	82.6	60	97	140	19.3	59
Cyanide	57-12-5	2000	190,000	NA	NA	< 0.27	NA	< 0.27	***340***	0.77	8.5	13	NA	8.3 J	NA
Iron	7439-89-6	- -	190,000	NA	NA	19,000	NA	9,460	NA	17,500	NA	NA	NA	33,600 J	NA
Lead	7439-92-1	450	190,000	160	200	111	290	6.3	***2,100***	274	110	200	240	6.6 J	160
Magnesium	7439-95-4	- -	- -	NA	NA	3,730	NA	1,230	NA	1,380	NA	NA	NA	1,720	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	187	NA	112	NA	121	NA	NA	NA	102 J	NA
Mercury	7439-97-6	10	190,000	0.15	0.25	< 0.031	0.93	0.16	0.41	0.39	2.3	2.5	0.29	0.46 J	0.43
Nickel	7440-02-0	650	190,000	27	9.8	13.7	7.6	9.2	42	12.3	9.2	16	18	20.3	11
Potassium	7440-09-7	- -	- -	NA	NA	1,370	NA	798 J	NA	< 1,200	NA	NA	NA	813 J	NA
Selenium	7782-49-2	26	190,000	3.4	3.1	< 2.4	< 2.1	< 2.2	5.9	< 2.3	3.3	3.8	4.3	< 4.6	2.9
Silver	7440-22-4	84	190,000	< 3.2	< 3	0.25 J	< 3	< 0.55	< 4.4	< 0.59	< 3	< 3.1	< 2.9	< 1.1	< 3.2
Sodium	7440-23-5	- -	- -	NA	NA	158 J	NA	< 1,100	NA	< 1,200	NA	NA	NA	< 1,100	NA
Thallium	7440-28-0	14	190,000	< 1.6	< 1.5	< 1.2	< 1.4	< 1.1	< 2.1	< 1.2	< 1.4	< 1.5	< 1.4	< 2.3	< 1.5
Vanadium	7440-62-2	820	190,000	NA	NA	14.1	NA	10.2	NA	16.0	NA	NA	NA	19.8 J	NA
Zinc	7440-66-6	12,000	190,000	94	160	115	150	28.9	2,800	102	67	150	190	28.0	210

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-36 6 2/18/05	PCTP-236 7 2/18/05	PCTP-37 3 2/17/05	PCTP-47 6 2/17/05	PCTP-47R 5-7 4/9/19	PCTP-58 2 2/24/05	PCTP-61 7.5 9/8/05	PCTP-64 7 9/8/05	PCTP-65 7.5 9/8/05	PCTP-66R-HC 2-4 4/4/19	PCTP-75 11 9/9/05	PCTP-75R 10-12 4/11/19
Volatile Organic Compounds															
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.00096	< 0.00095	< 0.00062	< 0.0013	< 0.0023	< 0.00057	< 0.00027	< 0.0003	< 0.00033	R	< 0.0014	< 0.0042
1,1-Dichloroethane	75-34-3	16	1,600	< 0.00098	< 0.00097	< 0.00063	< 0.0013	< 0.0012	< 0.00058	< 0.00081	< 0.0009	< 0.001	R	< 0.0043	< 0.0021
1,2,3-Trichlorobenzene	87-61-6	- -	- -	NA	NA	NA	NA	< 0.0058	NA	NA	NA	NA	R	NA	< 0.011
1,2,4-Trichlorobenzene	120-82-1	27	10,000	NA	NA	NA	NA	< 0.0058	NA	NA	NA	NA	R	NA	< 0.011
1,3-Dichlorobenzene	541-73-1	61	10,000	NA	NA	NA	NA	< 0.0012	NA	NA	NA	NA	R	NA	< 0.0021
1,4-Dichlorobenzene	106-46-7	10	230	NA	NA	NA	NA	< 0.0012	NA	NA	NA	NA	R	NA	< 0.0021
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0016	< 0.0016	< 0.001	< 0.0021	< 0.012	< 0.00093	< 0.00084	< 0.00093	< 0.001	R	< 0.0044	< 0.021
Acetone	67-64-1	10,000	10,000	< 0.0072	< 0.0071	0.023	< 0.0096	0.0259	< 0.0042	< 0.0057	0.042	0.043	R	0.11	0.0523
Benzene	71-43-2	0.5	330	< 0.00051	< 0.00051	< 0.00033	< 0.00069	< 0.00058	< 0.0003	< 0.00055	< 0.00061	< 0.00068	R	***2.8***	< 0.0011
Carbon Disulfide	75-15-0	620	10,000	0.0057	< 0.0011	< 0.00069	< 0.0014	0.0012 J	< 0.00063	< 0.0007	< 0.00077	< 0.00087	R	< 0.0037	< 0.0042
Carbon Tetrachloride	56-23-5	0.5	430	< 0.0019	< 0.0019	< 0.0012	< 0.0025	< 0.0023	< 0.0011	< 0.00091	< 0.001	< 0.0011	R	< 0.0048	< 0.0042
Chloroform	67-66-3	8	110	< 0.00053	< 0.00053	< 0.00034	< 0.00071	< 0.0023	< 0.00031	< 0.00049	< 0.00054	< 0.0006	R	< 0.0025	< 0.0042
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00075	< 0.00074	< 0.00048	< 0.001	< 0.0012	< 0.00044	< 0.00051	< 0.00057	< 0.00064	R	< 0.0027	< 0.0021
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	< 0.0023	NA	NA	NA	NA	R	NA	< 0.0042
Dichloromethane	75-09-2	0.5	10,000	0.021 B	0.021 B	0.012 B	0.028 B	< 0.0058	0.0095 B	0.01 B	0.014 B	0.0086 B	R	0.03 B	< 0.011
Ethylbenzene	100-41-4	70	1,000	< 0.0014	< 0.0014	< 0.00091	< 0.0019	< 0.0012	< 0.00083	< 0.0008	< 0.00089	< 0.00099	R	2.4	< 0.0021
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0017	< 0.0017	< 0.0011	< 0.0023	< 0.0012	< 0.001	< 0.0012	< 0.0013	< 0.0015	R	0.1	< 0.0021
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	< 0.0058	NA	NA	NA	NA	R	NA	< 0.011
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	< 0.0023	NA	NA	NA	NA	R	NA	< 0.0042
o,p-Xylene	136777-61-2	- -	- -	< 0.00037	< 0.00036	< 0.00024	< 0.00049	NA	< 0.00022	< 0.0005	< 0.00056	< 0.00062	NA	0.23	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	< 0.0012	NA	NA	NA	NA	R	NA	< 0.0021
Styrene (Monomer)	100-42-5	24	10,000	< 0.00032	< 0.00032	< 0.00021	< 0.00043	< 0.0023	< 0.00019	< 0.00067	< 0.00074	< 0.00083	R	< 0.0035	< 0.0042
Toluene	108-88-3	100	10,000	< 0.00038	< 0.00038	< 0.00025	< 0.00051	< 0.0012	< 0.00023	< 0.00081	< 0.0009	< 0.001	0.0687 J	0.028	< 0.0021
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	< 0.0012	NA	NA	NA	NA	R	< 0.0034	< 0.0021
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	< 0.0023	NA	NA	NA	NA	R	5.558	NA
Trichloroethene	79-01-6	0.5	180	< 0.001	< 0.00098	< 0.00064	< 0.0013	< 0.0012	< 0.00059	< 0.00066	< 0.00073	< 0.00081	R	5.668	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	0.0138 J	NA	NA	NA	NA	0.677	NA	0.0255 J
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	NA	NA	NA	NA	< 0.19	NA	NA	NA	NA	< 0.17	NA	< 0.23
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	NA	NA	NA	NA	< 0.19	NA	NA	NA	NA	< 0.17	NA	< 0.23
2,4-Dichlorophenol	120-83-2	2	190,000	NA	NA	NA	NA	< 0.19	NA	NA	NA	NA	< 0.17	NA	< 0.23
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.028	< 0.12	< 0.031	< 0.029	< 0.19	< 0.2	< 0.03	< 0.055	< 0.061	< 0.17	< 39	< 0.23
2-Methylnaphthalene	91-57-6	1,900	190,000	< 0.07	< 0.058	0.15	0.047 J	0.0417	0.65	< 0.061	0.11	1.4	1.96	340	0.0866
2-Methylphenol	95-48-7	580	190,000	< 0.12	< 0.1	< 0.13	< 0.12	< 0.076	< 0.12	< 0.13	< 0.19	< 0.21	< 0.069	< 130	< 0.091
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	< 0.076	NA	NA	NA	NA	< 0.069	NA	< 0.091
4-Methylphenol	106-44-5	58	190,000	< 0.15	< 0.099	< 0.16	< 0.15	NA	< 0.13	< 0.13	0.071 J	0.17 J	NA	< 150	NA
Acenaphthene	83-32-9	4,700	190,000	< 0.011	< 0.012	0.13	< 0.011	0.111	0.079	< 0.0059	0.31	0.86	0.616	< 12	0.0867

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs DC Non-Res Subsurf Soil (No Exceedances)	PCTP-36 6 2/18/05	PCTP-236 7 2/18/05	PCTP-37 3 2/17/05	PCTP-47 6 2/17/05	PCTP-47R 5-7 4/9/19	PCTP-58 2 2/24/05	PCTP-61 7.5 9/8/05	PCTP-64 7 9/8/05	PCTP-65 7.5 9/8/05	PCTP-66R-HC 2-4 4/4/19	PCTP-75 11 9/9/05	PCTP-75R 10-12 4/11/19
Semi-Volatile Organic Compounds (cont'd)															
Acenaphthylene	208-96-8	8,000	190,000	< 0.012	< 0.01	0.063	0.062	0.11	0.78	< 0.0054	0.06	0.16	7.04 D	< 6.5	0.0453 J
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	< 0.19	NA	NA	NA	NA	< 0.17	NA	< 0.23
Anthracene	120-12-7	350	190,000	< 0.01	< 0.0081	0.11	0.083	0.364	0.71	< 0.0071	0.24	0.59	8.17 D	< 7.4	0.254
Benz(a)anthracene	56-55-3	430	190,000	< 0.013	0.075	0.47	0.7	1.64	3.4	< 0.005	0.39	1.2	13 D	< 4.9	0.437
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	< 0.19 J	NA	NA	NA	NA	< 0.17	NA	< 0.23
Benzo(a)pyrene	50-32-8	46	190,000	< 0.0088	0.055	0.46	0.7	1.43	3.1	< 0.006	0.34	1.3	12.5 D	< 6.5	0.417
Benzo(b)fluoranthene	205-99-2	170	190,000	0.085	0.14	0.69	1.3	1.67	7.4	< 0.01	0.4	1.3	15.3 D	< 8.4	0.482
Benzo(g,h,i)perylene	191-24-2	180	190,000	< 0.012	0.045	0.35	0.49	0.908	1.9	< 0.0051	0.19	0.81	8.24 D	< 5.3	0.277
Benzo(k)fluoranthene	207-08-9	610	190,000	< 0.014	0.046	0.16	0.31	0.721	2.3	< 0.013	0.15	0.47	6.32 D	< 9.1	0.185
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.024	< 0.011	< 0.026	< 0.024	0.142 J	0.21	< 0.023	0.056	0.068	< 0.069	< 25	0.0533 J
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.012	< 0.0088	< 0.013	< 0.012	< 0.076	< 0.0091	< 0.0097	< 0.016	< 0.018	< 0.069	< 11	< 0.091
Caprolactam	105-60-2	- -	- -	NA	NA	NA	NA	< 0.076	NA	NA	NA	NA	< 0.069	NA	< 0.091
Carbazole	86-74-8	110	190,000	< 0.0093	< 0.0057	< 0.01	< 0.0094	0.159	0.44	< 0.0069	0.29	0.16	2.41	< 8.3	0.12
Chrysene	218-01-9	230	190,000	0.064	0.15	0.62	0.83	1.72	5.1	< 0.01	0.38	1.3	11.3 D	< 5.8	0.524
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.015	< 0.013	0.12	0.18	0.247	0.78	< 0.0066	0.052	0.26	2.24	< 9.8	0.0825
Dibenzofuran	132-64-9	310	190,000	< 0.099	0.051 J	< 0.11	< 0.1	0.0651 J	0.53	< 0.046	0.11	0.24	5.28 D	< 36	0.0831 J
Diethyl phthalate	84-66-2	9,300	10,000	0.041 B	0.05	0.066 B	0.056 B	< 0.076	< 0.0065	< 0.0084	< 0.011	< 0.012	< 0.069	< 7.7	< 0.091
Dimethyl phthalate	131-11-3	- -	- -	< 0.01	< 0.011	< 0.012	< 0.011	< 0.076	< 0.012	< 0.0062	< 0.009	< 0.01	< 0.069	< 6.4	< 0.091
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.012	< 0.007	< 0.013	< 0.012	< 0.076	< 0.0051	< 0.0073	0.051	0.07	< 0.069	< 6.3	< 0.091
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.012	< 0.0068	< 0.013	< 0.012	< 0.076	< 0.0083	< 0.012	< 0.0094	< 0.01	< 0.069	< 6.6	< 0.091
Fluoranthene	206-44-0	3,200	190,000	< 0.013	0.1	0.64	1	2.6	7.7	0.044	0.55	1.8	28.9 D	< 8.1	0.764
Fluorene	86-73-7	3,800	190,000	< 0.013	< 0.01	0.052	< 0.014	0.11	0.19	< 0.0086	0.32	0.69	9.19 D	< 7.1	0.115
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	< 0.012	0.046	0.28	0.44	0.912	2.4	< 0.0061	0.17	0.64	8.58 D	< 3.9	0.258
Naphthalene	91-20-3	25	190,000	< 0.0084	0.048	0.2	0.48	0.0707	0.77	< 0.0035	0.98	3.3	1.76	***2,700***	0.184
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	< 0.15	NA	NA	NA	NA	< 0.14	NA	< 0.18
Phenanthrene	85-01-8	10,000	190,000	< 0.014	0.053	0.34	0.38	1.36	3.3	< 0.008	0.38	1.4	29.7 D	35	1.11
Phenol	108-95-2	200	18,000	< 0.028	< 0.048	< 0.031	< 0.029	< 0.076	< 0.11	< 0.059	0.12	< 0.068	< 0.069	< 43	< 0.091
Pyrene	129-00-0	2,200	190,000	< 0.011	0.16	0.95	0.97	2.54	5.7	0.041	1.1	2.9	22.5 D	< 6.5	0.739
Total PAHs and 2-Methylnaphthalene	-	- -	- -	0.149	0.918	5.79	7.97	16.6	46.3	0.085	6.12	20.4	187	3,080	6.05
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	11,000 J	NA	NA	NA	NA	4,950	NA	1,770
Antimony	7440-36-0	27	190,000	< 2.4	< 2.4	< 2.7	< 2.5	2.2 J	5.8	< 2.2	< 2.4	< 2.7	< 2.1	< 2.2	< 2.8
Arsenic	7440-38-2	29	190,000	4.9	5.1	28	4.8	7.5	***79***	3.2	3	13	4.2	3.8	7.7
Barium	7440-39-3	8,200	190,000	150	180	81	39	97.9	220	21	39	45	28.1	46	34.0
Beryllium	7440-41-7	320	190,000	< 0.73	0.89	1.3	< 0.74	0.59	< 0.74	< 0.65	< 0.71	< 0.8	0.44	< 0.67	0.37
Cadmium	7440-43-9	38	190,000	< 0.73	< 0.72	< 0.81	< 0.74	0.39 J	< 0.74	< 0.65	< 0.71	2.5	0.11 J	< 0.67	0.18 J
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	37,500	NA	NA	NA	NA	364 J	NA	1,510

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	PCTP-36 6 2/18/05	PCTP-236 7 2/18/05	PCTP-37 3 2/17/05	PCTP-47 6 2/17/05	PCTP-47R 5-7 4/9/19	PCTP-58 2 2/24/05	PCTP-61 7.5 9/8/05	PCTP-64 7 9/8/05	PCTP-65 7.5 9/8/05	PCTP-66R-HC 2-4 4/4/19	PCTP-75 11 9/9/05	PCTP-75R 10-12 4/11/19
Metals (cont'd)															
Chromium	7440-47-3	190,000	190,000	6.3	8.1	10	< 6.2	20.6	< 6.2	15	33	39	12.8	7.4	4.1
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	6.0	NA	NA	NA	NA	6.0	NA	5.7 J
Copper	7440-50-8	43,000	190,000	29	40	39	28	265	120	31	21	26	8.5	< 5.6	16.0
Cyanide	57-12-5	2000	190,000	0.54	1.7	NA	NA	0.20 J	0.37	NA	NA	NA	0.13 J	NA	0.41
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	19,000 J	NA	NA	NA	NA	13,100	NA	6,180
Lead	7439-92-1	450	190,000	< 6.1	6.3	320	17	359	***1,000***	34	48	120	25.8	6.6	31.9
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	12,500	NA	NA	NA	NA	1,140	NA	307 J
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	299 J	NA	NA	NA	NA	203	NA	23.9
Mercury	7439-97-6	10	190,000	< 0.1	< 0.1	0.19	< 0.1	0.53	< 0.1	< 0.09	0.32	0.38	0.046	< 0.094	0.043
Nickel	7440-02-0	650	190,000	16	18	13	< 6.2	12.8	7.8	6.8	13	17	8.4	13	11.8
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	1,460	NA	NA	NA	NA	982 J	NA	152 J
Selenium	7782-49-2	26	190,000	3.1	4.2	2.9	2.6	< 2.4	2.8	< 1.9	2.3	< 2.4	< 2.1	2.9	1.5 J
Silver	7440-22-4	84	190,000	< 3	< 3	< 3.4	< 3.1	0.48 J	< 3.1	< 2.7	< 3	< 3.3	< 0.53	< 2.8	< 0.70
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	135 J	NA	NA	NA	NA	< 1,100	NA	< 1,400
Thallium	7440-28-0	14	190,000	< 1.5	< 1.4	< 1.6	< 1.5	< 1.2	< 1.5	< 1.3	< 1.4	< 1.6	< 1.1	< 1.3	< 1.4
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	27.0	NA	NA	NA	NA	13.4	NA	6.8 J
Zinc	7440-66-6	12,000	190,000	< 12	< 12	280	< 12	244	110	35	190	810	47.3	22	61.0

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-76 6.5 9/12/05	PCTP-80 8 9/12/05	PSSTP-01B 5-6 3/11/03	PSSTP-01R 5-6 4/10/19	PSSTP-02B 5-6 3/11/03	PSSTP-04R 7-8 4/11/19	PSSTP-08B 6-7 3/11/03	PSSTP-09B 6-7 3/12/03	PSSTP-22R 4-6 4/24/19	PSSTP-23B 7-8 3/13/03
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.0005	< 0.00054	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
1,1-Dichloroethane	75-34-3	16	1,600	< 0.00051	< 0.00055	NA	< 0.0017	NA	< 19	NA	NA	< 0.15	NA
1,2,3-Trichlorobenzene	87-61-6	- -	- -	NA	NA	NA	0.0019 J	NA	< 94	NA	NA	< 0.76	NA
1,2,4-Trichlorobenzene	120-82-1	27	10,000	NA	NA	NA	< 0.0083	NA	< 94	NA	NA	< 0.76	NA
1,3-Dichlorobenzene	541-73-1	61	10,000	NA	NA	NA	< 0.0017	NA	< 19	NA	NA	< 0.15	NA
1,4-Dichlorobenzene	106-46-7	10	230	NA	NA	NA	< 0.0017	NA	< 19	NA	NA	< 0.15	NA
2-Butanone (MEK)	78-93-3	400	10,000	< 0.00082	< 0.00088	NA	< 0.017	NA	< 190	NA	NA	< 1.5	NA
Acetone	67-64-1	10,000	10,000	< 0.0038	0.041	< 0.024	0.0668	0.08	< 190	< 0.027	< 0.025	< 1.5	< 0.022
Benzene	71-43-2	0.5	330	< 0.00027	< 0.00029	0.0073 B	< 0.00083	< 0.0013	***16.9***	0.0028	< 0.0012	0.482	< 0.0011
Carbon Disulfide	75-15-0	620	10,000	< 0.00056	< 0.0006	< 0.0059	0.0048	< 0.0065	< 38	< 0.0067	< 0.0062	< 0.3	< 0.0056
Carbon Tetrachloride	56-23-5	0.5	430	< 0.001	< 0.0011	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
Chloroform	67-66-3	8	110	< 0.00028	< 0.0003	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00039	0.0016	NA	< 0.0017	NA	< 19	NA	NA	< 0.15	NA
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
Dichloromethane	75-09-2	0.5	10,000	0.01 B	0.015 B	0.0073 B	< 0.0083	0.0085 B	< 94	0.0053 JB	0.0023 JB	< 0.76	0.0049 JB
Ethylbenzene	100-41-4	70	1,000	< 0.00074	< 0.00079	< 0.0012	< 0.0017	< 0.0013	< 19	< 0.0013	< 0.0012	0.17	< 0.0011
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.00089	< 0.00095	NA	< 0.0017	NA	73.5	NA	NA	3.2	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	< 0.0083 J	NA	< 94	NA	NA	< 0.76	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00019	< 0.00021	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	< 0.0017	NA	26.5	NA	NA	1.11	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00017	< 0.00018	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
Toluene	108-88-3	100	10,000	< 0.0002	< 0.00022	< 0.0012	< 0.0017	< 13	34.5	0.0015	< 0.0012	1.09	< 0.0011
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	0	< 0.0017	0.0089 J	100	0	0	4.31	0
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	< 0.0033	NA	< 38	NA	NA	< 0.3	NA
Trichloroethene	79-01-6	0.5	180	< 0.00052	< 0.00056	NA	< 0.0017	NA	< 19	NA	NA	< 0.15	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	0.262	NA	***301 D***	NA	NA	6.85 D	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	NA	NA	NA	< 0.41	NA	< 3	NA	NA	< 0.21	NA
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	NA	NA	NA	R	NA	< 3	NA	NA	< 0.21	NA
2,4-Dichlorophenol	120-83-2	2	190,000	NA	NA	NA	R	NA	< 3	NA	NA	< 0.21	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 1	< 0.16	< 2	R	< 0.43	58.3	< 1.3	< 2.1	0.437 J	< 3.7
2-Methylnaphthalene	91-57-6	1,900	190,000	1.4	0.25	0.34 J	0.861	1.3	1,780 D	0.19 J	0.21 J	31.9 D	0.4 J
2-Methylphenol	95-48-7	580	190,000	< 3.5	< 0.56	NA	R	NA	52.5 D	NA	NA	0.173	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 2	R	0.086	136 D	< 1.3	< 2.1	0.304	< 3.7
4-Methylphenol	106-44-5	58	190,000	< 3.9	< 0.62	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	4.7	0.81	1.5 J	2.13	2.7	142 D	0.35 J	1.1 J	3.78	< 3.7

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-76 6.5 9/12/05	PCTP-80 8 9/12/05	PSSTP-01B 5-6 3/11/03	PSSTP-01R 5-6 4/10/19	PSSTP-02B 5-6 3/11/03	PSSTP-04R 7-8 4/11/19	PSSTP-08B 6-7 3/11/03	PSSTP-09B 6-7 3/12/03	PSSTP-22R 4-6 4/24/19	PSSTP-23B 7-8 3/13/03
Semi-Volatile Organic Compounds (cont'd)													
Acenaphthylene	208-96-8	8,000	190,000	< 0.17	< 0.027	< 2	0.0544 J	0.24 J	354 D	0.25 J	< 2.1	13.4 D	5.2
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	< 0.41	NA	13.3	NA	NA	0.0407 J	NA
Anthracene	120-12-7	350	190,000	20	1.6	27	6.15	2.1	***883 D***	1.4	2.4	38.9 D	2.3 J
Benz(a)anthracene	56-55-3	430	190,000	46	3.1	5.3	10.4 D	2.5	***819 D***	3.2	5.4	39.8 D	9.2
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	0.0270 J	NA	< 3	NA	NA	< 0.21	NA
Benzo(a)pyrene	50-32-8	46	190,000	37	2.9	3.8	7.67	1.9	***566 D***	2.1	4.2	34.9 D	6.9
Benzo(b)fluoranthene	205-99-2	170	190,000	44	3.6	5.6	11.2 D	2.8	***723 D***	3.4	6	49.2 D	13
Benzo(g,h,i)perylene	191-24-2	180	190,000	22	2	1.1 J	5	0.9	***267 DJ***	0.97 J	1.4 J	18.6 D	4.1
Benzo(k)fluoranthene	207-08-9	610	190,000	12	1.3	1.9 J	4.29 D	1	261 D	1.2 J	2.4	15.7 D	4.3
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.66	0.28	< 2	3.3	8.5	< 1.2	0.55 J	< 2.1	< 0.083	< 3.7
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.29	< 0.047	< 2	< 0.16	0.85	< 1.2	< 1.3	< 2.1	< 0.083	< 3.7
Caprolactam	105-60-2	- -	- -	NA	NA	NA	< 0.16	NA	< 1.2	NA	NA	< 0.083	NA
Carbazole	86-74-8	110	190,000	3.9	0.82	0.74 J	2.55	1.8	***573 D***	0.51 J	1.1 J	18.8 D	0.81
Chrysene	218-01-9	230	190,000	44	2.9	5.4	9.78 D	2.3	***701 D***	2.7	5.3	36.5 D	11
Dibenz(a,h)anthracene	53-70-3	270	190,000	8.5	0.64	0.42 J	1.28	0.29 J	106 DJ	0.32 J	0.59 J	5.68 D	1.6 J
Dibenzofuran	132-64-9	310	190,000	6.1	0.61	0.77 J	1.82	1.4	***1,220 D***	0.35 J	0.62 J	32.5 D	0.61 J
Diethyl phthalate	84-66-2	9,300	10,000	< 0.2	< 0.032	NA	< 0.16	NA	< 1.2	NA	NA	< 0.083	NA
Dimethyl phthalate	131-11-3	- -	- -	< 0.17	< 0.027	NA	< 0.16	NA	< 1.2	NA	NA	< 0.083	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.16	< 0.026	< 2	< 0.16	0.41 JB	< 1.2	< 1.3	0.22 J	< 0.083	< 3.7
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.17	< 0.028	< 2	< 0.16	1.5	< 1.2	< 1.3	< 2.1	< 0.083	< 3.7
Fluoranthene	206-44-0	3,200	190,000	86	6.6	11	25.2 D	6.4	2,710 D	5.7	11	107 D	18
Fluorene	86-73-7	3,800	190,000	7.2	1	1.7 J	2.92	2.2	2,020 D	0.51 J	1.2 J	54.2 D	0.85 J
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	20	1.9	1.2 J	4.97	0.74	274 DJ	0.95 J	1.6 J	20.7 D	4.4
Naphthalene	91-20-3	25	190,000	1.4	0.6	0.37 J	0.577	3	***9,350 D***	0.26 J	0.37 J	***103 D***	1.4 J
Pentachlorophenol	87-86-5	5	190,000	NA	NA	< 2	R	< 0.43	< 2.4	< 1.3	< 2.1	< 0.17	< 3.7
Phenanthrene	85-01-8	10,000	190,000	98	5.9	11	29 D	7.7	4,730 D	4.9	8.8	152 D	8.6
Phenol	108-95-2	200	18,000	< 1.1	< 0.18	< 1.5	0.183 J	2.6	69 D	< 1.3	1.6	0.115	< 1.4
Pyrene	129-00-0	2,200	190,000	100	5.8	10	19.5 D	5.7	1,490 D	6.1	8.7	80.2 D	14
Total PAHs and 2-Methylnaphthalene	-	- -	- -	552	40.9	87.6	141	43.8	27,200	34.5	60.7	805	105
Metals													
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	10,900	NA	1,090	NA	NA	9,590 J	NA
Antimony	7440-36-0	27	190,000	5.7	3.3	3.2	3.6	< 2.6	20.6	< 2.7	2.7	1.1 J	< 2.2
Arsenic	7440-38-2	29	190,000	7	3.5	5.2	4.1	5.6	10.2 J	6.7	4.7	12.2	5.1
Barium	7440-39-3	8,200	190,000	160	140	520	77.9	45	74.4	58	160	209 J	50
Beryllium	7440-41-7	320	190,000	< 0.66	< 0.71	< 0.71	0.56	< 0.78	< 0.25	< 0.8	< 0.74	0.73	< 0.67
Cadmium	7440-43-9	38	190,000	< 0.66	< 0.71	< 0.71	0.33 J	0.8	0.68	< 0.8	1	0.84	< 0.67
Calcium	7440-70-2	- -	- -	NA	NA	NA	86,800	NA	3,650	NA	NA	13,200 J	NA

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-76 6.5 9/12/05	PCTP-80 8 9/12/05	PSSTP-01B 5-6 3/11/03	PSSTP-01R 5-6 4/10/19	PSSTP-02B 5-6 3/11/03	PSSTP-04R 7-8 4/11/19	PSSTP-08B 6-7 3/11/03	PSSTP-09B 6-7 3/12/03	PSSTP-22R 4-6 4/24/19	PSSTP-23B 7-8 3/13/03
Metals (cont'd)													
Chromium	7440-47-3	190,000	190,000	42	27	22	28.4	9.8	791	6.7	23	18.8	13
Cobalt	7440-48-4	160	190,000	NA	NA	NA	5.5 J	NA	12.5	NA	NA	4.4 J	NA
Copper	7440-50-8	43,000	190,000	95	88	61	33.3	43	452	42	80	250	53
Cyanide	57-12-5	2000	190,000	NA	NA	0.49	0.58	1.2	2.7	5.5	< 0.31	8.3 J	15
Iron	7439-89-6	- -	190,000	NA	NA	NA	13,900	NA	71,400	NA	NA	22,700	NA
Lead	7439-92-1	450	190,000	***740***	***520***	260	300	140	78.6	27	230	***477***	170
Magnesium	7439-95-4	- -	- -	NA	NA	NA	5,480	NA	218 J	NA	NA	6,960 J	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	235	NA	351	NA	NA	575	NA
Mercury	7439-97-6	10	190,000	0.63	1.6	1.1	0.14	0.41	0.79	0.19	0.49	0.82 J	5.6
Nickel	7440-02-0	650	190,000	20	16	15	13.7	8.8	164	< 6.7	18	21.7	14
Potassium	7440-09-7	- -	- -	NA	NA	NA	1,700	NA	44.4 J	NA	NA	1,080 J	NA
Selenium	7782-49-2	26	190,000	2.6	< 2.1	< 2.1	< 2.4	< 2.3	< 12	< 2.4	< 2.2	0.94 J	< 2
Silver	7440-22-4	84	190,000	< 2.7	< 2.9	< 2.9	< 0.59	< 3.2	< 3.1	< 3.3	< 3.1	< 0.66	< 2.8
Sodium	7440-23-5	- -	- -	NA	NA	NA	217 J	NA	< 1,200	NA	NA	281 J	NA
Thallium	7440-28-0	14	190,000	< 1.3	< 1.4	< 1.4	< 1.2	< 1.6	< 6.2	< 1.6	< 1.5	< 1.3	< 1.3
Vanadium	7440-62-2	820	190,000	NA	NA	NA	20.0	NA	17.9	NA	NA	25.8	NA
Zinc	7440-66-6	12,000	190,000	250	210	550	179	110	178	13	660	335 J	130

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-25B 7-8 3/13/03	S-105 2-4 4/12/19	S-106 2-4 4/12/19	S-107 2-4 4/23/19	S-108 2-4 4/15/19	S-109 2-4 4/15/19	S-110 2-4 4/12/19	S-111 2-4 4/23/19	S-114 2-4 4/15/19	S-127 2-4 4/17/19
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	20	10,000	NA	< 0.0025	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
1,1-Dichloroethane	75-34-3	16	1,600	NA	< 0.0012	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
1,2,3-Trichlorobenzene	87-61-6	- -	- -	NA	< 0.0062	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0059	< 0.61 [< 0.73]
1,2,4-Trichlorobenzene	120-82-1	27	10,000	NA	< 0.0062	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0059	< 0.61 [< 0.73]
1,3-Dichlorobenzene	541-73-1	61	10,000	NA	< 0.0012	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
1,4-Dichlorobenzene	106-46-7	10	230	NA	< 0.0012	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
2-Butanone (MEK)	78-93-3	400	10,000	NA	< 0.012	< 27	< 0.016	< 0.016 [< 0.015]	< 0.019	< 0.015	< 0.013	< 0.012	< 1.2 [< 1.5]
Acetone	67-64-1	10,000	10,000	< 0.027	0.0214	< 27	< 0.016	0.127 J [0.0125 J]	0.0379	0.0265	< 0.013	0.0281	< 1.2 [< 1.5]
Benzene	71-43-2	0.5	330	< 0.0013	< 0.00062	***48.9***	< 0.00082	0.0017 J [0.0020]	0.00086 J	< 0.00077	< 0.00064	< 0.00059	0.134 J [0.365 J]
Carbon Disulfide	75-15-0	620	10,000	< 0.0067	< 0.0025	3.72 J	< 0.0033	0.0063 J [0.0052]	0.0049	0.0015 J	0.0013 J	< 0.0024	< 0.24 [< 0.29]
Carbon Tetrachloride	56-23-5	0.5	430	NA	< 0.0025	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	0.0012 J	< 0.0026	< 0.0024	< 0.24 [< 0.29]
Chloroform	67-66-3	8	110	NA	< 0.0025	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
cis-1,2-Dichloroethene	156-59-2	7	10,000	NA	< 0.0012	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0025	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
Dichloromethane	75-09-2	0.5	10,000	0.0077 B	< 0.0062	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0059	< 0.61 [< 0.73]
Ethylbenzene	100-41-4	70	1,000	< 0.0013	< 0.0012	3.85	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	< 0.0012	93.5	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	0.434 J [0.912 J]
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.0062	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0059	< 0.61 [< 0.73]
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0025	< 5.4	< 0.0033	0.0013 J [0.0019 J]	0.0016 J	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	< 0.0012	35.3	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	0.198 J [0.383 J]
Styrene (Monomer)	100-42-5	24	10,000	NA	< 0.0025	20.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
Toluene	108-88-3	100	10,000	< 0.0013	< 0.0012	67	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	0.143 J [0.36 J]
Total Xylenes	1330-20-7	1,000	9,100	0	< 0.0012	129	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	0.632 J [1.3 J]
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	< 0.0025	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0024	< 0.24 [< 0.29]
Trichloroethene	79-01-6	0.5	180	NA	< 0.0012	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0012	< 0.12 [< 0.15]
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	190,000	NA	0.0737 J	***331***	0.143	0.0701 J [0.0711 J]	0.438	0.0423 J	0.101	< 0.076 B	9.32 D [14.7 D]
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	NA	< 0.19	< 4.8	< 0.18	< 0.19 [< 0.19]	< 0.19	< 0.19	< 0.19	< 0.19	< 0.37 J [< 0.39]
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	NA	< 0.19	< 4.8	< 0.18	< 0.19 [< 0.19]	< 0.19	< 0.19	< 0.19	< 0.19	< 0.37 J [< 0.39]
2,4-Dichlorophenol	120-83-2	2	190,000	NA	< 0.19	< 4.8	< 0.18	< 0.19 [< 0.19]	< 0.19	< 0.19	< 0.19	< 0.19	< 0.37 J [< 0.39]
2,4-Dimethylphenol	105-67-9	230	10,000	< 1.3	< 0.19	185	< 0.18	< 0.19 [< 0.19]	0.0772 J	< 0.19	< 0.19	< 0.19	0.997 J [1.93 J]
2-Methylnaphthalene	91-57-6	1,900	190,000	0.26 J	0.269	1,760	0.359	0.236 [0.246]	1.2	0.249	0.447	0.0109 J	41.1 DJ [64.3 D]
2-Methylphenol	95-48-7	580	190,000	NA	< 0.075	189	< 0.074	< 0.077 [< 0.074]	0.133	< 0.076	< 0.076	< 0.076	0.573 J [1.18 J]
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 1.3	< 0.075	476	< 0.074 J	0.102 [0.117]	0.538	< 0.076	0.0533 J	< 0.076	1.16 J [2.39 J]
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	< 1.3	0.142	161	0.146	0.129 [0.106]	0.427	0.15	0.121	0.0527	4.14 J [7.15 J]

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-25B 7-8 3/13/03	S-105 2-4 4/12/19	S-106 2-4 4/12/19	S-107 2-4 4/23/19	S-108 2-4 4/15/19	S-109 2-4 4/15/19	S-110 2-4 4/12/19	S-111 2-4 4/23/19	S-114 2-4 4/15/19	S-127 2-4 4/17/19
Semi-Volatile Organic Compounds (cont'd)													
Acenaphthylene	208-96-8	8,000	190,000	0.19 J	2.73	1,430	1.61	1.73 [1.43]	10.9 D	0.203	3.14	0.0466	12.2 D [19.9 D]
Acetophenone	98-86-2	1,200	10,000	NA	0.0239 J	< 4.8	< 0.18 J	0.0228 J [< 0.19]	< 0.19	< 0.19	0.0318 J	< 0.19	0.0954 J [0.194 J]
Anthracene	120-12-7	350	190,000	0.86 J	2.36	***1,350***	3.96 D	1.4 [1.2]	13.4 D	0.317	2.21	0.205	54.8 DJ [90.8 D]
Benz(a)anthracene	56-55-3	430	190,000	4.1	7.11	***1,180***	6.51 D	6.47 DJ [5.67 D]	40.5 D	0.834	4.48 D	0.549	45.3 DJ [75.2 D]
Benzaldehyde	100-52-7	- -	- -	NA	< 0.19	< 4.8	< 0.18	< 0.19 [< 0.19]	< 0.19	< 0.19	< 0.19	< 0.19	< 0.37 J [< 0.39]
Benzo(a)pyrene	50-32-8	46	190,000	3.5	7.46	***956***	5.54 D	6.75 DJ [6.02 D]	36.3 D	0.767	7.11 D	0.565	37.6 D ***[60.9 D]***
Benzo(b)fluoranthene	205-99-2	170	190,000	5.7	8.45	***1,070***	6.86 D	9.74 DJ [8.59 D]	49 D	1.08	8.79 D	0.664	46.1 D [74.4 D]
Benzo(g,h,i)perylene	191-24-2	180	190,000	< 1.3	4.62	***538***	3.6 D	2.49 [2.11]	22 D	0.504	5.67 D	0.351	18.7 D [31 D]
Benzo(k)fluoranthene	207-08-9	610	190,000	2.2	2.4	374	3.07	3.39 DJ [1.91 J]	21.1 D	0.343	2.72 D	0.228	15.7 D [29.4 DJ]
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 1.3	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 1.3	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Caprolactam	105-60-2	- -	- -	NA	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Carbazole	86-74-8	110	190,000	0.29 J	0.409	***677***	0.459	0.358 [0.271]	3.16	0.0756 J	0.354	< 0.076 B	27.5 D [43.3 D]
Chrysene	218-01-9	230	190,000	4.7	7.11	***956***	5.8 D	7.77 DJ [6.71 D]	39.7 D	0.812	4.26 D	0.544	39.3 D [64.6 D]
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.81 J	1.11	149	1.45	1.23 [1.06]	5.35 D	0.133	2.02	0.0786	5.74 DJ [11 DJ]
Dibenzofuran	132-64-9	310	190,000	0.25 J	0.196	***1,280***	0.989	0.267 [0.242]	4.19 D	0.128	0.387	0.0258 J	46.6 D [73 D]
Diethyl phthalate	84-66-2	9,300	10,000	NA	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Dimethyl phthalate	131-11-3	- -	- -	NA	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 1.3	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 1.3	< 0.075	< 1.9	< 0.074	< 0.077 [< 0.074]	< 0.075	< 0.076	< 0.076	< 0.076	< 0.15 J [< 0.16]
Fluoranthene	206-44-0	3,200	190,000	5.3	14	***3,290***	14.4 D	8.09 D [6.69 D]	73.2 D	1.79	6.89 D	1.19	130 D [211 D]
Fluorene	86-73-7	3,800	190,000	0.15 J	0.462	2,120	2.28	0.243 [0.192]	6.44 D	0.206	0.448	0.0580	64.3 D [103 D]
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	1.9	3.63	515	2.99 D	2.73 [2.3]	23.4 D	0.516	4.87 D	0.341	19.6 D [32.2 D]
Naphthalene	91-20-3	25	190,000	0.32 J	0.411	***7,730***	0.627	0.968 [1.23]	1.91	0.22	1.47	0.0197 J	***168 D [278 D]***
Pentachlorophenol	87-86-5	5	190,000	< 1.3	< 0.15	< 3.9	< 0.15	< 0.15 [< 0.15]	< 0.15	< 0.15	< 0.15	< 0.15	< 0.3 J [< 0.31]
Phenanthrene	85-01-8	10,000	190,000	3	8.22	5,410	11.3 D	3.41 [2.62]	46.5 D	1.37	3.22	0.827	216 D [350 D]
Phenol	108-95-2	200	18,000	1.7	< 0.075	***296***	< 0.074	0.0922 [0.122]	0.635	< 0.076	0.0490 J	< 0.076	0.338 J [0.72 J]
Pyrene	129-00-0	2,200	190,000	4.4	16.2	2,190	10.5 D	7.99 DJ [6.7 D]	69 D	1.5	6.44 D	1.08	82.8 D [137 D]
Total PAHs and 2-Methylnaphthalene	-	- -	- -	37.4	86.7	31,200	81.0	64.8 [54.8]	460	11.0	64.3	6.81	1,000 [1,640]
Metals													
Aluminum	7429-90-5	- -	190,000	NA	8,650	1,560	8,800	35,000 J [9,710 J]	8,650 J	6,060	5,750	12,200 J	9,820 J [11,600 J]
Antimony	7440-36-0	27	190,000	< 2.7	< 2.2	< 2.3	2.7	< 2.3 [< 2.3]	< 2.3	< 2.3	0.65 J	< 2.3	< 2.3 J [< 2.4 J]
Arsenic	7440-38-2	29	190,000	4.3	***170***	5.8	***57.7***	11.9 [6.5]	5.3	20.1	6.7	7.0	9.7 [7.9]
Barium	7440-39-3	8,200	190,000	94	99.1	37.4	85.0	65.7 [43.9]	33.8	207	66.5	76.0	121 [176]
Beryllium	7440-41-7	320	190,000	< 0.8	0.62	0.34	0.63	0.72 [0.51]	0.50	0.85	0.41	0.75	0.82 [0.90]
Cadmium	7440-43-9	38	190,000	< 0.8	< 0.56	< 0.57	0.46 J	< 1.2 [1.2]	< 0.57	< 0.57	0.50 J	0.18 J	0.35 J [0.33 J]
Calcium	7440-70-2	- -	- -	NA	9,490	< 570	757	2,080 J [644 J]	792 J	2,890	6,330	6,050 J	14,800 [19,700]

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-25B 7-8 3/13/03	S-105 2-4 4/12/19	S-106 2-4 4/12/19	S-107 2-4 4/23/19	S-108 2-4 4/15/19	S-109 2-4 4/15/19	S-110 2-4 4/12/19	S-111 2-4 4/23/19	S-114 2-4 4/15/19	S-127 2-4 4/17/19
Metals (cont'd)													
Chromium	7440-47-3	190,000	190,000	11	21.6	7.5	15.4	51.6 J [14.6 J]	13.9 J	21.1	16.2	21.4 J	22.0 J [24.9]
Cobalt	7440-48-4	160	190,000	NA	9.2	< 5.7	5.0 J	5.0 J [7.4]	3.6 J	7.3	5.2 J	5.0 J	4.9 J [5.3 J]
Copper	7440-50-8	43,000	190,000	50	72.2	13.4	52.7	13.5 [13.2]	8.9	332	49.0	18.1	37.6 [47.7]
Cyanide	57-12-5	2000	190,000	0.75	3.2	3.9	12.3	10.8 J [12.7 J]	5.5 J	8.0	0.78	< 0.29	1.1 J [0.63 J]
Iron	7439-89-6	- -	190,000	NA	31,100	2,860	18,500	38,100 J [16,600 J]	12,700 J	37,600	15,400	15,700 J	25,700 [21,800]
Lead	7439-92-1	450	190,000	140	***504***	27.1	***683***	13.9 J [32.1 J]	23.3 J	221	137	193 J	417 ***[454]***
Magnesium	7439-95-4	- -	- -	NA	2,560	< 570	1,490	1,420 [1,950]	1,330	803	3,330	2,330	7,300 [9,260]
Manganese	7439-96-5	2,000	190,000	NA	253	16.4	131	83.7 J [261 J]	91.5 J	301	143	160 J	624 J [1,080 J]
Mercury	7439-97-6	10	190,000	0.12	0.25	0.34	0.36 J	0.023 J [0.31 J]	0.13 J	0.35	0.44 J	0.57 J	R [R]
Nickel	7440-02-0	650	190,000	27	21.7	29.1	13.4	13.4 [11.9]	8.1	15.6	16.6	10.6	14.4 [15.6]
Potassium	7440-09-7	- -	- -	NA	1,800	< 1,100	660 J	1,190 J [1,070 J]	540 J	< 1,100	697 J	1,210	1,440 [1,600]
Selenium	7782-49-2	26	190,000	< 2.4	< 4.5	< 2.3	< 2.3	< 4.6 [< 2.3]	< 2.3	< 4.6	< 2.4	1.2 J	< 4.6 [< 2.4]
Silver	7440-22-4	84	190,000	< 3.3	< 1.1	< 0.57	< 0.57	< 1.2 [< 0.57]	< 0.57	< 1.1	< 0.59	< 0.57	< 1.2 [< 0.60]
Sodium	7440-23-5	- -	- -	NA	< 1,100	< 1,100	< 1,100	126 J [139 J]	157 J	< 1,100	< 1,200	98.2 J	252 J [348 J]
Thallium	7440-28-0	14	190,000	< 1.6	< 2.2	1.7	< 1.1	< 2.3 [< 1.1]	< 1.1	< 2.3	< 1.2	< 1.1	< 2.3 [< 2.4]
Vanadium	7440-62-2	820	190,000	NA	30.8	137	16.7	66.6 J [20.1 J]	16.6 J	27.3	27.1	25.0 J	24.2 [36.3]
Zinc	7440-66-6	12,000	190,000	230	271	21.6	144	44.0 [51.0]	31.2	93.3	126	80.7	208 J [180 J]

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	S-128 2-4 4/18/19	S-129 2-4 4/18/19	S-130 2-4 4/17/19	S-132 2-4 4/17/19	S-133 2-4 4/17/19	S-146 14-16 4/25/19	S-148 8-10 4/25/19	S-149 8-10 4/25/19	S-156 3-5 5/3/19	S-156 7.5-9.5 5/3/19	S-161 5-7 5/3/19
Volatile Organic Compounds														
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.0029	0.00082 J	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
1,1-Dichloroethane	75-34-3	16	1,600	< 0.0015	0.00052 J	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1 J	< 0.28	< 0.0012	< 10
1,2,3-Trichlorobenzene	87-61-6	- -	- -	< 0.0073 J	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 0.0062	< 51
1,2,4-Trichlorobenzene	120-82-1	27	10,000	< 0.0073	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 0.0062	< 51
1,3-Dichlorobenzene	541-73-1	61	10,000	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.0012	< 10
1,4-Dichlorobenzene	106-46-7	10	230	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.0012	< 10
2-Butanone (MEK)	78-93-3	400	10,000	< 0.015	< 0.013	< 0.018	< 0.014	0.0403	< 0.0084	< 37	< 10	< 2.8	0.0082 J	< 100
Acetone	67-64-1	10,000	10,000	< 0.015	0.0552	< 0.018	< 0.014	0.447	0.0250	< 37	< 10	< 2.8	0.0587	< 100
Benzene	71-43-2	0.5	330	0.0252	0.0012	0.0176	< 0.00068	< 0.00067	< 0.00042	***4.01***	***2.31***	0.368	0.0010	***103***
Carbon Disulfide	75-15-0	620	10,000	< 0.0029	0.0013 J	0.0017 J	< 0.0027	0.0095	0.00083 J	6.43 J	5.32	< 0.55	< 0.0025	< 21
Carbon Tetrachloride	56-23-5	0.5	430	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
Chloroform	67-66-3	8	110	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.0012	< 10
Cyclohexane	110-82-7	6,900	10,000	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
Dichloromethane	75-09-2	0.5	10,000	< 0.0073	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 0.0062	< 51
Ethylbenzene	100-41-4	70	1,000	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	3.52 J	1.51	< 0.28	< 0.0012	6.52 J
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	9.49	2.88	0.568	< 0.0012	59.9
Methyl Acetate	79-20-9	10,000	10,000	< 0.0073 J	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 0.0062	< 51
Methylcyclohexane	108-87-2	- -	- -	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	2.98 J	1.38	< 0.28	< 0.0012	19.8
Styrene (Monomer)	100-42-5	24	10,000	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	11 J
Toluene	108-88-3	100	10,000	0.0010 J	< 0.0013	0.0015 J	< 0.0014	< 0.0013	0.00035 J	2.31 J	1.8	0.424	< 0.0012	40.8
Total Xylenes	1330-20-7	1,000	9,100	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	12.5	4.26	0.568	< 0.0012	79.7
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.55	< 0.0025	< 21
Trichloroethene	79-01-6	0.5	180	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.0012	< 10
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	0.0685 J	0.0479 J	0.0980	0.195	< 0.079 B	NA	NA	NA	72.1 D	0.0322 J	51.9 D
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	< 0.2	< 0.18	< 0.2	< 0.19	< 0.2	NA	NA	NA	< 0.99	< 0.22	< 0.91
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	< 0.2	< 0.18	< 0.2	< 0.19	0.0291 J	NA	NA	NA	< 0.99	< 0.22	< 0.91
2,4-Dichlorophenol	120-83-2	2	190,000	< 0.2	< 0.18	< 0.2	< 0.19	< 0.2	< 0.19	< 1.6	< 0.43	< 0.99	< 0.22	< 0.91
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.2	< 0.18	< 0.2	< 0.19	< 0.2	< 0.19	17.8 J	0.814 J	5.92	< 0.22	4.43 J
2-Methylnaphthalene	91-57-6	1,900	190,000	0.237	0.159	0.592	1.28	0.0745	< 0.039	495 D	37.3 D	312 D	0.0935	155 D
2-Methylphenol	95-48-7	580	190,000	< 0.079	< 0.074	0.188	0.0716 J	< 0.079	< 0.078	12	0.604	2.68	< 0.087	1.48
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.079	< 0.074	0.368	0.177	< 0.079	< 0.078	40.4 D	1.76	7.15	< 0.087	1.33
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.996	0.255	< 0.04	0.925	0.0843	< 0.039	65.7 D	14.4 D	35.2 D	0.374	48.2 D

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-128 2-4 4/18/19	S-129 2-4 4/18/19	S-130 2-4 4/17/19	S-132 2-4 4/17/19	S-133 2-4 4/17/19	S-146 14-16 4/25/19	S-148 8-10 4/25/19	S-149 8-10 4/25/19	S-156 3-5 5/3/19	S-156 7.5-9.5 5/3/19	S-161 5-7 5/3/19
Semi-Volatile Organic Compounds (cont'd)														
Acenaphthylene	208-96-8	8,000	190,000	0.511	0.809	0.12	14.2 D	0.351	< 0.039	575 D	68.5 D	125 D	0.155	286 D
Acetophenone	98-86-2	1,200	10,000	< 0.2	0.0170 J	0.0835 J	0.0385 J	< 0.2	NA	NA	NA	1.9	< 0.22	< 0.91
Anthracene	120-12-7	350	190,000	2.03	1.22	0.0285 J	13.6 D	0.661	< 0.039	***969 D***	163 D	***373 D***	0.403	178 D
Benz(a)anthracene	56-55-3	430	190,000	5.26 D	2.67	0.0269 J	36.1 D	1.56	< 0.039	***551 D***	164 D	302 D	0.957	168 D
Benzaldehyde	100-52-7	- -	- -	< 0.2	0.0220 J	< 0.2	< 0.19	< 0.2	NA	NA	NA	< 0.99	< 0.22	< 0.91
Benzo(a)pyrene	50-32-8	46	190,000	5.48 D	2.94	0.0300 J	33.5 D	1.57	< 0.039	***438 D***	***140 D***	***219 D***	0.837	***148 D***
Benzo(b)fluoranthene	205-99-2	170	190,000	7.31 D	4.37 D	0.0456	45.2 D	2.17	< 0.039	***500 D***	***181 D***	***267 D***	0.94	***171 D***
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.85	1.43	0.0380 J	19.4 D	1.15	< 0.039	***245 D***	79.8 D	97.3 D	0.418	83.6 D
Benzo(k)fluoranthene	207-08-9	610	190,000	1.6	1.78 D	< 0.04	15.6 D	0.719	< 0.039	212 D	55.4 D	108 D	0.386	59.9 D
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.0938	0.0805	< 0.079	< 0.076	0.396	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.079	0.0470 J	< 0.079	< 0.076	0.0454 J	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Caprolactam	105-60-2	- -	- -	< 0.079	< 0.074	< 0.079	< 0.076	< 0.079	NA	NA	NA	< 0.4	< 0.087	< 0.36
Carbazole	86-74-8	110	190,000	0.916	0.413	0.0214 J	2.19 B	0.355	< 0.078	***491 D***	83.5 D	***167 D***	0.0509 J	***111 D***
Chrysene	218-01-9	230	190,000	5.53 D	2.97	0.0531	31.2 D	1.58	< 0.039	***502 D***	152 D	***270 D***	0.86	133 D
Dibenz(a,h)anthracene	53-70-3	270	190,000	1.09	0.533	< 0.04	5.91 D	0.289	< 0.039	81.6 D	27.9 D	28.3 D	0.119	24.7 D
Dibenzofuran	132-64-9	310	190,000	0.545	0.384	0.0760 J	3.19	0.278	< 0.078	***720 D***	101 D	***364 D***	0.0555 J	218 D
Diethyl phthalate	84-66-2	9,300	10,000	< 0.079	< 0.074	< 0.079	< 0.076	< 0.079	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Dimethyl phthalate	131-11-3	- -	- -	< 0.079	< 0.074	< 0.079	< 0.076	< 0.079	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.079	< 0.074	< 0.079	< 0.076	0.0982	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.079	< 0.074	< 0.079	< 0.076	< 0.079	< 0.078	< 0.63	< 0.17	< 0.4	< 0.087	< 0.36
Fluoranthene	206-44-0	3,200	190,000	9.62 D	6.35 D	0.0299 J	73.7 D	3.52	< 0.039	1,840 D	519 D	908 D	1.97	544 D
Fluorene	86-73-7	3,800	190,000	1.05	0.689	0.0230 J	6.94 D	0.328	< 0.039	1,100 D	168 D	563 D	0.13	334 D
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	2.83	1.41	0.0326 J	19.7 D	1.13	< 0.039	237 D	68.8 D	110 D	0.489	87.9 DJ
Naphthalene	91-20-3	25	190,000	0.51	0.352	6.71 D	2.99	0.157	< 0.039	***2,640 D***	***228 D***	***1,830 D***	1.07	***854 D***
Pentachlorophenol	87-86-5	5	190,000	< 0.16	< 0.15	< 0.16	< 0.15	0.447	< 0.16	< 1.3	< 0.34	< 0.79	< 0.17	< 0.72
Phenanthrene	85-01-8	10,000	190,000	8.7 D	5.83 D	0.249	43.8 D	3.26	< 0.039	3,120 D	623 D	1,840 D	0.872	860 D
Phenol	108-95-2	200	18,000	< 0.079	< 0.074	0.647	0.196	< 0.079	< 0.078	37.3 D	0.795	2.72	< 0.087	0.455
Pyrene	129-00-0	2,200	190,000	9.22 D	5.93 D	0.0347 J	53.3 D	2.85	< 0.039	1,200 D	381 D	611 D	1.39	348 D
Total PAHs and 2-Methylnaphthalene	-	- -	- -	64.8	39.7	8.01	417	21.5	< 0.039	14,800	3,070	8,000	11.5	4,480
Metals														
Aluminum	7429-90-5	- -	190,000	8,370	8,600	2,610 J	4,930 J	11,400 J	9,990	3,200	6,350	3,280 J	8,660 J	9,750 J
Antimony	7440-36-0	27	190,000	< 2.4 J	< 2.3 J	0.67 J	3.9 J	2.8 J	< 2.3 J	< 4.9 J	1.9 J	2.6 J	2.2 J	< 2.2 J
Arsenic	7440-38-2	29	190,000	9.3	6.3	8.1	21.1	11.2	2.2 J	13.6	13.8	10.2	15.9	5.8
Barium	7440-39-3	8,200	190,000	211	157	120	163	168	23.3	102	82.6	90.6	93.0	37.3
Beryllium	7440-41-7	320	190,000	0.49	0.39	0.38	0.35	0.93	0.34	0.35	0.91	0.34	1.4	0.56
Cadmium	7440-43-9	38	190,000	0.99	0.88	0.14 J	0.34 J	4.8	< 0.57	0.71	1.4	0.53 J	0.11 J	0.11 J
Calcium	7440-70-2	- -	- -	58,100	35,700	2,040 J	5,200 J	21,100 J	211 J	5,120 J	897 J	5,300	2,170	917

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	S-128 2-4 4/18/19	S-129 2-4 4/18/19	S-130 2-4 4/17/19	S-132 2-4 4/17/19	S-133 2-4 4/17/19	S-146 14-16 4/25/19	S-148 8-10 4/25/19	S-149 8-10 4/25/19	S-156 3-5 5/3/19	S-156 7.5-9.5 5/3/19	S-161 5-7 5/3/19
Metals (cont'd)														
Chromium	7440-47-3	190,000	190,000	25.9	24.3	18.5 J	169 J	107 J	14.0	118	53.3	99.4	25.1	21.3
Cobalt	7440-48-4	160	190,000	5.3 J	4.9 J	2.9 J	4.7 J	7.2	5.7	4.7 J	5.3 J	7.3	8.3	7.0
Copper	7440-50-8	43,000	190,000	52.7	66.7	96.7	195	143	7.3	104	108	175	97.6	26.6
Cyanide	57-12-5	2000	190,000	0.38 J	0.64	8.4 J	4.2 J	0.61 J	0.14 J	8.0 J	12.6 J	16.0 J	< 0.31 J	5.1 J
Iron	7439-89-6	- -	190,000	41,100	17,400	8,800	47,000	33,800	14,800	37,400	12,700	26,900	50,400	20,200
Lead	7439-92-1	450	190,000	***769 J***	279 J	181	246	297	7.7 J	86.0 J	154 J	204 J	150 J	38.0 J
Magnesium	7439-95-4	- -	- -	7,110 J	9,790 J	291 J	1,920	4,590	2,240	899	1,500	575 J	1,660	2,170
Manganese	7439-96-5	2,000	190,000	617 J	260 J	44.8 J	268 J	607 J	127 J	191 J	60.6 J	84.4	265	138
Mercury	7439-97-6	10	190,000	0.93 J	0.56 J	0.57 J	1.4 J	1.3 J	< 0.034 J	0.26 J	1.8 J	3.1	0.83	0.032 J
Nickel	7440-02-0	650	190,000	17.9	18.9	11.0	25.5	56.3	9.3	36.1	31.6	46.8	17.8	16.4
Potassium	7440-09-7	- -	- -	1,080 J	1,200	368 J	956 J	2,050	1,040 J	365 J	476 J	242 J	895 J	1,180
Selenium	7782-49-2	26	190,000	3.0 J	< 2.3	1.5 J	< 7.1	< 4.7	< 2.3	2.8 J	2.0 J	2.0 J	4.1 J	< 2.2
Silver	7440-22-4	84	190,000	< 1.8	0.52 J	< 0.65	< 1.8	< 1.2	< 0.57	< 1.2	0.63	0.51 J	0.60 J	0.32 J
Sodium	7440-23-5	- -	- -	265 J	212 J	< 1,300	201 J	167 J	< 1,100	< 1,200	< 1,300	< 1,200	126 J	95.1 J
Thallium	7440-28-0	14	190,000	< 3.6	< 1.1	< 1.3	< 3.5	< 2.4	< 1.1	< 2.4	< 1.3	< 2.4	< 2.7	< 1.1
Vanadium	7440-62-2	820	190,000	23.4	24.7	12.4	35.7	24.9	20.8	12.7	30.0	17.5	72.7	16.0
Zinc	7440-66-6	12,000	190,000	721	308	48.2 J	331 J	383 J	40.7	104	475	185 J	124 J	77.4 J

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs		S-167	S-168	S-171	S-172	S-173	TP-30	TP-35	TP-44	TP-44R	TP-64
		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	7-9 9/20/19	6-8 9/19/19	5-7 9/19/19	5-7 9/19/19	5-7 9/19/19	2 3/14/05	4 3/15/05	4 3/16/05	3-5 4/22/19	3 3/21/05
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	20	10,000	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.0003	< 0.00043	< 0.00064	< 0.4	< 0.00035
1,1-Dichloroethane	75-34-3	16	1,600	< 0.00089	< 0.15	< 0.00099	< 0.11	< 0.0012	< 0.00091	< 0.0013	< 0.00065	< 0.2	< 0.0011
1,2,3-Trichlorobenzene	87-61-6	- -	- -	< 0.0045	< 0.77	< 0.0050	< 0.56	< 0.0061	NA	NA	NA	< 1	NA
1,2,4-Trichlorobenzene	120-82-1	27	10,000	< 0.0045	< 0.77	< 0.0050	0.606	< 0.0061	NA	NA	NA	< 1	NA
1,3-Dichlorobenzene	541-73-1	61	10,000	< 0.00089	< 0.15	< 0.00099	0.12	< 0.0012	NA	NA	NA	< 0.2	NA
1,4-Dichlorobenzene	106-46-7	10	230	< 0.00089	< 0.15	< 0.00099	0.407	< 0.0012	NA	NA	NA	< 0.2	NA
2-Butanone (MEK)	78-93-3	400	10,000	0.0060 J	< 1.5	< 0.0099	< 1.1	0.0191	< 0.00094	< 0.0013	< 0.001	< 2	< 0.0011
Acetone	67-64-1	10,000	10,000	0.0446	1.96	0.0242	< 1.1	0.217	0.019	0.053	0.064	< 2	0.028
Benzene	71-43-2	0.5	330	< 0.00045	***1.84***	< 0.00050	< 0.056	< 0.00061	< 0.00061	***0.51***	0.0018	0.494	< 0.00072
Carbon Disulfide	75-15-0	620	10,000	< 0.0018	0.185 J	< 0.0020	< 0.22	0.0020 J	< 0.00078	< 0.0011	< 0.00071	< 0.4	< 0.00092
Carbon Tetrachloride	56-23-5	0.5	430	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.001	< 0.0015	< 0.0013	< 0.4	< 0.0012
Chloroform	67-66-3	8	110	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.00055	< 0.00078	< 0.00035	< 0.4	< 0.00064
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00089	< 0.15	< 0.00099	< 0.11	< 0.0012	< 0.00057	< 0.00082	< 0.0005	< 0.2	< 0.00068
Cyclohexane	110-82-7	6,900	10,000	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	NA	NA	NA	< 0.4	NA
Dichloromethane	75-09-2	0.5	10,000	0.0011 J	< 0.77	< 0.0050	< 0.56	< 0.0061	0.011 B	0.013 B	0.025 B	< 1	0.026 B
Ethylbenzene	100-41-4	70	1,000	< 0.00089	0.216	< 0.00099	< 0.11	0.00079 J	< 0.0009	0.39	0.019	2.29	< 0.0011
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.00089	0.315	< 0.00099	< 0.11	0.0015	< 0.0013	0.13	0.13	2.95	< 0.0016
Methyl Acetate	79-20-9	10,000	10,000	< 0.0045	4.74	0.0022 J	< 0.56	< 0.0061	NA	NA	NA	< 1	NA
Methylcyclohexane	108-87-2	- -	- -	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	NA	NA	NA	< 0.4	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	< 0.00056	0.11	0.046	NA	< 0.00066
o-Xylene	95-47-6	- -	- -	< 0.00089	< 0.15	< 0.00099	< 0.11	0.00095 J	NA	NA	NA	0.354	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.00075	< 0.0011	< 0.00021	< 0.4	< 0.00088
Toluene	108-88-3	100	10,000	< 0.00089	0.465	< 0.00099	< 0.11	< 0.0012	< 0.00091	0.011	0.0099	1.04	< 0.0011
Total Xylenes	1330-20-7	1,000	9,100	< 0.00089	0.315	< 0.00099	< 0.11	0.0025	NA	NA	NA	3.3	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	NA	NA	NA	< 0.4	NA
Trichloroethene	79-01-6	0.5	180	< 0.00089	< 0.15	< 0.00099	< 0.11	< 0.0012	< 0.00074	< 0.0011	< 0.00066	< 0.2	< 0.00087
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	190,000	0.0543 J	0.0602 J	0.0445 J	0.0328 J	0.0588 J	NA	NA	NA	0.227	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	16	190,000	< 0.19	< 0.19	< 0.18	0.0185 J	< 0.18	NA	NA	NA	< 0.21	NA
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	190,000	< 0.19	< 0.19	< 0.18	< 0.19	< 0.18	NA	NA	NA	< 0.21	NA
2,4-Dichlorophenol	120-83-2	2	190,000	< 0.19	< 0.19	< 0.18	0.0642 J	< 0.18	NA	NA	NA	< 0.21	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.19	< 0.19	< 0.18	< 0.19	< 0.18	< 0.028	< 6.9	< 4.4	< 0.21	< 4.5
2-Methylnaphthalene	91-57-6	1,900	190,000	0.199	0.163	0.173	0.0943	0.19	0.049 J	23	24	4.11	13
2-Methylphenol	95-48-7	580	190,000	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.12	< 4.2	< 2.7	< 0.083	< 8.6
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	NA	NA	NA	< 0.083	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	< 0.15	< 4.4	< 2.8	NA	< 11
Acenaphthene	83-32-9	4,700	190,000	0.296	0.802	0.361	0.41	0.96	< 0.011	5.7	6.4	0.0707	4.4

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-167 7-9 9/20/19	S-168 6-8 9/19/19	S-171 5-7 9/19/19	S-172 5-7 9/19/19	S-173 5-7 9/19/19	TP-30 2 3/14/05	TP-35 4 3/15/05	TP-44 4 3/16/05	TP-44R 3-5 4/22/19	TP-64 3 3/21/05
Semi-Volatile Organic Compounds (cont'd)													
Acenaphthylene	208-96-8	8,000	190,000	0.787	0.609	0.137	0.147	0.114	0.18	5.8	< 0.27	< 0.041	46
Acetophenone	98-86-2	1,200	10,000	< 0.19	0.0168 J	< 0.18	0.0105 J	< 0.18	NA	NA	NA	< 0.21	NA
Anthracene	120-12-7	350	190,000	1.82	0.743	0.91	1.18	2.51	0.28	17	4.5	0.0351 J	100
Benz(a)anthracene	56-55-3	430	190,000	7.67 D	2.5	1.73	4.27 D	4.91 D	1.7	24	2	0.0165 J	300
Benzaldehyde	100-52-7	- -	- -	< 0.19	< 0.19	< 0.18	0.0235 J	< 0.18	NA	NA	NA	< 0.21	NA
Benzo(a)pyrene	50-32-8	46	190,000	6.78 D	2.39	1.36	4.55 D	4.32 D	1.4	21	2	< 0.041	***280***
Benzo(b)fluoranthene	205-99-2	170	190,000	7.97 D	3.13 D	1.69	5.33 D	5.16 D	2.3	32	1.8	0.0192 J	***470***
Benzo(g,h,i)perylene	191-24-2	180	190,000	3.76 D	1.58	0.796	2.63	2.68	0.77	6.3	1.1	< 0.041	100
Benzo(k)fluoranthene	207-08-9	610	190,000	2.68	0.942	0.592	1.39	1.72	0.76	10	< 0.15	< 0.041	130
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.077	0.105	0.0692 J	0.345	0.222	0.05	< 2.5	< 1.6	< 0.083	< 1
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.077	< 0.078	< 0.073	< 0.075	1.12	< 0.012	< 0.32	< 0.2	< 0.083	< 1.6
Caprolactam	105-60-2	- -	- -	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	NA	NA	NA	< 0.083	NA
Carbazole	86-74-8	110	190,000	0.783	0.175	0.373	0.49	1.28	0.044	6.9	< 0.22	0.0632 J	31
Chrysene	218-01-9	230	190,000	7.43 D	2.56	1.63	3.96 D	4.41 D	1.6	24	2.8	0.0398 J	***280***
Dibenz(a,h)anthracene	53-70-3	270	190,000	1.14	0.443	0.218	0.928	0.671	0.31	2.8	< 0.16	< 0.041	40
Dibenzofuran	132-64-9	310	190,000	0.204	0.4	0.347	0.22	0.617	0.055 J	7.4	4	0.219	42
Diethyl phthalate	84-66-2	9,300	10,000	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.013	< 0.23	< 0.15	< 0.083	< 0.93
Dimethyl phthalate	131-11-3	- -	- -	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.01	< 0.42	< 0.27	< 0.083	< 2
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.011	< 0.18	< 0.11	< 0.083	< 0.87
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.011	< 0.29	< 0.19	< 0.083	< 0.92
Fluoranthene	206-44-0	3,200	190,000	16.6 D	4.71 D	3.84 D	7.76 D	13 D	3.6	56	3.4	0.0232 J	710
Fluorene	86-73-7	3,800	190,000	0.504	0.962	0.483	0.389	1.13	0.12	16	7.8	0.161	59
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	3.82	1.6	0.865	2.55	2.5	0.75	9	0.94	0.0316 J	140
Naphthalene	91-20-3	25	190,000	0.513	0.347	0.406	0.605	0.453	0.24	***130***	11	1.42	***43***
Pentachlorophenol	87-86-5	5	190,000	< 0.15	< 0.16	< 0.15	< 0.15	< 0.15	NA	NA	NA	< 0.17	NA
Phenanthrene	85-01-8	10,000	190,000	5.3 D	1.82	3.69 D	4.21 D	10.2 D	0.9	44	12	0.284	340
Phenol	108-95-2	200	18,000	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.028	< 4	< 2.6	< 0.083	< 3.9
Pyrene	129-00-0	2,200	190,000	14.6 D	4.01 D	3.55	7.08 D	10.5 D	2.9	40	8.2	0.0702	460
Total PAHs and 2-Methylnaphthalene	-	- -	- -	81.9	29.3	22.4	47.5	65.4	17.9	467	87.9	6.28	3,520
Metals													
Aluminum	7429-90-5	- -	190,000	17,500	10,000	13,100	15,800	14,500	NA	NA	NA	2,730	NA
Antimony	7440-36-0	27	190,000	< 7.4	< 4.7	< 2.3	< 2.3	7.0	5.8	10	3.9	2.5	4
Arsenic	7440-38-2	29	190,000	10.1	***138***	6.0	14.7	7.6	8.2	***35***	29	17.0	16
Barium	7440-39-3	8,200	190,000	37.7	73.4	66.8	109	67.3	65	110	1,200	57.7	310
Beryllium	7440-41-7	320	190,000	6.2	0.75	0.68	0.65	0.65	< 0.72	< 0.87	< 0.83	0.38	3.4
Cadmium	7440-43-9	38	190,000	< 1.9	< 1.2	< 0.58	< 1.2	< 0.59	< 0.72	4	1.5	< 0.62	< 0.7
Calcium	7440-70-2	- -	- -	4,280	6,940	19,800	13,500	6,640	NA	NA	NA	852	NA

Table 9
Unsaturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	S-167 7-9 9/20/19	S-168 6-8 9/19/19	S-171 5-7 9/19/19	S-172 5-7 9/19/19	S-173 5-7 9/19/19	TP-30 2 3/14/05	TP-35 4 3/15/05	TP-44 4 3/16/05	TP-44R 3-5 4/22/19	TP-64 3 3/21/05
Metals (cont'd)													
Chromium	7440-47-3	190,000	190,000	30.3	19.8	25.7	42.8	23.7	36	85	7.9	8.9	56
Cobalt	7440-48-4	160	190,000	21.3	6.8	6.0	7.6	6.9	NA	NA	NA	3.5 J	NA
Copper	7440-50-8	43,000	190,000	306	66.8	27.1	252	18.1	220	400	110	154	89
Cyanide	57-12-5	2000	190,000	< 0.24	0.82	0.3	< 0.27	< 0.28	24	4.1	NA	2.7	45
Iron	7439-89-6	- -	190,000	59,100	41,800	18,900	32,200	22,200	NA	NA	NA	10,700	NA
Lead	7439-92-1	450	190,000	105	91.1	127	210	117	***860***	***620***	***9,600***	220	130
Magnesium	7439-95-4	- -	- -	7,340	2,760	7,030	3,770	2,910	NA	NA	NA	332 J	NA
Manganese	7439-96-5	2,000	190,000	720	311	189	307	262	NA	NA	NA	23.0	NA
Mercury	7439-97-6	10	190,000	0.21	0.40	0.61	0.75	1.4	0.37	1.2	< 0.12	0.23 J	0.54
Nickel	7440-02-0	650	190,000	49.5	15.6	13.0	26.3	12.8	8.4	110	18	8.2	24
Potassium	7440-09-7	- -	- -	1,230	< 1,200	1,510	1,760	1,530	NA	NA	NA	361 J	NA
Selenium	7782-49-2	26	190,000	< 7.4	< 4.7	< 2.3	< 4.7	< 2.4	3.3	< 2.6	3.2	1.2 J	3.6
Silver	7440-22-4	84	190,000	< 1.9	< 1.2	< 0.58	< 1.2	< 0.59	< 3	< 3.6	< 3.5	< 0.62	< 2.9
Sodium	7440-23-5	- -	- -	< 1,200	< 1,200	< 1,200	< 1,200	< 1,200	NA	NA	NA	< 1,200	NA
Thallium	7440-28-0	14	190,000	< 3.7	< 2.4	< 1.2	< 2.3	< 1.2	< 1.4	< 1.7	< 1.7	< 1.2	< 1.4
Vanadium	7440-62-2	820	190,000	35.0	27.6	28.6	30.9	30.1	NA	NA	NA	11.2	NA
Zinc	7440-66-6	12,000	190,000	297	137	137	787	79.5	83	420	2,700	19.5	240

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
4. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS).
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 6010 and 7471.
   - Cyanide using USEPA SW-846 Method 9010 (Veritech) or 9012B (SGS).
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for subsurface soil.
11. No results exceed the PADEP non-residential direct contact MSC (for subsurface soil).
12. Italics and bolding indicates that the result exceeds the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
13. - - = No PADEP MSC.
14. - = No actual Chemical Abstracts Service (CAS) number is available.
15. Brackets indicate the reported concentration of a duplicate sample.
16. The MSCs reported for chromium is for trivalent chromium. The reported chromium results are for total chromium.
17. The MSCs reported for cyanide are for free cyanide. The reported cyanide results are for total cyanide.
18. Total polycyclic aromatic hydrocarbons (PAHs) are the sum of the 16 priority pollutant PAHs identified by the USEPA and 2-methylnaphthalene.
19. Qualifier Definitions:
    B = Analyte is an estimated value between the instrument detection limit and the Reporting Limit.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
    R = Data rejected during validation.
20. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 10
Unsaturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	MW-103 6-7 5/16/18	PCSB-30 2 7/26/05	PCTP-61 7.5 9/8/05	PCTP-64 7 9/8/05	PCTP-65 7.5 9/8/05	PCTP-66R-HC 2-4 4/4/19	PCTP-75 11 9/9/05	PCTP-76 6.5 9/12/05	PCTP-80 8 9/12/05
Pesticides												
4,4-DDD	72-54-8	150	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	0.029
4,4-DDE	72-55-9	220	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	0.011
4,4-DDT	50-29-3	330	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	0.029	< 0.027	< 0.0059
Aldrin	309-00-2	2.4	190,000	< 0.00082 J	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Beta-BHC	319-85-7	1.1	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Chlordane	57-74-9	49	190,000	NA	< 0.015	< 0.011	< 0.012	< 0.013	NA	< 0.037	< 0.055	0.068
Dieldrin	60-57-1	0.58	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Endosulfan I	959-98-8	260	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Endosulfan sulfate	1031-07-8	70	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Endrin	72-20-8	5.5	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Endrin aldehyde	7421-93-4	- -	- -	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Endrin ketone	53494-70-5	- -	- -	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Heptachlor	76-44-8	0.68	190,000	< 0.00082 J	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
Heptachlor epoxide	1024-57-3	1.1	190,000	< 0.00082	< 0.0076	< 0.0054	< 0.006	< 0.0067	< 0.00063	< 0.019	< 0.027	< 0.0059
trans-chlordane	5103-74-2	- -	- -	< 0.00082	NA	NA	NA	NA	< 0.00063	NA	NA	NA
Polychlorinated Biphenyls												
Aroclor 1242	53469-21-9	20	10,000	< 0.041	< 0.038	< 0.027	< 0.03	< 0.033	< 0.16	< 0.019	< 0.027	0.17
Aroclor 1254	11097-69-1	340	10,000	0.2	< 0.038	< 0.027	< 0.03	< 0.033	< 0.16	< 0.019	< 0.027	< 0.029
Aroclor 1260	11096-82-5	770	190,000	< 0.041	< 0.038	< 0.027	< 0.03	< 0.033	< 0.16	< 0.019	0.7	0.14
Total PCBs	-	- -	- -	0.2	< 0.038	< 0.027	< 0.03	< 0.033	< 0.16	< 0.019	0.7	0.31

Table 10
Unsaturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-01B 5-6 3/11/03	PSSTP-01R 5-6 4/10/19	PSSTP-02B 5-6 3/11/03	PSSTP-04R 7-8 4/11/19	PSSTP-08B 6-7 3/11/03	PSSTP-09B 6-7 3/12/03	PSSTP-23B 7-8 3/13/03	PSSTP-25B 7-8 3/13/03
Pesticides											
4,4-DDD	72-54-8	150	190,000	0.056	< 0.00078	< 0.0043	< 0.0025	< 0.022	0.14	< 0.004	< 0.0044
4,4-DDE	72-55-9	220	190,000	0.049	0.0466 J	< 0.0043	0.0127 JN	< 0.022	< 0.082	< 0.004	< 0.0044
4,4-DDT	50-29-3	330	190,000	< 0.02	0.0360 JN	< 0.0043	0.0068 JN	0.2	< 0.082	0.052	< 0.0044
Aldrin	309-00-2	2.4	190,000	< 0.0039	0.0159 JN	< 0.0043	< 0.0025	< 0.022	< 0.082	< 0.004	< 0.0044
Beta-BHC	319-85-7	1.1	190,000	0.012	< 0.00078	< 0.023	< 0.0025	< 0.022	< 0.082	< 0.0037	< 0.0044
Chlordane	57-74-9	49	190,000	< 0.0078	NA	< 0.0087	NA	1.2	0.41	< 0.0075	< 0.0089
Dieldrin	60-57-1	0.58	190,000	< 0.026	0.0198 JN	0.024	< 0.0025	< 0.022	< 0.082	< 0.004	< 0.0044
Endosulfan I	959-98-8	260	190,000	< 0.0039	0.0121 JN	< 0.0043	< 0.0025	0.049	< 0.082	< 0.004	< 0.0044
Endosulfan sulfate	1031-07-8	70	190,000	< 0.0039	< 0.00078	< 0.0043	< 0.0025	< 0.022	< 0.082	0.082	< 0.0044
Endrin	72-20-8	5.5	190,000	< 0.0039	0.0282	0.028	< 0.0025	< 0.022	< 0.082	0.073	< 0.0044
Endrin aldehyde	7421-93-4	- -	- -	< 0.0039	< 0.00078	0.1	< 0.0025 J	< 0.022	< 0.082	< 0.004	< 0.0044
Endrin ketone	53494-70-5	- -	- -	< 0.0039	0.0255 JN	< 0.0043	< 0.0025	< 0.022	< 0.082	< 0.004	< 0.0044
Heptachlor	76-44-8	0.68	190,000	< 0.0039	0.0158	< 0.0043	< 0.0025	< 0.022	< 0.082	< 0.004	< 0.0044
Heptachlor epoxide	1024-57-3	1.1	190,000	0.0074	0.0377	< 0.0043	< 0.0025 J	< 0.022	< 0.082	< 0.004	< 0.0044
trans-chlordane	5103-74-2	- -	- -	NA	0.0120	NA	< 0.0025	NA	NA	NA	NA
Polychlorinated Biphenyls											
Aroclor 1242	53469-21-9	20	10,000	< 0.39	< 0.039	0.24	< 0.12	1.2	< 0.41	< 0.019	< 0.023
Aroclor 1254	11097-69-1	340	10,000	< 0.39	1.51	< 0.022	< 0.12	< 0.022	< 0.41	< 0.019	< 0.023
Aroclor 1260	11096-82-5	770	190,000	13	< 0.039	0.9	< 0.12	< 0.022	8.9	< 0.019	< 0.023
Total PCBs	-	- -	- -	13	1.51	1.14	< 0.12	1.2	8.9	< 0.019	< 0.023

Table 10
Unsaturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
4. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Pesticides using United States Environmental Protection Agency (USEPA) SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for subsurface soil.
11. No results exceed the PADEP non-residential direct contact MSC (for subsurface soil) or the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
12. - - = No PADEP MSC.
13. - = No actual Chemical Abstracts Service (CAS) number is available.
14. Brackets indicate the reported concentration of a duplicate sample.
15. Qualifier Definitions:
    J = Analyte is an estimated value.
    N = There is presumptive evidence to make a tentative identification of this compound.
16. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	MW-102 12-13 5/16/18	MW-103 15-16 5/16/18	MW-111 11-13 9/23/19	MW-111 13-15 9/23/19	PC-B13 15-17 2/10/05	PC-B14 15-17 2/11/05	PC-B8 15.5-16 2/9/05	PCSB-01 14.5-15 2/18/05	PCSB-01 18.5-19 2/18/05	PCSB-01R 14-16 4/5/19	PCSB-01R 18-20 4/5/19	PCSB-02 16 3/4/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.023	0.0239	< 62	< 2.1	< 0.0063	< 0.037	< 0.0067	< 0.027	< 0.00091	< 1.1	R	< 0.0014
Acetone	67-64-1	10,000	10,000	0.0383	0.0940 J	< 62	< 2.1	0.097	< 0.037	0.16	< 0.67	< 0.0042	< 1.1	0.0164 J	0.051
Benzene	71-43-2	0.5	330	0.0012	< 0.00060	***131***	***13.2***	< 0.0004	< 0.0015	< 0.00042	< 0.018	< 0.0003	< 0.056	R	< 0.00047
Carbon Disulfide	75-15-0	620	10,000	0.0334	< 0.0024	< 12	0.4 J	< 0.00074	< 0.0074	0.0092	< 0.026	< 0.00062	< 0.22	R	< 0.00098
Chlorobenzene	108-90-7	10	4,600	< 0.0047	< 0.0024	< 12	< 0.42	< 0.00097	< 0.0074	< 0.001	< 0.017	< 0.00024	< 0.22	R	< 0.00038
Chloroform	67-66-3	8	110	< 0.0047	< 0.0024	< 12	< 0.42	< 0.0021	< 0.0074	< 0.0022	< 0.043	< 0.00031	< 0.22	R	0.0038
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0023	< 0.0012	< 6.2	< 0.21	< 0.00065	< 0.0074	< 0.00069	< 0.042	< 0.00044	< 0.11	R	< 0.00068
Cyclohexane	110-82-7	6,900	10,000	< 0.0047	< 0.0024	< 12	< 0.42	NA	NA	NA	NA	NA	< 0.22	R	NA
Dichloromethane	75-09-2	0.5	10,000	< 0.012	0.0036 J	< 31	< 1.1	0.023 B	0.013 B	0.044 B	< 0.06	0.012 B	< 0.56	R	0.026 B
Ethylbenzene	100-41-4	70	1,000	< 0.0023	< 0.0012	21.3	0.19 J	0.0084	< 0.0015	< 0.0015	15	< 0.00082	< 0.11	R	< 0.0013
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0047	< 0.0024	< 12	0.192 J	NA	NA	NA	NA	NA	< 0.22	R	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0023	< 0.0012	127	0.346	< 0.0016	< 0.0029	< 0.0017	24	< 0.00098	< 0.11	R	< 0.0015
Methyl Acetate	79-20-9	10,000	10,000	< 0.012	< 0.0060	< 31	< 1.1	NA	NA	NA	NA	NA	< 0.56	R	NA
Methylcyclohexane	108-87-2	- -	- -	< 0.0047	< 0.0024	< 12	< 0.42	NA	NA	NA	NA	NA	< 0.22	R	NA
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0023	< 0.0012	< 6.2	< 0.21	NA	NA	NA	NA	NA	< 0.11	R	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	0.0056	< 0.0015	< 0.00054	3	< 0.00021	NA	NA	< 0.00033
o-Xylene	95-47-6	- -	- -	< 0.0023	< 0.0012	42.6	0.368	NA	NA	NA	NA	NA	< 0.11	R	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0047	< 0.0024	***29.5***	< 0.42	< 0.00038	< 0.0074	< 0.0004	< 0.019	< 0.00019	< 0.22	R	< 0.00029
Toluene	108-88-3	100	10,000	0.0020 J	< 0.0012	99.2	1.5	< 0.00072	< 0.0015	< 0.00075	< 0.024	< 0.00022	< 0.11	R	< 0.00035
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0023	< 0.0012	< 6.2	< 0.21	< 0.0011	< 0.0074	< 0.0011	< 0.087	< 0.00063	< 0.11	R	< 0.00099
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0047	< 0.0024	< 12	< 0.42	NA	NA	NA	NA	NA	< 0.22	R	NA
Total Xylenes	1330-20-7	1,000	9,100	< 0.0023	< 0.0012	170	0.714	NA	NA	NA	NA	NA	< 0.11	R	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	0.0548 J	< 0.093	158 D	0.357	NA	NA	NA	NA	NA	< 0.076	< 0.073	NA
2,4-Dimethylphenol	105-67-9	230	10,000	R	< 0.23	64.6	< 0.26	< 1.3	< 0.23	< 0.28	< 0.028	< 0.12	< 0.19	< 0.18	< 0.035
2-Methylnaphthalene	91-57-6	1,900	190,000	0.244	< 0.047	761 D	1.27	14	0.39	0.18	1.9	< 0.059	< 0.038	< 0.037	0.37
2-Methylphenol	95-48-7	580	190,000	R	< 0.093	27.7	< 0.11	< 0.76	< 0.14	< 0.17	< 0.12	< 0.1	< 0.076	< 0.073	< 0.14
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	R	< 0.093	79.3	< 0.11	NA	NA	NA	NA	NA	< 0.076	< 0.073	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	< 0.8	< 0.15	0.082 J	< 0.15	< 0.1	NA	NA	0.064 J
Acenaphthene	83-32-9	4,700	190,000	0.106	< 0.047	274 D	2.63	14	1.2	0.19	< 0.011	< 0.012	< 0.038	< 0.037	1.5
Acenaphthylene	208-96-8	8,000	190,000	< 0.061	< 0.047	770 D	0.411	1.4	0.3	0.2	< 0.011	< 0.011	< 0.038	< 0.037	0.14
Acetophenone	98-86-2	1,200	10,000	< 0.3	< 0.23	0.374 J	< 0.26	NA	NA	NA	NA	NA	< 0.19	< 0.18	NA
Anthracene	120-12-7	350	190,000	0.0842	< 0.047	***421 D***	1.17	11	0.67	0.48	< 0.0099	< 0.0082	0.0414	< 0.037	0.73
Benz(a)anthracene	56-55-3	430	190,000	0.156	0.0248 J	***592 D***	2.09	13	1.5	1.5	< 0.013	< 0.01	0.0604	< 0.037	1
Benzaldehyde	100-52-7	- -	- -	< 0.3	< 0.23	< 4.5	< 0.26	NA	NA	NA	NA	NA	< 0.19	< 0.18	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.0944	< 0.047	***469 D***	1.71	9.3	1.5	1.2	< 0.0087	< 0.0099	0.0498	< 0.037	0.81
Benzo(b)fluoranthene	205-99-2	170	190,000	0.0875	0.0278 J	***581 D***	1.91	12	1.9	1.8	< 0.016	< 0.0093	0.0711	< 0.037	0.92
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.0610	< 0.047	***242 D***	0.975	3.6	0.88	0.88	< 0.012	< 0.0088	0.0306 J	< 0.037	0.5
Benzo(k)fluoranthene	207-08-9	610	190,000	0.0372 J	< 0.047	194 D	0.803	4	0.6	0.55	< 0.014	< 0.01	0.0263 J	< 0.037	0.26
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.12	< 0.093	< 1.8	< 0.11	< 0.45	< 0.084	< 0.1	0.17	< 0.011	< 0.076	< 0.073	0.1 B
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.12	< 0.093	< 1.8	< 0.11	< 0.058	< 0.011	< 0.013	< 0.012	< 0.0089	< 0.076	< 0.073	< 0.015

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	MW-102 12-13 5/16/18	MW-103 15-16 5/16/18	MW-111 11-13 9/23/19	MW-111 13-15 9/23/19	PC-B13 15-17 2/10/05	PC-B14 15-17 2/11/05	PC-B8 15.5-16 2/9/05	PCSB-01 14.5-15 2/18/05	PCSB-01 18.5-19 2/18/05	PCSB-01R 14-16 4/5/19	PCSB-01R 18-20 4/5/19	PCSB-02 16 3/4/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	0.0450 J	< 0.093	***296 D***	0.82	2.2	0.15	0.099	< 0.0092	< 0.0057	0.0162 J	< 0.073	< 0.011
Chrysene	218-01-9	230	190,000	0.322	0.0212 J	***437 D***	1.58	11	1.5	1.3	< 0.0092	< 0.0087	0.0592	< 0.037	1.1
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.061	< 0.047	65.4	0.333	1.6	0.36	0.3	< 0.015	< 0.013	< 0.038	< 0.037	0.16
Dibenzofuran	132-64-9	310	190,000	0.181	< 0.093	***663 D***	1.66	6.2	0.15	0.14	< 0.098	< 0.059	0.0241 J	< 0.073	0.16
Diethyl phthalate	84-66-2	9,300	10,000	< 0.12	< 0.093	< 1.8	< 0.11	< 0.042	0.16	< 0.0094	< 0.013	0.05	< 0.076	< 0.073	< 0.016
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.12	< 0.093	< 1.8	< 0.11	< 0.033	0.065	< 0.0073	< 0.011	< 0.0071	< 0.076	< 0.073	< 0.014
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.12	< 0.093	< 1.8	< 0.11	< 0.053	< 0.0099	< 0.012	< 0.011	< 0.0069	< 0.076	< 0.073	< 0.014
Fluoranthene	206-44-0	3,200	190,000	0.15	0.0296 J	1,600 D	4.22	30	2.8	3.1	< 0.013	< 0.0097	0.156	< 0.037	1.4
Fluorene	86-73-7	3,800	190,000	0.175	< 0.047	983 D	2.49	12	0.56	0.28	< 0.013	< 0.01	0.0216 J	< 0.037	1
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.0488 J	< 0.047	261 D	1.04	3.6	0.82	0.87	< 0.012	< 0.0068	0.0310 J	< 0.037	0.37
Naphthalene	91-20-3	25	190,000	0.614	0.0167 J	***3,190 D***	4.5	2.8	0.7	0.48	3.4	< 0.0074	< 0.038	< 0.037	0.54
Pentachlorophenol	87-86-5	5	190,000	R	< 0.19	< 3.6	< 0.21	NA	NA	NA	NA	NA	< 0.15	< 0.15	NA
Phenanthrene	85-01-8	10,000	190,000	0.475	0.0174 J	2,380 D	7.07 D	38	2	1.2	< 0.014	< 0.007	0.21	< 0.037	2.9
Phenol	108-95-2	200	18,000	0.15 J	< 0.093	31.3	< 0.11	< 0.74	< 0.14	0.12 J	< 0.028	< 0.048	< 0.076	< 0.073	< 0.035
Pyrene	129-00-0	2,200	190,000	0.259	0.0398 J	1,080 D	3.72	29	3.2	3	< 0.011	< 0.0085	0.13	< 0.037	2.9
Total PAHs and 2-Methylnaphthalene	-	- -	- -	2.91	0.177	14,300	37.9	210	20.9	17.5	5.30	< 0.059	0.887	< 0.037	16.6
Metals															
Aluminum	7429-90-5	- -	190,000	1,440	21,700	4,410	17,500	NA	NA	NA	NA	NA	7,220	864	NA
Antimony	7440-36-0	27	190,000	< 3.7	< 2.7	< 2.2	< 3.0	< 3.2	< 2.9	< 3.6	< 2.4	< 2.4	< 2.5	< 2.3	< 3
Arsenic	7440-38-2	29	190,000	9.4	4.4	6.2	***34.7***	***33***	19	22	3	11	5.8	1.7 J	15
Barium	7440-39-3	8,200	190,000	< 37	159	32.8	170	180	140	260	20	44	22.5 J	4.8 J	200
Beryllium	7440-41-7	320	190,000	< 0.37	1.1	0.30	1.2	1	< 0.88	1.6	< 0.72	< 0.73	0.50	< 0.23	< 0.9
Cadmium	7440-43-9	38	190,000	< 0.92	< 0.68	< 0.55	1.5	1.6	< 0.88	< 1.1	< 0.72	< 0.73	< 0.61	< 0.59	< 0.9
Calcium	7440-70-2	- -	- -	164,000	2,510	893	3,580	NA	NA	NA	NA	NA	238 J	< 590	NA
Chromium	7440-47-3	190,000	190,000	6.6	43.9	12.5	162	130	90	150	20	20	15.5	3.7	44
Cobalt	7440-48-4	160	190,000	< 9.2	12.4	< 5.5	15.1	NA	NA	NA	NA	NA	5.2 J	0.56 J	NA
Copper	7440-50-8	43,000	190,000	6.0	9.3	25.0	88.8	100	73	98	7.7	7	7.6	< 2.9	37
Cyanide	57-12-5	2000	190,000	1.0	< 0.24	< 0.29	0.87	NA	NA	NA	NA	NA	< 0.29	< 0.27	< 0.37
Iron	7439-89-6	- -	190,000	3,250	24,900	11,100	28,200	NA	NA	NA	NA	NA	17,200	1,650	NA
Lead	7439-92-1	450	190,000	22.6	46.5	55.4	185	220	160	***760***	11	9.8	10.5	2.1 J	99
Magnesium	7439-95-4	- -	- -	141,000	5,320	1,460	4,760	NA	NA	NA	NA	NA	1,120	77.5 J	NA
Manganese	7439-96-5	2,000	190,000	216	320	168	860	NA	NA	NA	NA	NA	217	8.7	NA
Mercury	7439-97-6	10	190,000	0.075	0.17	0.15	1.4	0.63	1.3	2.9	< 0.1	< 0.1	< 0.035	< 0.032	0.19
Nickel	7440-02-0	650	190,000	9.4	28.4	9.5	30.6	30	22	33	7.3	8.6	8.3	0.76 J	22
Potassium	7440-09-7	- -	- -	< 1,800	1,690	< 1,100	1,950	NA	NA	NA	NA	NA	832 J	113 J	NA
Selenium	7782-49-2	26	190,000	< 3.7	< 2.7	< 2.2	< 3.0	4.5	4.3	6.2	< 2.2	< 2.2	< 2.5	< 2.3	3.3
Silver	7440-22-4	84	190,000	< 4.6	< 0.68	< 0.55	1.2	< 4	< 3.7	< 4.5	< 3	< 3	< 0.61	< 0.59	< 3.7
Sodium	7440-23-5	- -	- -	< 1,800	< 1,400	< 1,100	< 1,500	NA	NA	NA	NA	NA	< 1,200	< 1,200	NA
Thallium	7440-28-0	14	190,000	< 1.8	< 1.4	< 1.1	< 1.5	< 1.9	< 1.8	< 2.1	< 1.4	< 1.5	< 1.2	< 1.2	< 1.8
Vanadium	7440-62-2	820	190,000	10.3	44.3	8.7	32.6	NA	NA	NA	NA	NA	19.1	3.8 J	NA
Zinc	7440-66-6	12,000	190,000	15.4	66.8	74.0	504	550	380	520	32	38	32.5	3.9 J	130

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-03 14 3/4/05	PCSB-03 25 3/4/05	PCSB-04 4 3/7/05	PCSB-04 12 3/7/05	PCSB-04 25 3/7/05	PCSB-06 13 3/7/05	PCSB-06 18 3/7/05	PCSB-06 23.5 3/7/05	PCSB-07 14 3/8/05	PCSB-07 21.5 3/8/05	PCSB-08 10.5 3/9/05	PCSB-08 19 3/9/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0016	< 0.0016	< 0.00097	< 0.0011	< 0.0013	< 0.0014	< 0.0012	< 0.0013	< 0.0013	< 0.0029	< 0.0011	< 0.0018
Acetone	67-64-1	10,000	10,000	0.036	0.053	0.038	0.043	0.093	0.061	0.051	0.073	< 0.0092	0.19	0.022	0.041
Benzene	71-43-2	0.5	330	< 0.00052	< 0.00051	< 0.00064	0.0019	< 0.00088	< 0.00093	< 0.00078	< 0.00086	< 0.00088	< 0.0019	0.078	0.037
Carbon Disulfide	75-15-0	620	10,000	< 0.0011	< 0.0011	< 0.00081	< 0.00094	< 0.0011	< 0.0012	< 0.001	< 0.0011	0.022	0.061	< 0.00089	0.004
Chlorobenzene	108-90-7	10	4,600	< 0.00042	< 0.00041	< 0.00063	< 0.00073	< 0.00087	< 0.00091	< 0.00077	< 0.00085	< 0.00087	< 0.0019	< 0.00069	< 0.0011
Chloroform	67-66-3	8	110	0.0041	0.0041	0.0027	0.003	0.0036	0.0038	0.0034	0.0036	< 0.00078	< 0.0017	< 0.00062	< 0.001
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00076	< 0.00074	< 0.0006	< 0.00069	< 0.00082	< 0.00087	< 0.00073	< 0.00081	< 0.00082	< 0.0018	< 0.00065	< 0.0011
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.021 B	0.022 B	0.0093 B	0.01 B	0.013 B	0.013 B	0.012 B	0.013 B	0.023 B	0.055 B	0.018 B	0.03 B
Ethylbenzene	100-41-4	70	1,000	< 0.0014	< 0.0014	< 0.00093	0.012	< 0.0013	0.0019	< 0.0011	< 0.0013	< 0.0013	< 0.0028	< 0.001	< 0.0017
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0017	< 0.0017	< 0.0014	0.0058	< 0.0019	0.0038	< 0.0017	< 0.0019	< 0.0019	< 0.0041	0.0032	< 0.0025
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00037	< 0.00036	< 0.00058	0.01	< 0.00081	0.003	< 0.00072	< 0.00079	< 0.00081	< 0.0017	0.0023	< 0.0011
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00033	< 0.00032	< 0.00078	< 0.0009	< 0.0011	< 0.0011	< 0.00095	< 0.0011	< 0.0011	< 0.0023	< 0.00085	< 0.0014
Toluene	108-88-3	100	10,000	< 0.00039	< 0.00038	< 0.00094	< 0.0011	< 0.0013	< 0.0014	< 0.0012	< 0.0013	< 0.0013	< 0.0028	0.0093	0.0043
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0011	< 0.0011	< 0.0004	< 0.00046	< 0.00055	< 0.00058	< 0.00049	< 0.00054	< 0.00055	< 0.0012	< 0.00044	< 0.00072
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.041	< 0.039	< 1.2	< 1.3	< 0.04	< 0.42	< 0.036	< 0.039	< 0.4	< 0.057	0.34 J	< 0.039
2-Methylnaphthalene	91-57-6	1,900	190,000	2.1	< 0.095	5.5	30	0.62	4.1	2.1	0.073 J	1.9	< 0.14	0.32	< 0.095
2-Methylphenol	95-48-7	580	190,000	< 0.17	< 0.16	< 4.8	< 5.6	< 0.17	< 1.7	< 0.15	< 0.16	< 1.7	< 0.23	0.52	0.072 J
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	0.33	< 0.2	< 6	< 7	< 0.21	< 2.2	< 0.19	< 0.2	< 2.1	0.32	1	0.89
Acenaphthene	83-32-9	4,700	190,000	4.3	0.073	2	20	0.67	44	3.1	0.2	4.5	< 0.022	0.22	0.061
Acenaphthylene	208-96-8	8,000	190,000	0.38	< 0.016	11	7	0.12	< 0.17	0.15	< 0.016	< 0.16	< 0.023	0.26	< 0.016
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	2.6	< 0.014	42	60	1.4	24	1.8	0.1	7.7	< 0.02	0.44	0.065
Benz(a)anthracene	56-55-3	430	190,000	3.3	< 0.017	110	75	1.5	15	1.5	0.11	7	0.093	0.66	0.13
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	2.7	< 0.012	***82***	***53***	1.1	10	1.2	0.085	4.5	1	0.61	0.11
Benzo(b)fluoranthene	205-99-2	170	190,000	3.3	0.059	120	69	1.4	11	1.4	0.094	5.3	< 0.033	0.8	0.16
Benzo(g,h,i)perylene	191-24-2	180	190,000	1.5	< 0.017	53	30	0.6	5.3	0.63	< 0.017	2.5	0.094	0.32	0.081
Benzo(k)fluoranthene	207-08-9	610	190,000	0.72	< 0.02	33	22	0.56	4.3	0.27	< 0.02	2.1	< 0.029	0.3	0.077
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.034	0.086 B	< 0.97	< 1.1	< 0.034	< 0.35	< 0.03	0.066	< 0.34	< 0.048	< 0.23	< 0.032
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.018	< 0.017	< 0.5	< 0.58	< 0.017	< 0.18	< 0.015	< 0.017	< 0.17	< 0.024	< 0.03	< 0.017

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-03 14 3/4/05	PCSB-03 25 3/4/05	PCSB-04 4 3/7/05	PCSB-04 12 3/7/05	PCSB-04 25 3/7/05	PCSB-06 13 3/7/05	PCSB-06 18 3/7/05	PCSB-06 23.5 3/7/05	PCSB-07 14 3/8/05	PCSB-07 21.5 3/8/05	PCSB-08 10.5 3/9/05	PCSB-08 19 3/9/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	0.27	< 0.013	7.6	14	0.19	5.4	0.24	< 0.013	< 0.13	< 0.019	0.24	< 0.013
Chrysene	218-01-9	230	190,000	3.8	< 0.013	85	62	1.4	17	1.6	0.11	6.8	0.082	0.69	0.15
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.6	< 0.021	19	13	0.24	2.4	0.24	< 0.021	1.1	< 0.031	< 0.024	< 0.021
Dibenzofuran	132-64-9	310	190,000	0.94	< 0.14	14	43	1.2	14	0.99	< 0.14	2	< 0.2	< 0.15	< 0.14
Diethyl phthalate	84-66-2	9,300	10,000	< 0.018	< 0.017	< 0.52	< 0.6	< 0.018	< 0.19	< 0.016	< 0.018	< 0.18	< 0.025	< 0.022	< 0.017
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.017	0.058	< 0.47	< 0.55	< 0.016	< 0.17	< 0.015	0.064 B	< 0.16	< 0.023	< 0.017	< 0.016
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.017	< 0.016	< 0.47	< 0.55	< 0.016	< 0.17	< 0.015	< 0.016	< 0.16	< 0.023	< 0.028	< 0.016
Fluoranthene	206-44-0	3,200	190,000	5.8	0.12	200	150	2.8	42	3.2	0.21	18	0.093	1.3	0.24
Fluorene	86-73-7	3,800	190,000	3.2	0.064	29	78	1.9	35	2.4	0.13	6.1	< 0.027	0.17	< 0.018
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	1.2	< 0.017	50	29	0.55	4.6	0.52	< 0.017	2.2	< 0.025	0.46	0.074
Naphthalene	91-20-3	25	190,000	2.2	< 0.011	13	***81***	1.9	3.9	0.85	< 0.012	3.2	< 0.017	15	0.18
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	9.8	0.21	130	190	4.2	88	6.5	0.44	28	< 0.027	0.74	0.27
Phenol	108-95-2	200	18,000	< 0.041	< 0.039	< 1.2	< 1.3	< 0.04	< 0.42	< 0.036	< 0.039	< 0.4	< 0.057	1.9	< 0.039
Pyrene	129-00-0	2,200	190,000	8.6	0.14	180	140	3.1	49	4.3	0.25	20	0.13	0.95	0.28
Total PAHs and 2-Methylnaphthalene	-	- -	- -	56.1	0.666	1,160	1,110	24.1	360	31.8	1.80	121	1.49	23.2	1.88
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 3.5	< 3.3	< 2.5	3.2	< 3.4	5.1	< 3.1	< 3.4	4.3	< 4.9	19	< 3.3
Arsenic	7440-38-2	29	190,000	26	5	14	***39***	8.8	***49***	6	7.2	***76***	7.1	20	4.9
Barium	7440-39-3	8,200	190,000	130	150	110	160	130	200	150	200	260	210	1,500	220
Beryllium	7440-41-7	320	190,000	< 1.1	< 1	1.1	< 0.87	< 1	1.4	0.98	< 1	1.3	< 1.5	< 0.82	< 1
Cadmium	7440-43-9	38	190,000	< 1.1	< 1	0.85	2	< 1	2.5	< 0.92	< 1	2.6	< 1.5	< 0.82	< 1
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	99	43	15	160	36	280	42	50	260	30	31	34
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	81	14	140	120	15	160	15	13	170	14	6,200	23
Cyanide	57-12-5	2000	190,000	0.5	< 0.42	10	3.7	< 0.43	0.84	1.1	< 0.42	8	11	11	0.48
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	180	11	210	220	16	280	25	29	400	22	***26,000***	83
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.68	< 0.14	0.14	0.72	< 0.14	1.4	< 0.13	< 0.14	1.5	< 0.2	< 0.11	< 0.14
Nickel	7440-02-0	650	190,000	21	27	17	24	21	34	23	23	34	21	9	21
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	3.3	3.2	3	3.7	3.7	4.6	3.6	3.7	5.8	5.3	5.3	3.6
Silver	7440-22-4	84	190,000	< 4.4	< 4.2	< 3.1	< 3.6	< 4.3	< 4.5	< 3.8	< 4.2	< 4.3	< 6.1	< 3.4	< 4.2
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 2.1	< 2	< 1.5	< 1.7	< 2.1	< 2.2	< 1.8	< 2	< 2.1	< 2.9	< 1.6	< 2
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	420	72	190	590	75	740	83	86	940	73	1,300	110

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-09			PCSB-10		PCSB-11		PCSB-12		PCSB-13	PCSB-14		PCSB-15
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	10	15.5	27.5	16.5	20	17.5	23.5	9	21.5	17.5	11	25	4-5
Date Collected:	CAS Number			3/9/05	3/9/05	3/10/05	3/22/05	3/22/05	3/10/05	3/10/05	3/16/05	3/16/05	3/15/05	3/16/05	3/17/05	3/11/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0013	< 0.0017	< 0.0017	< 0.0015	0.085	< 0.0016	< 0.0015	< 0.0011	< 0.0013	< 0.0015	< 0.00093	< 0.0014	< 0.0014
Acetone	67-64-1	10,000	10,000	< 0.0092	0.077	0.088	0.15	0.38	0.063	0.098	0.025	0.089	0.1	0.032	0.12	0.046
Benzene	71-43-2	0.5	330	0.047	0.015	0.012	< 0.00098	< 0.0014	< 0.00051	< 0.00048	0.024	< 0.00041	< 0.00095	0.0076	< 0.00095	0.079
Carbon Disulfide	75-15-0	620	10,000	0.0019	0.069	0.031	< 0.0013	< 0.0017	< 0.0011	< 0.001	0.23	0.033	0.091	< 0.00063	< 0.0012	0.0061
Chlorobenzene	108-90-7	10	4,600	< 0.00087	< 0.0011	< 0.0011	< 0.00097	< 0.0013	< 0.00041	< 0.00039	< 0.00029	< 0.00033	< 0.00094	< 0.00024	< 0.00093	< 0.00037
Chloroform	67-66-3	8	110	< 0.00078	< 0.001	< 0.00096	< 0.00088	< 0.0012	0.0023	0.0024	< 0.00037	< 0.00043	< 0.00085	< 0.00031	< 0.00084	0.0022
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00082	< 0.0011	< 0.001	< 0.00092	< 0.0013	< 0.00074	< 0.0007	< 0.00052	< 0.0006	< 0.00089	< 0.00044	< 0.00089	< 0.00066
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.03 B	0.035 B	0.027 B	0.012 B	0.017 B	0.021 B	0.02 B	0.026 B	0.028 B	0.015 B	0.023 B	0.024 B	0.017 B
Ethylbenzene	100-41-4	70	1,000	< 0.0013	0.25	< 0.0016	0.011	< 0.002	< 0.0014	< 0.0013	0.0096	< 0.0011	< 0.0014	0.0029	< 0.0014	0.058
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0019	0.26	< 0.0023	0.006	< 0.0029	< 0.0017	< 0.0016	0.012	< 0.0014	< 0.0021	< 0.001	< 0.002	0.42
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00081	0.32	< 0.00099	0.014	< 0.0012	< 0.00036	< 0.00034	0.014	< 0.0003	< 0.00087	0.0035	< 0.00087	0.16
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0011	< 0.0014	< 0.0013	< 0.0012	< 0.0016	< 0.00032	< 0.0003	< 0.00022	< 0.00026	< 0.0012	< 0.00019	< 0.0012	< 0.00028
Toluene	108-88-3	100	10,000	0.0021	0.055	< 0.0016	< 0.0015	< 0.002	< 0.00038	< 0.00036	0.0058	< 0.00031	< 0.0014	< 0.00023	< 0.0014	0.089
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00055	< 0.00071	< 0.00068	< 0.00062	< 0.00085	< 0.0011	< 0.001	< 0.00076	< 0.00088	< 0.0006	< 0.00064	< 0.00059	< 0.00096
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	0.31 J	< 28	< 0.041	< 1.3	< 0.083	< 0.8	< 0.26	0.17 J	< 0.27	< 0.26	< 0.98	< 0.036	< 49
2-Methylnaphthalene	91-57-6	1,900	190,000	0.23 J	250	0.35	41	1	1.1	< 0.095	1.9	< 0.098	0.06 J	2.4	< 0.089	200
2-Methylphenol	95-48-7	580	190,000	0.35 J	< 17	0.39	< 2.5	< 0.16	< 0.49	< 0.16	< 0.14	< 0.16	< 0.16	< 0.59	< 0.15	< 30
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	1.2	< 18	2.8	< 3.1	< 0.19	< 0.52	< 0.17	0.21	0.28	< 0.17	< 0.63	< 0.19	< 32
Acenaphthene	83-32-9	4,700	190,000	0.41	180	0.32	43	0.86	4.3	< 0.011	4.4	< 0.012	< 0.011	6	< 0.014	31
Acenaphthylene	208-96-8	8,000	190,000	< 0.042	< 1.7	< 0.017	< 0.23	0.14	0.37	< 0.016	< 0.014	< 0.016	< 0.016	1.3	< 0.015	46
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.52	110	0.25	24	0.58	1.9	< 0.011	0.86	< 0.012	< 0.011	2	< 0.013	140
Benz(a)anthracene	56-55-3	430	190,000	0.62	42	0.13	14	0.66	2.1	< 0.009	1.7	< 0.0093	< 0.009	0.66	< 0.016	130
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.58	28	< 0.013	8.5	0.59	1.5	< 0.013	1.8	< 0.014	< 0.013	0.54	0.31	***100***
Benzo(b)fluoranthene	205-99-2	170	190,000	0.72	31	0.11	9.3	0.73	1.8	< 0.011	1.8	< 0.012	< 0.011	0.66	< 0.021	130
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.29	10	0.069	2.3	0.21	0.73	< 0.01	0.8	< 0.011	< 0.01	0.36	< 0.016	48
Benzo(k)fluoranthene	207-08-9	610	190,000	0.19	8.6	< 0.021	3.4	0.24	0.59	< 0.0089	0.55	< 0.0092	< 0.0089	0.24	< 0.018	43
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.25	< 10	< 0.035	< 0.31	0.084	< 0.29	0.11	0.078 J	0.079 J	0.067 J	< 0.35	0.063	< 18
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.032	< 1.3	< 0.018	< 0.46	< 0.029	< 0.037	< 0.012	< 0.011	< 0.012	< 0.012	< 0.045	< 0.016	< 2.3

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-09 10 3/9/05	PCSB-09 15.5 3/9/05	PCSB-09 27.5 3/10/05	PCSB-10 16.5 3/22/05	PCSB-10 20 3/22/05	PCSB-11 17.5 3/10/05	PCSB-11 23.5 3/10/05	PCSB-12 9 3/16/05	PCSB-12 21.5 3/16/05	PCSB-13 17.5 3/15/05	PCSB-14 11 3/16/05	PCSB-14 25 3/17/05	PCSB-15 4-5 3/11/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	< 0.034	25	< 0.014	8.1	0.15	< 0.04	< 0.013	0.43	< 0.013	< 0.013	< 0.049	< 0.012	50
Chrysene	218-01-9	230	190,000	0.65	48	0.13	14	0.69	2.4	< 0.0095	1.8	< 0.0098	< 0.0095	0.91	< 0.012	110
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.025	< 1	< 0.022	< 0.57	0.087	0.21	< 0.0094	0.3	< 0.0098	< 0.0094	< 0.036	< 0.02	15
Dibenzofuran	132-64-9	310	190,000	< 0.16	93	0.16	18	0.46	0.37	< 0.059	0.21	< 0.061	< 0.059	3.3	< 0.13	150
Diethyl phthalate	84-66-2	9,300	10,000	< 0.023	< 0.94	< 0.019	< 0.27	< 0.017	< 0.027	< 0.0087	< 0.0078	< 0.009	< 0.0087	< 0.033	< 0.016	< 1.7
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.018	< 0.73	< 0.017	< 0.25	< 0.016	< 0.021	< 0.0067	0.12	0.064	0.055	< 0.025	< 0.015	< 1.3
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.029	< 1.2	< 0.017	< 0.27	< 0.017	< 0.034	< 0.011	< 0.0099	< 0.011	< 0.011	< 0.042	< 0.015	< 2.1
Fluoranthene	206-44-0	3,200	190,000	1.2	180	0.39	40	1.9	5.1	0.062	3.5	< 0.0084	0.065	1.9	< 0.017	350
Fluorene	86-73-7	3,800	190,000	0.33	160	0.31	36	0.85	3	< 0.01	1.8	< 0.01	< 0.01	7.5	< 0.017	210
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.32	9.5	< 0.018	2.8	0.23	0.72	< 0.0076	0.85	< 0.0079	< 0.0076	0.36	< 0.016	62
Naphthalene	91-20-3	25	190,000	1.9	***570***	0.74	***94***	2.2	0.88	< 0.017	7.8	< 0.017	0.15	4	< 0.011	***1,100***
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	1	420	0.97	88	2.5	8.3	0.12	4.1	< 0.014	0.12	14	< 0.018	520
Phenol	108-95-2	200	18,000	0.99	< 17	0.87	< 1.1	< 0.071	< 0.47	< 0.15	< 0.14	< 0.16	< 0.15	< 0.57	< 0.036	< 29
Pyrene	129-00-0	2,200	190,000	1.1	150	0.35	39	1.4	5.2	< 0.0095	4.2	< 0.0099	< 0.0095	2.4	< 0.015	230
Total PAHs and 2-Methylnaphthalene	-	- -	- -	10.1	2,200	4.12	459	14.9	40.2	0.182	38.2	< 0.098	0.395	45.2	0.31	3,470
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.9	5.7	< 3.6	< 3.4	< 4.3	7	< 3.3	< 2.9	< 3.4	< 3.3	2.7	< 3.1	6.7
Arsenic	7440-38-2	29	190,000	14	***77***	7.9	18	5.2	***54***	5.3	12	7.1	5.4	3.8	4.6	***33***
Barium	7440-39-3	8,200	190,000	120	250	180	190	170	300	150	66	120	170	110	110	120
Beryllium	7440-41-7	320	190,000	< 0.87	< 1.1	< 1.1	< 1	< 1.3	2.3	1.1	< 0.88	< 1	1.6	0.86	1	1.1
Cadmium	7440-43-9	38	190,000	< 0.87	3.6	< 1.1	< 1	< 1.3	3.4	< 0.98	< 0.88	< 1	< 0.98	< 0.74	< 0.94	2.8
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	36	290	38	55	34	350	37	100	38	41	24	26	100
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	64	210	15	66	13	240	15	30	14	15	35	11	300
Cyanide	57-12-5	2000	190,000	16	6.2	3.8	NA	NA	< 0.42	< 0.41	4	6	5.4	NA	NA	11
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	190	400	15	190	12	380	16	66	14	21	57	9	***710***
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.86	2.8	< 0.15	1.4	< 0.18	0.82	< 0.14	1.7	< 0.14	< 0.14	< 0.1	< 0.13	1.8
Nickel	7440-02-0	650	190,000	16	37	25	22	20	39	24	17	25	24	20	17	51
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	4.2	6.2	4.2	3.7	4.6	5.5	3.9	2.9	3.7	3.8	3.2	3.3	5.4
Silver	7440-22-4	84	190,000	< 3.6	< 4.5	< 4.5	< 4.2	< 5.3	< 4.2	< 4.1	< 3.7	< 4.2	< 4.1	< 3.1	< 3.9	< 3.9
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.7	< 2.1	< 2.1	< 2	< 2.6	< 2	< 2	< 1.8	< 2	< 2	< 1.5	< 1.9	< 1.9
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	300	1,100	78	290	59	1,100	83	320	73	120	110	56	730

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-17 18 3/17/05	PCSB-18 13 3/14/05	PCSB-19 19 3/21/05	PCSB-19 26.5 3/21/05	PCSB-20 17 3/22/05	PCSB-20 22 3/22/05	PCSB-21 14-15 3/11/05	PCSB-21 38-40 3/11/05	PCSB-21 42654 3/11/05	PCSB-22 8.5 3/15/05	PCSB-22 23 3/15/05	PCSB-23 8.5 3/14/05	PCSB-23 21 3/14/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.002	< 0.00096	< 0.0015	< 0.00089	< 0.0017	< 0.0011	< 0.0016	< 0.00094	< 0.0012	< 0.0016	< 0.0015	< 0.0016	< 0.0018
Acetone	67-64-1	10,000	10,000	0.18	0.037	0.11	0.046	0.14	0.046	0.085	0.019	0.034	0.052	0.08	0.16	0.21
Benzene	71-43-2	0.5	330	< 0.0013	0.0015	0.0024	< 0.00058	< 0.0011	< 0.00073	< 0.00053	< 0.00031	< 0.00039	0.15	0.043	0.19	< 0.0012
Carbon Disulfide	75-15-0	620	10,000	0.013	0.0037	0.061	0.0025	< 0.0014	< 0.00093	< 0.0011	< 0.00064	< 0.00083	< 0.0013	< 0.0013	0.42	0.0062
Chlorobenzene	108-90-7	10	4,600	< 0.0013	< 0.00062	< 0.00094	< 0.00057	< 0.0011	< 0.00072	< 0.00043	< 0.00025	< 0.00032	< 0.001	< 0.00097	< 0.001	< 0.0012
Chloroform	67-66-3	8	110	< 0.0012	< 0.00056	< 0.00085	< 0.00052	< 0.00098	< 0.00065	0.003	0.0013	0.0019	< 0.00091	< 0.00088	< 0.00091	< 0.0011
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0012	< 0.00059	< 0.00089	< 0.00054	< 0.001	< 0.00068	< 0.00077	< 0.00045	< 0.00058	< 0.00095	< 0.00092	< 0.00095	< 0.0011
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.028 B	0.008 B	0.033 B	0.024 B	0.014 B	0.011 B	0.023 B	0.015 B	0.013 B	0.015 B	0.015 B	0.015 B	0.019 B
Ethylbenzene	100-41-4	70	1,000	< 0.0019	0.0068	0.0033	< 0.00085	< 0.0016	< 0.0011	< 0.0015	< 0.00084	< 0.0011	0.021	0.0033	< 0.0015	< 0.0018
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0029	0.004	0.0032	< 0.0013	< 0.0024	< 0.0016	< 0.0017	< 0.001	< 0.0013	0.023	0.0027	0.0048	< 0.0026
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.0012	0.0033	0.0047	< 0.00053	< 0.001	< 0.00067	< 0.00038	< 0.00022	< 0.00028	0.03	0.0027	0.0092	< 0.0011
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0016	< 0.00077	< 0.0012	< 0.0007	< 0.0013	< 0.00089	< 0.00033	< 0.00019	< 0.00025	< 0.0012	< 0.0012	< 0.0012	< 0.0015
Toluene	108-88-3	100	10,000	< 0.002	< 0.00093	0.0029	< 0.00086	< 0.0016	< 0.0011	< 0.0004	< 0.00023	< 0.0003	0.029	< 0.0015	0.019	< 0.0018
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00083	< 0.00039	< 0.0006	< 0.00036	< 0.00069	< 0.00046	< 0.0011	< 0.00065	< 0.00084	< 0.00064	< 0.00062	< 0.00064	< 0.00075
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.042	< 0.029	< 0.063	< 0.044	< 0.071	< 0.04	< 0.86	< 0.17	< 0.25	< 2.5	< 0.27	2.3	< 0.044
2-Methylnaphthalene	91-57-6	1,900	190,000	0.083 J	2.9	2.1	< 0.039	1	< 0.081	0.91	< 0.063	0.74	9.4	0.093 J	2.2	< 0.11
2-Methylphenol	95-48-7	580	190,000	< 0.17	< 0.12	< 0.12	< 0.084	< 0.14	< 0.18	< 0.52	< 0.11	< 0.15	< 1.5	< 0.16	4.3	< 0.18
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	0.41	0.069 J	< 0.15	< 0.1	0.47	< 0.18	< 0.55	< 0.11	0.32	< 1.6	< 0.17	5.9	0.59
Acenaphthene	83-32-9	4,700	190,000	0.11	2.6	6.5	< 0.014	1.6	< 0.0079	5	< 0.0075	0.5	21	0.32	3.3	< 0.017
Acenaphthylene	208-96-8	8,000	190,000	< 0.017	0.1	0.73	< 0.0076	0.38	< 0.0072	0.48	< 0.011	0.21	3.8	< 0.016	0.16	< 0.018
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.2	1.2	2.7	< 0.0095	1.1	< 0.0094	2.8	< 0.0076	0.39	20	0.17	2	< 0.015
Benz(a)anthracene	56-55-3	430	190,000	0.19	1	4.5	0.073	2	< 0.0066	2.7	< 0.006	0.68	16	0.12	1.7	< 0.02
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.14	0.86	3.9	0.069	1.9	0.15	2.1	< 0.0089	0.77	14	0.087	1.3	< 0.014
Benzo(b)fluoranthene	205-99-2	170	190,000	0.21	1.2	4.7	0.15	2.3	< 0.013	2.3	< 0.0075	0.83	17	0.095	1.7	< 0.025
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.079	0.38	0.78	< 0.014	0.38	< 0.0068	0.8	< 0.0069	0.33	6.7	< 0.011	0.54	< 0.019
Benzo(k)fluoranthene	207-08-9	610	190,000	< 0.021	0.26	1.3	0.054	0.75	< 0.017	0.69	< 0.006	0.31	6.3	< 0.0092	0.54	< 0.022
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.093	0.071	< 0.015	< 0.01	< 0.016	< 0.03	< 0.31	0.045 J	< 0.092	< 0.89	< 0.097	< 0.034	< 0.037
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.018	< 0.012	< 0.022	< 0.016	< 0.025	< 0.013	< 0.04	< 0.0081	< 0.012	< 0.11	< 0.012	< 0.018	< 0.019

Location ID:		Soil Standards or PQLs		PCSB-17	PCSB-18	PCSB-19		PCSB-20		PCSB-21			PCSB-22		PCSB-23	
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res	DC Non-Res Subsurf Soil	18	13	19	26.5	17	22	14-15	38-40	42654	8.5	23	8.5	21
Date Collected:	CAS Number	(Exceedances Bolded & Italicized)	(No Exceedances)	3/17/05	3/14/05	3/21/05	3/21/05	3/22/05	3/22/05	3/11/05	3/11/05	3/11/05	3/15/05	3/15/05	3/14/05	3/14/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	0.065	0.37	< 0.019	< 0.013	0.089	< 0.0091	< 0.043	< 0.0087	0.062	9	0.15	0.56	< 0.014
Chrysene	218-01-9	230	190,000	0.2	0.99	4.7	0.09	2.4	< 0.014	3	< 0.0063	0.89	16	0.11	1.9	< 0.014
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.023	0.13	0.33	< 0.019	0.22	< 0.0087	0.27	< 0.0063	0.12	2	< 0.0098	0.27	< 0.024
Dibenzofuran	132-64-9	310	190,000	0.099 J	1.2	0.36	< 0.066	0.38	< 0.062	0.41	< 0.04	0.17	13	0.15	1.2	< 0.15
Diethyl phthalate	84-66-2	9,300	10,000	< 0.019	< 0.013	< 0.013	< 0.009	< 0.014	< 0.011	< 0.029	< 0.0058	< 0.0085	< 0.083	< 0.009	< 0.018	< 0.02
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.017	< 0.012	< 0.012	< 0.0085	< 0.014	< 0.0096	< 0.022	< 0.0045	< 0.0066	< 0.064	< 0.0069	< 0.017	< 0.018
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.017	< 0.012	< 0.013	< 0.0089	< 0.014	< 0.016	< 0.037	< 0.0074	< 0.011	< 0.11	< 0.011	< 0.017	< 0.018
Fluoranthene	206-44-0	3,200	190,000	0.39	2.4	7.3	0.12	3.6	< 0.0078	5.6	0.041	1.5	37	0.33	4.5	< 0.02
Fluorene	86-73-7	3,800	190,000	0.18	2.4	3.8	< 0.0081	1.3	< 0.011	3.3	< 0.0068	0.48	25	0.3	3.3	< 0.021
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.075	0.34	0.95	< 0.027	0.52	< 0.0081	0.89	< 0.0051	0.33	7.9	< 0.0079	0.47	< 0.019
Naphthalene	91-20-3	25	190,000	0.29	2.9	3	< 0.0072	1.5	< 0.0046	1.3	< 0.011	1.4	13	0.4	3.8	< 0.013
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	0.67	4.3	8.9	0.042	3.5	< 0.011	9.9	0.055	0.95	48	0.58	6.9	< 0.021
Phenol	108-95-2	200	18,000	0.12	< 0.029	< 0.054	< 0.038	< 0.06	< 0.079	< 0.51	< 0.1	< 0.15	< 1.4	< 0.16	5.9	< 0.044
Pyrene	129-00-0	2,200	190,000	0.45	2.8	9.3	0.1	5	< 0.011	6.4	0.05	1.7	23	0.28	5.8	< 0.018
Total PAHs and 2-Methylnaphthalene	-	- -	- -	3.27	26.8	65.5	0.698	29.5	0.15	48.4	0.146	12.1	286	2.89	40.4	< 0.11
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 3.6	2.6	< 3.2	< 2.3	4.4	< 2.9	< 3.6	< 2.2	< 3.2	3.9	< 3.4	< 3.5	< 3.8
Arsenic	7440-38-2	29	190,000	13	16	17	< 2.3	***58***	5.2	11	< 2.2	12	18	6.2	***30***	4.1
Barium	7440-39-3	8,200	190,000	170	88	150	41	290	180	160	15	49	180	130	220	160
Beryllium	7440-41-7	320	190,000	1.4	< 0.74	1.4	0.79	1.6	1.1	1.3	< 0.66	< 0.97	2.3	1.4	1.2	< 1.1
Cadmium	7440-43-9	38	190,000	< 1.1	< 0.74	< 0.97	< 0.68	2.1	< 0.86	< 1.1	< 0.66	< 0.97	5.1	< 1	2.8	< 1.1
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	67	70	81	11	220	48	60	15	30	60	34	240	39
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	79	51	62	8.5	160	11	35	< 5.5	34	110	11	140	11
Cyanide	57-12-5	2000	190,000	NA	0.43	NA	NA	NA	NA	NA	NA	0.44	3.1	1	6.5	9.6
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	110	140	130	< 5.7	280	14	53	< 5.5	63	210	11	280	14
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	< 0.15	0.25	0.76	< 0.095	1.3	< 0.12	< 0.15	< 0.092	0.66	1.8	< 0.14	0.79	< 0.16
Nickel	7440-02-0	650	190,000	23	13	21	7.7	42	27	26	5.7	16	24	22	28	23
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	4.6	2.7	3.7	< 2	4.3	< 2.6	4.5	< 2	2.9	4.8	3.8	5.3	4.4
Silver	7440-22-4	84	190,000	< 4.5	< 3.1	< 4	< 2.8	< 4.5	< 3.6	< 4.5	< 2.7	< 4	< 3.9	< 4.2	< 4.4	< 4.7
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 2.2	< 1.5	< 1.9	< 1.4	< 2.2	< 1.7	< 2.2	< 1.3	< 1.9	< 1.9	< 2	< 2.1	< 2.3
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	300	200	310	28	840	78	170	21	230	440	67	840	68

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-24	PCSB-24	PCSB-24	PCSB-25	PCSB-25	PCSB-26	PCSB-26	PCSB-27	PCSB-28	PCSB-28	PCSB-29	PCSB-29	PCSB-30
Sample Depth (ft):				9	15	26.5	8	13	6	8	10.5	2	15	2	11.5	15
Date Collected:				3/18/05	3/18/05	3/21/05	3/18/05	3/18/05	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05	7/26/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0012	< 0.002	< 0.00094	< 0.00097	< 0.0012	< 0.0011	< 0.0012	< 0.0016	< 0.00084	< 0.0015	< 0.00084	< 0.0011	< 0.0015
Acetone	67-64-1	10,000	10,000	0.05	0.1	0.048	0.044	0.052	0.039	0.025	< 0.011	< 0.0057	0.073	< 0.0057	0.053	0.097
Benzene	71-43-2	0.5	330	0.25	0.0083	< 0.00061	0.011	< 0.00078	< 0.00074	< 0.00076	< 0.0011	< 0.00055	< 0.00096	< 0.00055	< 0.00075	< 0.00098
Carbon Disulfide	75-15-0	620	10,000	< 0.001	< 0.0016	< 0.00078	0.0029	< 0.001	0.0026	< 0.00097	< 0.0014	< 0.0007	< 0.0012	< 0.0007	< 0.00096	< 0.0013
Chlorobenzene	108-90-7	10	4,600	< 0.00079	< 0.0013	< 0.00061	< 0.00063	< 0.00077	< 0.00073	< 0.00075	< 0.001	< 0.00054	< 0.00095	< 0.00054	< 0.00074	< 0.00097
Chloroform	67-66-3	8	110	< 0.00071	< 0.0011	< 0.00055	< 0.00057	< 0.0007	< 0.00066	< 0.00067	< 0.00094	< 0.00049	< 0.00086	< 0.00049	< 0.00067	< 0.00087
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00075	< 0.0012	< 0.00057	< 0.0006	< 0.00073	< 0.00069	< 0.00071	< 0.00099	< 0.00051	< 0.0009	< 0.00051	< 0.0007	< 0.00092
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.013 B	0.021 B	0.027 B	0.014 B	0.017 B	0.016 B	0.018 B	0.023 B	0.011 B	0.016 B	0.0067 B	0.015 B	0.02 B
Ethylbenzene	100-41-4	70	1,000	0.0036	0.0029	< 0.0009	< 0.00093	< 0.0011	< 0.0011	< 0.0011	< 0.0016	< 0.0008	< 0.0014	< 0.0008	< 0.0011	< 0.0014
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0075	< 0.0028	< 0.0013	< 0.0014	< 0.0017	< 0.0016	< 0.0016	< 0.0023	< 0.0012	< 0.0021	< 0.0012	< 0.0016	< 0.0021
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	0.0028	< 0.0012	< 0.00056	< 0.00058	< 0.00072	< 0.00068	< 0.0007	< 0.00097	< 0.0005	< 0.00088	< 0.0005	< 0.00069	< 0.0009
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00097	< 0.0016	< 0.00075	< 0.00078	< 0.00095	< 0.0009	< 0.00092	< 0.0013	< 0.00067	< 0.0012	< 0.00067	< 0.00091	< 0.0012
Toluene	108-88-3	100	10,000	0.012	< 0.0019	< 0.00091	< 0.00094	< 0.0012	< 0.0011	< 0.0011	< 0.0016	< 0.00081	< 0.0014	< 0.00081	< 0.0011	< 0.0014
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0005	< 0.0008	< 0.00038	< 0.0004	< 0.00049	< 0.00046	< 0.00047	< 0.00067	< 0.00034	< 0.0006	< 0.00034	< 0.00047	< 0.00061
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.26	< 1.4	< 0.034	0.31	< 0.06	< 0.067	< 0.04	< 0.047	< 0.03	< 0.053	< 0.03	< 0.068	< 0.054
2-Methylnaphthalene	91-57-6	1,900	190,000	0.49	1.7	< 0.069	0.93	0.69	< 0.062	< 0.081	0.056 J	< 0.061	< 0.11	< 0.061	< 0.063	< 0.11
2-Methylphenol	95-48-7	580	190,000	< 0.49	< 0.84	< 0.15	< 0.093	< 0.11	< 0.23	< 0.18	< 0.21	< 0.13	< 0.23	< 0.13	< 0.23	< 0.24
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 0.6	0.3 J	< 0.15	0.78	0.24	< 0.26	< 0.18	< 0.21	< 0.13	< 0.23	< 0.13	< 0.26	< 0.24
Acenaphthene	83-32-9	4,700	190,000	1.9	9.8	< 0.0066	0.63	1.4	< 0.02	< 0.0079	< 0.0092	< 0.0059	< 0.01	< 0.0059	< 0.02	< 0.011
Acenaphthylene	208-96-8	8,000	190,000	< 0.044	1	< 0.0061	0.52	0.32	< 0.011	< 0.0072	< 0.0084	< 0.0054	< 0.0095	< 0.0054	< 0.011	< 0.0097
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.81	5	< 0.0079	0.84	0.86	< 0.013	< 0.0094	0.071	< 0.0071	< 0.012	< 0.0071	< 0.013	< 0.013
Benz(a)anthracene	56-55-3	430	190,000	0.91	6.8	< 0.0056	1.9	2	< 0.0084	< 0.0066	0.078	< 0.005	< 0.0088	0.078	< 0.0086	< 0.0089
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	1.1	6.2	0.68	1.7	1.9	0.48	0.43	0.068	< 0.006	0.11	0.066	< 0.011	< 0.011
Benzo(b)fluoranthene	205-99-2	170	190,000	1.5	6.2	< 0.011	2.1	2.4	< 0.014	< 0.013	0.095	< 0.01	< 0.017	0.085	< 0.015	< 0.018
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.73	2.4	< 0.0058	0.57	0.44	< 0.0092	< 0.0068	< 0.008	< 0.0051	< 0.009	0.038	< 0.0093	< 0.0092
Benzo(k)fluoranthene	207-08-9	610	190,000	0.39	1.7	< 0.014	0.7	0.81	< 0.016	< 0.017	< 0.019	< 0.013	< 0.022	0.039	< 0.016	< 0.022
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.059	< 0.5	0.074	0.061	0.086	0.2	0.077	0.072	0.14	< 0.04	< 0.023	0.51	0.27
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.09	< 0.064	< 0.011	< 0.017	< 0.021	< 0.019	< 0.013	< 0.015	< 0.0097	< 0.017	< 0.0097	< 0.02	< 0.017

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-24 9 3/18/05	PCSB-24 15 3/18/05	PCSB-24 26.5 3/21/05	PCSB-25 8 3/18/05	PCSB-25 13 3/18/05	PCSB-26 6 7/26/05	PCSB-26 8 7/26/05	PCSB-27 10.5 7/26/05	PCSB-28 2 7/26/05	PCSB-28 15 7/26/05	PCSB-29 2 7/26/05	PCSB-29 11.5 7/26/05	PCSB-30 15 7/26/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	0.98	0.34	< 0.0077	0.089	0.1	< 0.014	< 0.0091	< 0.011	< 0.0069	< 0.012	< 0.0069	< 0.015	< 0.012
Chrysene	218-01-9	230	190,000	1.1	7	< 0.011	1.9	2.1	< 0.01	< 0.014	0.091	< 0.01	< 0.018	0.076	< 0.01	< 0.018
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.11	0.86	< 0.0074	0.27	0.19	< 0.017	< 0.0087	< 0.01	< 0.0066	< 0.012	< 0.0066	< 0.017	< 0.012
Dibenzofuran	132-64-9	310	190,000	1.2	0.65	< 0.052	0.5	0.28	< 0.061	< 0.062	< 0.072	< 0.046	< 0.081	< 0.046	< 0.062	< 0.083
Diethyl phthalate	84-66-2	9,300	10,000	< 0.052	< 0.046	< 0.0095	< 0.01	< 0.012	< 0.013	< 0.011	< 0.013	< 0.0084	< 0.015	< 0.0084	< 0.013	< 0.015
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.049	< 0.036	< 0.0081	< 0.0093	0.22	< 0.011	0.054 B	< 0.011	< 0.0073	0.066	< 0.0073	< 0.011	< 0.013
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.052	< 0.059	< 0.014	< 0.0098	< 0.012	< 0.011	< 0.016	< 0.019	< 0.012	< 0.021	< 0.012	< 0.012	< 0.022
Fluoranthene	206-44-0	3,200	190,000	1.7	12	< 0.0066	3.2	3.8	< 0.014	< 0.0078	0.18	< 0.0059	< 0.01	0.15	0.061	0.075
Fluorene	86-73-7	3,800	190,000	2.8	5.9	< 0.0096	0.91	1.1	< 0.012	< 0.011	0.076	< 0.0086	< 0.015	< 0.0086	< 0.012	< 0.015
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.91	2.6	< 0.0068	0.71	0.54	< 0.0067	< 0.0081	< 0.0094	< 0.0061	< 0.011	< 0.0061	< 0.0068	< 0.011
Naphthalene	91-20-3	25	190,000	2.7	3.4	< 0.0039	7.1	1	< 0.011	< 0.0046	0.14	< 0.0035	< 0.0061	< 0.0035	< 0.012	< 0.0062
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	1.6	18	< 0.0089	1.9	3.5	< 0.011	< 0.011	0.079	< 0.008	< 0.014	0.04	< 0.011	< 0.014
Phenol	108-95-2	200	18,000	< 0.22	< 0.81	< 0.066	0.63	< 0.051	< 0.074	< 0.079	< 0.092	< 0.059	< 0.1	< 0.059	< 0.075	< 0.11
Pyrene	129-00-0	2,200	190,000	2.4	16	< 0.0092	2.6	3.8	< 0.011	< 0.011	0.19	< 0.0082	< 0.014	0.11	0.055	0.069
Total PAHs and 2-Methylnaphthalene	-	- -	- -	21.0	107	0.68	28.5	26.9	0.48	0.43	1.12	< 0.061	0.11	0.682	0.116	0.144
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	3.6	< 3.5	< 2.4	< 2.5	< 3.1	< 2.9	< 2.9	< 3.3	< 2.2	< 3.8	< 2.2	< 2.9	< 3.8
Arsenic	7440-38-2	29	190,000	6.7	26	< 2.4	12	***33***	5.2	< 2.9	6.8	5.2	4.9	< 2.2	4.9	6
Barium	7440-39-3	8,200	190,000	360	160	81	49	120	120	140	95	19	150	16	100	150
Beryllium	7440-41-7	320	190,000	1.5	1.5	0.78	0.89	1.1	1.1	0.98	1	< 0.65	< 1.1	< 0.65	< 0.88	1.2
Cadmium	7440-43-9	38	190,000	< 0.79	1.1	< 0.72	< 0.75	1	< 0.87	< 0.86	< 1	< 0.65	< 1.1	< 0.65	< 0.88	< 1.2
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	23	120	13	23	77	42	37	64	7.7	43	15	34	45
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	110	83	7.6	27	65	18	10	29	< 5.4	15	7.9	14	17
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	280	170	8.8	43	110	51	11	40	12	15	22	25	14
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	< 0.11	0.93	< 0.1	0.78	0.64	< 0.12	< 0.12	0.4	< 0.09	< 0.16	< 0.09	< 0.12	< 0.16
Nickel	7440-02-0	650	190,000	14	25	11	10	20	26	28	33	5.8	28	7.9	19	31
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	3	4.7	< 2.2	3.3	4.2	< 2.6	< 2.6	< 3	< 1.9	< 3.4	< 1.9	< 2.6	< 3.5
Silver	7440-22-4	84	190,000	< 3.3	< 4.4	< 3	< 3.1	< 3.8	< 3.6	< 3.6	< 4.2	< 2.7	< 4.7	< 2.7	< 3.7	< 4.8
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.6	< 2.1	< 1.4	< 1.5	< 1.8	< 1.7	< 1.7	< 2	< 1.3	< 2.3	< 1.3	< 1.8	< 2.3
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	110	440	31	110	420	69	61	270	20	66	19	59	89

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-31 3.5 7/28/05	PCSB-31 10.5 7/28/05	PCSB-32 3.5 7/28/05	PCSB-32 11.5 7/28/05	PCSB-33 4 7/28/05	PCSB-33 11.5 7/28/05	PCSB-34 5 7/27/05	PCSB-34 16.5 7/27/05	PCSB-35 2.5 8/2/05	PCSB-35 15.5 8/2/05	PCSB-36 4 7/27/05	PCSB-36 16 7/27/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0011	< 0.0012	< 0.00084	< 0.0016	< 0.00083	< 0.0012	< 0.0011	< 0.0012	< 0.001	< 0.00091	< 0.00094	< 0.0011
Acetone	67-64-1	10,000	10,000	< 0.0072	0.039	< 0.0057	0.084	< 0.0056	0.039	0.024	0.062	0.023	< 0.0062	< 0.0064	0.025
Benzene	71-43-2	0.5	330	< 0.00069	< 0.00078	< 0.00055	< 0.001	< 0.00054	< 0.00077	< 0.00075	< 0.00081	< 0.00066	< 0.00059	< 0.00061	< 0.00074
Carbon Disulfide	75-15-0	620	10,000	< 0.00088	< 0.001	< 0.0007	< 0.0013	< 0.00069	< 0.00098	< 0.00096	< 0.001	< 0.00084	< 0.00076	< 0.00078	< 0.00094
Chlorobenzene	108-90-7	10	4,600	< 0.00068	< 0.00077	< 0.00054	< 0.001	< 0.00053	< 0.00076	< 0.00074	< 0.0008	< 0.00065	< 0.00058	< 0.00061	< 0.00073
Chloroform	67-66-3	8	110	< 0.00061	< 0.0007	< 0.00049	< 0.00091	< 0.00048	< 0.00069	< 0.00067	< 0.00072	< 0.00059	< 0.00053	< 0.00055	< 0.00066
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00064	< 0.00073	< 0.00051	< 0.00095	< 0.00051	< 0.00072	< 0.0007	< 0.00076	< 0.00062	< 0.00055	< 0.00057	< 0.00069
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.03 B	0.03 B	0.014 B	0.024 B	0.015 B	0.018 B	0.023 B	0.023 B	0.015 B	0.016 B	0.01 B	0.018 B
Ethylbenzene	100-41-4	70	1,000	< 0.001	< 0.0011	< 0.0008	< 0.0015	< 0.00079	< 0.0011	< 0.0011	< 0.0012	< 0.00097	< 0.00087	< 0.0009	< 0.0011
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0015	< 0.0017	< 0.0012	< 0.0022	< 0.0012	< 0.0017	< 0.0016	< 0.0017	0.0013 J	< 0.0013	< 0.0013	< 0.0016
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00063	< 0.00072	< 0.0005	< 0.00094	< 0.0005	< 0.00071	< 0.00069	< 0.00074	< 0.00061	< 0.00054	< 0.00056	< 0.00068
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00084	< 0.00095	< 0.00067	< 0.0012	< 0.00066	< 0.00094	< 0.00091	< 0.00098	< 0.00081	< 0.00072	< 0.00075	< 0.0009
Toluene	108-88-3	100	10,000	< 0.001	< 0.0012	< 0.00081	< 0.0015	< 0.0008	< 0.0011	< 0.0011	< 0.0012	< 0.00098	< 0.00088	< 0.00091	< 0.0011
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00043	< 0.00049	< 0.00034	< 0.00064	< 0.00034	< 0.00048	< 0.00047	< 0.00051	< 0.00041	< 0.00037	< 0.00038	< 0.00046
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.062	< 0.071	< 0.03	< 0.092	< 0.03	< 0.07	< 0.041	< 0.045	< 0.06	< 0.033	< 0.034	< 0.067
2-Methylnaphthalene	91-57-6	1,900	190,000	0.18	< 0.066	< 0.061	0.6	< 0.061	< 0.065	< 0.084	< 0.09	1.1	< 0.066	0.11	< 0.062
2-Methylphenol	95-48-7	580	190,000	< 0.21	< 0.24	< 0.13	< 0.32	< 0.13	< 0.24	< 0.18	< 0.2	< 0.21	< 0.14	< 0.15	< 0.23
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 0.24	< 0.27	< 0.13	0.17 J	< 0.13	< 0.27	< 0.18	< 0.2	< 0.23	< 0.14	< 0.15	< 0.26
Acenaphthene	83-32-9	4,700	190,000	0.4	< 0.021	< 0.0059	0.35	< 0.0058	< 0.021	< 0.0081	< 0.0087	< 0.018	< 0.0064	< 0.0066	< 0.02
Acenaphthylene	208-96-8	8,000	190,000	< 0.01	< 0.012	< 0.0054	0.14	< 0.0054	0.089	< 0.0074	< 0.008	< 0.01	< 0.0059	0.087	< 0.011
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	1.3	< 0.013	< 0.0071	0.56	< 0.007	0.14	< 0.0097	< 0.01	0.35	< 0.0077	0.11	< 0.013
Benz(a)anthracene	56-55-3	430	190,000	3.9	0.079	< 0.005	0.91	0.052	0.081	< 0.0068	0.13	0.21	< 0.0054	0.32	< 0.0084
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	3.2	0.065	< 0.006	0.78	0.048	0.051	< 0.0081	0.11	0.081	0.36	0.33	0.18
Benzo(b)fluoranthene	205-99-2	170	190,000	4.2	< 0.015	< 0.01	1.1	0.07	0.077	< 0.014	< 0.015	0.24	< 0.011	0.54	< 0.014
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.7	0.073	< 0.0051	0.7	< 0.0051	< 0.0096	< 0.007	0.071	0.11	< 0.0056	0.3	< 0.0092
Benzo(k)fluoranthene	207-08-9	610	190,000	1.2	< 0.017	< 0.013	0.32	< 0.012	< 0.016	< 0.017	< 0.019	0.044	< 0.014	0.16	< 0.016
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.041	1.3	< 0.023	< 0.06	0.065	0.08	0.076	0.12	< 0.039	< 0.025	0.33	0.17
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.018	< 0.021	< 0.0097	< 0.027	< 0.0096	< 0.02	< 0.013	< 0.014	< 0.017	< 0.01	< 0.011	< 0.019

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-31 3.5 7/28/05	PCSB-31 10.5 7/28/05	PCSB-32 3.5 7/28/05	PCSB-32 11.5 7/28/05	PCSB-33 4 7/28/05	PCSB-33 11.5 7/28/05	PCSB-34 5 7/27/05	PCSB-34 16.5 7/27/05	PCSB-35 2.5 8/2/05	PCSB-35 15.5 8/2/05	PCSB-36 4 7/27/05	PCSB-36 16 7/27/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	0.69	< 0.015	< 0.0069	0.11	< 0.0068	< 0.015	< 0.0094	< 0.01	< 0.013	< 0.0074	0.052	< 0.014
Chrysene	218-01-9	230	190,000	3.8	0.11	< 0.01	1.1	0.059	0.078	< 0.014	0.12	0.3	< 0.011	0.39	< 0.01
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.82	< 0.018	< 0.0066	0.22	< 0.0065	< 0.018	< 0.009	< 0.0097	< 0.015	< 0.0071	0.081	< 0.017
Dibenzofuran	132-64-9	310	190,000	0.32	< 0.065	< 0.046	0.52	< 0.046	< 0.064	< 0.063	< 0.068	0.16	< 0.05	0.06	< 0.061
Diethyl phthalate	84-66-2	9,300	10,000	< 0.012	< 0.014	< 0.0084	< 0.018	< 0.0083	< 0.014	< 0.012	< 0.012	< 0.012	< 0.0091	< 0.0095	< 0.013
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.047	0.069	< 0.0073	0.2	< 0.0072	< 0.011	0.08	0.074	0.18	< 0.0078	< 0.0081	0.082
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.011	< 0.012	< 0.012	< 0.016	< 0.012	< 0.012	< 0.017	< 0.018	< 0.01	< 0.013	< 0.014	< 0.011
Fluoranthene	206-44-0	3,200	190,000	6.7	0.12	< 0.0059	1.7	0.085	0.11	0.052	0.25	0.25	< 0.0064	0.56	< 0.014
Fluorene	86-73-7	3,800	190,000	0.4	< 0.013	< 0.0086	0.6	< 0.0085	< 0.013	< 0.012	< 0.013	< 0.011	< 0.0093	0.049	< 0.012
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	2.4	0.055	< 0.0061	0.57	< 0.006	0.056	< 0.0083	0.067	0.12	< 0.0066	0.25	< 0.0067
Naphthalene	91-20-3	25	190,000	0.47	0.089	< 0.0035	1.6	< 0.0034	0.055	0.078	< 0.0051	1.1	< 0.0038	0.12	< 0.011
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	4.8	0.061	< 0.008	1.1	0.062	0.11	< 0.011	0.058	0.53	< 0.0086	0.46	< 0.011
Phenol	108-95-2	200	18,000	< 0.069	< 0.078	< 0.059	< 0.1	< 0.059	< 0.077	< 0.081	< 0.087	< 0.066	< 0.064	< 0.066	< 0.074
Pyrene	129-00-0	2,200	190,000	5.4	0.12	< 0.0082	1.5	0.087	0.095	0.11	0.24	0.38	< 0.0089	0.51	< 0.011
Total PAHs and 2-Methylnaphthalene	-	- -	- -	41.9	0.772	< 0.061	13.9	0.463	0.942	0.24	1.05	4.82	0.36	4.38	0.18
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	3.5	< 3.1	< 2.2	< 4	< 2.1	< 3	< 2.9	< 3.2	< 2.6	< 2.3	5.6	< 2.9
Arsenic	7440-38-2	29	190,000	***50***	7	< 2.2	28	< 2.1	4.8	< 2.9	4.7	11	< 2.3	5.6	3.1
Barium	7440-39-3	8,200	190,000	410	77	< 11	240	< 11	72	45	110	120	63	120	74
Beryllium	7440-41-7	320	190,000	< 0.81	< 0.92	< 0.65	< 1.2	< 0.64	< 0.91	< 0.88	< 0.95	< 0.78	< 0.7	< 0.72	< 0.87
Cadmium	7440-43-9	38	190,000	< 0.81	< 0.92	< 0.65	< 1.2	< 0.64	< 0.91	< 0.88	< 0.95	< 0.78	< 0.7	1.4	< 0.87
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	14	42	7.4	390	7.7	37	19	36	9.6	14	23	23
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	250	17	7.6	220	8.4	16	9.1	13	56	9.6	280	11
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	***2,700***	23	8.1	290	11	17	7.4	29	190	40	***2,600***	53
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	1.4	< 0.13	< 0.09	3	< 0.089	< 0.13	< 0.12	< 0.13	< 0.11	< 0.097	< 0.1	< 0.12
Nickel	7440-02-0	650	190,000	17	20	6	36	< 5.3	21	15	25	130	13	12	17
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	7.6	< 2.8	< 1.9	5.5	< 1.9	2.8	< 2.6	< 2.9	2.7	< 2.1	< 2.2	< 2.6
Silver	7440-22-4	84	190,000	< 3.4	< 3.8	< 2.7	< 5	< 2.7	< 3.8	< 3.7	< 4	< 3.2	< 2.9	< 3	< 3.6
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.6	< 1.8	< 1.3	< 2.4	< 1.3	< 1.8	< 1.8	< 1.9	< 1.6	< 1.4	< 1.4	< 1.7
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	610	89	28	640	20	67	36	67	290	28	1,700	84

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-37		PCSB-38		PCSB-39		PCSB-40		PCSB-41		PCSB-41R
				4 8/3/05	10.5 8/3/05	3.5 7/27/05	9.5 7/27/05	4 7/27/05	11 7/27/05	4 7/28/05	10.5 7/28/05	3.5 7/28/05	9.5 7/28/05	9-11 4/22/19
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	< 0.001	< 0.0013	< 0.00089	0.029	< 0.00088	< 0.0012	< 0.001 [< 0.001]	< 0.0012	< 0.00096	< 0.0011	0.0113 J
Acetone	67-64-1	10,000	10,000	0.037	0.05	< 0.006	0.12	< 0.006	0.055	0.028 [0.027]	0.031	< 0.0066	0.037	0.184
Benzene	71-43-2	0.5	330	< 0.00065	< 0.00085	< 0.00058	< 0.00089	< 0.00057	< 0.00081	< 0.00068 [< 0.00068]	< 0.00081	< 0.00063	< 0.00075	0.0015
Carbon Disulfide	75-15-0	620	10,000	< 0.00083	< 0.0011	< 0.00074	< 0.0011	< 0.00073	< 0.001	< 0.00087 [< 0.00087]	< 0.001	0.0077	< 0.00096	< 0.0026
Chlorobenzene	108-90-7	10	4,600	< 0.00064	< 0.00084	< 0.00057	< 0.00088	< 0.00056	< 0.0008	< 0.00067 [< 0.00067]	< 0.0008	< 0.00062	< 0.00074	< 0.0026
Chloroform	67-66-3	8	110	< 0.00058	< 0.00076	< 0.00052	< 0.0008	< 0.00051	< 0.00072	< 0.0006 [< 0.0006]	< 0.00072	< 0.00056	< 0.00067	< 0.0026
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00061	< 0.00079	< 0.00054	< 0.00084	< 0.00054	< 0.00076	0.0018 [< 0.00064]	< 0.00076	< 0.00059	< 0.0007	< 0.0013
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0023 J
Dichloromethane	75-09-2	0.5	10,000	0.003 B	0.0043 B	0.014 B	0.015 B	0.013 B	0.017 B	0.011 B [0.015 B]	0.012 B	0.017 B	0.018 B	< 0.0065
Ethylbenzene	100-41-4	70	1,000	< 0.00096	< 0.0012	< 0.00085	< 0.0013	< 0.00084	< 0.0012	< 0.00099 [< 0.00099]	< 0.0012	< 0.00092	< 0.0011	0.0077
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0011 J
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0014	< 0.0018	< 0.0013	< 0.0019	< 0.0012	< 0.0017	< 0.0015 [< 0.0015]	< 0.0017	< 0.0014	< 0.0016	0.0735
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0065
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0054
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0013
o,p-Xylene	136777-61-2	- -	- -	< 0.0006	< 0.00078	< 0.00053	< 0.00082	< 0.00053	< 0.00074	< 0.00062 [< 0.00062]	< 0.00074	< 0.00058	< 0.00069	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0316
Styrene (Monomer)	100-42-5	24	10,000	< 0.0008	< 0.001	< 0.0007	< 0.0011	< 0.0007	< 0.00098	< 0.00083 [< 0.00083]	< 0.00098	< 0.00077	< 0.00091	< 0.0026
Toluene	108-88-3	100	10,000	< 0.00097	< 0.0013	< 0.00086	< 0.0013	< 0.00085	< 0.0012	< 0.001 [< 0.001]	< 0.0012	< 0.00093	< 0.0011	0.0124
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00041	< 0.00053	< 0.00036	< 0.00056	< 0.00036	< 0.00051	< 0.00043 [< 0.00043]	< 0.00051	< 0.00039	< 0.00047	< 0.0013
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.105
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.093
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.059	< 0.077	< 0.032	< 0.081	< 0.032	< 0.045	< 0.061 [< 0.038]	< 0.045	< 0.035	< 0.041	< 0.23
2-Methylnaphthalene	91-57-6	1,900	190,000	< 0.055	< 0.072	< 0.065	0.072 J	< 0.064	< 0.09	0.29 [0.23]	< 0.09	< 0.07	< 0.084	< 0.046
2-Methylphenol	95-48-7	580	190,000	< 0.2	< 0.26	< 0.14	< 0.28	< 0.14	< 0.2	< 0.21 [< 0.17]	< 0.2	< 0.15	< 0.18	< 0.093
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.093
4-Methylphenol	106-44-5	58	190,000	< 0.23	< 0.29	< 0.14	< 0.31	< 0.14	< 0.2	< 0.24 [< 0.16]	< 0.2	< 0.15	< 0.18	NA
Acenaphthene	83-32-9	4,700	190,000	< 0.018	< 0.023	< 0.0062	< 0.024	< 0.0062	< 0.0087	0.29 [0.16]	< 0.0087	< 0.0068	< 0.0081	< 0.046
Acenaphthylene	208-96-8	8,000	190,000	< 0.0099	< 0.013	< 0.0057	< 0.014	< 0.0057	< 0.008	< 0.01 [< 0.0067]	< 0.008	< 0.0062	< 0.0074	< 0.046
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.23
Anthracene	120-12-7	350	190,000	< 0.011	< 0.015	< 0.0075	0.089	< 0.0074	< 0.01	0.65 [0.36]	< 0.01	0.073	< 0.0097	< 0.046
Benz(a)anthracene	56-55-3	430	190,000	< 0.0075	< 0.0097	< 0.0053	0.21	< 0.0052	< 0.0074	5.9 [3.4]	< 0.0074	0.38	< 0.0068	< 0.046
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.23
Benzo(a)pyrene	50-32-8	46	190,000	< 0.0098	0.093	< 0.0063	0.18	< 0.0062	0.33	6.6 [4.5]	< 0.0088	0.35	0.82	< 0.046
Benzo(b)fluoranthene	205-99-2	170	190,000	< 0.013	< 0.017	< 0.011	0.29	< 0.01	< 0.015	7.6 [5.6]	< 0.015	0.5	< 0.014	< 0.046
Benzo(g,h,i)perylene	191-24-2	180	190,000	< 0.0081	< 0.011	< 0.0054	0.18	< 0.0054	< 0.0076	6.1 [3.2]	< 0.0076	0.23	< 0.007	< 0.046
Benzo(k)fluoranthene	207-08-9	610	190,000	< 0.014	< 0.018	< 0.013	0.088	< 0.013	< 0.019	3 [2.2]	< 0.019	0.13	< 0.017	< 0.046
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.039	< 0.05	0.49	0.1	0.31	< 0.034	0.17 [0.1]	< 0.034	0.081	0.05	< 0.093
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.017	< 0.022	< 0.01	< 0.023	< 0.01	< 0.014	< 0.018 [< 0.012]	< 0.014	< 0.011	< 0.013	< 0.093

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-37		PCSB-38		PCSB-39		PCSB-40		PCSB-41		PCSB-41R
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	4	10.5	3.5	9.5	4	11	4	10.5	3.5	9.5	9-11
Date Collected:				8/3/05	8/3/05	7/27/05	7/27/05	7/27/05	7/27/05	7/28/05	7/28/05	7/28/05	7/28/05	4/22/19
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	< 0.013	< 0.016	< 0.0073	< 0.017	< 0.0072	< 0.01	0.54 [0.34]	< 0.01	< 0.0079	< 0.0094	< 0.093
Chrysene	218-01-9	230	190,000	< 0.0088	< 0.011	< 0.011	0.28	< 0.011	< 0.015	5.7 [4]	< 0.015	0.36	< 0.014	< 0.046
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.015	< 0.019	< 0.0069	< 0.02	< 0.0069	< 0.0097	2.3 [0.22]	< 0.0097	0.074	< 0.009	< 0.046
Dibenzofuran	132-64-9	310	190,000	< 0.054	< 0.071	< 0.049	0.065 J	< 0.048	< 0.068	0.17 [0.12]	< 0.068	< 0.053	< 0.063	< 0.093
Diethyl phthalate	84-66-2	9,300	10,000	< 0.012	< 0.015	< 0.0089	< 0.016	< 0.0088	< 0.012	< 0.012 [< 0.01]	< 0.012	< 0.0097	< 0.012	< 0.093
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.088	0.14	0.044	0.092	< 0.0076	0.059	0.12 [< 0.009]	< 0.011	0.061	< 0.0099	< 0.093
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.01	< 0.013	0.053	< 0.014	< 0.013	< 0.018	< 0.01 [< 0.015]	< 0.018	< 0.014	< 0.017	< 0.093
Fluoranthene	206-44-0	3,200	190,000	< 0.012	< 0.016	< 0.0062	0.4	< 0.0062	< 0.0087	6.5 [4.3]	0.071	0.66	< 0.0081	< 0.046
Fluorene	86-73-7	3,800	190,000	< 0.011	< 0.014	< 0.0091	0.095	< 0.009	< 0.013	0.17 [0.11]	< 0.013	< 0.0098	< 0.012	< 0.046
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	< 0.0059	< 0.0077	< 0.0064	0.17	< 0.0064	< 0.009	5.1 [2.7]	< 0.009	0.2	< 0.0083	< 0.046
Naphthalene	91-20-3	25	190,000	< 0.01	< 0.013	< 0.0037	0.22	< 0.0036	< 0.0051	0.5 [0.34]	< 0.0051	< 0.004	< 0.0048	< 0.046
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.19
Phenanthrene	85-01-8	10,000	190,000	< 0.0098	< 0.013	< 0.0084	0.25	< 0.0083	< 0.012	2.5 [1.7]	0.057	0.3	< 0.011	< 0.046
Phenol	108-95-2	200	18,000	< 0.065	< 0.085	< 0.063	< 0.089	< 0.062	< 0.087	< 0.068 [< 0.073]	< 0.087	< 0.068	< 0.081	< 0.093
Pyrene	129-00-0	2,200	190,000	0.056	< 0.013	< 0.0087	0.39	< 0.0086	< 0.012	5.8 [4.1]	0.077	0.57	< 0.011	< 0.046
Total PAHs and 2-Methylnaphthalene	-	- -	- -	0.056	0.093	< 0.065	2.91	< 0.064	0.33	59.0 [37.1]	0.205	3.83	0.82	< 0.046
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16,700
Antimony	7440-36-0	27	190,000	< 2.6	< 3.3	< 2.3	< 3.5	< 2.2	< 3.2	< 2.7 [< 2.7]	< 3.2	< 2.5	< 2.9	< 2.8
Arsenic	7440-38-2	29	190,000	3.3	4	< 2.3	12	3.2	< 3.2	4.5 [7.3]	7.1	< 2.5	< 2.9	5.5
Barium	7440-39-3	8,200	190,000	37	180	13	170	29	150	34 [46]	89	59	130	117
Beryllium	7440-41-7	320	190,000	< 0.77	< 1	< 0.68	< 1.1	< 0.67	< 0.95	< 0.8 [< 0.8]	< 0.95	< 0.74	0.9	0.83
Cadmium	7440-43-9	38	190,000	< 0.77	< 1	< 0.68	< 1.1	< 0.67	< 0.95	< 0.8 [< 0.8]	< 0.95	< 0.74	< 0.88	0.097 J
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,630
Chromium	7440-47-3	190,000	190,000	20	35	11	90	13	34	< 6.7 [9.9]	46	13	34	38.5
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.8
Copper	7440-50-8	43,000	190,000	14	15	< 5.7	34	19	15	33 [73]	25	16	12	9.0
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.29
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19,800
Lead	7439-92-1	450	190,000	17	16	< 5.7	100	170	10	73 [97]	30	60	27	19.4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,730
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	341
Mercury	7439-97-6	10	190,000	1.6	< 0.14	< 0.095	0.44	< 0.094	< 0.13	< 0.11 [0.13]	< 0.13	0.11	< 0.12	< 0.043 J
Nickel	7440-02-0	650	190,000	21	23	7.2	25	7	26	8.1 [11]	22	12	26	24.2
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,010
Selenium	7782-49-2	26	190,000	< 2.3	< 3	< 2	3.9	< 2	< 2.9	2.9 [3.2]	< 2.9	< 2.2	2.9	< 2.8
Silver	7440-22-4	84	190,000	< 3.2	< 4.2	< 2.8	< 4.4	< 2.8	< 4	< 3.3 [< 3.3]	< 4	< 3.1	< 3.7	< 0.69
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	256 J
Thallium	7440-28-0	14	190,000	< 1.5	< 2	< 1.4	< 2.1	< 1.3	< 1.9	< 1.6 [< 1.6]	< 1.9	< 1.5	< 1.8	< 1.4
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	34.8
Zinc	7440-66-6	12,000	190,000	300	59	18	98	22	68	42 [56]	90	130	60	59.4

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-42		PCSB-43		PCSB-44		PCSB-45		PCSB-46	PCSB-47	PCSB-48	PCSB-49	
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	2.5	13	3.5	9	4.5	11.5	3	10.5	13	10.5	11	4	11
Date Collected:	CAS Number			8/1/05	8/1/05	8/1/05	8/1/05	8/3/05	8/3/05	8/3/05	8/3/05	7/27/05	8/3/05	8/3/05	8/3/05	8/3/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.058	< 0.0015	< 0.00093	< 0.0011	< 0.075	< 0.0011	< 0.062	< 0.0013	< 0.0013	< 0.0012	< 0.0013	< 0.077	0.049
Acetone	67-64-1	10,000	10,000	< 0.41	0.057	0.024	0.023	< 0.53	0.059	< 0.44	0.067	0.059	0.074	0.09	< 0.55	0.27
Benzene	71-43-2	0.5	330	< 0.031	< 0.00096	< 0.00061	< 0.00071	< 0.04	< 0.00074	< 0.032	< 0.00084	< 0.00086	< 0.0008	< 0.00086	< 0.041	< 0.0011
Carbon Disulfide	75-15-0	620	10,000	< 0.049	< 0.0012	< 0.00077	< 0.0009	< 0.064	< 0.00094	< 0.052	< 0.0011	< 0.0011	< 0.001	< 0.0011	< 0.066	< 0.0014
Chlorobenzene	108-90-7	10	4,600	< 0.026	< 0.00095	< 0.0006	< 0.0007	< 0.033	< 0.00073	< 0.027	< 0.00082	< 0.00085	< 0.00079	< 0.00085	< 0.034	< 0.001
Chloroform	67-66-3	8	110	< 0.029	< 0.00086	< 0.00054	< 0.00063	< 0.038	< 0.00066	< 0.031	< 0.00074	< 0.00077	< 0.00071	< 0.00077	< 0.039	< 0.00094
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.024	< 0.0009	< 0.00057	< 0.00066	< 0.03	< 0.00069	< 0.025	< 0.00078	< 0.00081	< 0.00074	< 0.00081	< 0.031	< 0.00099
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.31 B	0.023 B	0.015 B	0.02 B	0.32 B	0.019 B	0.33 B	0.019 B	0.019 B	0.015 B	0.015 B	0.28 B	0.021 B
Ethylbenzene	100-41-4	70	1,000	< 0.06	< 0.0014	< 0.00089	< 0.001	< 0.077	< 0.0011	0.24	< 0.0012	< 0.0013	< 0.0012	< 0.0013	< 0.079	< 0.0016
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.17	< 0.0021	0.0013	< 0.0015	< 0.081	< 0.0016	0.17	< 0.0018	< 0.0019	< 0.0017	< 0.0019	< 0.083	< 0.0023
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.039	< 0.00088	< 0.00056	< 0.00065	< 0.051	< 0.00068	< 0.042	< 0.00077	< 0.00079	< 0.00073	< 0.00079	< 0.052	< 0.00097
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.013	< 0.0012	< 0.00074	< 0.00086	< 0.017	< 0.0009	< 0.014	< 0.001	< 0.0011	< 0.00097	< 0.0011	< 0.017	< 0.0013
Toluene	108-88-3	100	10,000	< 0.02	< 0.0014	< 0.0009	< 0.001	< 0.025	< 0.0011	< 0.021	< 0.0012	< 0.0013	< 0.0012	< 0.0013	< 0.026	< 0.0016
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.045	< 0.0006	< 0.00038	< 0.00044	< 0.057	< 0.00046	< 0.047	< 0.00052	< 0.00054	< 0.0005	< 0.00054	< 0.059	< 0.00067
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.49	< 0.053	< 0.16	< 0.054	< 0.063	< 0.041	< 0.32	< 0.075	< 0.048	< 0.044	< 0.048	< 1.3	< 0.059
2-Methylnaphthalene	91-57-6	1,900	190,000	4.1	< 0.11	9.8	< 0.047	5.4	< 0.083	9.1	< 0.07	< 0.097	< 0.089	< 0.097	18	< 0.12
2-Methylphenol	95-48-7	580	190,000	< 1.7	< 0.23	< 0.57	< 0.1	< 0.22	< 0.18	< 1.4	< 0.26	< 0.21	< 0.19	< 0.21	< 4.5	< 0.26
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 1.9	< 0.23	< 0.63	< 0.13	0.23 J	< 0.18	< 1.4	< 0.29	< 0.21	< 0.19	< 0.21	< 5	< 0.26
Acenaphthene	83-32-9	4,700	190,000	3.2	< 0.01	3.1	< 0.017	1.1	< 0.008	3.8	< 0.023	< 0.0093	< 0.0086	< 0.0093	14	< 0.011
Acenaphthylene	208-96-8	8,000	190,000	< 0.082	< 0.0095	< 0.028	< 0.0092	< 0.011	< 0.0073	< 0.057	< 0.013	< 0.0085	< 0.0079	< 0.0085	< 0.22	< 0.01
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.94	< 0.012	1.5	< 0.012	0.92	< 0.0096	1.4	0.058	< 0.011	< 0.01	< 0.011	6.4	< 0.014
Benz(a)anthracene	56-55-3	430	190,000	1.7	< 0.0088	2.9	< 0.019	0.64	< 0.0067	0.8	0.068	< 0.0079	< 0.0073	< 0.0079	1.6	< 0.0097
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	2.8	0.13	2.8	0.37	0.67	0.4	0.61	< 0.013	< 0.0094	0.71	0.19	1.1	0.48
Benzo(b)fluoranthene	205-99-2	170	190,000	3.9	< 0.017	3.5	< 0.024	1	< 0.013	0.79	0.076	< 0.016	< 0.014	< 0.016	1.7	< 0.019
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.3	< 0.009	2	< 0.017	0.57	< 0.0069	< 0.054	< 0.01	< 0.0081	< 0.0075	< 0.0081	< 0.18	< 0.01
Benzo(k)fluoranthene	207-08-9	610	190,000	1.4	< 0.022	1.2	< 0.021	0.37	< 0.017	< 0.13	< 0.018	< 0.02	< 0.018	< 0.02	< 0.31	< 0.024
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.32	0.73	0.31	0.11	0.11	< 0.031	< 0.24	0.069	< 0.036	< 0.033	< 0.036	< 0.85	< 0.044
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.14	< 0.017	< 0.048	< 0.019	< 0.018	< 0.013	< 0.1	< 0.022	< 0.015	< 0.014	< 0.015	< 0.38	< 0.019

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-42 2.5 8/1/05	PCSB-42 13 8/1/05	PCSB-43 3.5 8/1/05	PCSB-43 9 8/1/05	PCSB-44 4.5 8/3/05	PCSB-44 11.5 8/3/05	PCSB-45 3 8/3/05	PCSB-45 10.5 8/3/05	PCSB-46 13 7/27/05	PCSB-47 10.5 8/3/05	PCSB-48 11 8/3/05	PCSB-49 4 8/3/05	PCSB-49 11 8/3/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	< 0.11	< 0.012	< 0.035	< 0.016	< 0.014	< 0.0093	< 0.072	< 0.016	< 0.011	< 0.01	< 0.011	< 0.28	< 0.013
Chrysene	218-01-9	230	190,000	2.3	< 0.018	3	< 0.0086	0.93	< 0.014	0.78	0.075	< 0.016	< 0.015	< 0.016	1.7	< 0.02
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.61	< 0.012	0.71	< 0.023	0.19	< 0.0088	< 0.069	< 0.019	< 0.01	< 0.0095	< 0.01	< 0.33	< 0.013
Dibenzofuran	132-64-9	310	190,000	1.5	< 0.081	2	< 0.081	0.9	< 0.062	2.7	< 0.069	< 0.073	< 0.067	< 0.073	8.3	< 0.09
Diethyl phthalate	84-66-2	9,300	10,000	< 0.097	< 0.015	< 0.033	< 0.011	< 0.013	< 0.011	< 0.088	< 0.015	< 0.013	< 0.012	< 0.013	< 0.26	< 0.016
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.079	0.064	< 0.027	< 0.01	< 0.01	< 0.0098	< 0.076	0.077	< 0.011	0.062	< 0.011	< 0.21	< 0.014
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.084	< 0.021	< 0.028	< 0.011	< 0.011	< 0.016	< 0.13	< 0.013	< 0.019	< 0.018	< 0.019	< 0.22	< 0.024
Fluoranthene	206-44-0	3,200	190,000	3.9	< 0.01	5	< 0.017	1.4	< 0.008	2.4	0.11	< 0.0093	< 0.0086	< 0.0093	4.2	< 0.011
Fluorene	86-73-7	3,800	190,000	3.7	< 0.015	3.9	< 0.0099	2.2	< 0.012	5.1	0.065	< 0.014	< 0.012	< 0.014	20	< 0.017
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	2.1	< 0.011	1.8	< 0.033	0.48	< 0.0082	< 0.064	< 0.0075	< 0.0096	< 0.0088	< 0.0096	< 0.13	< 0.012
Naphthalene	91-20-3	25	190,000	2.6	< 0.0061	3.1	< 0.0088	3.3	< 0.0047	2.8	0.078	< 0.0055	< 0.0051	< 0.0055	13	< 0.0068
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	6.5	< 0.014	6.9	< 0.011	4.1	< 0.011	12	0.12	< 0.013	< 0.012	< 0.013	39	< 0.015
Phenol	108-95-2	200	18,000	< 0.54	< 0.1	< 0.18	< 0.046	0.056 J	< 0.08	< 0.62	< 0.083	< 0.093	< 0.086	< 0.093	< 1.4	< 0.11
Pyrene	129-00-0	2,200	190,000	3	< 0.014	4.7	< 0.0079	1.4	< 0.011	2.2	0.2	< 0.013	< 0.012	< 0.013	6	< 0.016
Total PAHs and 2-Methylnaphthalene	-	- -	- -	45.1	0.13	55.9	0.37	24.7	0.4	41.8	0.85	< 0.097	0.71	0.19	127	0.48
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	4	< 3.8	< 2.4	< 2.8	< 2.7	< 2.9	< 2.2	< 3.3	< 3.4	< 3.1	< 3.4	< 2.8	< 4.2
Arsenic	7440-38-2	29	190,000	24	5.2	***54***	3.6	***31***	3.3	***44***	5.8	5.1	< 3.1	< 3.4	22	5.6
Barium	7440-39-3	8,200	190,000	120	140	310	130	89	170	93	110	150	130	130	96	220
Beryllium	7440-41-7	320	190,000	< 0.64	< 1.1	< 0.71	< 0.83	< 0.82	1.1	< 0.67	< 0.98	< 1	< 0.94	< 1	< 0.85	< 1.2
Cadmium	7440-43-9	38	190,000	< 0.64	< 1.1	1.3	< 0.83	< 0.82	< 0.87	< 0.67	< 0.98	< 1	< 0.94	< 1	< 0.85	< 1.2
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	7.9	35	21	34	22	42	16	63	42	31	40	26	46
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	64	14	88	9.4	32	16	36	30	15	15	13	200	21
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	***2,500***	< 9.4	***2,600***	17	280	15	***490***	38	13	59	17	***540***	18
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.63	< 0.16	0.99	< 0.12	0.41	< 0.12	0.22	0.25	< 0.14	< 0.13	< 0.14	5.6	< 0.17
Nickel	7440-02-0	650	190,000	32	30	56	26	23	30	16	28	28	21	25	55	27
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 1.9	< 3.4	2.2	< 2.5	< 2.5	< 2.6	< 2	< 3	< 3.1	< 2.8	< 3.1	3.3	< 3.7
Silver	7440-22-4	84	190,000	< 2.7	< 4.7	< 3	< 3.5	< 3.4	< 3.6	< 2.8	< 4.1	< 4.2	< 3.9	< 4.2	< 3.5	< 5.2
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.3	< 2.3	< 1.4	< 1.7	< 1.6	< 1.7	< 1.3	< 2	< 2	< 1.9	< 2	< 1.7	< 2.5
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	530	60	910	64	420	67	270	120	70	45	63	300	42

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCSB-49R		PCSB-50		PCSB-52		PCSB-53	PCSB-54		PCSB-55		PCSB-56	PCSB-57
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	3-5	10-12	4	12.5	5.5	15.5	16.5	4.5	11.5	3.5	11	6.5	5.5
Date Collected:				4/19/19	4/19/19	8/3/05	8/3/05	8/2/05	8/2/05	8/1/05	8/3/05	8/3/05	8/3/05	8/3/05	8/15/05	8/15/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.01	< 0.01	< 0.058	< 0.0011	< 0.00094	< 0.0014	< 0.0011	< 0.0011	< 0.0013	< 0.064	< 0.0011	< 0.0015	< 0.0016
Acetone	67-64-1	10,000	10,000	0.0179	0.0197	< 0.41	0.067	0.041	0.044	0.033	0.022	0.061	< 0.45	0.051	0.068	0.087
Benzene	71-43-2	0.5	330	< 0.00052	< 0.00051	< 0.03	< 0.00075	< 0.00061	< 0.00093	< 0.0007	< 0.0007	< 0.00088	< 0.034	< 0.00069	< 0.00096	< 0.001
Carbon Disulfide	75-15-0	620	10,000	< 0.0021	< 0.0021	< 0.049	< 0.00096	0.0016	< 0.0012	< 0.00089	< 0.00089	< 0.0011	< 0.054	< 0.00088	< 0.0012	< 0.0013
Chlorobenzene	108-90-7	10	4,600	< 0.0021	< 0.0021	< 0.025	< 0.00074	< 0.00061	< 0.00091	< 0.00069	< 0.00069	< 0.00087	< 0.028	< 0.00068	< 0.00095	< 0.001
Chloroform	67-66-3	8	110	< 0.0021	< 0.0021	< 0.029	< 0.00067	< 0.00055	< 0.00082	< 0.00062	< 0.00062	< 0.00078	< 0.032	< 0.00061	< 0.00086	< 0.00093
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0010	< 0.0010	< 0.023	< 0.0007	< 0.00057	< 0.00087	< 0.00065	< 0.00065	< 0.00082	< 0.026	< 0.00064	< 0.0009	< 0.00097
Cyclohexane	110-82-7	6,900	10,000	< 0.0021	< 0.0021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	< 0.0052	< 0.0051	0.25 B	0.02 B	0.015 B	0.021 B	0.02 B	0.0038 B	0.0043 B	0.41 B	0.021 B	0.057 B	0.052 B
Ethylbenzene	100-41-4	70	1,000	< 0.0010	< 0.0010	< 0.059	< 0.0011	< 0.0009	< 0.0014	< 0.001	< 0.001	< 0.0013	< 0.066	< 0.001	< 0.0014	< 0.0015
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0021	< 0.0021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0010	< 0.0010	< 0.062	< 0.0016	< 0.0013	< 0.002	< 0.0015	< 0.0015	< 0.0019	< 0.069	< 0.0015	< 0.0021	< 0.0022
Methyl Acetate	79-20-9	10,000	10,000	< 0.0052	0.0021 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	< 0.0021	< 0.0021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0010	< 0.0010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	< 0.039	< 0.00069	< 0.00056	< 0.00085	< 0.00064	< 0.00064	< 0.00081	< 0.043	< 0.00063	< 0.00088	< 0.00095
o-Xylene	95-47-6	- -	- -	< 0.0010	< 0.0010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0021	< 0.0021	< 0.013	< 0.00091	< 0.00075	< 0.0011	< 0.00085	< 0.00085	< 0.0011	< 0.014	< 0.00084	< 0.0012	< 0.0013
Toluene	108-88-3	100	10,000	< 0.0010	< 0.0010	< 0.019	< 0.0011	< 0.00091	< 0.0014	< 0.001	< 0.001	< 0.0013	< 0.021	< 0.001	< 0.0014	< 0.0015
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0010	< 0.0010	< 0.044	< 0.00047	< 0.00038	< 0.00058	< 0.00044	< 0.00044	< 0.00055	< 0.049	< 0.00043	< 0.0006	< 0.00065
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0021	< 0.0021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	< 0.0010	< 0.0010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	< 0.073	0.0081 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.18	< 0.19	< 0.3	< 0.041	< 0.055	< 0.071	< 0.053	< 0.063	< 0.079	< 0.16	< 0.038	< 0.087	< 0.094
2-Methylnaphthalene	91-57-6	1,900	190,000	< 0.036	0.0333 J	14	< 0.084	0.18	< 0.062	< 0.047	< 0.059	< 0.074	2.5	< 0.077	0.97	0.67
2-Methylphenol	95-48-7	580	190,000	< 0.073	< 0.075	< 1.3	< 0.18	< 0.19	< 0.14	< 0.1	< 0.22	< 0.27	< 0.55	< 0.17	< 0.3	< 0.32
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.073	< 0.075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	< 1.3	< 0.18	< 0.21	< 0.16	< 0.12	< 0.24	< 0.3	< 0.62	< 0.17	0.35	0.39
Acenaphthene	83-32-9	4,700	190,000	< 0.036	0.0171 J	2.7	< 0.0081	0.19	< 0.022	< 0.016	< 0.019	< 0.024	2.8	< 0.0074	0.29	1.1
Acenaphthylene	208-96-8	8,000	190,000	0.0231 J	< 0.038	< 0.053	< 0.0074	0.06	< 0.012	< 0.0091	0.077	< 0.013	< 0.027	< 0.0068	0.21	0.26
Acetophenone	98-86-2	1,200	10,000	< 0.18	< 0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.0430	< 0.038	1.1	< 0.0097	0.47	< 0.015	< 0.012	0.086	0.095	1.6	< 0.0089	0.49	0.88
Benz(a)anthracene	56-55-3	430	190,000	0.185	< 0.038	< 0.049	< 0.0068	1.3	< 0.025	< 0.019	0.083	0.23	2.7	0.084	1.4	1.7
Benzaldehyde	100-52-7	- -	- -	< 0.18	< 0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.154	< 0.038	< 0.058	0.38	1.4	< 0.027	0.25	0.083	0.19	2.9	0.11	1.4	1.2
Benzo(b)fluoranthene	205-99-2	170	190,000	0.22	< 0.038	< 0.097	< 0.014	2.2	< 0.031	< 0.023	0.14	0.26	3.9	0.12	1.8	1.5
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.0744	< 0.038	< 0.05	< 0.007	0.95	< 0.022	< 0.017	0.097	0.13	2.1	0.069	0.59	0.69
Benzo(k)fluoranthene	207-08-9	610	190,000	0.0826	< 0.038	< 0.12	< 0.017	0.57	< 0.028	< 0.021	< 0.015	0.068	1.5	< 0.016	0.42	0.33
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.073	< 0.075	< 0.22	< 0.031	0.18	< 0.016	< 0.012	0.068	0.12	< 0.1	< 0.029	0.16	0.25
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.073	< 0.075	< 0.095	< 0.013	< 0.016	< 0.025	< 0.019	< 0.018	< 0.023	< 0.047	< 0.012	< 0.025	< 0.027

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-49R 3-5 4/19/19	PCSB-49R 10-12 4/19/19	PCSB-50 4 8/3/05	PCSB-50 12.5 8/3/05	PCSB-52 5.5 8/2/05	PCSB-52 15.5 8/2/05	PCSB-53 16.5 8/1/05	PCSB-54 4.5 8/3/05	PCSB-54 11.5 8/3/05	PCSB-55 3.5 8/3/05	PCSB-55 11 8/3/05	PCSB-56 6.5 8/15/05	PCSB-57 5.5 8/15/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	0.0121 J	< 0.075	< 0.067	< 0.0094	0.14	< 0.021	< 0.016	< 0.014	< 0.017	< 0.034	< 0.0086	< 0.019	< 0.02
Chrysene	218-01-9	230	190,000	0.14	< 0.038	< 0.1	< 0.014	1.6	< 0.011	< 0.0085	0.086	0.23	2.9	0.088	1.4	1.6
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.0255 J	< 0.038	< 0.064	< 0.009	0.37	< 0.031	< 0.023	< 0.016	< 0.02	0.69	< 0.0082	0.24	0.21
Dibenzofuran	132-64-9	310	190,000	< 0.073	0.0229 J	< 0.45	< 0.063	0.2	< 0.11	< 0.079	< 0.058	< 0.073	1.5	< 0.058	0.19	0.21
Diethyl phthalate	84-66-2	9,300	10,000	< 0.073	< 0.075	< 0.083	< 0.012	< 0.011	< 0.014	< 0.011	< 0.013	< 0.016	< 0.032	< 0.011	0.064	< 0.019
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.073	< 0.075	< 0.071	< 0.0099	0.041 B	0.079 B	< 0.01	0.11 B	0.16 B	< 0.026	0.064 B	0.13 B	0.13 B
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.073	< 0.075	< 0.12	< 0.017	< 0.0095	< 0.014	< 0.011	< 0.011	< 0.014	< 0.027	< 0.015	< 0.015	< 0.016
Fluoranthene	206-44-0	3,200	190,000	0.435	< 0.038	0.41	< 0.0081	2.5	< 0.022	< 0.017	0.074	0.41	4.6	0.15	1.9	1.7
Fluorene	86-73-7	3,800	190,000	< 0.036	0.0392	3	< 0.012	0.19	< 0.013	< 0.0097	< 0.012	< 0.015	3.3	< 0.011	0.46	0.89
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.0847	< 0.038	< 0.059	< 0.0083	0.84	< 0.044	< 0.033	0.08	0.12	2	0.047	0.51	0.51
Naphthalene	91-20-3	25	190,000	< 0.036	0.0158 J	< 0.034	< 0.0048	0.29	< 0.012	< 0.0087	< 0.011	0.073	2.6	< 0.0044	1.5	1.2
Pentachlorophenol	87-86-5	5	190,000	< 0.15	< 0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	0.183	0.0990	6.8	< 0.011	1.4	< 0.014	< 0.011	0.085	0.3	6.8	0.054	0.86	2.3
Phenol	108-95-2	200	18,000	< 0.073	< 0.075	< 0.58	< 0.081	< 0.061	< 0.06	< 0.045	< 0.07	< 0.088	< 0.18	< 0.074	< 0.096	< 0.1
Pyrene	129-00-0	2,200	190,000	0.343	0.0187 J	0.81	< 0.011	2	< 0.01	< 0.0078	0.079	0.47	4.5	0.15	4.1	4.5
Total PAHs and 2-Methylnaphthalene	-	- -	- -	1.99	0.223	28.8	0.38	16.5	< 0.062	0.25	0.97	2.58	47.4	0.872	18.5	21.2
Metals																
Aluminum	7429-90-5	- -	190,000	7,940	4,490	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.1 J	< 2.3 J	< 2.1	< 2.9	< 2.4	< 3.6	< 2.7	< 2.7	20	< 2.3	< 2.7	< 3.8	< 4.1
Arsenic	7440-38-2	29	190,000	6.3	2.8	< 2.1	3.4	7.5	< 3.6	< 2.7	5.3	11	7	3.9	***36***	***42***
Barium	7440-39-3	8,200	190,000	29.5	37.7	18	160	160	110	110	150	110	95	150	250	300
Beryllium	7440-41-7	320	190,000	0.51	0.27	< 0.63	< 0.88	1.1	< 1.1	< 0.82	< 0.82	< 1	< 0.7	< 0.81	1.5	1.3
Cadmium	7440-43-9	38	190,000	< 0.54	< 0.56	< 0.63	< 0.88	1.8	< 1.1	< 0.82	< 0.82	< 1	< 0.7	< 0.81	4.4	1.7
Calcium	7440-70-2	- -	- -	408 J	257 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	14.8	8.5	18	43	63	35	20	49	23	16	39	130	210
Cobalt	7440-48-4	160	190,000	5.8	4.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	11.9	8.8	17	15	170	76	10	120	3,700	120	18	120	160
Cyanide	57-12-5	2000	190,000	0.22 J	< 0.32 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	18,200	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	19.0 J	72.4 J	25	18	130	18	15	140	***2,200***	160	250	220	270
Magnesium	7439-95-4	- -	- -	1,850 J	1,050 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	173 J	88.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.11 J	0.19 J	< 0.088	< 0.12	0.21	< 0.15	< 0.11	0.4	< 0.14	< 0.097	< 0.11	0.89	0.95
Nickel	7440-02-0	650	190,000	12.6	10.3	6.8	28	32	25	19	19	35	15	26	51	49
Potassium	7440-09-7	- -	- -	853 J	595 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 2.1	< 2.3	< 1.9	< 2.6	2.6	< 3.3	< 2.5	< 2.5	< 3.1	< 2.1	< 2.4	6.9	7
Silver	7440-22-4	84	190,000	< 0.54	0.19 J	< 2.6	< 3.7	< 3	< 4.5	< 3.4	< 3.4	< 4.3	< 2.9	< 3.4	< 4.7	< 5.1
Sodium	7440-23-5	- -	- -	< 1,100	< 1,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.1	< 1.1	< 1.3	< 1.8	< 1.4	< 2.2	< 1.6	< 1.6	< 2.1	< 1.4	< 1.6	< 2.3	< 2.4
Vanadium	7440-62-2	820	190,000	19.4	10.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	41.3	61.7	37	68	370	130	37	90	960	650	77	850	850

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-58 11 8/15/05	PCSB-59 5.5 8/15/05	PCSB-59 10.5 8/15/05	PCSB-60 4 8/15/05	PCSB-60 11 8/15/05	PCTP-03 11.5 2/15/05	PCTP-04 12 2/15/05	PCTP-05 11.5 2/15/05	PCTP-06 16 2/16/05	PCTP-07 12 2/17/05	PCTP-07 14 2/17/05	PCTP-07R 10-12 9/20/19	PCTP-08 10.5 2/15/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0012	< 0.00089	0.077	< 0.0009	< 0.0011	< 0.0025	< 0.0026	< 0.0031	< 0.0034	< 0.001	< 0.0017	< 1.8	< 0.0068
Acetone	67-64-1	10,000	10,000	0.1	0.036	0.35	0.036	0.054	0.017	< 0.0018	0.023	0.027	< 0.0048	0.074	< 1.8	0.056
Benzene	71-43-2	0.5	330	< 0.00076	< 0.00058	< 0.0013	< 0.00059	< 0.00074	< 0.00016	< 0.00017	< 0.00019	< 0.00021	< 0.00034	< 0.00055	< 0.091	< 0.00043
Carbon Disulfide	75-15-0	620	10,000	< 0.00097	< 0.00074	< 0.0016	< 0.00075	< 0.00094	< 0.0003	< 0.0003	< 0.00036	< 0.00039	< 0.00071	< 0.0011	< 0.37	< 0.00079
Chlorobenzene	108-90-7	10	4,600	< 0.00075	< 0.00057	< 0.0013	< 0.00058	< 0.00073	< 0.00039	< 0.0004	< 0.00047	< 0.00051	< 0.00027	< 0.00044	< 0.37	< 0.001
Chloroform	67-66-3	8	110	< 0.00068	< 0.00052	< 0.0011	< 0.00052	< 0.00066	0.0014	0.0013	0.0015	0.0014	< 0.00035	< 0.00057	< 0.37	0.0042
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00071	< 0.00054	< 0.0012	< 0.00055	< 0.00069	< 0.00026	< 0.00027	< 0.00032	< 0.00035	< 0.0005	< 0.0008	< 0.18	< 0.0007
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.37	NA
Dichloromethane	75-09-2	0.5	10,000	0.03 B	0.024 B	0.058 B	0.019 B	0.026 B	0.02 B	0.023 B	0.022 B	0.02 B	0.012 B	0.02 B	< 0.91	0.05 B
Ethylbenzene	100-41-4	70	1,000	< 0.0011	< 0.00085	< 0.0019	< 0.00086	< 0.0011	< 0.00058	< 0.0006	< 0.0007	< 0.00077	< 0.00094	< 0.0015	< 0.18	< 0.0016
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.37	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0016	< 0.0013	< 0.0028	< 0.0013	< 0.0016	< 0.00063	< 0.00065	< 0.00076	< 0.00084	< 0.0011	< 0.0018	< 0.18	< 0.0017
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.91	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.37	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.18	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.0007	< 0.00053	< 0.0012	< 0.00054	< 0.00068	< 0.00021	< 0.00021	< 0.00025	< 0.00027	< 0.00024	< 0.00039	NA	< 0.00055
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.18	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00093	< 0.0007	< 0.0016	< 0.00071	< 0.0009	< 0.00015	< 0.00016	< 0.00018	< 0.0002	< 0.00021	< 0.00034	< 0.37	< 0.00041
Toluene	108-88-3	100	10,000	< 0.0011	< 0.00086	< 0.0019	< 0.00087	< 0.0011	< 0.00029	< 0.0003	< 0.00035	< 0.00038	< 0.00025	< 0.00041	< 0.18	< 0.00077
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00048	< 0.00036	< 0.0008	< 0.00037	< 0.00046	< 0.00043	< 0.00044	< 0.00051	< 0.00056	< 0.00072	< 0.0012	< 0.18	< 0.0011
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.37	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.18	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.45	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.042	< 0.052	< 0.12	< 0.053	< 0.067	< 0.17	< 0.11	< 0.2	< 0.67	< 0.032	< 0.12	< 1.1	< 0.45
2-Methylnaphthalene	91-57-6	1,900	190,000	< 0.085	0.37	< 0.11	0.58	0.059 J	< 0.061	< 0.053	< 0.074	0.22 J	0.83	2.7	< 0.22	< 0.16
2-Methylphenol	95-48-7	580	190,000	< 0.19	< 0.18	< 0.4	< 0.18	< 0.23	< 0.1	< 0.093	< 0.12	< 0.41	< 0.13	< 0.49	< 0.45	< 0.27
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.45	NA
4-Methylphenol	106-44-5	58	190,000	< 0.18	< 0.2	< 0.44	< 0.2	< 0.26	< 0.11	< 0.091	< 0.13	< 0.43	< 0.17	0.38 J	NA	0.67
Acenaphthene	83-32-9	4,700	190,000	< 0.0082	0.38	< 0.035	0.4	0.063	0.051	< 0.011	0.053	0.88	1.4	0.98	1.65	< 0.02
Acenaphthylene	208-96-8	8,000	190,000	< 0.0075	0.28	< 0.019	0.15	< 0.011	< 0.01	< 0.0095	0.13	0.29	0.61	1.2	< 0.22	< 0.028
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.1	NA
Anthracene	120-12-7	350	190,000	< 0.0098	1.1	0.13	0.46	0.073	0.083	< 0.0073	0.22	1.9	0.99	2.3	0.615	0.096
Benz(a)anthracene	56-55-3	430	190,000	< 0.0069	2	0.25	1.3	0.13	0.33	< 0.009	0.76	5.8	2	5.7	0.467	0.47
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.1	NA
Benzo(a)pyrene	50-32-8	46	190,000	< 0.0083	1.8	0.2	1.3	0.14	0.33	< 0.0089	0.61	5.1	1.9	8	0.305	0.17
Benzo(b)fluoranthene	205-99-2	170	190,000	< 0.014	2.7	0.31	2.1	0.18	0.38	< 0.0084	0.85	6	2.9	8.2	0.44	0.33
Benzo(g,h,i)perylene	191-24-2	180	190,000	< 0.0071	0.98	< 0.016	0.65	0.068	0.18	< 0.008	0.34	2	1.6	7.5	0.188 J	0.12
Benzo(k)fluoranthene	207-08-9	610	190,000	< 0.017	1.1	0.11	0.53	0.072	0.13	< 0.009	0.34	2.3	1.3	2	0.127 J	0.18
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.032	1.3	0.18	0.54	0.11	0.088	< 0.0096	0.068 J	< 0.24	0.084	< 0.099	< 0.45	< 0.16
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.013	< 0.015	< 0.033	< 0.015	< 0.019	< 0.0078	< 0.008	< 0.0094	< 0.031	< 0.014	< 0.051	< 0.45	< 0.021

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-58 11 8/15/05	PCSB-59 5.5 8/15/05	PCSB-59 10.5 8/15/05	PCSB-60 4 8/15/05	PCSB-60 11 8/15/05	PCTP-03 11.5 2/15/05	PCTP-04 12 2/15/05	PCTP-05 11.5 2/15/05	PCTP-06 16 2/16/05	PCTP-07 12 2/17/05	PCTP-07 14 2/17/05	PCTP-07R 10-12 9/20/19	PCTP-08 10.5 2/15/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	< 0.0096	0.51	< 0.025	0.12	< 0.014	0.038	< 0.0052	0.092	0.49	< 0.011	0.45	< 0.45	< 0.023
Chrysene	218-01-9	230	190,000	< 0.014	2.1	0.23	1.3	0.17	0.3	< 0.0079	0.65	5.6	2.4	6.8	0.445	0.45
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.0091	0.43	< 0.029	0.27	< 0.017	0.071	< 0.011	0.12	0.91	0.67	1.8	< 0.22	< 0.016
Dibenzofuran	132-64-9	310	190,000	< 0.064	0.56	< 0.11	0.28	< 0.061	< 0.038	< 0.053	0.053	0.32	< 0.11	0.51	0.444 J	< 0.1
Diethyl phthalate	84-66-2	9,300	10,000	< 0.012	< 0.01	< 0.023	0.13	0.05	< 0.0056	< 0.0097	< 0.0068	< 0.022	< 0.014	< 0.053	< 0.45	< 0.015
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.01	0.047 B	0.1 B	0.059 B	< 0.011	< 0.0044	< 0.0064	< 0.0053	< 0.017	< 0.013	< 0.048	< 0.45	0.16
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.017	< 0.0089	< 0.02	< 0.009	< 0.011	< 0.0072	< 0.0062	< 0.0086	< 0.028	< 0.013	< 0.048	< 0.45	< 0.019
Fluoranthene	206-44-0	3,200	190,000	0.11	3.7	0.49	2.5	0.28	0.58	< 0.0087	1.5	11	3.7	6.4	1.2	0.39
Fluorene	86-73-7	3,800	190,000	< 0.012	0.9	< 0.021	0.49	0.081	< 0.0066	< 0.0095	0.089	0.74	1.5	1.3	< 0.22	< 0.018
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	< 0.0084	0.92	< 0.011	0.59	0.06	0.18	< 0.0061	0.34	2.1	1.4	6.1	0.317	0.19
Naphthalene	91-20-3	25	190,000	< 0.0048	0.39	< 0.02	0.33	0.14	< 0.011	< 0.0066	0.06	0.3	1.2	6.5	0.204 J	0.14
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.89 J	NA
Phenanthrene	85-01-8	10,000	190,000	0.12	4.3	0.44	1.4	0.19	0.32	< 0.0063	0.8	8.1	1.7	4.4	0.542	0.32
Phenol	108-95-2	200	18,000	< 0.082	< 0.058	< 0.13	< 0.058	< 0.074	< 0.099	< 0.044	< 0.12	< 0.39	< 0.032	< 0.12	< 0.45	< 0.26
Pyrene	129-00-0	2,200	190,000	0.088	5.8	0.75	2.7	0.52	0.51	< 0.0077	1.2	12	3.4	11	1.5	0.5
Total PAHs and 2-Methylnaphthalene	-	- -	- -	0.318	29.3	2.91	17.1	2.23	3.45	< 0.053	8.06	65.2	29.5	82.9	8.00	3.36
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,740	NA
Antimony	7440-36-0	27	190,000	< 3	3.6	< 5	< 2.3	3.4	< 2.1	< 2.2	< 2.6	< 2.8	< 2.8	6.6	< 2.8	< 5.7
Arsenic	7440-38-2	29	190,000	3.5	***44***	7.8	16	***35***	< 2.1	< 2.2	9.9	14	6.2	***63***	12.2	11
Barium	7440-39-3	8,200	190,000	150	290	180	100	130	35	< 11	75	200	58	330	53.7	110
Beryllium	7440-41-7	320	190,000	< 0.9	< 0.68	< 1.5	< 0.69	< 0.87	< 0.64	< 0.66	< 0.77	1.5	< 0.83	2.3	0.46	< 1.7
Cadmium	7440-43-9	38	190,000	< 0.9	1.6	< 1.5	< 0.69	< 0.87	< 0.64	< 0.66	< 0.77	1.4	< 0.83	2.4	< 0.70	< 1.7
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,770	NA
Chromium	7440-47-3	190,000	190,000	44	36	44	21	96	< 5.3	< 5.5	15	15	11	330	4.7	< 14
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 7.0	NA
Copper	7440-50-8	43,000	190,000	16	150	29	58	200	8.3	< 5.5	21	82	59	200	20.4	42
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	< 0.27	< 0.27	0.43	< 0.29	NA	NA	< 0.36	< 0.71
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23,900	NA
Lead	7439-92-1	450	190,000	37	***2,000***	67	410	370	12	< 5.5	79	***470***	160	410	19.7	55
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 700	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	387	NA
Mercury	7439-97-6	10	190,000	< 0.12	1	< 0.21	0.13	0.25	< 0.089	< 0.092	0.46	0.37	0.22	1.2	2.5	< 0.24
Nickel	7440-02-0	650	190,000	27	28	31	22	23	< 5.3	< 5.5	14	27	8.9	47	8.4	< 14
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1,400	NA
Selenium	7782-49-2	26	190,000	3.5	3.1	4.8	2.2	4.4	< 1.9	< 2	2.8	2.8	3.7	6.3	< 2.8	< 5.1
Silver	7440-22-4	84	190,000	< 3.7	< 2.8	< 6.2	< 2.9	< 3.6	< 2.7	< 2.7	< 3.2	< 3.5	< 3.5	< 4.2	< 0.70	< 7.1
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1,400	NA
Thallium	7440-28-0	14	190,000	< 1.8	< 1.4	< 3	< 1.4	< 1.7	< 1.3	< 1.3	< 1.5	< 1.7	< 1.7	< 2	< 1.4	< 3.4
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.9	NA
Zinc	7440-66-6	12,000	190,000	82	2,600	110	610	440	37	15	64	340	170	1,000	82.2	91

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-08R 10-12 4/9/19	PCTP-09 7 2/9/05	PCTP-10 8 2/9/05	PCTP-10R 7-9 4/9/19	PCTP-11 4 2/9/05	PCTP-12R 9-11 4/12/19	PCTP-13 8 2/10/05	PCTP-15 3.5 3/3/05	PCTP-17 8 2/10/05	PCTP-17R 7-9 4/15/19	PCTP-17R 9-11 4/15/19
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	< 0.015	< 0.0031	< 0.0035	< 0.015	< 0.0028	< 0.012	< 0.0062	< 0.00094	< 23	0.0033 J	0.0157 J
Acetone	67-64-1	10,000	10,000	0.0987	0.12	0.071	0.0647	0.073	0.0726	0.045	< 0.0043	< 5.2	0.0407	0.119
Benzene	71-43-2	0.5	330	< 0.00073	0.049	< 0.00022	< 0.00076	< 0.00018	0.0039	0.0027	< 0.00031	***4.7***	< 0.00043	0.0019
Carbon Disulfide	75-15-0	620	10,000	0.0014 J	< 0.00036	< 0.00041	< 0.0031	< 0.00032	< 0.0024	< 0.00072	< 0.00064	< 0.99	< 0.0017	0.0048
Chlorobenzene	108-90-7	10	4,600	< 0.0029	< 0.00047	< 0.00054	< 0.0031	< 0.00042	< 0.0024	< 0.00095	< 0.00025	< 1	< 0.0017	< 0.0038
Chloroform	67-66-3	8	110	< 0.0029	< 0.001	< 0.0012	< 0.0031	< 0.00093	< 0.0024	< 0.0021	0.0021	< 2.2	< 0.0017	< 0.0038
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0015	< 0.00032	< 0.00036	< 0.0015	< 0.00029	< 0.0012	< 0.00064	< 0.00045	< 1.4	< 0.00085	< 0.0019
Cyclohexane	110-82-7	6,900	10,000	< 0.0029	NA	NA	< 0.0031	NA	< 0.0024	NA	NA	NA	< 0.0017	< 0.0038
Dichloromethane	75-09-2	0.5	10,000	< 0.0073	0.023 B	0.026 B	< 0.0076	0.022 B	< 0.0060	0.019 B	0.029 B	< 2	< 0.0043	< 0.0095
Ethylbenzene	100-41-4	70	1,000	< 0.0015	0.002	< 0.0008	< 0.0015	< 0.00063	< 0.0012	< 0.0014	< 0.00084	2.1	< 0.00085	< 0.0019
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0029	NA	NA	< 0.0031	NA	< 0.0024	NA	NA	NA	< 0.0017	< 0.0038
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0015	0.0018	< 0.00088	< 0.0015	< 0.00069	< 0.0012	< 0.0015	< 0.001	52	< 0.00085	< 0.0019
Methyl Acetate	79-20-9	10,000	10,000	< 0.0073	NA	NA	< 0.0076	NA	< 0.0060	NA	NA	NA	< 0.0043	< 0.0095
Methylcyclohexane	108-87-2	- -	- -	< 0.0029	NA	NA	< 0.0031	NA	< 0.0024	NA	NA	NA	< 0.0017	0.0013 J
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0015	NA	NA	< 0.0015	NA	< 0.0012	NA	NA	NA	< 0.00085	< 0.0019
o,p-Xylene	136777-61-2	- -	- -	NA	< 0.00025	< 0.00029	NA	< 0.00023	NA	< 0.0005	< 0.00022	14	NA	NA
o-Xylene	95-47-6	- -	- -	< 0.0015	NA	NA	< 0.0015	NA	< 0.0012	NA	NA	NA	< 0.00085	< 0.0019
Styrene (Monomer)	100-42-5	24	10,000	< 0.0029	< 0.00019	< 0.00021	< 0.0031	< 0.00017	< 0.0024	< 0.00037	< 0.00019	4.5	< 0.0017	< 0.0038
Toluene	108-88-3	100	10,000	< 0.0015	0.0038	< 0.0004	< 0.0015	< 0.00031	< 0.0012	< 0.0007	< 0.00023	21	< 0.00085	< 0.0019
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0015	< 0.00052	< 0.00059	< 0.0015	< 0.00047	< 0.0012	< 0.001	< 0.00065	< 1.7	< 0.00085	< 0.0019
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0029	NA	NA	< 0.0031	NA	< 0.0024	NA	NA	NA	< 0.0017	< 0.0038
Total Xylenes	1330-20-7	1,000	9,100	< 0.0015	NA	NA	< 0.0015	NA	< 0.0012	NA	NA	NA	< 0.00085	< 0.0019
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	< 0.087	NA	NA	0.0160 J	NA	0.0145 J	NA	NA	NA	0.0054 J	0.0617 J
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.22	< 0.21	< 1.2	< 0.2	< 0.18	< 0.21	0.47	< 0.029	< 1,000	< 0.18	0.145 J
2-Methylnaphthalene	91-57-6	1,900	190,000	0.0195 J	0.39	2.8	0.0480	0.042 J	0.0581	0.097	0.068 J	***6,100***	0.0145 J	0.205
2-Methylphenol	95-48-7	580	190,000	< 0.087	< 0.12	< 0.71	< 0.081	< 0.11	0.0556 J	1	0.047 J	< 630	< 0.072	0.215
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.087	NA	NA	< 0.081	NA	0.0977	NA	NA	NA	< 0.072	0.664
4-Methylphenol	106-44-5	58	190,000	NA	< 0.13	< 0.75	NA	< 0.12	NA	2.2	0.12 J	< 670	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.0248 J	0.8	6.2	0.234	< 0.0079	0.179	1.1	0.28	1,100	< 0.036	0.239
Acenaphthylene	208-96-8	8,000	190,000	< 0.044	0.27	0.71	0.0320 J	0.1	0.0648	0.23	0.075	3,600	< 0.036	0.102
Acetophenone	98-86-2	1,200	10,000	< 0.22	NA	NA	< 0.2	NA	< 0.21	NA	NA	NA	< 0.18	< 0.28
Anthracene	120-12-7	350	190,000	< 0.044	0.9	12	0.507	0.097	0.125	0.18	0.59	***6,900***	< 0.036	0.721
Benz(a)anthracene	56-55-3	430	190,000	0.0654	2.1	16	0.915	0.38	0.375	0.75	1.2	***5,500***	0.0264 J	0.409
Benzaldehyde	100-52-7	- -	- -	< 0.22	NA	NA	0.0230 J	NA	< 0.21	NA	NA	NA	< 0.18	0.0556 J
Benzo(a)pyrene	50-32-8	46	190,000	0.0633	1.6	13	0.836	0.37	0.338	0.86	1.1	***3,800***	0.0280 J	0.449
Benzo(b)fluoranthene	205-99-2	170	190,000	0.0731	2.8	17	0.934	0.43	0.426	1.1	1.8	***4,600***	0.0341 J	0.505
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.0395 J	0.96	5.9	0.324	0.26	0.187	0.47	0.74	***1,500***	0.0203 J	0.289
Benzo(k)fluoranthene	207-08-9	610	190,000	0.0313 J	0.79	5.7	0.396	0.16	0.154	0.4	0.46	***1,700***	< 0.036	0.206
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.087	< 0.074	< 0.42	< 0.081	< 0.066	< 0.085	< 0.092	0.37 B	< 380	< 0.072	< 0.11
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.087	< 0.0095	< 0.054	< 0.081	< 0.0085	< 0.085	< 0.012	< 0.012	< 49	< 0.072	< 0.11

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
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Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-08R 10-12 4/9/19	PCTP-09 7 2/9/05	PCTP-10 8 2/9/05	PCTP-10R 7-9 4/9/19	PCTP-11 4 2/9/05	PCTP-12R 9-11 4/12/19	PCTP-13 8 2/10/05	PCTP-15 3.5 3/3/05	PCTP-17 8 2/10/05	PCTP-17R 7-9 4/15/19	PCTP-17R 9-11 4/15/19
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	0.0103 J	0.38	3.8	0.155	< 0.0092	0.0272 J	0.097	0.33	***3,100***	0.0079 J	0.113
Chrysene	218-01-9	230	190,000	0.0839	2.6	15	1.06	0.49	0.335	0.76	1.3	***5,500***	0.0276 J	0.527
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.044	0.41	2.1	0.122	0.092	0.0480	0.14	0.21	***610***	< 0.036	0.0677
Dibenzofuran	132-64-9	310	190,000	< 0.087	0.1	4	0.0947	< 0.042	0.0439 J	< 0.058	0.14	***5,300***	< 0.072	0.158
Diethyl phthalate	84-66-2	9,300	10,000	< 0.087	< 0.0069	< 0.039	< 0.081	< 0.0062	< 0.085	< 0.0085	< 0.013	< 35	< 0.072	< 0.11
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.087	< 0.0053	< 0.03	< 0.081	< 0.0048	< 0.085	0.063	0.097	< 27	< 0.072	< 0.11
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.087	< 0.0087	< 0.049	< 0.081	< 0.0078	< 0.085	< 0.011	< 0.012	< 44	< 0.072	< 0.11
Fluoranthene	206-44-0	3,200	190,000	0.0853	5.3	39	1.69	0.67	0.814	1.4	2.9	***15,000***	0.0362	0.767
Fluorene	86-73-7	3,800	190,000	< 0.044	0.55	8.1	0.187	< 0.0072	0.0886	0.11	0.33	***8,200***	< 0.036	0.19
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.0312 J	0.99	5.5	0.325	0.23	0.228	0.46	0.67	1,600	< 0.036	0.247
Naphthalene	91-20-3	25	190,000	0.0280 J	4.5	3.5	0.0782	0.11	1.2	0.92	0.44	***31,000***	0.0380	0.652
Pentachlorophenol	87-86-5	5	190,000	< 0.17	NA	NA	< 0.16	NA	< 0.17	NA	NA	NA	< 0.14	< 0.23
Phenanthrene	85-01-8	10,000	190,000	0.0934	2.4	41	1.97	0.33	0.369	0.42	2.1	***24,000***	0.0630	1.01
Phenol	108-95-2	200	18,000	< 0.087	< 0.12	< 0.68	< 0.081	< 0.11	0.0630 J	2.6	0.11	< 610	< 0.072	0.54
Pyrene	129-00-0	2,200	190,000	0.132	4.9	33	1.81	0.91	0.684	1.2	3.2	***11,000***	0.0302 J	0.807
Total PAHs and 2-Methylnaphthalene	-	- -	- -	0.771	32.3	227	11.5	4.67	5.67	10.6	17.5	132,000	0.318	7.39
Metals														
Aluminum	7429-90-5	- -	190,000	7,790 J	NA	NA	6,490 J	NA	5,520	NA	NA	NA	17,400 J	12,100 J
Antimony	7440-36-0	27	190,000	0.89 J	***92***	3.7	1.6 J	< 2.3	< 2.5	< 3.2	27	5	< 4.5	< 3.6
Arsenic	7440-38-2	29	190,000	7.7	***51***	16	9.0	8.5	9.0	***44***	16	15	2.9 J	7.5
Barium	7440-39-3	8,200	190,000	114	930	470	489	130	45.5	60	90	51	120	62.4
Beryllium	7440-41-7	320	190,000	0.65	< 0.78	1.3	0.46	1.2	0.34	< 0.97	< 0.75	1.4	0.80	0.71
Cadmium	7440-43-9	38	190,000	0.74	6.4	3.3	5.9	< 0.7	< 0.63	< 0.97	< 0.75	6.2	< 0.56	0.18 J
Calcium	7440-70-2	- -	- -	8,290	NA	NA	9,700	NA	2,180	NA	NA	NA	1,950 J	1,250 J
Chromium	7440-47-3	190,000	190,000	14.9	37	98	21.0	15	36.8	< 8.1	120	69	27.3 J	22.2 J
Cobalt	7440-48-4	160	190,000	5.5 J	NA	NA	5.8 J	NA	< 6.3	NA	NA	NA	11.7	9.2
Copper	7440-50-8	43,000	190,000	78.3	560	210	82.5	52	16.3	55	270	400	16.6	27.9
Cyanide	57-12-5	2000	190,000	0.22 J	NA	NA	< 0.28	NA	< 0.30	0.82	20	***670***	0.58 J	9.5 J
Iron	7439-89-6	- -	190,000	20,700 J	NA	NA	20,300 J	NA	14,800	NA	NA	NA	23,600 J	23,000 J
Lead	7439-92-1	450	190,000	193	***6,500***	***700***	***2,530***	370	42.3	160	100	***480***	9.1 J	40.9 J
Magnesium	7439-95-4	- -	- -	2,950	NA	NA	6,720	NA	1,830	NA	NA	NA	10,600	3,190
Manganese	7439-96-5	2,000	190,000	118 J	NA	NA	181 J	NA	237	NA	NA	NA	427 J	374 J
Mercury	7439-97-6	10	190,000	0.23	4.2	0.67	0.18	< 0.097	0.11	0.38	0.65	5	0.038 J	3.0 J
Nickel	7440-02-0	650	190,000	14.3	49	23	12.9	17	11.3	20	33	26	25.4	17.2
Potassium	7440-09-7	- -	- -	886 J	NA	NA	715 J	NA	< 1,300	NA	NA	NA	9,760	1,320 J
Selenium	7782-49-2	26	190,000	0.95 J	4.6	4.6	0.89 J	3.6	< 2.5	4.4	3.3	8.4	< 4.5	< 3.6
Silver	7440-22-4	84	190,000	0.34 J	< 3.2	< 3.7	0.44 J	< 2.9	< 0.63	< 4	< 3.1	< 4.7	0.61 J	< 0.89
Sodium	7440-23-5	- -	- -	108 J	NA	NA	< 1,200	NA	< 1,300	NA	NA	NA	272 J	409 J
Thallium	7440-28-0	14	190,000	< 1.3	4.3	< 1.8	< 1.2	< 1.4	< 1.3	< 1.9	< 1.5	3.5	< 2.2	< 1.8
Vanadium	7440-62-2	820	190,000	21.2	NA	NA	15.4	NA	10.9	NA	NA	NA	33.2 J	26.2 J
Zinc	7440-66-6	12,000	190,000	312	4,900	1,700	487	160	120	260	130	1,500	73.8	111

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-17R (cont'd) 18-20 4/15/19	PCTP-17R (cont'd) 24-25 4/15/19	PCTP-19 6 2/18/05	PCTP-19 11 2/18/05	PCTP-20 20 3/2/05	PCTP-21 4 2/11/05	PCTP-214 7.5 3/3/05	PCTP-22 4.5 3/2/05	PCTP-23 7 3/2/05	PCTP-23 10 3/2/05	PCTP-236 7 2/18/05	PCTP-24 19.5 2/11/05	PCTP-25 5 2/18/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 2.7	0.117	< 0.0015	< 0.0016	< 0.0012	< 0.037	< 0.0013	< 0.0014	< 0.0043	< 0.0011	< 0.0016	< 0.037	< 0.00094
Acetone	67-64-1	10,000	10,000	< 2.7	0.495	< 0.0068	< 0.0072	< 0.0056	< 0.037	< 0.0061	< 0.0062	< 0.02	< 0.0051	< 0.0071	< 0.037	0.023
Benzene	71-43-2	0.5	330	< 0.14	< 0.0015	< 0.00049	0.0048	< 0.0004	0.016	< 0.00044	< 0.00044	0.0095	0.021	< 0.00051	0.0076	< 0.00031
Carbon Disulfide	75-15-0	620	10,000	7.25	0.0050 J	< 0.001	0.056	< 0.00084	< 0.0074	< 0.00091	< 0.00093	< 0.0029	0.0085	< 0.0011	< 0.0074	< 0.00064
Chlorobenzene	108-90-7	10	4,600	< 0.55	< 0.0059	< 0.00039	< 0.00042	< 0.00032	< 0.0074	< 0.00035	< 0.00036	< 0.0011	< 0.00029	< 0.00041	< 0.0074	< 0.00025
Chloroform	67-66-3	8	110	< 0.55	< 0.0059	< 0.00051	< 0.00054	0.0029	< 0.0074	0.0034	0.0031	0.0097	0.0024	< 0.00053	< 0.0074	< 0.00032
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.27	< 0.0030	< 0.00071	< 0.00075	< 0.00059	< 0.0074	< 0.00064	< 0.00065	< 0.0021	< 0.00053	< 0.00074	< 0.0074	< 0.00045
Cyclohexane	110-82-7	6,900	10,000	< 0.55	< 0.0059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	< 1.4	< 0.015	0.016 B	0.016 B	0.0094 B	0.014 B	0.023 B	0.063 B	0.24 B	0.009 B	0.021 B	0.012 B	0.013 B
Ethylbenzene	100-41-4	70	1,000	< 0.27	< 0.0030	< 0.0013	< 0.0014	< 0.0011	< 0.0015	< 0.0012	< 0.0012	0.18	< 0.001	< 0.0014	0.011	< 0.00084
Isopropylbenzene	98-82-8	2,500	10,000	0.353 J	< 0.0059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.248 J	< 0.0030	< 0.0016	< 0.0017	< 0.0013	< 0.0029	< 0.0014	< 0.0015	0.25	< 0.0012	< 0.0017	0.026	< 0.001
Methyl Acetate	79-20-9	10,000	10,000	2.9	< 0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	1.21	0.0053 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.27	< 0.0030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	< 0.00035	< 0.00037	< 0.00029	< 0.0015	< 0.00031	< 0.00032	0.37	< 0.00026	< 0.00036	0.019	< 0.00022
o-Xylene	95-47-6	- -	- -	0.173 J	< 0.0030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.55	< 0.0059	< 0.00031	< 0.00032	< 0.00025	< 0.0074	< 0.00027	< 0.00028	< 0.00088	< 0.00023	< 0.00032	< 0.0074	< 0.00019
Toluene	108-88-3	100	10,000	1.07	< 0.0030	< 0.00037	< 0.00038	< 0.0003	< 0.0015	< 0.00033	< 0.00033	0.019	0.0032	< 0.00038	0.003	< 0.00023
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.27	< 0.0030	< 0.001	< 0.0011	< 0.00085	< 0.0074	< 0.00093	< 0.00094	< 0.003	< 0.00077	< 0.0011	< 0.0074	< 0.00065
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.55	< 0.0059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	0.421	< 0.0030	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	0.0793 J	0.0170 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.3	< 0.32	< 0.031	0.33	< 0.11	0.075 J	< 1.2	< 1.7	< 1.1	< 0.035	< 0.12	< 14	< 0.087
2-Methylnaphthalene	91-57-6	1,900	190,000	0.467	0.0742	0.11	0.19	1.6	0.52	< 2.9	4.5	54	0.23	< 0.058	41	0.13 J
2-Methylphenol	95-48-7	580	190,000	< 0.12	< 0.13	< 0.13	1.2	< 0.47	0.12 J	< 4.8	< 7	< 4.4	0.16	< 0.1	< 8.5	< 0.36
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	0.319	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	< 0.16	2.8	< 0.59	0.12 J	< 6	< 8.8	< 5.6	0.42	< 0.099	< 8.9	< 0.45
Acenaphthene	83-32-9	4,700	190,000	1.76	0.105	< 0.012	0.14	6.8	0.21	< 0.45	3.3	37	1.2	< 0.012	53	< 0.033
Acenaphthylene	208-96-8	8,000	190,000	0.237	< 0.063	0.15	0.097	< 0.047	0.14	7	19	89	0.33	< 0.01	23	1.1
Acetophenone	98-86-2	1,200	10,000	< 0.3	< 0.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.919	0.0559 J	0.22	0.39	2.7	0.35	13	34	52	0.8	< 0.0081	57	1.4
Benz(a)anthracene	56-55-3	430	190,000	0.884	0.0314 J	1.4	0.76	4.3	0.63	45	58	44	1.6	0.075	67	12
Benzaldehyde	100-52-7	- -	- -	< 0.3	< 0.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.799	< 0.063	1.1	0.8	3.2	0.74	39	***54***	30	1.4	0.055	***51***	10
Benzo(b)fluoranthene	205-99-2	170	190,000	0.809	< 0.063	1.6	1	3.2	0.77	58	71	37	1.7	0.14	66	17
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.354	< 0.063	0.71	0.5	2	0.35	28	38	14	0.7	0.045	23	7.4
Benzo(k)fluoranthene	207-08-9	610	190,000	0.259	< 0.063	0.63	0.24	1.5	0.29	15	22	15	0.42	0.046	17	3.7
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.12	< 0.13	< 0.026	< 0.034	< 0.096	< 0.084	< 0.97	64	2.5	< 0.029	< 0.011	< 5	< 0.073
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.12	< 0.13	< 0.013	< 0.017	< 0.049	< 0.011	< 0.5	< 0.73	< 0.46	< 0.015	< 0.0088	< 0.65	< 0.037

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-17R (cont'd) 18-20 4/15/19	PCTP-17R (cont'd) 24-25 4/15/19	PCTP-19 6 2/18/05	PCTP-19 11 2/18/05	PCTP-20 20 3/2/05	PCTP-21 4 2/11/05	PCTP-214 7.5 3/3/05	PCTP-22 4.5 3/2/05	PCTP-23 7 3/2/05	PCTP-23 10 3/2/05	PCTP-236 7 2/18/05	PCTP-24 19.5 2/11/05	PCTP-25 5 2/18/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	0.0420 J	0.0218 J	0.05	0.072	< 0.037	0.075	2.4	16	23	0.23	< 0.0057	23	0.41
Chrysene	218-01-9	230	190,000	1.25	0.0314 J	1.4	0.95	4.5	0.67	46	54	34	1.6	0.15	53	11
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.0976	< 0.063	0.29	0.19	0.73	0.15	12	17	6.4	0.45	< 0.013	9.3	2.6
Dibenzofuran	132-64-9	310	190,000	0.197	0.0417 J	0.086 J	0.077 J	< 0.4	0.15	2.5 J	17	68	0.34	0.051 J	46	0.19 J
Diethyl phthalate	84-66-2	9,300	10,000	< 0.12	< 0.13	0.048 B	0.078 B	< 0.051	< 0.0078	< 0.52	< 0.76	< 0.48	< 0.016	0.05	< 0.47	< 0.039
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.12	< 0.13	< 0.012	< 0.016	< 0.047	< 0.006	< 0.47	35 B	< 0.43	< 0.014	< 0.007	< 0.36	< 0.035
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.12	< 0.13	< 0.012	< 0.016	< 0.047	< 0.0099	< 0.47	13	< 0.43	< 0.014	< 0.0068	< 0.59	< 0.035
Fluoranthene	206-44-0	3,200	190,000	2.19	0.0671	2.1	1.2	7.3	1	63	120	110	2.2	0.1	160	14
Fluorene	86-73-7	3,800	190,000	< 0.06	0.0762	0.067	0.19	4.5	0.27	4	29	88	0.95	< 0.01	73	0.28
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.269	< 0.063	0.63	0.43	1.7	0.34	26	46	15	0.59	0.046	24	6.6
Naphthalene	91-20-3	25	190,000	0.991	0.149	0.6	0.66	2.3	1.6	3.2	21	17	1.1	0.048	***190***	0.32
Pentachlorophenol	87-86-5	5	190,000	< 0.24	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	4.23	0.232	0.79	0.72	13	0.7	37	110	170	2.4	0.053	210	4.7
Phenol	108-95-2	200	18,000	< 0.12	< 0.13	< 0.031	3.6	< 0.11	< 0.14	< 1.2	< 1.7	< 1.1	< 0.035	< 0.048	< 8.2	< 0.087
Pyrene	129-00-0	2,200	190,000	2.39	0.0680	2.2	1.5	10	1.1	77	91	86	2.8	0.16	120	15
Total PAHs and 2-Methylnaphthalene	-	- -	- -	17.9	0.890	14.0	9.96	69.3	9.83	473	792	898	20.5	0.918	1,240	107
Metals																
Aluminum	7429-90-5	- -	190,000	14,400 J	11,800 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 3.7	< 3.7	14	< 3.4	< 3.3	< 2.9	3.4	< 3.6	3.5	< 3	< 2.4	< 2.9	2.9
Arsenic	7440-38-2	29	190,000	14.6	7.6	***140***	23	***42***	8.4	7.1	***100***	12	20	5.1	21	9.4
Barium	7440-39-3	8,200	190,000	312	41.7	420	160	260	69	720	26	36	100	180	170	140
Beryllium	7440-41-7	320	190,000	0.61	0.68	1.9	1.7	< 0.98	< 0.88	< 0.75	< 1.1	< 0.69	< 0.9	0.89	< 0.88	1.7
Cadmium	7440-43-9	38	190,000	0.87 J	< 0.92	2	1.6	1.8	< 0.88	< 0.75	< 1.1	< 0.69	< 0.9	< 0.72	0.9	0.9
Calcium	7440-70-2	- -	- -	2,910 J	1,060 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	32.5 J	18.9 J	94	140	180	31	29	11	8.2	80	8.1	85	11
Cobalt	7440-48-4	160	190,000	7.2 J	12.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	288	16.6	1,800	120	140	36	97	83	40	62	40	83	70
Cyanide	57-12-5	2000	190,000	3.0 J	1.5 J	1.5	< 0.43	1.8	NA	13	64	2.1	1.1	1.7	NA	2.2
Iron	7439-89-6	- -	190,000	27,800 J	22,600 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	***697 J***	18.3 J	***790***	220	250	59	200	73	220	130	6.3	210	430
Magnesium	7439-95-4	- -	- -	2,530	3,180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	204 J	493 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	1.3 J	0.057 J	< 0.11	2.1	0.99	0.14	2.5	0.42	0.2	0.28	< 0.1	0.84	0.13
Nickel	7440-02-0	650	190,000	22.7	18.5	93	30	32	17	16	36	7.3	24	18	22	18
Potassium	7440-09-7	- -	- -	1,170 J	1,410 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 3.7	< 3.7	3.7	5.2	4.5	< 2.6	3.8	5.8	< 2.1	2.9	4.2	3.7	2.9
Silver	7440-22-4	84	190,000	0.66 J	< 0.92	< 3.3	< 4.3	< 4.1	< 3.7	< 3.1	< 4.5	< 2.9	< 3.7	< 3	< 3.7	< 3.1
Sodium	7440-23-5	- -	- -	589 J	< 1,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.8	< 1.8	2.3	< 2.1	< 2	< 1.8	< 1.5	< 2.2	< 1.4	< 1.8	< 1.4	< 1.8	< 1.5
Vanadium	7440-62-2	820	190,000	70.6 J	24.4 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	448	57.6	690	620	730	260	150	67	50	290	< 12	390	330

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-26 12 2/18/05	PCTP-27 11 2/16/05	PCTP-28 7 2/17/05	PCTP-28R 6-8 4/11/19	PCTP-28R 11-12 4/11/19	PCTP-29 13 2/18/05	PCTP-30 7 2/22/05	PCTP-31 11 2/11/05	PCTP-32 7 3/2/05	PCTP-32R 6-8 4/9/19	PCTP-33 12 3/2/05	PCTP-34 10 2/28/05	PCTP-34 14 2/28/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0017	< 0.0039	< 0.0011	0.0045 J	< 0.024	< 0.0013	< 0.0034	< 0.031	< 0.034	0.0172	< 0.0014	< 0.00099	< 0.0013
Acetone	67-64-1	10,000	10,000	0.042	0.049	< 0.0052	0.0381	0.0435	< 0.0059	0.031	< 0.031	< 0.84	0.204	< 0.0063	< 0.0045	0.026
Benzene	71-43-2	0.5	330	< 0.00054	< 0.00025	< 0.00037	< 0.00058	< 0.0012	< 0.00042	0.0017	0.0013	***1.8***	0.0052	0.0026	0.0015	0.011
Carbon Disulfide	75-15-0	620	10,000	0.017	< 0.00046	< 0.00078	0.0068	0.0035 J	< 0.00088	< 0.00039	< 0.0063	< 0.033	0.0018 J	< 0.00095	0.0082	0.006
Chlorobenzene	108-90-7	10	4,600	< 0.00044	< 0.0006	< 0.0003	< 0.0023	< 0.0049	< 0.00034	< 0.00051	< 0.0063	< 0.022	< 0.0024	< 0.00037	< 0.00026	< 0.00033
Chloroform	67-66-3	8	110	< 0.00056	< 0.0013	< 0.00039	< 0.0023	< 0.0049	< 0.00044	0.002	< 0.0063	< 0.054	< 0.0024	0.0036	< 0.00034	< 0.00042
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00079	< 0.00041	< 0.00054	< 0.0012	< 0.0024	< 0.00061	< 0.00035	< 0.0063	< 0.053	< 0.0012	< 0.00066	< 0.00047	< 0.00059
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	< 0.0023	< 0.0049	NA	NA	NA	NA	< 0.0024	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.018 B	0.018 B	0.016 B	< 0.0058	< 0.012	0.014 B	0.021 B	0.011 B	0.31	< 0.0060	0.011 B	0.023 B	0.028 B
Ethylbenzene	100-41-4	70	1,000	< 0.0015	< 0.0009	< 0.001	< 0.0012	< 0.0024	< 0.0012	< 0.00077	< 0.0013	23	< 0.0012	0.031	< 0.00089	0.07
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	< 0.0023	< 0.0049	NA	NA	NA	NA	< 0.0024	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0018	< 0.00098	0.0025	< 0.0012	< 0.0024	< 0.0014	0.0016	< 0.0025	0.64	0.0011 J	0.013	< 0.0011	0.027
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	< 0.0058	< 0.012	NA	NA	NA	NA	< 0.0060	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	< 0.0023	< 0.0049	NA	NA	NA	NA	< 0.0024	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	< 0.0012	< 0.0024	NA	NA	NA	NA	< 0.0012	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00038	< 0.00032	< 0.00026	NA	NA	< 0.0003	< 0.00027	< 0.0013	1.2	NA	0.013	< 0.00023	0.066
o-Xylene	95-47-6	- -	- -	NA	NA	NA	< 0.0012	< 0.0024	NA	NA	NA	NA	< 0.0012	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00034	< 0.00024	< 0.00023	< 0.0023	< 0.0049	< 0.00026	< 0.0002	< 0.0063	< 0.023	< 0.0024	< 0.00028	< 0.0002	< 0.00025
Toluene	108-88-3	100	10,000	0.003	< 0.00044	< 0.00028	< 0.0012	< 0.0024	< 0.00031	< 0.00038	< 0.0013	0.6	0.0019	0.0043	< 0.00024	0.0072
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0011	< 0.00066	0.0025	NA	< 0.0024	< 0.00089	< 0.00056	< 0.0063	< 0.11	< 0.0012	< 0.00096	< 0.00068	< 0.00086
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	0.0025	NA	< 0.0049	NA	NA	NA	NA	< 0.0024	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	< 0.00093	< 0.0023	< 0.0024	NA	NA	NA	NA	0.0011 J	NA	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	0.0518 J	0.152	NA	NA	NA	NA	0.0718 J	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.12	< 0.19	< 0.035	< 0.18	< 0.22	< 0.033	< 2.2	< 0.2	< 11	< 0.43	< 0.86	< 0.031	< 0.97
2-Methylnaphthalene	91-57-6	1,900	190,000	2.7	0.75	0.24	0.122	0.318	0.076 J	1.3	0.44	250	0.492	110	< 0.075	97
2-Methylphenol	95-48-7	580	190,000	< 0.5	< 0.12	< 0.15	< 0.072	< 0.088	< 0.14	< 1.4	< 0.12	< 44	0.218	< 3.6	< 0.13	< 4
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	< 0.072	< 0.088	NA	NA	NA	NA	0.28	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	0.41 J	< 0.12	0.057 J	NA	NA	0.047 J	< 1.4	< 0.13	< 55	NA	< 4.5	< 0.16	< 5
Acenaphthene	83-32-9	4,700	190,000	7.6	1.4	0.82	0.7	0.373	0.085	0.55	0.63	45	0.127	110	0.23	88
Acenaphthylene	208-96-8	8,000	190,000	0.88	0.65	< 0.014	1.12	< 0.044	0.4	0.99	0.31	< 4.3	0.0745 J	< 0.35	< 0.012	< 0.39
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	< 0.18	< 0.22	NA	NA	NA	NA	0.0414 J	NA	NA	NA
Anthracene	120-12-7	350	190,000	4.6	0.82	1.4	3.55	< 0.044	1.7	2.1	1.5	< 3.7	0.132	66	0.061	45
Benz(a)anthracene	56-55-3	430	190,000	6.3	2.7	2.9	8.11 D	0.0362 J	4.3	2.3	2.4	< 4.7	0.213	26	0.075	24
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	< 0.18	< 0.22	NA	NA	NA	NA	< 0.43	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	5.2	2.1	2.5	6.42 D	< 0.044	3.4	2	2	< 3.3	0.239	16	0.063	14
Benzo(b)fluoranthene	205-99-2	170	190,000	5.6	4.1	3.3	8.61 D	0.0250 J	4.7	2.7	2.8	< 6.1	0.238	18	0.079	16
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.8	1.2	1.6	3.48 DJ	< 0.044	2.3	1.1	0.96	< 4.6	0.184	6.7	0.045	7.7
Benzo(k)fluoranthene	207-08-9	610	190,000	1.7	1.1	0.75	3.31	< 0.044	1.6	0.81	0.8	< 5.3	0.103	7.1	< 0.015	5.7
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.1	0.18	< 0.03	0.116	< 0.088	0.11	< 0.8	0.16	< 8.9	< 0.17	< 0.72	< 0.026	< 0.81
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.052	< 0.009	< 0.015	< 0.072	< 0.088	< 0.014	< 0.1	< 0.0092	< 4.5	< 0.17	< 0.37	< 0.013	< 0.42

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-26 12 2/18/05	PCTP-27 11 2/16/05	PCTP-28 7 2/17/05	PCTP-28R 6-8 4/11/19	PCTP-28R 11-12 4/11/19	PCTP-29 13 2/18/05	PCTP-30 7 2/22/05	PCTP-31 11 2/11/05	PCTP-32 7 3/2/05	PCTP-32R 6-8 4/9/19	PCTP-33 12 3/2/05	PCTP-34 10 2/28/05	PCTP-34 14 2/28/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	< 0.039	0.84	0.52	1.19	< 0.088	0.17	< 0.11	0.54	< 3.5	0.0396 J	13	0.29	10
Chrysene	218-01-9	230	190,000	7.4	2.7	2.9	7.19 D	0.0515	3.9	2.3	2.1	< 3.5	0.246	26	0.064	25
Dibenz(a,h)anthracene	53-70-3	270	190,000	1.1	0.56	0.54	1.68 J	< 0.044	0.86	< 0.081	0.4	< 5.7	< 0.085	2.6	< 0.017	2.4
Dibenzofuran	132-64-9	310	190,000	0.71	1.4	0.42	0.774	< 0.088	0.27	1.6	0.58	25 J	0.0963 J	49	0.049 J	41
Diethyl phthalate	84-66-2	9,300	10,000	< 0.054	< 0.0065	< 0.016	< 0.072	< 0.088	< 0.015	< 0.075	< 0.0066	< 4.7	< 0.17	< 0.39	< 0.014	< 0.43
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.049	< 0.005	< 0.014	< 0.072	< 0.088	< 0.013	< 0.058	< 0.0051	20 B	< 0.17	< 0.35	< 0.012	< 0.39
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.049	< 0.0082	< 0.014	< 0.072	< 0.088	< 0.013	< 0.095	< 0.0084	< 4.3	< 0.17	< 0.35	< 0.012	< 0.39
Fluoranthene	206-44-0	3,200	190,000	10	4.8	4.3	22.9 D	0.0607 J	8.2	5.7	5.7	< 4.9	0.341	98	0.17	69
Fluorene	86-73-7	3,800	190,000	5.9	1.5	0.83	1.94	< 0.044	0.7	2.3	1.1	37	0.132	89	0.11	74
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	2.4	1.2	1.5	3.38 DJ	< 0.044	2.1	1.3	0.98	< 4.6	0.161	5.9	< 0.013	6.1
Naphthalene	91-20-3	25	190,000	3.3	2.5	0.57	0.259	0.415	0.25	12	1.3	***1,300***	4.88	***68***	0.12	***140***
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	< 0.14	< 0.18	NA	NA	NA	NA	< 0.34	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	18	3.3	4.1	9.39 D	< 0.044	3.8	7.4	4.5	43	0.344	230	0.058	180
Phenol	108-95-2	200	18,000	< 0.12	< 0.11	0.23	< 0.072	< 0.088	0.093	< 1.3	< 0.12	< 11	< 0.17	< 0.86	< 0.031	< 0.97
Pyrene	129-00-0	2,200	190,000	17	3.9	5.9	14.4 D	0.125	8.1	7.2	4.1	< 4.3	0.401	82	0.26	90
Total PAHs and 2-Methylnaphthalene	-	- -	- -	102	35.3	34.2	96.6	1.40	46.5	52.1	32.0	1,680	8.31	961	1.34	884
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	12,900	3,590	NA	NA	NA	NA	4,290 J	NA	NA	NA
Antimony	7440-36-0	27	190,000	5.5	3.2	7.6	< 2.3	1.3 J	4.6	< 2.8	2.9	11	< 2.6 J	5.5	< 2.6	< 3.3
Arsenic	7440-38-2	29	190,000	***54***	***34***	20	5.7	***31.6***	22	7.3	13	18	3.9	***71***	< 2.6	***59***
Barium	7440-39-3	8,200	190,000	340	41	4,700	190	61.0	340	71	140	140	30.3	290	24	220
Beryllium	7440-41-7	320	190,000	2.1	< 0.73	1	1.2	0.37	< 0.85	0.86	1.3	1	0.22 J	1.3	< 0.79	1.5
Cadmium	7440-43-9	38	190,000	2.8	< 0.73	7.6	0.84	0.49 J	1.1	< 0.85	< 0.75	< 0.91	0.13 J	2.8	< 0.79	2.3
Calcium	7440-70-2	- -	- -	NA	NA	NA	61,000	3,440	NA	NA	NA	NA	65,200	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	230	14	97	38.4	6.5	19	33	42	26	14.6	380	16	200
Cobalt	7440-48-4	160	190,000	NA	NA	NA	6.9	7.2	NA	NA	NA	NA	4.2 J	NA	NA	NA
Copper	7440-50-8	43,000	190,000	200	66	150	66.1	46.9	150	210	260	230	13.8	210	21	170
Cyanide	57-12-5	2000	190,000	< 0.43	NA	NA	2.4	0.3	NA	0.4	NA	< 0.38	0.45	< 0.46	0.44	1.7
Iron	7439-89-6	- -	190,000	NA	NA	NA	14,800	35,800	NA	NA	NA	NA	9,540 J	NA	NA	NA
Lead	7439-92-1	450	190,000	400	54	***62,000***	233	92.0	420	190	98	***940***	21.3	***470***	12	310
Magnesium	7439-95-4	- -	- -	NA	NA	NA	10,400	650 J	NA	NA	NA	NA	37,200	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	804	157	NA	NA	NA	NA	196 J	NA	NA	NA
Mercury	7439-97-6	10	190,000	2	< 0.1	0.62	< 0.037	0.074	1.5	0.16	0.16	0.85	0.21	2.1	< 0.11	1.3
Nickel	7440-02-0	650	190,000	41	14	18	14.0	24.6	15	22	28	26	8.6	41	7.4	34
Potassium	7440-09-7	- -	- -	NA	NA	NA	1,330	356 J	NA	NA	NA	NA	679 J	NA	NA	NA
Selenium	7782-49-2	26	190,000	6.8	2.9	3.8	0.79 J	< 5.3	4.4	5.5	2.5	4.3	< 2.6	4.9	4	4
Silver	7440-22-4	84	190,000	< 4.3	< 3	< 3.8	< 0.56	< 1.3	< 3.5	< 3.5	< 3.1	< 3.8	< 0.65	< 4.6	< 3.3	< 4.2
Sodium	7440-23-5	- -	- -	NA	NA	NA	265 J	140 J	NA	NA	NA	NA	< 1,300	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 2.1	< 1.5	< 1.8	< 1.1	< 2.6	< 1.7	< 1.7	< 1.5	< 1.8	< 1.3	< 2.2	< 1.6	< 2
Vanadium	7440-62-2	820	190,000	NA	NA	NA	22.2	13.1	NA	NA	NA	NA	10.6	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	1,000	39	4,100	239	154	520	150	160	550	66.5	1,100	28	860

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCTP-35	PCTP-38		PCTP-39	PCTP-40		PCTP-41	PCTP-42	PCTP-43	PCTP-44		PCTP-45
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	6	10	12	8	9	10	6.5	13.5	7	4	9	10
Date Collected:	CAS Number			2/16/05	2/22/05	2/22/05	2/24/05	2/14/05	2/14/05	2/24/05	2/23/05	2/23/05	2/14/05	2/14/05	2/14/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0039	< 0.0048	< 0.0051	< 0.001	< 0.0032	< 0.002	< 0.0011	< 2.1	< 0.0011	< 0.0016	< 0.003	< 0.0018
Acetone	67-64-1	10,000	10,000	< 0.0026	0.057	0.037	0.03	0.035	< 0.01	< 0.0048	< 2.5	0.051	< 0.0083	0.033	< 0.0093
Benzene	71-43-2	0.5	330	< 0.00025	0.0022	< 0.00033	0.0024	0.16	0.066	< 0.00034	***4.2***	0.051	< 0.00064	< 0.0012	< 0.00073
Carbon Disulfide	75-15-0	620	10,000	< 0.00045	< 0.00056	< 0.00059	< 0.00068	0.66	0.25	< 0.00072	< 0.32	0.34	< 0.0013	0.15	< 0.0015
Chlorobenzene	108-90-7	10	4,600	< 0.00059	< 0.00073	< 0.00078	< 0.00026	< 0.0013	< 0.00082	< 0.00028	< 0.13	< 0.00028	< 0.00065	< 0.0012	< 0.00073
Chloroform	67-66-3	8	110	< 0.0013	0.0029	< 0.0017	< 0.00034	< 0.0018	< 0.0012	< 0.00036	< 0.24	< 0.00036	< 0.00093	< 0.0017	< 0.0011
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0004	< 0.00049	< 0.00053	< 0.00048	< 0.0018	< 0.0012	< 0.0005	< 0.31	< 0.0005	< 0.00092	< 0.0017	< 0.001
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.016 B	0.03 B	0.012 B	0.015 B	0.023 B	0.016 B	0.015 B	***0.91 B***	0.0093 B	0.014 B	0.025 B	0.015 B
Ethylbenzene	100-41-4	70	1,000	< 0.00089	< 0.0011	< 0.0012	< 0.0009	0.0016	< 0.00071	< 0.00095	***180***	0.0058	< 0.00057	< 0.0011	< 0.00064
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.00097	< 0.0012	< 0.0013	< 0.0011	0.0046	0.0019	< 0.0011	260	0.0081	< 0.00092	< 0.0017	< 0.001
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00032	< 0.00039	< 0.00042	< 0.00023	0.0066	0.0027	< 0.00025	79	0.0062	< 0.00065	< 0.0012	< 0.00074
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00023	< 0.00029	< 0.00031	< 0.0002	< 0.00086	< 0.00056	< 0.00021	< 0.18	< 0.00021	< 0.00044	< 0.00083	< 0.0005
Toluene	108-88-3	100	10,000	< 0.00044	< 0.00054	< 0.00058	< 0.00024	0.018	0.0061	< 0.00026	2.6	0.0026	< 0.00061	< 0.0011	< 0.00069
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00065	< 0.0008	< 0.00086	< 0.00069	< 0.0016	< 0.001	< 0.00073	< 0.31	< 0.00073	< 0.00083	< 0.0016	< 0.00094
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.2	< 0.21	< 0.25	< 1.3	0.86	0.98	< 0.033	< 80	0.19 J	< 0.026	0.67	< 0.03
2-Methylnaphthalene	91-57-6	1,900	190,000	0.86	0.22	0.27	0.88	1.1	1.4	0.075 J	290	0.12	< 0.065	0.31	< 0.073
2-Methylphenol	95-48-7	580	190,000	< 0.12	< 0.13	< 0.15	< 0.77	< 0.16	2	< 0.14	< 49	0.35	0.043 J	2.5	< 0.12
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 0.13	< 0.13	0.15 J	< 0.81	2.1	1.9	< 0.17	< 51	0.61	0.099 J	1	< 0.15
Acenaphthene	83-32-9	4,700	190,000	0.089	0.45	0.22	0.94	2	2	< 0.013	330	0.11	< 0.01	0.22	< 0.011
Acenaphthylene	208-96-8	8,000	190,000	0.83	0.11	0.17	3.4	0.097	< 0.014	< 0.013	52	0.09	< 0.011	0.076	< 0.012
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.86	0.5	0.26	6.7	0.66	1.3	0.07	310	0.13	< 0.0093	0.28	< 0.011
Benz(a)anthracene	56-55-3	430	190,000	2.7	0.42	0.77	15	0.99	1.2	0.26	290	0.42	< 0.012	0.81	0.063
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	2.5	0.35	0.96	13	0.93	0.85	0.25	***200***	0.44	< 0.0082	0.82	0.055
Benzo(b)fluoranthene	205-99-2	170	190,000	4.3	0.51	1.1	19	1.1	1.1	0.37	***260***	0.56	< 0.015	1	0.077
Benzo(g,h,i)perylene	191-24-2	180	190,000	1.6	0.23	0.51	6.6	0.41	0.39	0.15	84	0.22	< 0.011	0.41	< 0.013
Benzo(k)fluoranthene	207-08-9	610	190,000	1.1	0.14	0.37	6.6	0.32	0.28	0.11	92	0.21	< 0.013	0.26	< 0.015
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.36	< 0.075	< 0.091	< 0.46	< 0.032	< 0.028	0.076	< 29	< 0.08	< 0.022	< 0.031	< 0.025
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.0091	< 0.0097	< 0.012	< 0.059	< 0.016	< 0.014	< 0.014	< 3.7	< 0.01	< 0.011	< 0.016	< 0.013

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-35 6 2/16/05	PCTP-38 10 2/22/05	PCTP-38 12 2/22/05	PCTP-39 8 2/24/05	PCTP-40 9 2/14/05	PCTP-40 10 2/14/05	PCTP-41 6.5 2/24/05	PCTP-42 13.5 2/23/05	PCTP-43 7 2/23/05	PCTP-44 4 2/14/05	PCTP-44 9 2/14/05	PCTP-45 10 2/14/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	0.24	< 0.01	< 0.013	1.8	0.2	0.32	< 0.011	85	0.055	< 0.0086	0.085	< 0.0098
Chrysene	218-01-9	230	190,000	2.7	0.49	0.9	15	1.2	1.3	0.26	***260***	0.46	< 0.0087	0.88	0.048
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.64	< 0.0076	0.26	2.5	0.17	0.18	0.047	26	0.053	< 0.014	0.16	< 0.016
Dibenzofuran	132-64-9	310	190,000	0.48	0.42	0.11	2.5	0.4	0.57	< 0.11	240	0.048 J	< 0.093	0.096 J	< 0.1
Diethyl phthalate	84-66-2	9,300	10,000	< 0.0065	0.077	0.11	< 0.042	< 0.017	< 0.015	< 0.015	< 2.7	< 0.0075	< 0.012	< 0.017	< 0.013
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.052	< 0.0054	0.073 B	< 0.033	< 0.016	< 0.014	< 0.013	< 2.1	< 0.0058	< 0.011	0.055	< 0.012
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.0083	< 0.0088	< 0.011	< 0.054	< 0.016	< 0.014	< 0.013	< 3.4	< 0.0095	< 0.011	< 0.015	< 0.012
Fluoranthene	206-44-0	3,200	190,000	6.3	0.97	1.3	31	2.6	3.3	0.43	670	0.57	< 0.012	1.2	0.1
Fluorene	86-73-7	3,800	190,000	0.44	0.25	0.2	4.5	1.2	1.6	< 0.016	400	< 0.0087	< 0.013	0.21	< 0.014
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	1.6	0.22	0.45	7.6	0.39	0.37	0.14	90	0.23	< 0.012	0.39	< 0.013
Naphthalene	91-20-3	25	190,000	0.77	2.3	0.98	5.2	3.7	2.6	0.089	***2,700***	0.55	0.079	1	0.14
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	3	0.41	0.61	12	3.1	5.2	0.32	1,000	0.4	< 0.013	0.86	< 0.014
Phenol	108-95-2	200	18,000	< 0.11	0.089 J	< 0.15	< 0.74	1.8	2	< 0.033	< 47	0.54	0.068	0.92	< 0.03
Pyrene	129-00-0	2,200	190,000	4.8	0.98	1.5	26	2.7	3.3	0.47	490	0.64	< 0.011	1.6	0.11
Total PAHs and 2-Methylnaphthalene	-	- -	- -	35.1	8.55	10.8	176	22.7	26.4	3.04	7,540	5.20	0.079	10.5	0.593
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	3.1	2.7	< 3.2	7.8	< 3.3	< 2.9	***34***	< 2.5	< 2.8	< 2.3	< 3.2	< 2.6
Arsenic	7440-38-2	29	190,000	26	15	18	11	18	< 2.9	13	6.9	3	3.7	***33***	< 2.6
Barium	7440-39-3	8,200	190,000	67	75	110	110	200	46	130	33	64	150	170	190
Beryllium	7440-41-7	320	190,000	< 0.74	< 0.79	< 0.95	< 0.8	1	< 0.86	< 0.85	< 0.76	< 0.85	1.3	< 0.97	1.4
Cadmium	7440-43-9	38	190,000	< 0.74	< 0.79	< 0.95	< 0.8	1.3	< 0.86	< 0.85	< 0.76	< 0.85	< 0.68	1.1	< 0.77
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	14	30	84	35	150	18	14	16	39	38	130	41
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	68	120	60	150	130	19	130	16	36	65	120	24
Cyanide	57-12-5	2000	190,000	NA	< 0.33	< 0.4	4.1	1.5	3.1	0.63	0.5	< 0.35	18	4.5	1.8
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	160	86	110	240	260	43	***1,400***	30	80	16	230	7.1
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.2	0.51	0.76	1	2.7	< 0.12	< 0.12	< 0.11	0.27	< 0.095	1.7	< 0.11
Nickel	7440-02-0	650	190,000	12	20	20	21	25	8.9	18	11	8.8	37	28	33
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	3.2	3.9	3.4	2.6	3.5	< 2.6	3.4	< 2.3	< 2.5	2.3	4.3	3.1
Silver	7440-22-4	84	190,000	< 3.1	< 3.3	< 4	< 3.3	< 4.1	< 3.6	< 3.5	< 3.2	< 3.5	< 2.8	< 4	< 3.2
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.5	< 1.6	< 1.9	< 1.6	< 2	< 1.7	< 1.7	< 1.5	< 1.7	< 1.4	< 1.9	< 1.5
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	220	220	270	170	610	90	210	140	58	120	560	110

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		PCTP-46		PCTP-49	PCTP-49R		PCTP-50	PCTP-51	PCTP-51R	PCTP-52	PCTP-53	PCTP-54	PCTP-55
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	9	10.5	9	8-10	10-11	11	11	10-12	7	10	8	7
Date Collected:	CAS Number			2/22/05	2/22/05	2/23/05	4/16/19	4/16/19	2/23/05	2/22/05	4/18/19	2/22/05	2/22/05	2/28/05	2/28/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.007	< 1.1	< 0.0015	< 0.011	< 1.7	< 0.00099	< 0.0032	0.0097 J	< 0.0028	< 0.0096	< 0.0019	< 0.0011
Acetone	67-64-1	10,000	10,000	0.19	< 1.3	0.045	0.0280	< 1.7	< 0.0045	0.035	0.0488	0.039	0.063	< 0.0087	< 0.0052
Benzene	71-43-2	0.5	330	0.054	***5.1***	0.023	0.0034	***0.563***	0.018	< 0.00021	0.00047 J	< 0.00018	0.034	< 0.00062	< 0.00037
Carbon Disulfide	75-15-0	620	10,000	< 0.00082	< 0.17	0.0043	0.0080	6.61	< 0.00067	< 0.00038	< 0.0024	< 0.00033	0.012	< 0.0013	< 0.00078
Chlorobenzene	108-90-7	10	4,600	< 0.0011	< 0.066	< 0.0004	< 0.0022	< 0.35	< 0.00026	< 0.00049	< 0.0024	< 0.00043	< 0.0015	< 0.0005	< 0.0003
Chloroform	67-66-3	8	110	0.0036	< 0.13	< 0.00052	< 0.0022	< 0.35	< 0.00034	0.0017	< 0.0024	0.0015	0.005	< 0.00065	0.0028
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00072	< 0.16	< 0.00073	< 0.0011	< 0.17	< 0.00047	< 0.00033	< 0.0012	< 0.00029	< 0.00098	< 0.00091	< 0.00054
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	< 0.0022	< 0.35	NA	NA	< 0.0024	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.052 B	***1.2 B***	0.018 B	< 0.0054	< 0.87	0.0096 B	0.023 B	< 0.0060	0.019 B	0.06 B	0.032 B	0.065 B
Ethylbenzene	100-41-4	70	1,000	0.032	18	0.06	< 0.0011	1.85	0.0077	< 0.00074	< 0.0012	< 0.00065	< 0.0022	< 0.0017	< 0.001
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	0.0013 J	3.03	NA	NA	< 0.0024	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0081	25	0.01	< 0.0011	0.847	0.0021	< 0.00081	< 0.0012	< 0.00071	< 0.0024	< 0.002	< 0.0012
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	< 0.0054	< 0.87	NA	NA	0.0027 J	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	< 0.0022	0.778	NA	NA	< 0.0024	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	< 0.0011	< 0.17	NA	NA	< 0.0012	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	0.014	9.2	0.019	NA	NA	0.0016	< 0.00026	NA	< 0.00023	< 0.00078	< 0.00044	< 0.00026
o-Xylene	95-47-6	- -	- -	NA	NA	NA	< 0.0011	0.756	NA	NA	< 0.0012	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00042	< 0.094	< 0.00031	< 0.0022	< 0.35	< 0.0002	< 0.00019	< 0.0024	< 0.00017	< 0.00058	< 0.00039	< 0.00023
Toluene	108-88-3	100	10,000	0.0043	8	0.0063	< 0.0011	0.406	< 0.00024	< 0.00036	0.00077 J	< 0.00032	< 0.0011	< 0.00046	< 0.00028
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0012	< 0.16	< 0.0011	< 0.0011	< 0.17	< 0.00068	< 0.00054	< 0.0012	< 0.00048	< 0.0016	< 0.0013	< 0.00079
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	< 0.0022	< 0.35	NA	NA	< 0.0024	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	< 0.0011	1.6	NA	NA	< 0.0012	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	0.0178 J	0.878	NA	NA	0.0114 J	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 5.8	< 920	< 1.9	< 0.2	< 0.25	< 0.031	< 0.21	< 0.22	< 0.94	0.21 J	< 0.22	< 0.035
2-Methylnaphthalene	91-57-6	1,900	190,000	4.6	***7,200***	27	0.0322 J	0.957	0.13	0.38	0.0234 J	1.3	2.3	2.8	7.2
2-Methylphenol	95-48-7	580	190,000	< 3.5	< 560	< 7.9	0.0478 J	0.0727 J	< 0.13	< 0.13	< 0.087	< 0.57	0.23 J	< 0.92	< 0.15
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	0.105	0.25	NA	NA	< 0.087	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 3.7	< 590	< 9.9	NA	NA	< 0.16	0.053 J	NA	< 0.6	0.41	0.73 J	< 0.18
Acenaphthene	83-32-9	4,700	190,000	23	1,100	130	0.47	3.88	3.1	0.29	0.155	1.7	8.1	7.7	1.4
Acenaphthylene	208-96-8	8,000	190,000	6.1	4,200	< 0.78	0.0871	0.219	< 0.012	0.11	0.285	2.6	0.73	0.78	< 0.014
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	< 0.2	< 0.25	NA	NA	< 0.22	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	19	***3,800***	98	0.32	1.79	0.41	0.28	0.344	5.1	< 0.018	4.8	0.56
Benz(a)anthracene	56-55-3	430	190,000	61	***3,400***	38	0.398	0.951	0.29	0.49	0.936	8	0.092	6.7	0.12
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	< 0.2	< 0.25	NA	NA	< 0.22	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	37	***2,500***	21	0.468	0.917	0.23	0.54	0.976	7	< 0.021	4.6	0.074
Benzo(b)fluoranthene	205-99-2	170	190,000	59	***3,000***	26	0.426	0.944	0.31	0.65	1.12	10	0.11	5.3	0.097
Benzo(g,h,i)perylene	191-24-2	180	190,000	16	***970***	10	0.264	0.49	0.14	0.36	0.603	3.8	< 0.016	2.5	0.061
Benzo(k)fluoranthene	207-08-9	610	190,000	16	***1,000***	7.6	0.176	0.327	0.083	0.24	0.452	3.6	< 0.014	1.7	< 0.018
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 2.1	< 330	< 1.6	< 0.079	< 0.1	0.083 B	0.05 J	< 0.087	0.47	< 0.15	< 0.19	0.099
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.27	< 43	< 0.82	< 0.079	0.0586 J	< 0.013	< 0.0099	< 0.087	< 0.044	< 0.019	< 0.096	< 0.015

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-46 9 2/22/05	PCTP-46 10.5 2/22/05	PCTP-49 9 2/23/05	PCTP-49R 8-10 4/16/19	PCTP-49R 10-11 4/16/19	PCTP-50 11 2/23/05	PCTP-51 11 2/22/05	PCTP-51R 10-12 4/18/19	PCTP-52 7 2/22/05	PCTP-53 10 2/22/05	PCTP-54 8 2/28/05	PCTP-55 7 2/28/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	< 0.29	***1,800***	23	0.0479 J	0.739	1.2	0.078	0.0720 J	3.3	1.5	< 0.073	< 0.012
Chrysene	218-01-9	230	190,000	40	***2,500***	35	0.387	1.06	0.28	0.54	0.865	7.6	< 0.015	8.2	0.12
Dibenz(a,h)anthracene	53-70-3	270	190,000	7.8	< 33	3.4	0.0592	0.105	0.044	0.14	0.136	1.3	< 0.015	0.99	< 0.019
Dibenzofuran	132-64-9	310	190,000	8.6	***3,600***	68	0.0773 J	1.91	1.2	0.22	0.0854 J	4.3	0.5	1.4	0.73
Diethyl phthalate	84-66-2	9,300	10,000	< 0.19	< 31	< 0.85	< 0.079	< 0.1	0.072 B	0.072	< 0.087	< 0.031	< 0.014	< 0.1	< 0.016
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.15	< 24	< 0.78	< 0.079	< 0.1	0.1 B	0.064 B	< 0.087	< 0.024	< 0.011	< 0.091	< 0.014
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.25	< 39	< 0.78	< 0.079	< 0.1	< 0.012	< 0.0091	< 0.087	< 0.04	< 0.018	< 0.091	< 0.014
Fluoranthene	206-44-0	3,200	190,000	160	***8,300***	120	0.576	2.82	0.6	0.84	1.8	22	0.2	12	0.37
Fluorene	86-73-7	3,800	190,000	22	***5,500***	110	0.327	2.91	2.3	0.23	0.224	7	0.99	6.2	2.3
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	20	1,000	7.9	0.259	0.482	0.11	0.33	0.642	4.2	< 0.012	2.1	< 0.015
Naphthalene	91-20-3	25	190,000	< 0.37	***31,000***	***91***	0.159	2.02	0.51	1	0.0821	6.6	16	3.8	0.43
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	< 0.16	< 0.2	NA	NA	< 0.17	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	3.2	***14,000***	300	0.845	9.2 D	2.8	0.76	0.761	22	0.14	20	3.1
Phenol	108-95-2	200	18,000	< 3.4	< 540	< 1.9	0.145	0.293	< 0.031	0.061 J	< 0.087	< 0.55	0.41	< 0.22	< 0.035
Pyrene	129-00-0	2,200	190,000	110	***6,500***	120	0.719	2.58	0.81	0.84	1.49	15	0.17	20	0.72
Total PAHs and 2-Methylnaphthalene	-	- -	- -	605	96,000	1,140	5.97	31.7	12.1	8.02	10.9	129	28.8	110	16.6
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	5,030 J	10,000 J	NA	NA	12,000	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.9	< 2.6	< 3.3	< 2.4 J	< 3.2 J	< 2.6	< 2.7	< 2.7 J	7.6	< 5.3	< 3.8	< 3
Arsenic	7440-38-2	29	190,000	< 2.9	< 2.6	***38***	5.6	24.6	7.5	4.6	12.2	14	22	***32***	4.5
Barium	7440-39-3	8,200	190,000	< 15	15	190	37.7	118	41	50	93.4	140	50	270	49
Beryllium	7440-41-7	320	190,000	< 0.88	< 0.79	< 0.98	0.39	0.72	< 0.79	< 0.81	2.2	< 0.71	< 1.6	1.8	< 0.91
Cadmium	7440-43-9	38	190,000	< 0.88	< 0.79	1.4	0.18 J	1.2	< 0.79	2.2	0.60 J	1.7	< 1.6	1.4	< 0.91
Calcium	7440-70-2	- -	- -	NA	NA	NA	1,030 J	3,320 J	NA	NA	3,300	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	8.4	< 6.6	150	15.2 J	71.6 J	20	30	64.6	31	18	110	20
Cobalt	7440-48-4	160	190,000	NA	NA	NA	5.4 J	11.2	NA	NA	11.0	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	58	29	120	14.4	62.3	14	130	73.6	120	36	100	25
Cyanide	57-12-5	2000	190,000	0.82	2	6.6	< 0.27 J	0.52 J	< 0.33	6.3	1.1 J	NA	NA	1.5	< 0.38
Iron	7439-89-6	- -	190,000	NA	NA	NA	12,000	21,300	NA	NA	13,800	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	11	< 6.6	240	32.4	139	29	52	107 J	410	< 13	190	62
Magnesium	7439-95-4	- -	- -	NA	NA	NA	1,640	3,000	NA	NA	3,320 J	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	258 J	563 J	NA	NA	140 J	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	< 0.12	< 0.11	1.7	0.12 J	1.2 J	0.14	0.17	0.49 J	0.46	< 0.22	0.8	0.14
Nickel	7440-02-0	650	190,000	8.4	< 6.6	26	10.2	20.0	8.1	21	26.1	23	17	39	12
Potassium	7440-09-7	- -	- -	NA	NA	NA	724 J	1,330 J	NA	NA	1,570	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 2.6	< 2.4	4.2	< 2.4	1.2 J	< 2.4	2.9	< 2.7	2.9	5.7	4.1	< 2.7
Silver	7440-22-4	84	190,000	< 3.7	< 3.3	< 4.1	< 0.60	0.47 J	< 3.3	< 3.4	< 0.68	< 3	< 6.6	< 4.8	< 3.8
Sodium	7440-23-5	- -	- -	NA	NA	NA	< 1,200	442 J	NA	NA	139 J	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.8	< 1.6	< 2	< 1.2	< 1.6	< 1.6	< 1.6	< 1.4	< 1.4	< 3.2	< 2.3	< 1.8
Vanadium	7440-62-2	820	190,000	NA	NA	NA	7.8	19.3	NA	NA	22.1	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	51	39	620	82.5 J	365 J	120	480	278	240	39	550	120

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-56 8 2/28/05	PCTP-57 12 2/25/05	PCTP-59 5 2/25/05	PCTP-59 7 2/25/05	PCTP-60 2 2/25/05	PCTP-62 10.5 9/8/05	PCTP-63 10.5 9/8/05	PCTP-66 7.5 9/8/05	PCTP-66R 8-10 4/24/19	PCTP-67 8 9/12/05	PCTP-68 6 9/9/05	PCTP-69 17.5 9/9/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0012	< 0.0011	< 0.00094	< 0.00096	< 0.00096	< 0.0013	< 0.001	< 0.0011	0.0368 J	< 0.0011	< 0.0012	< 0.00091
Acetone	67-64-1	10,000	10,000	< 0.0054	0.03	< 0.0043	< 0.0044	< 0.0044	0.12	< 0.0048	0.056	0.238 J	0.028	0.05	< 0.0062
Benzene	71-43-2	0.5	330	< 0.00038	< 0.00036	< 0.00031	< 0.00031	< 0.00031	< 0.00085	< 0.00034	< 0.00075	0.0093 J	0.024	< 0.00078	< 0.00059
Carbon Disulfide	75-15-0	620	10,000	< 0.0008	< 0.00075	< 0.00064	< 0.00066	< 0.00066	< 0.0011	< 0.00071	< 0.00096	0.0021 J	< 0.00096	< 0.001	< 0.00076
Chlorobenzene	108-90-7	10	4,600	< 0.00031	< 0.00029	< 0.00025	< 0.00025	< 0.00025	< 0.00084	< 0.00027	< 0.00074	< 0.0043	< 0.00074	< 0.00077	< 0.00058
Chloroform	67-66-3	8	110	< 0.0004	< 0.00037	< 0.00032	< 0.00033	< 0.00033	< 0.00076	< 0.00035	< 0.00067	< 0.0043	< 0.00067	< 0.0007	< 0.00053
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00056	< 0.00052	< 0.00045	< 0.00046	< 0.00046	< 0.00079	< 0.0005	< 0.0007	< 0.0021	< 0.0007	< 0.00073	< 0.00055
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	0.0122 J	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.026 B	0.014 B	0.011 B	0.011 B	0.0072 B	0.011 B	0.015 B	0.013 B	< 0.011	0.023 B	0.013 B	0.0088 B
Ethylbenzene	100-41-4	70	1,000	< 0.0011	< 0.00099	< 0.00084	< 0.00086	< 0.00086	< 0.0012	< 0.00094	< 0.0011	0.272 J	< 0.0011	< 0.0011	< 0.00087
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	6.37 D	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0013	< 0.0012	< 0.001	< 0.001	< 0.001	< 0.0018	< 0.0011	< 0.0016	0.0490 J	< 0.0016	< 0.0017	< 0.0013
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	< 0.011	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	0.0773 J	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0021	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00027	< 0.00026	< 0.00022	< 0.00022	< 0.00022	< 0.00078	< 0.00024	< 0.00069	NA	< 0.00069	< 0.00072	< 0.00054
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	0.16 J	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00024	< 0.00022	< 0.00019	< 0.0002	< 0.0002	< 0.001	< 0.00021	< 0.00091	< 0.0043	< 0.00091	< 0.00095	< 0.00072
Toluene	108-88-3	100	10,000	0.0023	< 0.00027	< 0.00023	< 0.00023	< 0.00023	< 0.0013	< 0.00025	< 0.0011	0.0250 J	< 0.0011	< 0.0012	< 0.00088
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00081	< 0.00076	< 0.00065	< 0.00067	< 0.00067	< 0.00053	< 0.00072	< 0.00047	< 0.0021	< 0.00047	< 0.00049	< 0.00037
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0043	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA	NA	NA	0.209 J	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	61.1 D	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.15	< 0.23	< 0.029	< 0.2	< 0.03	< 0.077	< 0.064	< 0.068	< 0.55	< 0.041	< 0.071	< 0.033
2-Methylnaphthalene	91-57-6	1,900	190,000	3.3	0.2	0.59	2.1	0.29	0.53	0.28	0.38	420 D	0.19	0.18	< 0.066
2-Methylphenol	95-48-7	580	190,000	< 0.61	< 0.14	< 0.12	< 0.12	< 0.12	< 0.26	< 0.22	< 0.23	< 0.22	< 0.18	< 0.24	< 0.14
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	0.907	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 0.77	0.11 J	< 0.15	< 0.13	< 0.15	0.23 J	< 0.25	0.079 J	NA	0.25	0.26 J	< 0.14
Acenaphthene	83-32-9	4,700	190,000	1.2	0.25	0.3	0.094	0.069	0.27	1.8	0.13	314 D	0.12	1	< 0.0064
Acenaphthylene	208-96-8	8,000	190,000	0.36	< 0.014	< 0.012	0.13	< 0.012	0.32	0.1	0.18	6.52	0.15	0.32	< 0.0059
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	< 0.55	NA	NA	NA
Anthracene	120-12-7	350	190,000	1.1	0.45	0.28	0.16	0.12	0.44	1	0.27	203 D	0.23	1.2	< 0.0077
Benz(a)anthracene	56-55-3	430	190,000	1.3	1	1.1	0.44	0.46	0.74	1.1	0.75	54.1 D	0.81	3.7	< 0.0054
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	< 0.55	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	1.2	0.75	0.98	0.5	0.22	1.1	1	0.75	35.5 D	0.89	3	< 0.0064
Benzo(b)fluoranthene	205-99-2	170	190,000	1.5	1.1	1.4	0.82	0.82	1.3	1.1	0.78	39.3 D	1.1	3.7	< 0.011
Benzo(g,h,i)perylene	191-24-2	180	190,000	1.4	0.38	0.67	0.37	0.2	1.2	0.61	0.45	14.1 D	0.5	2.1	< 0.0056
Benzo(k)fluoranthene	207-08-9	610	190,000	0.67	0.46	0.37	0.26	0.26	0.45	0.29	0.25	15 D	0.32	1.6	< 0.014
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.36	< 0.084	0.098	0.28	0.49	0.88	0.062	0.084	< 0.22	< 0.031	< 0.046	< 0.025
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.064	< 0.011	< 0.012	< 0.0094	0.25	< 0.022	< 0.019	< 0.02	< 0.22	< 0.013	< 0.021	< 0.01

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-56 8 2/28/05	PCTP-57 12 2/25/05	PCTP-59 5 2/25/05	PCTP-59 7 2/25/05	PCTP-60 2 2/25/05	PCTP-62 10.5 9/8/05	PCTP-63 10.5 9/8/05	PCTP-66 7.5 9/8/05	PCTP-66R 8-10 4/24/19	PCTP-67 8 9/12/05	PCTP-68 6 9/9/05	PCTP-69 17.5 9/9/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	< 0.049	0.18	0.085	< 0.01	< 0.0098	0.16	0.14	0.089	31.6 D	0.051	0.36	< 0.0074
Chrysene	218-01-9	230	190,000	2	1	0.97	0.63	0.81	0.9	1	0.71	58 D	0.91	3.5	< 0.011
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.73	0.17	0.24	0.12	0.099	0.37	0.22	0.13	3.59	0.15	0.74	< 0.0071
Dibenzofuran	132-64-9	310	190,000	< 0.52	0.16	0.2	0.4	0.24	0.17	1.3	0.14	180 D	0.08	0.45	< 0.05
Diethyl phthalate	84-66-2	9,300	10,000	< 0.067	0.06	< 0.013	< 0.0068	< 0.013	< 0.015	< 0.013	< 0.013	< 0.22	< 0.012	< 0.014	< 0.0091
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.061	0.14	< 0.012	< 0.0053	< 0.012	0.18	0.06	< 0.011	< 0.22	< 0.0099	0.071	< 0.0078
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.061	< 0.0099	< 0.012	< 0.0086	< 0.012	0.22	< 0.011	< 0.012	< 0.22	< 0.017	< 0.012	< 0.013
Fluoranthene	206-44-0	3,200	190,000	1.9	1.9	1.4	0.65	0.75	1	3.9	0.61	250 D	0.85	6.1	< 0.0064
Fluorene	86-73-7	3,800	190,000	2.5	0.28	0.32	< 0.0079	< 0.014	0.32	2.6	0.27	281 D	0.16	0.99	< 0.0093
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.75	0.46	0.59	0.43	0.2	0.86	0.52	0.36	14.4 D	0.42	1.8	< 0.0066
Naphthalene	91-20-3	25	190,000	1.6	0.26	0.4	5.4	0.42	1.2	1.2	1.1	***95.3 D***	0.91	1.2	< 0.0038
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA	NA	NA	< 0.44	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	3.8	1.4	1.2	0.94	0.75	0.98	1	0.79	720 D	0.58	4.2	< 0.0086
Phenol	108-95-2	200	18,000	< 0.15	< 0.14	< 0.029	< 0.12	< 0.03	< 0.085	< 0.071	< 0.075	0.15 J	< 0.081	< 0.078	< 0.064
Pyrene	129-00-0	2,200	190,000	3.1	1.6	1.6	0.68	0.59	1.6	4.6	1.7	205 D	1.4	6.8	< 0.0089
Total PAHs and 2-Methylnaphthalene	-	- -	- -	28.4	11.7	12.4	13.7	6.06	13.6	22.3	9.61	2,730	9.69	42.1	< 0.066
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	17,500 J	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.6	3.5	< 2.5	< 2.6	< 2.6	< 3.3	< 2.8	< 2.9	0.75 J	< 2.9	6.1	< 2.3
Arsenic	7440-38-2	29	190,000	10	18	14	22	2.9	25	9.8	19	***59.0***	13	***37***	6.3
Barium	7440-39-3	8,200	190,000	150	130	740	160	< 13	190	48	130	246 J	76	700	20
Beryllium	7440-41-7	320	190,000	< 0.77	< 0.88	< 0.75	< 0.77	< 0.77	1.5	< 0.83	< 0.88	1.4	< 0.88	< 0.92	< 0.7
Cadmium	7440-43-9	38	190,000	< 0.77	0.95	2.3	< 0.77	< 0.77	2.2	< 0.83	< 0.88	2.7	< 0.88	4.1	< 0.7
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	31,700 J	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	17	66	12	8.4	< 6.4	150	32	130	172	45	260	12
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	21.5	NA	NA	NA
Copper	7440-50-8	43,000	190,000	58	460	160	33	7.9	240	50	80	157	48	220	10
Cyanide	57-12-5	2000	190,000	NA	< 0.37	< 0.31	< 0.32	< 0.32	NA	NA	NA	1.9 J	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	30,100	NA	NA	NA
Lead	7439-92-1	450	190,000	160	***500***	***7,300***	***960***	9.9	250	53	160	323	100	***2,500***	6.8
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	4,230 J	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	747	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.13	0.78	3.5	0.28	< 0.11	0.53	0.24	0.96	1.3 J	0.47	***31***	< 0.097
Nickel	7440-02-0	650	190,000	13	21	58	18	< 6.4	31	15	23	38.7	21	69	8.5
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	1,900	NA	NA	NA
Selenium	7782-49-2	26	190,000	2.7	2.8	< 2.2	< 2.3	< 2.3	4.7	< 2.5	4.5	2.3 J	3.2	19	< 2.1
Silver	7440-22-4	84	190,000	< 3.2	< 3.7	< 3.1	< 3.2	< 3.2	< 4.2	< 3.5	< 3.7	0.98	< 3.7	< 3.8	< 2.9
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	556 J	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.5	< 1.8	< 1.5	< 1.5	< 1.5	< 2	< 1.7	< 1.8	< 1.8	< 1.8	< 1.8	< 1.4
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	35.9	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	460	660	1,300	450	< 13	710	160	380	810 J	280	3,400	22

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-70 18 9/9/05	PCTP-71 17.5 9/9/05	PCTP-72 12 9/9/05	PCTP-73 9.5 9/9/05	PCTP-74 12.5 9/9/05	PCTP-75R 14-16 4/11/19	PCTP-77 10.5 9/12/05	PCTP-78 9.5 9/12/05	PCTP-79 10 9/12/05	PSSTP-03B 8-9 3/11/03	PSSTP-04B 8-9 3/11/03
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	< 0.00084	< 0.00084	< 0.00096	< 0.00095	< 0.0011	< 0.018	< 0.0011	< 0.0011	< 0.00099	NA	NA
Acetone	67-64-1	10,000	10,000	< 0.0057	< 0.0057	< 0.0044	< 0.0043	< 0.0078	0.0313	< 0.0052	< 0.0073	0.051	< 0.024	< 6
Benzene	71-43-2	0.5	330	< 0.00055	< 0.00055	< 0.00031	< 0.00031	< 0.00075	< 0.00088	< 0.00037	< 0.0007	0.018	0.0012 B	< 0.3 JB
Carbon Disulfide	75-15-0	620	10,000	< 0.0007	< 0.0007	< 0.00066	< 0.00065	< 0.00096	< 0.0035	< 0.00078	< 0.00089	< 0.00067	< 0.006	< 1.5
Chlorobenzene	108-90-7	10	4,600	< 0.00054	< 0.00054	< 0.00025	< 0.00025	< 0.00074	< 0.0035	< 0.0003	< 0.00069	< 0.00026	< 0.006	< 1.5
Chloroform	67-66-3	8	110	< 0.00049	< 0.00049	< 0.00033	< 0.00032	< 0.00067	< 0.0035	< 0.00039	< 0.00062	< 0.00034	NA	NA
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.00051	< 0.00051	< 0.00046	< 0.00045	< 0.0007	< 0.0018	< 0.00054	< 0.00065	< 0.00047	NA	NA
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	< 0.0035	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.0074 B	0.012 B	0.011 B	0.012 B	0.0058 B	< 0.0088	0.011 B	0.021 B	0.011 B	0.0079 B	< 0.3 JB
Ethylbenzene	100-41-4	70	1,000	< 0.0008	< 0.0008	< 0.00086	< 0.00085	< 0.0011	< 0.0018	< 0.001	< 0.001	< 0.00089	< 0.00125	< 0.33
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	< 0.0035	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0012	< 0.0012	< 0.001	< 0.001	< 0.0016	< 0.0018	< 0.0012	< 0.0015	< 0.0011	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	< 0.0088	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	< 0.0035	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	< 0.0018	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.0005	< 0.0005	< 0.00022	< 0.00022	< 0.00069	NA	< 0.00026	< 0.00064	< 0.00023	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	< 0.0018	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00067	< 0.00067	< 0.0002	< 0.00019	< 0.00091	< 0.0035	< 0.00023	< 0.00085	< 0.0002	NA	NA
Toluene	108-88-3	100	10,000	< 0.00081	< 0.00081	< 0.00023	< 0.00023	< 0.0011	< 0.0018	< 0.00028	< 0.001	< 0.00024	< 0.0012	< 0.3
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00034	< 0.00034	< 0.00067	< 0.00066	< 0.00047	< 0.0018	< 0.00079	< 0.00044	< 0.00068	NA	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	< 0.0035	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	< 0.0018	NA	NA	NA	0	0.45 J
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	0.0103 J	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.03	< 0.03	< 0.059	< 0.058	< 0.041	< 0.2	< 0.043	< 0.63	< 0.037	< 2	< 20
2-Methylnaphthalene	91-57-6	1,900	190,000	< 0.061	< 0.061	0.16	0.085	0.06 J	0.0226 J	0.33	0.77	0.39	0.2 J	31
2-Methylphenol	95-48-7	580	190,000	< 0.13	< 0.13	< 0.2	< 0.2	< 0.18	< 0.081	< 0.19	< 2.2	< 0.16	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	< 0.081	NA	NA	NA	< 2	< 20
4-Methylphenol	106-44-5	58	190,000	< 0.13	< 0.13	< 0.23	< 0.22	< 0.18	NA	< 0.19	< 2.4	< 0.16	NA	NA
Acenaphthene	83-32-9	4,700	190,000	< 0.0059	< 0.0059	0.47	0.1	< 0.0081	< 0.04	0.2	0.86	< 0.0072	1.5 J	8.8 J
Acenaphthylene	208-96-8	8,000	190,000	< 0.0054	< 0.0054	0.062	0.061	< 0.0074	< 0.04	0.089	< 0.11	0.14	< 2	37
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	< 0.0071	< 0.0071	0.67	0.25	< 0.0097	0.0395 J	0.25	2.8	0.14	4	83
Benz(a)anthracene	56-55-3	430	190,000	< 0.005	0.043	1.4	1.1	0.15	0.0717	0.58	6.4	0.47	5.4	87
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	< 0.006	0.037	1.4	0.92	0.15	0.0599	0.55	5.8	0.45	3.1	***62***
Benzo(b)fluoranthene	205-99-2	170	190,000	< 0.01	0.049	1.7	1.4	0.23	0.0774	0.82	7.1	0.94	4.5	84
Benzo(g,h,i)perylene	191-24-2	180	190,000	< 0.0051	< 0.0051	0.95	0.61	0.12	0.0417	0.38	4.4	0.41	1.1 J	31
Benzo(k)fluoranthene	207-08-9	610	190,000	< 0.013	< 0.013	0.72	0.38	0.076	0.0254 J	0.23	2.5	0.28	0.93 J	27
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.023	0.037	0.18	0.18	< 0.031	< 0.081	< 0.032	< 0.41	< 0.028	< 2	< 20
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.0097	< 0.0097	< 0.017	< 0.017	< 0.013	< 0.081	< 0.014	< 0.18	< 0.012	< 2	< 20

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-70 18 9/9/05	PCTP-71 17.5 9/9/05	PCTP-72 12 9/9/05	PCTP-73 9.5 9/9/05	PCTP-74 12.5 9/9/05	PCTP-75R 14-16 4/11/19	PCTP-77 10.5 9/12/05	PCTP-78 9.5 9/12/05	PCTP-79 10 9/12/05	PSSTP-03B 8-9 3/11/03	PSSTP-04B 8-9 3/11/03
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	< 0.0069	< 0.0069	0.32	0.088	< 0.0094	0.0166 J	0.13	1.1	0.099	0.47 J	39
Chrysene	218-01-9	230	190,000	< 0.01	0.04	1.5	1	0.21	0.104	0.69	6.7	0.62	4.1	69
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.0066	< 0.0066	0.32	0.27	0.051	< 0.04	0.14	1.3	0.14	0.62 J	11 J
Dibenzofuran	132-64-9	310	190,000	< 0.046	< 0.046	0.29	0.07	< 0.063	< 0.081	0.17	0.59	0.17	0.98 J	63
Diethyl phthalate	84-66-2	9,300	10,000	< 0.0084	< 0.0084	< 0.012	< 0.012	< 0.012	< 0.081	< 0.012	< 0.13	< 0.01	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.0073	0.044	0.089	< 0.0094	< 0.0099	< 0.081	< 0.01	< 0.1	< 0.0089	< 2	< 20
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.012	< 0.012	< 0.01	< 0.01	< 0.017	< 0.081	< 0.017	< 0.11	< 0.015	< 2	< 20
Fluoranthene	206-44-0	3,200	190,000	< 0.0059	0.095	2.4	1.5	0.24	0.108	1.3	11	0.76	10	210
Fluorene	86-73-7	3,800	190,000	< 0.0086	< 0.0086	0.45	0.092	< 0.012	< 0.04	0.15	1.2	0.082	1.5 J	93
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	< 0.0061	< 0.0061	0.82	0.57	0.1	0.0528	0.32	3.6	0.36	1.2 J	25
Naphthalene	91-20-3	25	190,000	< 0.0035	< 0.0035	0.18	0.12	0.13	0.0297 J	0.45	< 0.11	1.5	0.41 J	***160***
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	< 0.16	NA	NA	NA	< 2	< 20
Phenanthrene	85-01-8	10,000	190,000	< 0.008	0.036	2.5	1	0.15	0.167	1.1	12	0.6	11	270
Phenol	108-95-2	200	18,000	< 0.059	< 0.059	< 0.065	< 0.064	< 0.081	< 0.081	< 0.083	< 0.7	< 0.072	< 1.5	4.5
Pyrene	129-00-0	2,200	190,000	< 0.0082	0.064	3.3	2.1	0.23	0.118	1.3	11	0.75	12	190
Total PAHs and 2-Methylnaphthalene	-	- -	- -	< 0.061	0.364	19.0	11.6	1.90	0.918	8.88	77.4	8.03	61.6	1,480
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	4,450	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.2	< 2.2	3.7	10	< 2.9	< 2.4	< 3	6.5	6.6	< 2.4	5.1
Arsenic	7440-38-2	29	190,000	5	2.8	***66***	20	14	11.5	***81***	27	***99***	4.4	12
Barium	7440-39-3	8,200	190,000	25	21	94	83	84	119	71	440	140	120	63
Beryllium	7440-41-7	320	190,000	0.99	< 0.65	0.84	0.86	1.4	0.46	< 0.91	< 0.82	1.3	0.87	< 0.71
Cadmium	7440-43-9	38	190,000	< 0.65	< 0.65	< 0.77	< 0.76	< 0.88	0.085 J	< 0.91	1.7	< 0.79	< 0.71	1.1
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	2,560	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	17	12	24	15	11	10.0	16	24	31	17	40
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	9.9	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	15	11	67	95	110	27.7	77	250	89	16	170
Cyanide	57-12-5	2000	190,000	NA	NA	NA	NA	NA	0.32	NA	NA	NA	< 0.3	11
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	32,400	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	< 5.4	22	***1,400***	450	170	28.2	88	***2,700***	150	46	190
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	363 J	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	151	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	< 0.09	< 0.09	0.61	0.21	0.53	0.020 J	0.33	1.5	0.39	0.17	1
Nickel	7440-02-0	650	190,000	12	9.2	21	15	26	23.2	16	41	20	18	43
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	466 J	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 1.9	< 1.9	3.1	3	10	< 4.9	4.5	6	3.6	< 2.1	< 2.1
Silver	7440-22-4	84	190,000	< 2.7	< 2.7	< 3.2	< 3.2	< 3.7	0.44 J	< 3.8	< 3.4	< 3.3	< 3	< 3
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	193 J	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.3	< 1.3	< 1.5	< 1.5	< 1.8	< 2.4	< 1.8	< 1.6	< 1.6	< 1.4	< 1.4
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	14.8	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	32	21	390	180	110	51.3	93	960	180	60	330

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-04R 8-9 4/11/19	PSSTP-04R 16-17 4/11/19	PSSTP-05B 5-6 3/11/03	PSSTP-06B 5-6 3/11/03	PSSTP-07B 8-9 3/11/03	PSSTP-07R 8-9 4/18/19	PSSTP-07R 20-22 4/18/19	PSSTP-10B 8-9 3/12/03	PSSTP-10R 8-9 4/16/19	PSSTP-11B 8-9 3/12/03	PSSTP-12B 7-8 3/12/03
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	< 160	0.0059 J	NA	NA	NA	< 0.0097	0.0398	NA	< 0.0091	NA	NA
Acetone	67-64-1	10,000	10,000	< 160	0.0510	< 0.024	< 0.026	< 0.026	< 0.0097	0.139	< 0.033	0.0226	< 0.025	< 0.028
Benzene	71-43-2	0.5	330	< 8.1	< 0.00067	< 0.12	< 0.0013	< 0.013	0.0061	0.0033	< 0.0017	< 0.00046	< 0.0012	< 0.0014
Carbon Disulfide	75-15-0	620	10,000	< 32	0.0025 J	< 0.006	< 0.0064	< 0.0064	< 0.0019	0.0929	< 0.0083	< 0.0018	< 0.0062	< 0.007
Chlorobenzene	108-90-7	10	4,600	< 32	< 0.0027	< 5	< 0.0064	< 0.0064	< 0.0019	< 0.0025	< 0.0083	< 0.0018	< 0.0062	< 0.007
Chloroform	67-66-3	8	110	< 32	< 0.0027	NA	NA	NA	< 0.0019	< 0.0025	NA	< 0.0018	NA	NA
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 16	< 0.0013	NA	NA	NA	< 0.00097	< 0.0013	NA	< 0.00091	NA	NA
Cyclohexane	110-82-7	6,900	10,000	< 32	< 0.0027	NA	NA	NA	< 0.0019	< 0.0025	NA	< 0.0018	NA	NA
Dichloromethane	75-09-2	0.5	10,000	< 81	< 0.0067	0.0093 B	0.0086 B	0.011 B	< 0.0048	< 0.0064	0.0043 JB	< 0.0046	0.0054 JB	0.0053 JB
Ethylbenzene	100-41-4	70	1,000	< 16	< 0.0013	< 0.0012	< 0.0013	< 0.0013	< 0.00097	< 0.0013	< 0.0017	< 0.00091	< 0.0012	< 0.0014
Isopropylbenzene	98-82-8	2,500	10,000	< 32	< 0.0027	NA	NA	NA	< 0.0019	< 0.0025	NA	< 0.0018	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	14.3 J	< 0.0013	NA	NA	NA	< 0.00097	< 0.0013	NA	< 0.00091	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	< 81	< 0.0067	NA	NA	NA	< 0.0048	0.0054 J	NA	< 0.0046	NA	NA
Methylcyclohexane	108-87-2	- -	- -	< 32	< 0.0027	NA	NA	NA	< 0.0019	0.0017 J	NA	< 0.0018	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	< 16	< 0.0013	NA	NA	NA	< 0.00097	< 0.0013	NA	< 0.00091	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	< 16	< 0.0013	NA	NA	NA	< 0.00097	< 0.0013	NA	< 0.00091	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 32	< 0.0027	NA	NA	NA	< 0.0019	< 0.0025	NA	< 0.0018	NA	NA
Toluene	108-88-3	100	10,000	< 16	< 0.0013	< 0.0012	< 0.0013	< 0.0013	< 0.00097	0.0023	< 0.0017	< 0.00091	< 0.0012	< 0.0014
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 16	< 0.0013	NA	NA	NA	< 0.00097	< 0.0013	NA	< 0.00091	NA	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 32	< 0.0027	NA	NA	NA	< 0.0019	< 0.0025	NA	< 0.0018	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	14.3 J	< 0.0013	0	0	0	< 0.00097	< 0.0013	0	< 0.00091	0	0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	40.1 D	0.0140 J	NA	NA	NA	< 0.074	0.0085 J	NA	< 0.077	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	2.95	< 0.2	< 0.4	< 0.43	< 0.43	< 0.19	< 0.23	< 0.56	< 0.19	< 0.41	< 0.47
2-Methylnaphthalene	91-57-6	1,900	190,000	194 D	0.0557	< 0.4	< 0.43	0.062 J	< 0.037	0.0163 J	0.96	< 0.038	< 0.41	< 0.47
2-Methylphenol	95-48-7	580	190,000	3.42	< 0.081	NA	NA	NA	< 0.074	< 0.091	NA	< 0.077	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	2.11	< 0.081	< 0.4	0.086	< 0.43	< 0.074	< 0.091	0.15 J	< 0.077	< 0.41	< 0.47
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	23.2 D	0.0679	< 0.4	< 0.43	0.1 J	< 0.037	0.101	5.7	0.0147 J	< 0.41	0.11 J
Acenaphthylene	208-96-8	8,000	190,000	95.8 D	0.0359 J	< 0.4	< 0.43	< 0.43	< 0.037	0.0275 J	0.35 J	0.124	< 0.41	< 0.47
Acetophenone	98-86-2	1,200	10,000	0.677 J	< 0.2	NA	NA	NA	< 0.19	< 0.23	NA	0.0232 J	NA	NA
Anthracene	120-12-7	350	190,000	181 D	0.184	0.11 J	< 0.43	0.19 J	< 0.037	0.0787	1.6	0.0351 J	< 0.41	0.11 J
Benz(a)anthracene	56-55-3	430	190,000	168 D	0.489	0.26 J	0.071 J	0.38 J	0.0413	0.126	1.5	0.125	< 0.41	0.14 J
Benzaldehyde	100-52-7	- -	- -	< 1.1	< 0.2	NA	NA	NA	< 0.19	< 0.23	NA	< 0.19	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	***126 D***	0.4	0.2 J	0.06 J	0.28 J	0.0453	0.145	1.8	0.163	< 0.41	0.11 J
Benzo(b)fluoranthene	205-99-2	170	190,000	165 D	0.45	0.22 J	0.068 J	0.32 J	0.0504	0.155	2.6	0.217	< 0.41	0.14 J
Benzo(g,h,i)perylene	191-24-2	180	190,000	74.9 DJ	0.25 J	0.1 J	0.046 J	0.24 J	0.0286 J	0.0809	0.56 J	0.135	< 0.41	< 0.47
Benzo(k)fluoranthene	207-08-9	610	190,000	60.3 D	0.163	0.11 J	< 0.43	0.14 J	0.0196 J	0.0612	0.8	0.0721	< 0.41	0.058 J
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.42	< 0.081	< 0.4	< 0.43	< 0.43	< 0.074	< 0.091	< 0.56	< 0.077	< 0.41	< 0.47
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.42	< 0.081	< 0.4	< 0.43	< 0.43	< 0.074	< 0.091	< 0.56	< 0.077	< 0.41	< 0.47

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-04R 8-9 4/11/19	PSSTP-04R 16-17 4/11/19	PSSTP-05B 5-6 3/11/03	PSSTP-06B 5-6 3/11/03	PSSTP-07B 8-9 3/11/03	PSSTP-07R 8-9 4/18/19	PSSTP-07R 20-22 4/18/19	PSSTP-10B 8-9 3/12/03	PSSTP-10R 8-9 4/16/19	PSSTP-11B 8-9 3/12/03	PSSTP-12B 7-8 3/12/03
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	82.5 D	0.0770 J	0.045 J	< 0.43	0.083 J	< 0.074	0.0201 J	0.091 J	0.0093 J	< 0.41	0.054 J
Chrysene	218-01-9	230	190,000	137 D	0.462	0.19 J	0.063 J	0.32 J	0.0444	0.133	2	0.145	< 0.41	0.17 J
Dibenz(a,h)anthracene	53-70-3	270	190,000	19.2 DJ	0.0685 J	< 0.4	< 0.43	0.062 J	< 0.037	< 0.045	0.24 J	0.0332 J	< 0.41	< 0.47
Dibenzofuran	132-64-9	310	190,000	196 D	0.0671 J	< 0.4	< 0.43	0.071 J	< 0.074	0.0215 J	2.1	< 0.077	< 0.41	< 0.47
Diethyl phthalate	84-66-2	9,300	10,000	< 0.42	< 0.081	NA	NA	NA	< 0.074	< 0.091	NA	< 0.077	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.42	< 0.081	0.08 JB	0.13 JB	0.051 JB	< 0.074	< 0.091	0.059 J	< 0.077	< 0.41	0.068 J
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.42	< 0.081	< 0.4	< 0.43	< 0.43	< 0.074	< 0.091	< 0.56	< 0.077	< 0.41	< 0.47
Fluoranthene	206-44-0	3,200	190,000	587 D	0.695	0.36 J	0.13 J	0.88	0.0384	0.207	2.8	0.16	< 0.41	0.28 J
Fluorene	86-73-7	3,800	190,000	329 D	0.112	0.043 J	< 0.43	0.12 J	< 0.037	0.0768	4.6	< 0.038	< 0.41	0.074 J
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	67.3 DJ	0.219 J	0.088 J	< 0.43	0.16 J	0.0286 J	0.0847	0.55 J	0.134	< 0.41	< 0.47
Naphthalene	91-20-3	25	190,000	***869 D***	0.0792	< 0.4	0.07 J	0.17 J	< 0.037	0.0481	1.8	0.0368 J	< 0.41	0.4 J
Pentachlorophenol	87-86-5	5	190,000	< 0.85	< 0.16	< 0.4	< 0.43	< 0.43	< 0.15	< 0.18	< 0.56	< 0.15	< 0.41	< 0.47
Phenanthrene	85-01-8	10,000	190,000	824 D	0.655	0.37 J	0.13 J	0.88	0.0163 J	0.283	7	0.0890	< 0.41	0.14 J
Phenol	108-95-2	200	18,000	< 0.42	< 0.081	< 0.4	< 0.43	< 0.43	< 0.074	< 0.091	< 0.56	< 0.077	< 0.41	< 0.47
Pyrene	129-00-0	2,200	190,000	369 D	0.781	0.5 J	0.15 J	1.2	0.0587	0.231	3.5	0.174	0.044 J	0.31 J
Total PAHs and 2-Methylnaphthalene	-	- -	- -	4,290	5.17	2.55	0.788	5.50	0.372	1.86	38.4	1.66	0.044	2.04
Metals														
Aluminum	7429-90-5	- -	190,000	3,230	12,600	NA	NA	NA	8,170	3,780	NA	7,300 J	NA	NA
Antimony	7440-36-0	27	190,000	1.4 J	3.5	< 2.4	< 2.6	< 2.6	< 2.4 J	< 2.6 J	5.1	< 2.4 J	< 2.5	< 2.8
Arsenic	7440-38-2	29	190,000	19.7	***29.7***	4.5	3.9	4	6.6	4.8	***45***	12.1	< 2.5	< 2.8
Barium	7440-39-3	8,200	190,000	134	70.8	32	46	61	43.5	40.3	210	51.5	14	47
Beryllium	7440-41-7	320	190,000	0.45	9.5	< 0.72	< 0.77	< 0.77	0.36	0.21 J	1.2	0.46	< 0.74	< 0.85
Cadmium	7440-43-9	38	190,000	0.54 J	< 3.2	< 0.72	< 0.77	< 0.77	< 0.60	0.16 J	1.9	0.27 J	1.7	< 0.85
Calcium	7440-70-2	- -	- -	4,040	2,310	NA	NA	NA	661	1,150	NA	478 J	NA	NA
Chromium	7440-47-3	190,000	190,000	157	283	13	18	23	11.2	17.4	230	16.4 J	9.1	14
Cobalt	7440-48-4	160	190,000	5.3 J	65.2	NA	NA	NA	5.5 J	4.8 J	NA	5.4 J	NA	NA
Copper	7440-50-8	43,000	190,000	129	219	12	28	21	33.1	13.1	140	61.7	7.2	13
Cyanide	57-12-5	2000	190,000	14.7	0.59	1.1	0.68	0.64	< 0.26 J	1.4 J	0.68	0.28 J	< 0.31	120
Iron	7439-89-6	- -	190,000	28,700	124,000	NA	NA	NA	14,500	8,320	NA	26,300	NA	NA
Lead	7439-92-1	450	190,000	127	***457***	33	51	110	92.2 J	44.2 J	300	192	26	32
Magnesium	7439-95-4	- -	- -	645 J	741	NA	NA	NA	1,680 J	1,210 J	NA	1,460	NA	NA
Manganese	7439-96-5	2,000	190,000	152	1,120	NA	NA	NA	104 J	193 J	NA	192 J	NA	NA
Mercury	7439-97-6	10	190,000	1.9	0.052	< 0.1	< 0.11	0.32	0.046 J	0.50 J	1.3	0.17 J	< 0.1	< 0.12
Nickel	7440-02-0	650	190,000	33.0	***2,480***	9.9	10	12	12.2	8.2	26	12.6	< 6.2	11
Potassium	7440-09-7	- -	- -	456 J	390 J	NA	NA	NA	758 J	583 J	NA	729 J	NA	NA
Selenium	7782-49-2	26	190,000	1.9 J	< 13	< 2.2	< 2.3	< 2.3	< 2.4	< 2.6	< 3	< 4.9	< 2.2	< 2.5
Silver	7440-22-4	84	190,000	< 1.4	< 3.2	< 3	< 3.2	< 3.2	0.34 J	< 0.66	< 4.2	< 1.2	< 3.1	< 3.5
Sodium	7440-23-5	- -	- -	111 J	150 J	NA	NA	NA	< 1,200	105 J	NA	< 1,200	NA	NA
Thallium	7440-28-0	14	190,000	< 2.7	< 6.4	< 1.4	< 1.5	< 1.5	< 1.2	< 1.3	< 2	< 2.4	< 1.5	< 1.7
Vanadium	7440-62-2	820	190,000	22.4	40.4	NA	NA	NA	14.0	6.8	NA	16.9	NA	NA
Zinc	7440-66-6	12,000	190,000	108	228	37	73	150	51.9	69.1	720	110 J	60	< 0.35

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-13B 7-8 3/12/03	PSSTP-14B 7-8 3/12/03	PSSTP-15B 8-9 3/12/03	PSSTP-16B 5-6 3/12/03	PSSTP-17B 8-9 3/12/03	PSSTP-18B 6-7 3/12/03	PSSTP-19B 7-8 3/12/03	PSSTP-20B 8-9 3/13/03	PSSTP-21B 8-9 3/13/03	PSSTP-22B 6-7 3/13/03	PSSTP-24B 7-8 3/13/03
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	10,000	10,000	< 0.028	< 0.029	< 0.023	< 0.027	< 0.024	< 0.025	< 0.026	< 0.023	0.086	< 0.033	< 0.035
Benzene	71-43-2	0.5	330	0.0028	< 0.0014	0.038	0.0042	0.0044	< 0.0013	0.0024	< 0.0012	< 0.0018	0.004	< 0.0018
Carbon Disulfide	75-15-0	620	10,000	0.032	< 0.0071	< 0.57	< 0.0068	< 0.006	< 0.0063	< 0.0065	< 0.0058	< 0.0091	0.0028 J	< 0.0088
Chlorobenzene	108-90-7	10	4,600	< 5	< 0.0071	< 0.0057	< 0.0068	< 5	< 0.0063	< 0.0065	< 0.0058	< 5	< 0.0082	< 0.0088
Chloroform	67-66-3	8	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	156-59-2	7	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.0043 JB	0.0024 JB	0.0014 JB	0.0031 JB	0.0023 JB	0.0023 JB	0.0018 JB	0.0009 B	0.014 B	0.013 B	0.0092 B
Ethylbenzene	100-41-4	70	1,000	0.0019	< 0.0014	< 0.0011	0.013	0.0031	< 0.0013	< 0.0013	< 0.0012	< 0.0018	< 0.0016	< 0.0018
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	100	10,000	< 0.0014	< 0.0014	< 0.0011	0.0015	0.0015	< 0.0013	< 0.0013	< 0.0012	< 0.0018	0.0023	< 0.0018
trans-1,2-Dichloroethene	156-60-5	10	5,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	0	0	0.0081	0.0042 J	0.0089	0	0	0	0	0.0057 J	0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.47	< 0.48	< 1.1	0.062 J	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	< 0.58
2-Methylnaphthalene	91-57-6	1,900	190,000	0.12 J	0.2 J	0.36 J	0.15 J	0.77	0.17 J	0.33 J	< 0.39	0.88	3.1 J	1.5
2-Methylphenol	95-48-7	580	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	0.12 J	0.1 J	< 1.1	0.35 J	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	0.36 J
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.6	0.22 J	1.5	0.77	0.7	0.37 J	1.2 J	< 0.39	0.15 J	1.4 J	2.4
Acenaphthylene	208-96-8	8,000	190,000	0.085 J	0.16 J	0.88 J	0.83	0.38 J	0.24 J	0.43 J	< 0.39	0.24 J	3.7 J	0.22 J
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	0.46 J	0.15 J	3.1	0.23 J	1.2	1.2	1.8	< 0.39	0.38 J	14	1.1
Benz(a)anthracene	56-55-3	430	190,000	0.58	0.62	4.3	0.15 J	2.1	1.9	5.5	< 0.39	0.68	39	1.5
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	0.45 J	0.86	3.1	0.13 J	1.5	1.4	4.2	< 0.39	0.73	25	1.1
Benzo(b)fluoranthene	205-99-2	170	190,000	0.56	1.1	4.8	0.17 J	2.6	2.2	7.4	< 0.39	1.1	41	1.7
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.13 J	0.31 J	1.1 J	0.049 J	0.42	0.37 J	1.7	< 0.39	0.31 J	11	0.32 J
Benzo(k)fluoranthene	207-08-9	610	190,000	0.25 J	0.35 J	1.7	0.071 J	1	0.68	2.3	< 0.39	0.42 J	15	0.47 J
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.47	< 0.48	< 1.1	< 0.46	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	< 0.58
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.47	< 0.48	< 1.1	< 0.46	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	< 0.58

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-13B 7-8 3/12/03	PSSTP-14B 7-8 3/12/03	PSSTP-15B 8-9 3/12/03	PSSTP-16B 5-6 3/12/03	PSSTP-17B 8-9 3/12/03	PSSTP-18B 6-7 3/12/03	PSSTP-19B 7-8 3/12/03	PSSTP-20B 8-9 3/13/03	PSSTP-21B 8-9 3/13/03	PSSTP-22B 6-7 3/13/03	PSSTP-24B 7-8 3/13/03
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	0.27 J	< 0.48	< 1.1	1.1	0.58	0.42 J	0.85 J	< 0.39	0.11 J	3.6 J	0.091 J
Chrysene	218-01-9	230	190,000	0.67	0.73	6	0.17 J	2.2	2	6.3	< 0.39	0.81	39	1.9
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.061 J	0.14 J	0.48 J	< 0.46	0.19 J	0.17 J	0.66 J	< 0.39	0.12 J	4.8 J	0.16 J
Dibenzofuran	132-64-9	310	190,000	0.095 J	< 0.48	1.3	0.87	0.6	0.39 J	0.86 J	< 0.39	0.2 J	5.5 J	0.69
Diethyl phthalate	84-66-2	9,300	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	4,900	10,000	0.062 J	0.065 J	< 1.1	< 0.46	0.063 J	< 0.42	< 1.3	0.041 J	0.13 J	< 11	0.13 J
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.47	< 0.48	< 1.1	< 0.46	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	< 0.58
Fluoranthene	206-44-0	3,200	190,000	1.1	0.92	7.3	0.38 J	3.9	4.1	12	< 0.39	1.1	83	3.8
Fluorene	86-73-7	3,800	190,000	0.35 J	0.13 J	2.7	1.2	1.3	0.77	1.4	< 0.39	0.27 J	7.7 J	1.3
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.14 J	0.33 J	1.3	0.047 J	0.48	0.44	1.9	< 0.39	0.3 J	13	0.33 J
Naphthalene	91-20-3	25	190,000	2	0.65	2.4	1.4	2.2	0.65	1 J	< 0.39	6.8	8.3 J	3.2
Pentachlorophenol	87-86-5	5	190,000	< 0.47	< 0.48	< 1.1	< 0.46	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	< 11	< 0.58
Phenanthrene	85-01-8	10,000	190,000	0.51	0.41 J	4.4	0.1 J	4	4	6.4	< 0.39	1	51	3.6
Phenol	108-95-2	200	18,000	0.21 J	0.095 J	1.5	0.33 J	< 0.4	< 0.42	< 1.3	< 0.39	< 0.61	2.4	2.6
Pyrene	129-00-0	2,200	190,000	1.3	0.97	0.33 J	0.32 J	3.9	3.5	10	< 0.39	1.1	65	4.5
Total PAHs and 2-Methylnaphthalene	-	- -	- -	9.37	8.25	45.8	6.17	28.8	24.2	64.5	< 0.39	16.4	425	29.1
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.8	< 2.9	3.1	< 2.7	< 2.4	< 2.5	8.6	< 2.3	3.9	7	< 3.5
Arsenic	7440-38-2	29	190,000	6.3	10	9.5	< 2.7	4.5	6.8	11	< 2.3	22	14	18
Barium	7440-39-3	8,200	190,000	38	77	100	33	110	86	130	20	180	240	160
Beryllium	7440-41-7	320	190,000	< 0.85	< 0.86	< 0.68	< 0.82	< 0.72	< 0.76	1.1	< 0.7	1.3	< 0.98	< 1.1
Cadmium	7440-43-9	38	190,000	< 0.85	< 0.86	< 0.68	< 0.82	< 0.72	< 0.76	1.9	< 0.7	2.8	1.4	< 1.1
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	34	33	24	7.3	23	27	29	8.6	140	40	77
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	19	68	86	17	69	23	160	5.8	140	1,300	57
Cyanide	57-12-5	2000	190,000	5.8	3	1.8	2.5	0.73	< 0.32	6.6	< 0.29	5.1	99	1.5
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	41	130	***470***	26	120	150	300	6	240	***570***	120
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	0.28	0.17	0.63	< 0.11	0.44	0.6	0.7	< 0.097	1.9	3.2	0.97
Nickel	7440-02-0	650	190,000	26	15	19	9.1	15	13	28	6.2	36	44	23
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 2.5	< 2.6	< 2	< 2.5	< 2.2	< 2.3	< 2.3	< 2.1	< 3.3	< 3.2	< 3.2
Silver	7440-22-4	84	190,000	< 3.5	< 3.6	< 2.8	< 3.4	< 3	< 3.2	< 3.2	< 2.9	< 4.5	< 4.1	< 4.4
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.7	< 1.7	< 1.4	< 1.6	< 1.4	< 1.5	< 1.6	< 1.4	< 2.2	< 2	< 2.1
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	190	180	250	40	140	110	550	25	1,200	730	220

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-26B 7-8 3/13/03	PSSTP-27B 5-6 3/13/03	PSSTP-28B 5-6 3/13/03	PSSTP-29B 5-6 3/13/03	PSSTP-30B 5-6 3/13/03	S-101 10-12 4/10/19	S-101 14.5-16.5 4/10/19	S-102 10-12 4/10/19	S-102 13.5-15.5 4/10/19	S-103 10-12 4/11/19	S-103 13-15 4/11/19
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	NA	NA	NA	NA	NA	< 0.019	< 0.014	0.0111 J	0.0042 J	< 0.019	< 0.019
Acetone	67-64-1	10,000	10,000	< 0.027	< 0.027	< 0.13	< 2.8	< 0.13	0.0451	0.0529	0.0740	0.0521	0.0270	0.0255
Benzene	71-43-2	0.5	330	0.018	< 0.0014	< 0.0066	< 0.14	< 0.0065	< 0.00094	< 0.00072	< 0.00062	< 0.00054	< 0.00095	< 0.00095
Carbon Disulfide	75-15-0	620	10,000	< 0.0068 J	< 0.0068	< 0.033	< 0.7	< 0.032	< 0.0038	0.0019 J	< 0.0025	< 0.0022	< 0.0038	0.0021 J
Chlorobenzene	108-90-7	10	4,600	0.28	< 0.0068	< 0.033	< 5	< 0.032	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
Chloroform	67-66-3	8	110	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
cis-1,2-Dichloroethene	156-59-2	7	10,000	NA	NA	NA	NA	NA	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
Dichloromethane	75-09-2	0.5	10,000	0.009 B	0.0059 JB	0.037 B	0.39 J	0.046 B	< 0.0094	< 0.0072	< 0.0062	< 0.0054	< 0.0095	< 0.0095
Ethylbenzene	100-41-4	70	1,000	0.0015	< 0.0014	< 0.0066	< 0.14	< 0.0065	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	NA	NA	NA	NA	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	< 0.0094	< 0.0072	< 0.0062	< 0.0054	< 0.0095	< 0.0095
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
Styrene (Monomer)	100-42-5	24	10,000	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
Toluene	108-88-3	100	10,000	0.0026	< 0.0014	< 0.0066	< 0.14	< 0.0065	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
trans-1,2-Dichloroethene	156-60-5	10	5,500	NA	NA	NA	NA	NA	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	< 0.0038	< 0.0029	< 0.0025	< 0.0022	< 0.0038	< 0.0038
Total Xylenes	1330-20-7	1,000	9,100	0.0036	0	0	0	0	< 0.0019	< 0.0014	< 0.0012	< 0.0011	< 0.0019	< 0.0019
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	0.0842	0.0142 J	0.0191 J	0.122	0.0138 J	< 0.092
2,4-Dimethylphenol	105-67-9	230	10,000	< 1.4	< 0.46	< 0.44	< 3.7	< 0.43	< 0.21	< 0.2	< 0.43	< 0.21	< 0.21	< 0.23
2-Methylnaphthalene	91-57-6	1,900	190,000	0.46 J	0.91	1.5	51	1	0.378	0.0595	0.0636 J	0.305	0.0527	< 0.046
2-Methylphenol	95-48-7	580	190,000	NA	NA	NA	NA	NA	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 1.4	< 0.46	< 0.44	< 3.7	< 0.43	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	7.1	0.34 J	0.98	7.2	2	0.0909	0.0331 J	0.54	0.977	0.0258 J	< 0.046
Acenaphthylene	208-96-8	8,000	190,000	0.63 J	< 0.46	< 0.44	< 3.7	< 0.43	0.0289 J	0.0236 J	0.589	0.262	0.0465	< 0.046
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	< 0.21	< 0.2	< 0.43	< 0.21	< 0.21	< 0.23
Anthracene	120-12-7	350	190,000	2.6	0.26 J	0.74	3.3 J	0.85	0.106	0.0613	2.3	2.38	0.0656	< 0.046
Benz(a)anthracene	56-55-3	430	190,000	3.9	0.37 J	0.67	< 3.7	0.083 J	0.151	0.13	4.53	3.44	0.258	0.0687
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	< 0.21	< 0.2	< 0.43	0.0437 J	< 0.21	< 0.23
Benzo(a)pyrene	50-32-8	46	190,000	1.6	0.24 J	0.5	< 3.7	0.045 J	0.139	0.118	3.75	2.74	0.24	0.0679
Benzo(b)fluoranthene	205-99-2	170	190,000	2.7	0.37 J	0.55	< 3.7	0.065 J	0.172	0.129	4.22	3.29	0.339	0.0917
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.28 J	0.17 J	0.19 J	< 3.7	< 0.43	0.0936	0.0686	1.69	1.58	0.183	0.0709 J
Benzo(k)fluoranthene	207-08-9	610	190,000	1.1 J	0.097 J	0.23 J	< 3.7	< 0.43	0.0638	0.0489	1.41	1.12	0.0906	0.0288 J
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 1.4	0.12 J	0.11 JB	< 3.7	< 0.43	0.0847	0.0404 J	< 0.17	< 0.082	0.114	< 0.092
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 1.4	< 0.46	< 0.44	< 3.7	< 0.43	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-26B 7-8 3/13/03	PSSTP-27B 5-6 3/13/03	PSSTP-28B 5-6 3/13/03	PSSTP-29B 5-6 3/13/03	PSSTP-30B 5-6 3/13/03	S-101 10-12 4/10/19	S-101 14.5-16.5 4/10/19	S-102 10-12 4/10/19	S-102 13.5-15.5 4/10/19	S-103 10-12 4/11/19	S-103 13-15 4/11/19
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	1.1 J	< 0.46	< 0.44	< 3.7	< 0.43	0.0366 J	0.0218 J	0.288	0.555	0.0235 J	0.0106 J
Chrysene	218-01-9	230	190,000	3.2	0.46	0.55	< 3.7	0.1 J	0.203	0.15	4.49	3.57	0.31	0.0746
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.18 J	0.087 J	0.11 J	< 3.7	< 0.43	0.0291 J	0.0220 J	0.512	0.523	0.0624 J	0.0202 J
Dibenzofuran	132-64-9	310	190,000	2.6	0.13 J	0.79	4	1	0.0727 J	0.0261 J	0.115 J	0.802	< 0.083	< 0.092
Diethyl phthalate	84-66-2	9,300	10,000	NA	NA	NA	NA	NA	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 1.4	0.066 J	< 0.44	< 3.7	< 0.43	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 1.4	< 0.46	< 0.44	< 3.7	< 0.43	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
Fluoranthene	206-44-0	3,200	190,000	10	0.48	0.87	1.1 J	0.5	0.276	0.187	10.7 D	5.75 D	0.434	0.1 J
Fluorene	86-73-7	3,800	190,000	5.5	0.44 J	1.6	12	3.3	0.107	0.0392	0.824	1.39	0.0422	< 0.046
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.31 J	0.14 J	0.14 J	< 3.7	< 0.43	0.0969	0.0801	1.89	1.68	0.152 J	0.0508 J
Naphthalene	91-20-3	25	190,000	5.7	0.31 J	< 0.44	< 3.7	0.36 J	2.11	0.255	0.0285 J	0.243	0.353	0.0267 J
Pentachlorophenol	87-86-5	5	190,000	< 1.4	< 0.46	< 0.44	< 3.7	< 0.43	< 0.16	< 0.16	< 0.34	< 0.16	< 0.17	< 0.18
Phenanthrene	85-01-8	10,000	190,000	3.8	0.42 J	3.1	18	2.1	0.43	0.225	8.18	7.62 D	0.281	0.0897
Phenol	108-95-2	200	18,000	< 1.4	< 0.46	2.4	< 1.4	< 0.43	< 0.082	< 0.079	< 0.17	< 0.082	< 0.083	< 0.092
Pyrene	129-00-0	2,200	190,000	9.3	0.68	1.5	1.2 J	0.4 J	0.283	0.292	9.92 D	6.43 D	0.458	0.118
Total PAHs and 2-Methylnaphthalene	-	- -	- -	58.4	5.77	13.2	93.8	10.8	4.76	1.92	55.6	43.3	3.39	0.808
Metals														
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	< 2.7	6.8	< 2.6	< 2.2	< 2.6	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	29	190,000	< 2.7	11	3.8	< 2.2	< 2.6	NA	NA	NA	NA	NA	NA
Barium	7440-39-3	8,200	190,000	45	140	62	18	28	NA	NA	NA	NA	NA	NA
Beryllium	7440-41-7	320	190,000	< 0.81	< 0.82	< 0.79	< 0.67	< 0.78	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	38	190,000	< 0.81	< 0.82	< 0.79	< 0.67	< 0.78	NA	NA	NA	NA	NA	NA
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	< 6.8	24	12	11	12	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	11	1,200	10	24	8.7	NA	NA	NA	NA	NA	NA
Cyanide	57-12-5	2000	190,000	< 0.34	0.79	< 0.33	< 0.28	< 0.32	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	47	180	260	< 5.6	18	NA	NA	NA	NA	NA	NA
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	< 0.11	< 0.11	< 0.11	< 0.094	< 0.11	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	650	190,000	< 6.8	22	13	13	6.7	NA	NA	NA	NA	NA	NA
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	< 2.4	< 2.5	< 2.4	< 2	< 2.3	NA	NA	NA	NA	NA	NA
Silver	7440-22-4	84	190,000	< 3.4	< 3.4	< 3.3	< 2.8	< 3.2	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.6	< 1.6	< 1.6	< 1.3	< 1.6	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	29	690	120	370	34	NA	NA	NA	NA	NA	NA

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-104		S-105	S-106	S-107	S-108		S-109	S-110	S-111	S-112	
				10-12 4/10/19	15.5-17.5 4/10/19	8-10 4/12/19	8-10 4/12/19	4-5.5 4/23/19	8-10 4/15/19	15-17 4/15/19	8-10 4/15/19	8-10 4/12/19	4.5-6.5 4/23/19	2-4 4/12/19	8-10 4/12/19
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.011	< 0.01	< 0.012	< 0.018	< 0.01	< 0.0070	< 2.7	< 0.016	< 0.014	< 0.011	< 0.02	< 0.012
Acetone	67-64-1	10,000	10,000	0.0615	0.0286	0.0256	0.0686	< 0.01	0.0324	< 2.7	0.138	0.0882	0.0643	0.0400	0.0079 J
Benzene	71-43-2	0.5	330	< 0.00056	< 0.00051	< 0.00059	< 0.00089	< 0.00052	0.0034	0.196	0.0035	< 0.00070	< 0.00055	< 0.00099	< 0.00061
Carbon Disulfide	75-15-0	620	10,000	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	0.0014	51	0.0041	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Chlorobenzene	108-90-7	10	4,600	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	< 0.54	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Chloroform	67-66-3	8	110	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	< 0.54	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	< 0.27	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
Cyclohexane	110-82-7	6,900	10,000	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	< 0.54	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Dichloromethane	75-09-2	0.5	10,000	< 0.0056	< 0.0051	< 0.0059	< 0.0089	< 0.0052	< 0.0035	< 1.3	< 0.0081	< 0.0070	< 0.0055	< 0.0099	< 0.0061
Ethylbenzene	100-41-4	70	1,000	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	3.1	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	2.41	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	2.99	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
Methyl Acetate	79-20-9	10,000	10,000	< 0.0056	< 0.0051	< 0.0059	< 0.0089	< 0.0052	< 0.0035	3.14	< 0.0081	< 0.0070	< 0.0055	< 0.0099	< 0.0061
Methylcyclohexane	108-87-2	- -	- -	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	0.466 J	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	< 0.27	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	3.88	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
Styrene (Monomer)	100-42-5	24	10,000	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	< 0.54	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Toluene	108-88-3	100	10,000	< 0.0011	< 0.0010	0.00045 J	< 0.0018	< 0.0010	0.00032 J	1.25	< 0.0016	< 0.0014	0.00060 J	< 0.0020	< 0.0012
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	< 0.27	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0022	< 0.0020	< 0.0024	< 0.0036	< 0.0021	< 0.0014	< 0.54	< 0.0032	< 0.0028	< 0.0022	< 0.0040	< 0.0024
Total Xylenes	1330-20-7	1,000	9,100	< 0.0011	< 0.0010	< 0.0012	< 0.0018	< 0.0010	< 0.00070	6.87	< 0.0016	< 0.0014	< 0.0011	< 0.0020	< 0.0012
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	0.0425 J	0.0104 J	0.0071 J	0.0304 J	0.0357 J	0.0939	19.1 D	0.0759 J	0.0183 J	< 0.074	< 0.09	0.0069 J
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.21	< 0.19	< 0.21	< 0.26	< 0.19	0.121 J	< 0.29	0.0713 J	< 0.24	< 0.18	< 0.23	< 0.22
2-Methylnaphthalene	91-57-6	1,900	190,000	0.195	0.0244 J	0.0182 J	0.134	0.155	0.295	140 D	0.194	0.0608	< 0.037	0.0237 J	0.0188 J
2-Methylphenol	95-48-7	580	190,000	0.0305 J	< 0.076	< 0.083	< 0.1	0.0361 J	0.194	0.0373 J	0.122	< 0.094	< 0.074	< 0.09	< 0.086
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	0.138	< 0.076	< 0.083	0.166	0.0756 J	0.945	0.339	0.378	0.0646 J	< 0.074 J	< 0.09	< 0.086
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.133	< 0.038	< 0.041	0.0582	0.179	1.04	93.5 D	0.324	0.0386 J	< 0.037	< 0.045	0.0197 J
Acenaphthylene	208-96-8	8,000	190,000	0.0463	< 0.038	< 0.041	0.13	0.39	0.185	1.93	0.488	0.0539	0.104	< 0.045	< 0.043
Acetophenone	98-86-2	1,200	10,000	< 0.21	< 0.19	< 0.21	< 0.26	< 0.19	< 0.2	< 0.29	0.0111 J	< 0.24	< 0.18 J	< 0.23	< 0.22
Anthracene	120-12-7	350	190,000	0.312	< 0.038	< 0.041	0.182	1.98	0.573	49.6 D	0.636	0.179	0.0330 J	< 0.045	< 0.043
Benz(a)anthracene	56-55-3	430	190,000	0.553	0.0268 J	0.0429	0.361	4.32 D	0.168	18.4 D	1.6	0.427	0.0427	0.0648	0.0565
Benzaldehyde	100-52-7	- -	- -	< 0.21	< 0.19	< 0.21	< 0.26	< 0.19	< 0.2	< 0.29	< 0.19	< 0.24	< 0.18	< 0.23	< 0.22
Benzo(a)pyrene	50-32-8	46	190,000	0.518	0.0221 J	0.0445	0.404	4.51 D	0.151	10.8 D	1.72	0.423	0.312	0.0550	0.0661
Benzo(b)fluoranthene	205-99-2	170	190,000	0.603	0.0271 J	0.0493	0.418	4.84 D	0.192	10.8 D	2.27	0.456	0.353	0.0720	0.0667
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.311	0.0208 J	0.0277 J	0.213	2.55	0.105	1.53	1.26	0.214	0.233	0.0337 J	0.0356 J
Benzo(k)fluoranthene	207-08-9	610	190,000	0.246	< 0.038	0.0213 J	0.134	1.73	0.0632	1.7	0.772	0.165	0.131	0.0280 J	0.0253 J
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.0475 J	0.0365 J	< 0.083	< 0.1	< 0.078	< 0.079	< 0.11	< 0.077	< 0.094	< 0.074	< 0.09	< 0.086
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.084	< 0.076	< 0.083	< 0.1	< 0.078	< 0.079	< 0.11	< 0.077	< 0.094	< 0.074	< 0.09	< 0.086

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-104 10-12 4/10/19	S-104 15.5-17.5 4/10/19	S-105 8-10 4/12/19	S-106 8-10 4/12/19	S-107 4-5.5 4/23/19	S-108 8-10 4/15/19	S-108 15-17 4/15/19	S-109 8-10 4/15/19	S-110 8-10 4/12/19	S-111 4.5-6.5 4/23/19	S-112 2-4 4/12/19	S-112 8-10 4/12/19
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	0.139	0.0067 J	0.0067 J	0.0523 J	0.436	0.671	12.1 D	0.163	0.0185 J	< 0.074	0.0074 J	< 0.086
Chrysene	218-01-9	230	190,000	0.57	0.0341 J	0.0477	0.361	4.27 D	0.199	19.4 D	1.83	0.356	0.0765	0.0613	0.0601
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.0848	< 0.038	< 0.041	0.0569	0.826	0.0255 J	0.552	0.415 J	0.0540	0.0589	< 0.045	< 0.043
Dibenzofuran	132-64-9	310	190,000	0.125	< 0.076	< 0.083	0.0728 J	0.2	0.357	53 D	0.371	0.0305 J	< 0.074	< 0.09	< 0.086
Diethyl phthalate	84-66-2	9,300	10,000	< 0.084	< 0.076	< 0.083	< 0.1	< 0.078	< 0.079	< 0.11	< 0.077	< 0.094	< 0.074	< 0.09	< 0.086
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.084	< 0.076	< 0.083	< 0.1	< 0.078	< 0.079	< 0.11	< 0.077	< 0.094	< 0.074	< 0.09	< 0.086
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.084	< 0.076	< 0.083	< 0.1	< 0.078	< 0.079	< 0.11	< 0.077	< 0.094	< 0.074	< 0.09	< 0.086
Fluoranthene	206-44-0	3,200	190,000	1.07	0.0248 J	0.0913	0.584	6.12 D	0.414	77.2 D	3.04	0.756	0.0168 J	0.128	0.0607
Fluorene	86-73-7	3,800	190,000	0.174	< 0.038	< 0.041	0.132	0.387	0.589	81.2 D	0.314	0.0696	< 0.037	< 0.045	< 0.043
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.335	0.0348 J	0.0645	0.267	2.35	0.0840	1.42	1.11 J	0.265	0.207	0.0743	0.0717
Naphthalene	91-20-3	25	190,000	1.19	0.0336 J	0.0658	0.633	0.43	3.82	***325 D***	1.06	0.268	0.0133 J	0.0578	0.0717
Pentachlorophenol	87-86-5	5	190,000	< 0.17	< 0.15	< 0.17	< 0.21	< 0.16	< 0.16	< 0.23	< 0.15	< 0.19	< 0.15	< 0.18	< 0.17
Phenanthrene	85-01-8	10,000	190,000	1.2	0.0493	0.0999	0.518	3.3	0.576	223 D	1.82	0.459	< 0.037	0.113	0.0456
Phenol	108-95-2	200	18,000	0.0808 J	< 0.076	< 0.083	< 0.1	< 0.078	1.37	0.132	0.299	< 0.094	< 0.074	< 0.09	< 0.086
Pyrene	129-00-0	2,200	190,000	1.07	0.0363 J	0.105	0.751	5 D	0.447	61.1 D	2.32	0.713	0.0454	0.104	0.0867
Total PAHs and 2-Methylnaphthalene	-	- -	- -	8.61	0.334	0.678	5.34	43.3	8.93	1,120	21.2	4.96	1.63	0.816	0.685
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	4,820	10,500	8,430 J	23,000 J	11,600 J	11,400 J	7,180	8,310	5,950	4,790
Antimony	7440-36-0	27	190,000	NA	NA	< 2.5	< 3.1	0.53 J	< 2.5	< 3.4	< 2.5	< 2.7	< 2.3	< 2.8	< 2.5
Arsenic	7440-38-2	29	190,000	NA	NA	5.5	21.5	20.2	9.0	6.1	11.0	12.9	4.5	11.6	5.2
Barium	7440-39-3	8,200	190,000	NA	NA	35.4	104	51.5 J	75.9	46.6	126	67.6	23.9	90.3	27.3
Beryllium	7440-41-7	320	190,000	NA	NA	0.28	0.77	0.53	0.75	0.53	1.8	0.61	1.0	0.61	0.28
Cadmium	7440-43-9	38	190,000	NA	NA	< 0.64	0.83	0.24 J	0.099 J	0.15 J	1.1	< 0.68	0.34 J	< 0.70	< 0.63
Calcium	7440-70-2	- -	- -	NA	NA	1,070	3,320	1,100 J	1,300 J	714 J	24,300 J	2,430	358 J	1,630	1,040
Chromium	7440-47-3	190,000	190,000	NA	NA	16.5	77.5	19.0	32.9 J	19.6 J	44.5 J	36.5	31.0	20.7	16.2
Cobalt	7440-48-4	160	190,000	NA	NA	6.6	11.4	7.4	7.6	4.9 J	8.9	9.6	6.8	< 7.0	< 6.3
Copper	7440-50-8	43,000	190,000	NA	NA	17.4	49.0	40.0	14.1	12.6	75.6	40.7	41.5	67.7	15.5
Cyanide	57-12-5	2000	190,000	NA	NA	0.58	< 0.37	7.5 J	3.3 J	9.6 J	17.5 J	< 0.31	2.8	1.5	< 0.29
Iron	7439-89-6	- -	190,000	NA	NA	12,100	20,300	24,500	27,900 J	17,900 J	19,900 J	18,400	19,600	11,900	12,000
Lead	7439-92-1	450	190,000	NA	NA	49.1	127	115	38.1 J	45.4 J	147 J	75.2	44.8	117	27.4
Magnesium	7439-95-4	- -	- -	NA	NA	1,700	3,320	1,910 J	2,290	2,060	5,920	2,620	1,410	736	1,770
Manganese	7439-96-5	2,000	190,000	NA	NA	212	718	217	201 J	156 J	359 J	428	89.5	110	238
Mercury	7439-97-6	10	190,000	NA	NA	0.12	0.47	0.55 J	2.6 J	1.7 J	0.19 J	0.25	0.16 J	0.30	0.061
Nickel	7440-02-0	650	190,000	NA	NA	12.8	21.0	15.8	15.1	11.7	19.4	16.3	15.1	11.8	11.0
Potassium	7440-09-7	- -	- -	NA	NA	< 1,300	< 1,600	957 J	1,440	961 J	1,150 J	< 1,400	872 J	< 1,400	< 1,300
Selenium	7782-49-2	26	190,000	NA	NA	< 2.5	< 3.1	< 2.5	< 4.9	< 3.4	2.0 J	< 2.7	< 2.3	< 2.8	< 2.5
Silver	7440-22-4	84	190,000	NA	NA	< 0.64	< 0.79	< 0.63	< 1.2	< 0.85	< 0.62	< 0.68	< 0.58	< 0.70	< 0.63
Sodium	7440-23-5	- -	- -	NA	NA	< 1,300	< 1,600	< 1,300	< 1,200	< 1,700	722 J	< 1,400	< 1,200	< 1,400	< 1,300
Thallium	7440-28-0	14	190,000	NA	NA	< 1.3	< 1.6	< 1.3	< 2.5	< 1.7	< 1.2	< 1.4	< 1.2	< 1.4	< 1.3
Vanadium	7440-62-2	820	190,000	NA	NA	7.9	23.6	20.6	46.1 J	24.8 J	25.8 J	14.4	18.7	13.5	7.9
Zinc	7440-66-6	12,000	190,000	NA	NA	422	310	94.4 J	63.4	55.1	335	254	144	83.4	140

Location ID:		Soil Standards or PQLs		S-113B			S-114			S-115	S-116	S-117	S-118	S-122
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	10-12	13-15	15-17	8-10	14-15	23-25	4-6	4-6	4-6	4-6	10-12
Date Collected:	CAS Number			4/24/19	4/24/19	4/24/19	4/15/19	4/15/19	4/15/19	4/16/19	4/16/19	4/16/19	4/16/19	4/9/19
Volatile Organic Compounds														
2-Butanone (MEK)	78-93-3	400	10,000	0.0182	0.0131 J	< 0.013	0.0137 J	< 24	0.0626	< 0.017 [< 0.016]	< 0.015 J	< 0.014	< 0.016	< 2.3
Acetone	67-64-1	10,000	10,000	0.104	0.0740	0.0188	0.0703	< 24	0.213	0.0143 J [0.0388]	0.0531 J	0.0274 J	0.0366	< 2.3
Benzene	71-43-2	0.5	330	0.0175	< 0.00088	< 0.00065	< 0.00071	***20.8***	0.00084 J	0.0079 J [0.0112]	< 0.00077 J	< 0.00069	0.0024	< 0.11
Carbon Disulfide	75-15-0	620	10,000	< 0.0036	< 0.0035	< 0.0026	< 0.0029	5.26	0.0056	0.0018 J [0.0016 J]	< 0.0031 J	< 0.0027	0.0042	< 0.45
Chlorobenzene	108-90-7	10	4,600	< 0.0036	< 0.0035	< 0.0026	< 0.0029	< 4.7	< 0.0034	< 0.0034 [< 0.0033]	< 0.0031 J	< 0.0027 J	< 0.0033	< 0.45
Chloroform	67-66-3	8	110	< 0.0036	< 0.0035	< 0.0026	< 0.0029	< 4.7	< 0.0034	< 0.0034 [< 0.0033]	< 0.0031 J	< 0.0027	< 0.0033	< 0.45
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0018	< 0.0018	< 0.0013	< 0.0014	< 2.4	< 0.0017	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014	< 0.0016	< 0.23
Cyclohexane	110-82-7	6,900	10,000	0.0018 J	0.0039	0.0022 J	< 0.0029	< 4.7	< 0.0034	0.00084 J [< 0.0033]	< 0.0031 J	0.00062 J	0.0011 J	< 0.45
Dichloromethane	75-09-2	0.5	10,000	< 0.0090	< 0.0088	< 0.0065	< 0.0071	< 12	< 0.0086	< 0.0085 [< 0.0082]	< 0.0077 J	< 0.0069	< 0.0082	***0.829 J***
Ethylbenzene	100-41-4	70	1,000	0.0437	< 0.0018	< 0.0013	< 0.0014	1.95 J	< 0.0017	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014 J	< 0.0016	1.02
Isopropylbenzene	98-82-8	2,500	10,000	0.139	0.0225	0.0097	< 0.0029	< 4.7	0.0025 J	< 0.0034 [< 0.0033]	< 0.0031 J	< 0.0027 J	< 0.0033	1.78
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0096	< 0.0018	0.0264	< 0.0014	37	< 0.0017	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014 J	< 0.0016	0.475
Methyl Acetate	79-20-9	10,000	10,000	< 0.0090	< 0.0088 J	< 0.0065 J	< 0.0071	< 12	< 0.0086	< 0.0085 [< 0.0082]	< 0.0077 J	< 0.0069	< 0.0082	< 1.1
Methylcyclohexane	108-87-2	- -	- -	0.0131	0.0479	0.0107	< 0.0029	< 4.7	0.0023 J	0.0015 J [0.0016 J]	< 0.0031	0.0014 J	0.0021 J	0.339 J
Methyl-tert-butylether	1634-04-4	2	9,900	0.00092 J	< 0.0018	< 0.0013	< 0.0014	< 2.4	< 0.0017	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014	< 0.0016	< 0.23
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	0.0340	0.0033	0.0013	< 0.0014	12.4	0.0013 J	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014 J	< 0.0016	0.315
Styrene (Monomer)	100-42-5	24	10,000	< 0.0036	< 0.0035	< 0.0026	< 0.0029	5.57	< 0.0034	< 0.0034 [< 0.0033]	< 0.0031 J	< 0.0027	< 0.0033	< 0.45
Toluene	108-88-3	100	10,000	0.0027	0.0011 J	< 0.0013	< 0.0014	26.6	0.0015 J	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014 J	0.00090 J	0.212 J
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0018	< 0.0018	< 0.0013	< 0.0014	< 2.4	< 0.0017	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014	< 0.0016	< 0.23
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0036	< 0.0035	< 0.0026	< 0.0029	< 4.7	< 0.0034	< 0.0034 [< 0.0033]	< 0.0031 J	< 0.0027	< 0.0033	< 0.45
Total Xylenes	1330-20-7	1,000	9,100	0.0436	0.0033	0.0277	< 0.0014	49.4	0.0013 J	< 0.0017 [< 0.0016]	< 0.0015 J	< 0.0014 J	< 0.0016	0.79
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	190	190,000	17.2 D	0.637	< 0.088	0.525	132 D	< 0.11	0.0612 J [0.0714 J]	0.113	0.0672 J	1.57	1.91
2,4-Dimethylphenol	105-67-9	230	10,000	0.165 J	< 0.25	< 0.22	< 0.24	10.7	< 0.27	< 0.2 [< 0.19]	< 0.2	< 0.2	0.0773 J	< 1.3
2-Methylnaphthalene	91-57-6	1,900	190,000	153 D	4.82	< 0.044	0.327	499 D	0.0234 J	0.279 [0.303]	0.274	0.305	2.44	37.6 D
2-Methylphenol	95-48-7	580	190,000	< 0.11	< 0.1	< 0.088	< 0.097	0.818 J	< 0.11	0.0405 J [0.0435 J]	< 0.082	< 0.081	0.0494 J	< 0.53
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	1	1.55	< 0.088	0.152	1.75	0.909	0.112 [0.124]	< 0.082	< 0.081	0.181	0.975
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	139 D	8.24 D	< 0.044	17.2 D	253 D	< 0.054	0.179 [0.231]	0.869	0.37	3.23	55.3 D
Acenaphthylene	208-96-8	8,000	190,000	4.63	0.962	< 0.044	10.5 D	425 D	< 0.054	0.309 [0.329]	0.895	0.161	20.5 D	2.04
Acetophenone	98-86-2	1,200	10,000	< 0.27	< 0.25	< 0.22	< 0.24	< 2.2	< 0.27	< 0.2 [< 0.19]	< 0.2	< 0.2	< 0.19	< 1.3
Anthracene	120-12-7	350	190,000	89.6 D	4.01	< 0.044	23.2 D	***580 D***	< 0.054	0.597 [0.838]	1.84	0.761	28.1 D	30.4 D
Benz(a)anthracene	56-55-3	430	190,000	29.5 D	3.05	0.0249 J	25.9 D	428 D	0.0159 J	2.12 [3.38]	3.82	6.07 D	48.6 D	11.2
Benzaldehyde	100-52-7	- -	- -	< 0.27	< 0.25	< 0.22	< 0.24	< 2.2	0.103 J	< 0.2 [< 0.19]	< 0.2	< 0.2	< 0.19	< 1.3
Benzo(a)pyrene	50-32-8	46	190,000	19.2 D	2.75	0.0200 J	23.7 D	***396 D***	< 0.054	2.56 J [4.86 DJ]	5.11 D	8.33 D	37.2 D	7.07
Benzo(b)fluoranthene	205-99-2	170	190,000	21.6 D	3.12	0.0254 J	24.9 D	***430 D***	< 0.054	3.16 J [6.13 DJ]	6.64 D	9.84 D	55.7 D	7.33
Benzo(g,h,i)perylene	191-24-2	180	190,000	7.97 D	1.45	< 0.044	13.6 D	***188 D***	< 0.054	1.76 J [3.06 J]	2.81	5.52 D	23.4 D	3.42
Benzo(k)fluoranthene	207-08-9	610	190,000	4.29	0.873	< 0.044	9.92 D	172 D	< 0.054	1.04 [1.68 D]	1.9 D	3.74 D	18.3 D	2.73
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.11	< 0.1	< 0.088	< 0.097	< 0.87	< 0.11	< 0.078 [< 0.078]	< 0.082	< 0.081	< 0.076	< 0.53
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.11	< 0.1	< 0.088	< 0.097	< 0.87	< 0.11	< 0.078 [< 0.078]	< 0.082	< 0.081	< 0.076	< 0.53

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		S-113B			S-114			S-115	S-116	S-117	S-118	S-122
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	10-12	13-15	15-17	8-10	14-15	23-25	4-6	4-6	4-6	4-6	10-12
Date Collected:				4/24/19	4/24/19	4/24/19	4/15/19	4/15/19	4/15/19	4/16/19	4/16/19	4/16/19	4/16/19	4/9/19
Semi-Volatile Organic Compounds (cont'd)														
Carbazole	86-74-8	110	190,000	14.8 D	0.185	< 0.088	6.91 D	***277 D***	< 0.11	0.281 J [0.484 J]	0.704	0.644	9.67 D	7.79
Chrysene	218-01-9	230	190,000	32.3 D	3.77	0.0207 J	22.5 D	***435 D***	< 0.054	2.26 [3.7]	3.96	6.59 D	42.4 D	12.6
Dibenz(a,h)anthracene	53-70-3	270	190,000	2.44	0.406	< 0.044	2.28	61.3 D	< 0.054	0.504 J [0.844 J]	0.951	1.58	7.5 D	0.884
Dibenzofuran	132-64-9	310	190,000	69.9 D	1.08	< 0.088	13.6 D	***546 D***	< 0.11	0.208 [0.209]	0.905	0.196	14.4 D	28 D
Diethyl phthalate	84-66-2	9,300	10,000	< 0.11	< 0.1	< 0.088	< 0.097	< 0.87	< 0.11	< 0.078 [< 0.078]	< 0.082	< 0.081	< 0.076	< 0.53
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.11	< 0.1	< 0.088	< 0.097	< 0.87	< 0.11	< 0.078 [< 0.078]	< 0.082	< 0.081	< 0.076	< 0.53
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.11	< 0.1	< 0.088	< 0.097	< 0.87	< 0.11	< 0.078 [< 0.078]	< 0.082	< 0.081	< 0.076	< 0.53
Fluoranthene	206-44-0	3,200	190,000	126 D	8.57 D	0.0517	72.7 D	1,210 D	0.0272 J	3.19 [5.29 D]	8.36 D	8.51 D	120 D	42.4 D
Fluorene	86-73-7	3,800	190,000	118 D	4.53	< 0.044	24.7 D	821 D	0.0325 J	0.268 [0.293]	1.84	0.249	29.1 D	43.2 D
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	7.98 D	1.35	< 0.044	14.8 D	180 D	< 0.054	1.88 J [3.26 J]	3.05	6.06 D	26.3 D	3.26
Naphthalene	91-20-3	25	190,000	24.6 D	8.96 D	0.0937	1.18	***3,010 D***	0.136	1.88 [1.94]	1.15	0.765	6.59 D	***26.4***
Pentachlorophenol	87-86-5	5	190,000	< 0.21	< 0.2	< 0.18	< 0.19	< 1.7	< 0.22	< 0.16 [< 0.16]	< 0.16	< 0.16	< 0.15	< 1.1
Phenanthrene	85-01-8	10,000	190,000	322 D	17 D	0.0391 J	39.7 D	2,340 D	0.0658	2.17 [2.95]	6.59 D	2.79	107 D	129 D
Phenol	108-95-2	200	18,000	0.119	< 0.1	< 0.088	< 0.097	0.771 J	0.223	0.2 [0.194]	< 0.082	0.0848	0.214	< 0.53
Pyrene	129-00-0	2,200	190,000	108 D	9.48 D	0.0365 J	56.4 D	859 D	0.0228 J	2.89 J [4.93 DJ]	6.78 D	7.55 D	83.4 D	39.3 D
Total PAHs and 2-Methylnaphthalene	-	- -	- -	1,210	83.3	0.312	384	12,300	0.324	27.0 [44.0]	56.8	69.2	660	454
Metals														
Aluminum	7429-90-5	- -	190,000	16,800 J	13,400 J	19,300 J	11,700 J	10,800 J	14,700 J	2,250 J [1,750 J]	1,310 J	1,310 J	4,680 J	18,200 J
Antimony	7440-36-0	27	190,000	0.76 J	1.3 J	< 2.8 J	< 3.0	< 2.7	< 3.6	1.1 J [1.3 J]	0.68 J	1.2 J	0.56 J	1.5 J
Arsenic	7440-38-2	29	190,000	***57.8***	20.2	4.0	6.9	7.0	8.3	21.6 [16.8]	12.1	12.6	5.7	***49.4***
Barium	7440-39-3	8,200	190,000	219 J	189 J	139 J	42.0	24.7 J	45.6	72.1 [49.4]	55.0	81.5	38.8	187
Beryllium	7440-41-7	320	190,000	1.3	1.0	0.96	0.59	0.55	0.69	0.61 [0.45]	0.52	0.41	0.40	1.2
Cadmium	7440-43-9	38	190,000	2.1	1.3	< 0.71	< 0.76	< 0.69	< 0.89	0.50 J [0.39 J]	0.70	0.49 J	0.23 J	2.2
Calcium	7440-70-2	- -	- -	4,530 J	3,290 J	2,160 J	645 J	178 J	3,380 J	1,770 J [3,880 J]	1,110 J	1,420 J	2,590 J	4,120
Chromium	7440-47-3	190,000	190,000	194	67.3	43.0	19.5 J	16.8 J	27.5 J	90.2 J [25.4 J]	13.8 J	18.1 J	24.4 J	200
Cobalt	7440-48-4	160	190,000	19.8	16.9	11.6	8.2	9.1	9.7	4.4 J [3.7 J]	3.0 J	3.0 J	3.7 J	17.5
Copper	7440-50-8	43,000	190,000	145	73.9	6.4	13.8	13.2	16.9	135 [98.5]	110	312	37.1	127
Cyanide	57-12-5	2000	190,000	1.7 J	1.5 J	1.0 J	0.59 J	12.1 J	4.6 J	18.3 J [21.2 J]	2.5	13.2 J	18.3 J	< 0.39
Iron	7439-89-6	- -	190,000	28,700	22,900	26,000	20,000 J	21,100 J	26,700 J	32,200 [25,900]	19,000	22,900	10,500	31,600 J
Lead	7439-92-1	450	190,000	306	169	13.2	14.8 J	9.2 J	14.3 J	162 [108]	69.0	134	65.2	251
Magnesium	7439-95-4	- -	- -	4,030 J	3,690 J	5,170 J	2,430	2,150	3,360	464 J [1,820]	202 J	561 J	1,510	4,630
Manganese	7439-96-5	2,000	190,000	687	595	402	335 J	150 J	259 J	211 J [280 J]	253 J	193 J	83.6 J	751 J
Mercury	7439-97-6	10	190,000	1.3 J	0.61 J	< 0.045 J	0.81 J	1.7 J	0.029 J	0.22 J [0.14 J]	0.26	0.19 J	0.49 J	1.1
Nickel	7440-02-0	650	190,000	35.8	30.7	25.6	14.7	14.7	19.7	24.0 [19.2]	15.9	17.1	12.3	31.2
Potassium	7440-09-7	- -	- -	1,840	1,540	1,730	1,090 J	954 J	1,460 J	290 J [255 J]	201 J	226 J	565 J	2,130
Selenium	7782-49-2	26	190,000	1.6 J	< 2.9	< 2.8	< 3.0	< 2.7	< 3.6	< 5.1 [< 5.0]	2.1 J	1.7 J	< 2.2	1.5 J
Silver	7440-22-4	84	190,000	1.1	0.80	< 0.71	< 0.76	< 0.69	< 0.89	< 1.3 [< 1.3]	< 0.65	< 0.62	< 0.56	1.1
Sodium	7440-23-5	- -	- -	516 J	387 J	328 J	< 1,500	162 J	201 J	< 1,300 [< 1,300]	< 1,300	142 J	< 1,100	202 J
Thallium	7440-28-0	14	190,000	< 1.7	< 1.5	< 1.4	< 1.5	< 1.4	< 1.8	< 2.6 [< 2.5]	< 1.3	< 1.2	< 1.1	< 1.7
Vanadium	7440-62-2	820	190,000	33.1	26.6	38.8	24.6 J	21.9 J	30.8 J	11.1 [10.4]	9.2	9.4	13.6	36.9
Zinc	7440-66-6	12,000	190,000	691 J	390 J	64.0 J	45.1	38.4	55.6	183 J [115 J]	216 J	169 J	86.5 J	684

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-123 7-9 4/18/19	S-123 13-15 4/18/19	S-124 7-9 4/18/19	S-124 10-12 4/18/19	S-125 7-9 4/18/19	S-125 11-13 4/18/19	S-125 13-15 4/18/19	S-126 7-9 4/17/19	S-126 13-15 4/17/19	S-127 6-8 4/17/19	S-127 13-15 4/17/19	S-128 10-12 4/18/19	S-128 13-15 4/18/19
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.011	0.0174 J	< 3.9	0.0153 J	< 31	< 22	0.0084 J	< 0.0088	0.0093 J	< 9	0.0112 J	< 6.3	0.0196
Acetone	67-64-1	10,000	10,000	< 0.011	0.127	< 3.9	0.124	< 31	< 22	0.106	0.0293	0.0698	< 9	0.0693	< 6.3	0.125
Benzene	71-43-2	0.5	330	0.00085	0.0466	***38.8***	0.0337	***157***	***69***	0.0916	0.0035	< 0.00063	***8.52***	< 0.00073	***1.29***	0.0019
Carbon Disulfide	75-15-0	620	10,000	< 0.0023	< 0.0035	1.68	< 0.0036	< 6.3	< 4.3	< 0.0034	0.0012 J	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
Chlorobenzene	108-90-7	10	4,600	< 0.0023	< 0.0035	1.12	< 0.0036	***47.5***	***19***	0.0021 J	< 0.0018	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
Chloroform	67-66-3	8	110	< 0.0023	< 0.0035	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0011	< 0.0018	< 0.39	< 0.0018	< 3.1	< 2.2	< 0.0017	< 0.00088	< 0.0013	< 0.9	< 0.0015	< 0.63	< 0.0019
Cyclohexane	110-82-7	6,900	10,000	< 0.0023	< 0.0035	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
Dichloromethane	75-09-2	0.5	10,000	< 0.0056	< 0.0089	< 1.9	< 0.0089	< 16	< 11	< 0.0086	< 0.0044	< 0.0063	< 4.5	< 0.0073	< 3.1	< 0.0095
Ethylbenzene	100-41-4	70	1,000	< 0.0011	< 0.0018	3.42	< 0.0018	51	18.2	0.0037	< 0.00088	< 0.0013	7.46	< 0.0015	< 0.63	< 0.0019
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0023	< 0.0035	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	0.0043	< 1.8	0.0012 J	< 1.3	0.0020 J
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.0011	< 0.0018	1.56	< 0.0018	89.7	29.7	0.0050	< 0.00088	< 0.0013	19.7	< 0.0015	0.915	< 0.0019
Methyl Acetate	79-20-9	10,000	10,000	< 0.0056	< 0.0089	< 1.9	< 0.0089	< 16	< 11	< 0.0086	< 0.0044	< 0.0063	< 4.5	< 0.0073	< 3.1	< 0.0095
Methylcyclohexane	108-87-2	- -	- -	< 0.0023	0.0019 J	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	< 0.0025	< 1.8	0.0034	< 1.3	0.0035 J
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0011	< 0.0018	< 0.39	< 0.0018	< 3.1	< 2.2	< 0.0017	< 0.00088	< 0.0013	< 0.9	< 0.0015	< 0.63	< 0.0019
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	< 0.0011	< 0.0018	0.634	< 0.0018	23.1	8.23	0.0021	< 0.00088	< 0.0013	8.26	< 0.0015	< 0.63	0.0013 J
Styrene (Monomer)	100-42-5	24	10,000	< 0.0023	< 0.0035	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
Toluene	108-88-3	100	10,000	< 0.0011	0.00092 J	1.67	0.00069 J	22.7	14.6	0.0032	< 0.00088	< 0.0013	7.56	0.00060 J	0.626 J	< 0.0019
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0011	< 0.0018	< 0.39	< 0.0018	< 3.1	< 2.2	< 0.0017	< 0.00088	< 0.0013	< 0.9	< 0.0015	< 0.63	< 0.0019
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0023	< 0.0035	< 0.78	< 0.0036	< 6.3	< 4.3	< 0.0034	< 0.0018	< 0.0025	< 1.8	< 0.0029	< 1.3	< 0.0038
Total Xylenes	1330-20-7	1,000	9,100	< 0.0011	< 0.0018	2.2	< 0.0018	113	37.9	0.0071	< 0.00088	< 0.0013	27.9	< 0.0015	0.915	0.0013 J
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	0.0096 J	< 0.11	0.0351 J	< 0.11	1.33	15.3 D	0.0173 J	< 0.078 B	< 0.11 B	7.08	0.0773 J	29.3 D	0.0369 J
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.21	< 0.27	< 0.24	< 0.28	< 0.2	1.06	< 0.29	0.0913 J	< 0.27	3.17	< 0.26	0.659	< 0.3
2-Methylnaphthalene	91-57-6	1,900	190,000	0.0310 J	< 0.054	0.0601	0.0225 J	1.48	57.7 D	0.0628	0.0114 J	0.853	46.8 D	0.405	123 D	0.142
2-Methylphenol	95-48-7	580	190,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	0.0852 J	< 0.12	0.0630 J	< 0.11	0.362	< 0.11	0.136 J	< 0.12
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	0.0662 J	< 0.12	0.129	0.0746 J	2.16	0.142	0.389	0.154
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	0.0628	< 0.054	0.0731	0.261	9.61 D	82.5 D	0.206	< 0.039	6.79 D	42.6 D	1.5	60.5 D	1.99
Acenaphthylene	208-96-8	8,000	190,000	0.0956	< 0.054	0.0672	0.0446 J	1.41	22.9 D	0.0403 J	< 0.039	0.256	16.4 D	0.228	33.6 D	0.119
Acetophenone	98-86-2	1,200	10,000	< 0.21	< 0.27	< 0.24	< 0.28	< 0.2	< 0.39	< 0.29	0.0120 J	< 0.27	< 0.37	< 0.26	< 0.43	< 0.3
Anthracene	120-12-7	350	190,000	0.151	< 0.054	< 0.049	0.0746	7.7 D	54.4 D	0.137	0.0351 J	3.09	29.9 D	1.04	140 D	0.996
Benz(a)anthracene	56-55-3	430	190,000	0.496	0.0302 J	0.0249 J	0.126	6.07 D	48 D	0.154	0.0985	1.25	30.5 D	0.94	141 D	0.584
Benzaldehyde	100-52-7	- -	- -	< 0.21	< 0.27	< 0.24	< 0.28	< 0.2	< 0.39	< 0.29	< 0.2	< 0.27	< 0.37	< 0.26	< 0.43	< 0.3
Benzo(a)pyrene	50-32-8	46	190,000	0.581	0.0426 J	0.0274 J	0.164	5.49 D	43.4 D	0.158	0.0937	0.992	27.1 D	1.07	***110 D***	0.533
Benzo(b)fluoranthene	205-99-2	170	190,000	0.753	0.0505 J	0.0448 J	0.17	6.31 D	52.2 D	0.184	0.116	0.972	31.9 D	1.08	150 D	0.585
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.415	0.0380 J	0.0417 J	0.0914	2.47	20.8 D	0.0849	0.0624	0.462	14.3 D	0.587	55.5 D	0.273
Benzo(k)fluoranthene	207-08-9	610	190,000	0.251	< 0.054	< 0.049	0.0585	2.77 D	6.04	0.0614	0.0405	0.376	11.3 D	0.384	50 D	0.166
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	< 0.15	< 0.12	< 0.078	< 0.11	< 0.15	< 0.11	< 0.17	< 0.12
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	< 0.15	< 0.12	< 0.078	< 0.11	< 0.15	< 0.11	< 0.17	< 0.12

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		S-123		S-124		S-125			S-126		S-127		S-128	
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	7-9	13-15	7-9	10-12	7-9	11-13	13-15	7-9	13-15	6-8	13-15	10-12	13-15
Date Collected:				4/18/19	4/18/19	4/18/19	4/18/19	4/18/19	4/18/19	4/18/19	4/17/19	4/17/19	4/17/19	4/17/19	4/18/19	4/18/19
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	0.0573 J	< 0.11	< 0.097	< 0.11	9.03 D	27 D	0.0321 J	< 0.078 B	0.687	15.6 D	0.0599 J	70.9 D	0.0659 J
Chrysene	218-01-9	230	190,000	0.502	0.0342 J	0.0298 J	0.145	5.09 D	41.4 D	0.148	0.11	1.42	25.1 D	1.1	135 D	0.776
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.115	< 0.054	< 0.049	< 0.056	0.866	1.57	< 0.059	< 0.039	0.122	3.37	0.145	2.36	0.0776
Dibenzofuran	132-64-9	310	190,000	0.0384 J	< 0.11	< 0.097	< 0.11	7.74 D	63.3 D	0.0777 J	< 0.078	2.19	38.3 D	0.382	172 D	0.502
Diethyl phthalate	84-66-2	9,300	10,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	< 0.15	< 0.12	< 0.078	< 0.11	< 0.15	< 0.11	< 0.17	< 0.12
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	< 0.15	< 0.12	< 0.078	< 0.11	< 0.15	< 0.11	< 0.17	< 0.12
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	< 0.15	< 0.12	< 0.078	< 0.11	< 0.15	< 0.11	< 0.17	< 0.12
Fluoranthene	206-44-0	3,200	190,000	0.889	0.0560	0.0465 J	0.322	17.1 D	128 D	0.378	0.182	5.01	87.1 D	2.09	396 D	1.83
Fluorene	86-73-7	3,800	190,000	0.0594	< 0.054	< 0.049	0.151	11.9 D	94.4 D	0.164	0.0201 J	4.39	51.3 D	1.12	197 D	1.31
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.437	0.0365 J	0.0409 J	0.0983	2.31	18.7 D	0.0902	0.0773	0.414	13.9 D	0.518	51.7 D	0.209
Naphthalene	91-20-3	25	190,000	0.141	< 0.054	0.176	0.0503 J	19.2 D	***302 D***	0.213	0.251	0.831	***282 D***	1.03	***557 D***	0.451
Pentachlorophenol	87-86-5	5	190,000	< 0.17	< 0.22	< 0.19	< 0.22	< 0.16	< 0.31	< 0.24	< 0.16	< 0.22	< 0.3	< 0.21	< 0.35	< 0.24
Phenanthrene	85-01-8	10,000	190,000	0.517	0.0243 J	< 0.049	0.152	29.8 D	254 D	0.613	0.105	16.5 D	154 D	4.69	718 D	5.12
Phenol	108-95-2	200	18,000	< 0.086	< 0.11	< 0.097	< 0.11	< 0.079	0.126 J	< 0.12	0.0373 J	< 0.11	0.276	< 0.11	0.204	< 0.12
Pyrene	129-00-0	2,200	190,000	0.755	0.0613	0.0564	0.302	12.5 D	87.8 D	0.303	0.176	4.39	55.8 D	2.3	286 D	1.91
Total PAHs and 2-Methylnaphthalene	-	- -	- -	6.25	0.374	0.689	2.23	142	1,320	3.00	1.38	48.1	923	20.2	3,210	17.1
Metals																
Aluminum	7429-90-5	- -	190,000	17,300	22,700	14,700	17,000	2,190	6,940	19,900	8,020 J	18,700 J	9,850 J	16,400 J	14,500	24,500
Antimony	7440-36-0	27	190,000	0.68 J	< 3.4 J	< 3.0 J	< 3.5 J	< 2.4 J	< 2.5 J	1.6 J	< 2.3 J	< 3.4 J	< 2.3 J	0.71 J	< 2.7 J	< 3.6 J
Arsenic	7440-38-2	29	190,000	11.9	***46.9***	11.9	***69.9***	3.6	4.7	***56.3***	6.9	***60.2***	8.2	***41.6***	12.9	***80.7***
Barium	7440-39-3	8,200	190,000	109	212	103	193	33.3	57.6	267	85.0	216	29.5	165	148	257
Beryllium	7440-41-7	320	190,000	0.74	1.6	0.93	1.1	0.35	0.57	1.3	0.56	1.5	0.45	0.97	1.3	1.7
Cadmium	7440-43-9	38	190,000	0.28 J	2.5	1.6	3.1	0.18 J	0.17 J	2.5	0.28 J	1.7	0.10 J	1.8	0.49 J	3.1
Calcium	7440-70-2	- -	- -	2,140	4,290	2,430	4,750	31,600	13,600	5,330	1,120 J	3,480 J	516 J	2,900 J	30,900	6,290
Chromium	7440-47-3	190,000	190,000	28.4	187	25.9	296	7.1	19.8	271	14.7 J	273 J	15.4 J	122 J	33.3	247
Cobalt	7440-48-4	160	190,000	7.7	22.5	15.7	17.4	8.5	6.2 J	19.1	5.7	15.9	4.7 J	13.9	7.5	22.6
Copper	7440-50-8	43,000	190,000	92.0	158	119	136	42.2	28.8	162	31.9	156	12.2	97.5	52.3	182
Cyanide	57-12-5	2000	190,000	2.9 J	1.1 J	2.3 J	0.18 J	8.3 J	1.3 J	1.1	< 0.28 J	0.33 J	< 0.25 J	0.50 J	2.1 J	1.7 J
Iron	7439-89-6	- -	190,000	26,300	39,600	20,800	28,200	5,710	12,900	32,200	19,200	31,000	19,400	24,000	13,200	39,800
Lead	7439-92-1	450	190,000	***459 J***	288 J	225 J	280 J	10.9 J	30.3 J	408 J	***749***	303	24.1	186	84.2 J	374 J
Magnesium	7439-95-4	- -	- -	2,520 J	5,210 J	2,700 J	4,510 J	870 J	1,540 J	4,760 J	1,250	4,080	1,700	3,750	15,000 J	5,290 J
Manganese	7439-96-5	2,000	190,000	186 J	1,090 J	189 J	868 J	66.3 J	205 J	947 J	137 J	736 J	172 J	562 J	1,380 J	886 J
Mercury	7439-97-6	10	190,000	0.68 J	1.6 J	0.49 J	2.4 J	0.018 J	0.065 J	2.0 J	0.31 J	1.4 J	0.052 J	0.87 J	0.29 J	2.0 J
Nickel	7440-02-0	650	190,000	22.6	41.7	39.5	31.8	67.6	30.5	37.8	11.9	33.0	11.6	26.7	21.5	43.3
Potassium	7440-09-7	- -	- -	1,900	2,370	2,290	1,810	183 J	661 J	2,090	842 J	1,900	954 J	1,670	2,320	2,470
Selenium	7782-49-2	26	190,000	< 2.7	3.5 J	1.5 J	< 3.5	< 2.4	< 2.5	1.4 J	< 2.3	1.8 J	< 2.3	1.4 J	1.4 J	4.3 J
Silver	7440-22-4	84	190,000	< 0.67	2.2	< 0.75	0.96	< 0.59	< 0.64	1.4	< 0.57	1.1	< 0.57	< 0.79	< 0.69	2.5
Sodium	7440-23-5	- -	- -	109 J	264 J	135 J	237 J	< 1,200	102 J	276 J	< 1,100	215 J	< 1,100	175 J	1,400	337 J
Thallium	7440-28-0	14	190,000	0.82 J	< 3.4	0.88 J	< 1.8	< 1.2	< 1.3	< 1.8	< 1.1	< 1.7	< 1.1	< 1.6	< 2.7	< 3.6
Vanadium	7440-62-2	820	190,000	38.5	42.2	39.0	35.0	3.9 J	16.6	40.1	15.8	35.4	19.3	31.4	32.0	44.3
Zinc	7440-66-6	12,000	190,000	569	793	527	929	512	268	850	118 J	632 J	159 J	507 J	144	960

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-129 8-10 4/18/19	S-129 10-12 4/18/19	S-130 7-8 4/17/19	S-130 10-12 4/17/19	S-130 13-15 4/17/19	S-131 2-4 4/17/19	S-131 7-9 4/17/19	S-132 8-10 4/17/19	S-133 7-9 4/17/19	S-133 13-15 4/17/19	S-135 4-6 4/22/19	S-135 8-10 4/22/19	S-136 4-6 4/22/19	S-136 7-9 4/22/19
Volatile Organic Compounds																	
2-Butanone (MEK)	78-93-3	400	10,000	< 130	0.0111 J	0.0162	< 2.1	0.0084 J	< 0.0098	0.0085 J	< 2.4	0.0304	0.0104 J	< 1.7	0.0096 J	0.0229	< 0.011
Acetone	67-64-1	10,000	10,000	< 130	0.105	0.133	< 2.1	0.0492	0.0324	0.0577	< 2.4	0.173	0.0648	< 1.7	0.105	0.176	0.0664
Benzene	71-43-2	0.5	330	***44.3***	0.0824	0.0661	0.285	< 0.00083	< 0.00049	0.0018	0.363	0.0088	< 0.00074	< 0.083	< 0.00064	0.0022	< 0.00057
Carbon Disulfide	75-15-0	620	10,000	< 26	0.0020 J	0.0030	2.08	< 0.0033	< 0.0020	0.0038 J	0.607	0.0063	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
Chlorobenzene	108-90-7	10	4,600	< 26	< 0.0033	< 0.0024	< 0.43	< 0.0033	< 0.0020	< 0.0039	< 0.47	< 0.0035	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
Chloroform	67-66-3	8	110	< 26	< 0.0033	< 0.0024	< 0.43	< 0.0033	< 0.0020	< 0.0039	< 0.47	< 0.0035	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 13	< 0.0017	< 0.0012	< 0.21	< 0.0017	< 0.00098	< 0.0019	< 0.24	< 0.0017	< 0.0015	< 0.17	< 0.0013	< 0.0015	< 0.0011
Cyclohexane	110-82-7	6,900	10,000	< 26	< 0.0033	< 0.0024	< 0.43	< 0.0033	< 0.0020	< 0.0039	< 0.47	< 0.0035	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
Dichloromethane	75-09-2	0.5	10,000	< 66	< 0.0083	< 0.0060	< 1.1	< 0.0083	< 0.0049	< 0.0097	< 1.2	< 0.0087	< 0.0074	< 0.83	< 0.0064	< 0.0073	< 0.0057
Ethylbenzene	100-41-4	70	1,000	11.6 J	0.0010 J	0.00071 J	0.235	< 0.0017	< 0.00098	0.0021	0.249	< 0.0017	< 0.0015	0.119 J	< 0.0013	< 0.0015	< 0.0011
Isopropylbenzene	98-82-8	2,500	10,000	< 26	0.0024 J	< 0.0024	0.541	0.0014 J	< 0.0020	0.0044	< 0.47	< 0.0035	0.0010 J	< 0.33	< 0.0026	< 0.0029	< 0.0023
m&p-Xylenes	ARC-mpXyl	- -	- -	80.9	0.0045	< 0.0012	0.162 J	< 0.0017	< 0.00098	< 0.0019	0.311	< 0.0017	< 0.0015	0.212	< 0.0013	< 0.0015	< 0.0011
Methyl Acetate	79-20-9	10,000	10,000	< 66	< 0.0083	0.0024 J	< 1.1	< 0.0083	< 0.0049	< 0.0097	1.03 J	0.0039 J	< 0.0074	< 0.83	< 0.0064	< 0.0073	< 0.0057
Methylcyclohexane	108-87-2	- -	- -	< 26	< 0.0033	< 0.0024	0.209 J	0.0014 J	< 0.0020	0.0024 J	< 0.47	< 0.0035	0.0019 J	< 0.33	< 0.0026	< 0.0029	< 0.0023
Methyl-tert-butylether	1634-04-4	2	9,900	< 13	< 0.0017	< 0.0012	< 0.21	< 0.0017	< 0.00098	< 0.0019	< 0.24	< 0.0017	< 0.0015	< 0.17	< 0.0013	< 0.0015	< 0.0011
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	29.7	0.0026	< 0.0012	< 0.21	< 0.0017	< 0.00098	< 0.0019	< 0.24	< 0.0017	< 0.0015	< 0.17	< 0.0013	< 0.0015	< 0.0011
Styrene (Monomer)	100-42-5	24	10,000	< 26	< 0.0033	< 0.0024	< 0.43	< 0.0033	< 0.0020	< 0.0039	< 0.47	< 0.0035	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
Toluene	108-88-3	100	10,000	17.6	0.0026	0.0015	0.381	< 0.0017	< 0.00098	0.00083 J	1.63	0.0010 J	< 0.0015	2.07	0.00080 J	0.0013 J	0.00068 J
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 13	< 0.0017	< 0.0012	< 0.21	< 0.0017	< 0.00098	< 0.0019	< 0.24	< 0.0017	< 0.0015	< 0.17	< 0.0013	< 0.0015	< 0.0011
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 26	< 0.0033	< 0.0024	< 0.43	< 0.0033	< 0.0020	< 0.0039	< 0.47	< 0.0035	< 0.0030	< 0.33	< 0.0026	< 0.0029	< 0.0023
Total Xylenes	1330-20-7	1,000	9,100	111	0.0071	< 0.0012	0.162 J	< 0.0017	< 0.00098	0.0017 J	0.311	< 0.0017	< 0.0015	0.212	< 0.0013	< 0.0015	< 0.0011
Semi-Volatile Organic Compounds																	
1,1-Biphenyl	92-52-4	190	190,000	127 D	0.0542 J	0.0413 J	0.16	0.0452 J	< 0.075	0.218	< 0.12 B	< 0.071 B	< 0.1 B	< 0.093	0.0091 J	0.0242 J	< 0.08
2,4-Dimethylphenol	105-67-9	230	10,000	4.18	< 0.29	0.783	< 0.28	< 0.26	< 0.19	< 0.28	< 0.29	< 0.18	< 0.26	< 0.23	< 0.24	< 0.23	< 0.2
2-Methylnaphthalene	91-57-6	1,900	190,000	533 D	0.234	0.227	3.72	0.279	< 0.038	0.752	0.181	0.0771	0.253	0.108	< 0.047	0.0765	< 0.04
2-Methylphenol	95-48-7	580	190,000	< 0.78	< 0.12	1.54	0.166	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	0.39 J	0.0604 J	1.48	0.231	0.128	< 0.075	0.101 J	0.345	< 0.071	0.121	0.0827 J	< 0.095	< 0.091 J	< 0.08 J
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	469 D	0.885	0.0908	6.8 D	1.1	< 0.038	7.65 D	0.265	0.758	0.461	0.216	< 0.047	0.0375 J	< 0.04
Acenaphthylene	208-96-8	8,000	190,000	121 D	0.0859	0.0292 J	0.325	0.136	< 0.038	0.223	0.0621	0.0551	0.234	< 0.046	< 0.047	0.0473	< 0.04
Acetophenone	98-86-2	1,200	10,000	< 1.9	< 0.29	0.0424 J	< 0.28	< 0.26	< 0.19	0.0334 J	0.0182 J	< 0.18	0.0118 J	< 0.23	< 0.24	< 0.23 J	< 0.2 J
Anthracene	120-12-7	350	190,000	325 D	0.392	0.0854	1.88	0.44	< 0.038	4.93	0.0988	0.139	0.39	0.114	< 0.047	0.0616	< 0.04
Benz(a)anthracene	56-55-3	430	190,000	357 D	0.314	0.0770	1.15	0.436	0.0114 J	1.59	0.137	0.0873	0.807	0.126	0.0422 J	0.0799	< 0.04
Benzaldehyde	100-52-7	- -	- -	< 1.9	< 0.29	< 0.22	< 0.28	< 0.26	< 0.19	< 0.28	< 0.29	< 0.18	< 0.26	< 0.23	< 0.24	0.0149 J	< 0.2
Benzo(a)pyrene	50-32-8	46	190,000	***299 D***	0.303	0.0635	1.06	0.445	< 0.038	0.989	0.184	0.0724	1.06	0.143	0.0408 J	0.0990	< 0.04
Benzo(b)fluoranthene	205-99-2	170	190,000	***345 D***	0.336	0.0840	0.993	0.48	< 0.038	1.23	0.177	0.0955	1.05	0.152	0.0492	0.102	< 0.04
Benzo(g,h,i)perylene	191-24-2	180	190,000	135 D	0.168	0.0440	0.513	0.253	< 0.038	0.426	0.121	0.0367	0.616	0.0966	0.0291 J	0.0731	< 0.04
Benzo(k)fluoranthene	207-08-9	610	190,000	147 D	0.147	0.0265 J	0.318	0.146	< 0.038	0.411	0.0717	0.0360	0.376	0.0623	< 0.047	0.0441 J	< 0.04
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.78	< 0.12	< 0.088	< 0.11	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.78	< 0.12	< 0.088	< 0.11	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-129		S-130			S-131		S-132	S-133		S-135		S-136	
				8-10 4/18/19	10-12 4/18/19	7-8 4/17/19	10-12 4/17/19	13-15 4/17/19	2-4 4/17/19	7-9 4/17/19	8-10 4/17/19	7-9 4/17/19	13-15 4/17/19	4-6 4/22/19	8-10 4/22/19	4-6 4/22/19	7-9 4/22/19
Semi-Volatile Organic Compounds (cont'd)																	
Carbazole	86-74-8	110	190,000	***152 D***	0.191	0.0400 J	0.783	0.0247 J	< 0.075	1.61	< 0.12 B	< 0.071	0.0571 J	< 0.093	0.0071 J	< 0.091	< 0.08
Chrysene	218-01-9	230	190,000	***296 D***	0.382	0.0931	1.22	0.535	< 0.038	2.02	0.175	0.0997	0.931	0.15	0.0391 J	0.0841	< 0.04
Dibenz(a,h)anthracene	53-70-3	270	190,000	9.11	0.0535 J	< 0.044	0.16	0.0611	< 0.038	0.12	0.0270 J	< 0.035	0.163	0.0287 J	< 0.047	< 0.046	< 0.04
Dibenzofuran	132-64-9	310	190,000	***472 D***	0.256	0.0514 J	1.54	0.0823 J	< 0.075	2.78	0.0450 J	0.103	0.0943 J	0.131	< 0.095	< 0.091	< 0.08
Diethyl phthalate	84-66-2	9,300	10,000	< 0.78	< 0.12	< 0.088	< 0.11	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.78	< 0.12	< 0.088	< 0.11	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.78	< 0.12	< 0.088	< 0.11	< 0.1	< 0.075	< 0.11	< 0.12	< 0.071	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
Fluoranthene	206-44-0	3,200	190,000	864 D	0.75	0.153	2.9	0.982	0.0171 J	6.59 D	0.282	0.289	1.27	0.305	0.0481	0.111	< 0.04
Fluorene	86-73-7	3,800	190,000	693 D	0.604	0.0826	3.29	0.55	< 0.038	5.69 D	0.103	0.465	0.293	0.302	< 0.047	0.0331 J	< 0.04
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	120 D	0.139	0.0441	0.502	0.239	< 0.038	0.4	0.12	0.0516	0.58	0.105	0.0464 J	0.0537	< 0.04
Naphthalene	91-20-3	25	190,000	***2,440 D***	0.984	11.7 D	2.11	0.587	< 0.038	1.12	0.762	1.26	0.752	0.104	0.0258 J	0.395	< 0.04
Pentachlorophenol	87-86-5	5	190,000	< 1.6	0.197 J	< 0.18	< 0.22	< 0.21	< 0.15	< 0.22	< 0.23	< 0.14	< 0.21	< 0.19	< 0.19	< 0.18	< 0.16
Phenanthrene	85-01-8	10,000	190,000	1,700 D	1.07	0.27	9.57 D	1.9	0.0160 J	17 D	0.34	0.173	0.916	0.142	0.0343 J	0.0722	< 0.04
Phenol	108-95-2	200	18,000	< 0.78	< 0.12	1.73	0.196	< 0.1	< 0.075	< 0.11	< 0.12	0.0232 J	< 0.1	< 0.093	< 0.095	< 0.091	< 0.08
Pyrene	129-00-0	2,200	190,000	586 D	0.752	0.141	3.08	1.13	0.0131 J	5.27	0.347	0.296	1.4	0.274	0.0574	0.156	< 0.04
Total PAHs and 2-Methylnaphthalene	-	- -	- -	9,440	7.6	13.2	39.6	9.70	0.0576	56.4	3.45	3.99	11.6	2.43	0.412	1.53	< 0.04
Metals																	
Aluminum	7429-90-5	- -	190,000	5,970	14,200	4,490 J	16,300 J	19,400 J	21,400 J	16,600 J	19,900 J	6,230 J	17,200 J	12,300	7,510	10,400	4,850
Antimony	7440-36-0	27	190,000	< 2.4 J	< 3.6 J	< 2.6 J	< 3.4 J	1.1 J	< 2.5 J	< 3.4 J	3.6 J	1.3 J	4.2 J	< 2.8	< 2.8	< 2.8	< 2.5
Arsenic	7440-38-2	29	190,000	7.4	24.9	16.5	***35.8***	***64.3***	4.9	***33.4***	***34.5***	3.8	***38.4***	***52.2***	4.6	20.8	5.7
Barium	7440-39-3	8,200	190,000	58.4	154	45.8	165	260	51.6	150	241	43.5	195	136	46.6	123	29.3
Beryllium	7440-41-7	320	190,000	0.32	0.82	0.60	1.2	1.6	0.66	1.0	1.3	0.37	1.1	0.95	0.36	0.70	0.22 J
Cadmium	7440-43-9	38	190,000	0.50 J	1.2	0.90	1.6	2.8	< 0.61	1.2	1.4	0.073 J	1.6	1.6	0.14 J	2.1	0.10 J
Calcium	7440-70-2	- -	- -	1,380	4,120	1,050 J	3,880 J	5,250 J	672 J	3,310 J	3,910 J	1,400 J	2,630 J	2,810	1,940	1,820	1,040
Chromium	7440-47-3	190,000	190,000	11.5	109	18.4 J	151 J	427 J	31.5 J	129 J	149 J	17.6 J	207 J	125	23.7	79.0	12.4
Cobalt	7440-48-4	160	190,000	5.9	12.8	8.7	15.5	17.8	7.5	17.6	17.4	4.5 J	14.7	13.2	6.8 J	8.0	6.2 J
Copper	7440-50-8	43,000	190,000	45.2	78.4	46.8	103	204	12.0	85.8	93.6	28.6	127	104	10.1	74.3	6.8
Cyanide	57-12-5	2000	190,000	7.7 J	1.0 J	1.8 J	0.81 J	0.92 J	0.44 J	2.1 J	0.50 J	0.28 J	0.36 J	0.67	< 0.37	2.7	0.72
Iron	7439-89-6	- -	190,000	17,000	24,400	14,800	29,600	32,300	21,200	29,800	32,000	14,600	26,500	23,100	13,500	17,600	10,400
Lead	7439-92-1	450	190,000	196 J	196 J	169	212	***497***	20.2	153	178	23.1	270	189	25.6	137	9.0
Magnesium	7439-95-4	- -	- -	1,170 J	4,380 J	911	4,050	4,550	2,110	4,100	4,840	2,220	3,320	3,340	3,200	2,690	1,820
Manganese	7439-96-5	2,000	190,000	469 J	843 J	158 J	718 J	743 J	209 J	867 J	1,180 J	254 J	785 J	557	401	144	304
Mercury	7439-97-6	10	190,000	0.086 J	0.88 J	0.15 J	1.6 J	2.3 J	R	1.2 J	1.3 J	0.070 J	1.6 J	0.99 J	0.051 J	0.80 J	0.037 J
Nickel	7440-02-0	650	190,000	11.7	26.3	26.2	33.5	38.4	14.2	29.7	34.5	11.4	28.3	24.2	15.3	21.4	10.1
Potassium	7440-09-7	- -	- -	601 J	1,780 J	467 J	1,890	2,180	1,060 J	1,710	2,080	988 J	1,580 J	1,530	1,150 J	1,230 J	774 J
Selenium	7782-49-2	26	190,000	< 2.4	< 3.6	2.3 J	1.5 J	3.6	< 2.5	< 3.4	< 3.7	< 2.1	< 3.2	1.3 J	< 2.8	1.1 J	< 2.5
Silver	7440-22-4	84	190,000	< 0.59	0.34 J	< 0.65	0.77 J	2.5	< 0.61	< 0.85	< 0.93	< 0.52	0.68 J	0.79	< 0.70	0.43 J	< 0.63
Sodium	7440-23-5	- -	- -	< 1,200	179 J	< 1,300	270 J	421 J	< 1,200	222 J	171 J	135 J	142 J	121 J	116 J	121 J	< 1,300
Thallium	7440-28-0	14	190,000	< 1.2	< 1.8	< 1.3	< 1.7	< 1.7	< 1.2	< 1.7	< 1.9	< 1.0	< 1.6	< 1.4	< 1.4	< 1.4	< 1.3
Vanadium	7440-62-2	820	190,000	10.6	27.8	13.8	35.8	38.7	45.3	32.4	41.1	15.6	32.4	24.7	15.9	22.0	8.1
Zinc	7440-66-6	12,000	190,000	249	380	85.8 J	485 J	1,040 J	55.9 J	453 J	514 J	56.1 J	679 J	531	61.9	332	86.6

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		S-142		S-144		S-146	S-147		S-148	S-149	S-151
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	6-6.5	7-8	15-17	22-24	17-19	12-14	18-20	16-18	18.5-20.5	3-5
Date Collected:	CAS Number			4/25/19	4/25/19	4/24/19	4/24/19	4/25/19	4/25/19	4/25/19	4/25/19	4/25/19	4/25/19
Volatile Organic Compounds													
2-Butanone (MEK)	78-93-3	400	10,000	NA	0.0355	< 0.01	< 0.015	< 0.01	< 0.019	0.0561	0.0209	0.0317	< 0.013 [< 0.01]
Acetone	67-64-1	10,000	10,000	NA	0.129	0.0294 J	0.0554	0.0053 J	0.0924	0.24	0.0890	0.134	0.0139 [0.0278]
Benzene	71-43-2	0.5	330	NA	< 0.0011	< 0.00052	< 0.00073	< 0.00052	< 0.00095	< 0.00082	< 0.00075	< 0.00072	< 0.00064 [< 0.00051]
Carbon Disulfide	75-15-0	620	10,000	NA	< 0.0046	0.0119 J	< 0.0029	< 0.0021	0.0053	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Chlorobenzene	108-90-7	10	4,600	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Chloroform	67-66-3	8	110	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
cis-1,2-Dichloroethene	156-59-2	7	10,000	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
Cyclohexane	110-82-7	6,900	10,000	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Dichloromethane	75-09-2	0.5	10,000	NA	0.0068 J	< 0.0052	< 0.0073	0.0057	< 0.0095	< 0.0082	< 0.0075	< 0.0072	< 0.0064 [< 0.0051]
Ethylbenzene	100-41-4	70	1,000	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
Isopropylbenzene	98-82-8	2,500	10,000	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
m&p-Xylenes	ARC-mpXyl	- -	- -	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
Methyl Acetate	79-20-9	10,000	10,000	NA	< 0.011	< 0.0052	< 0.0073	< 0.0052	< 0.0095	< 0.0082	< 0.0075	< 0.0072	< 0.0064 [< 0.0051]
Methylcyclohexane	108-87-2	- -	- -	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Methyl-tert-butylether	1634-04-4	2	9,900	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
Styrene (Monomer)	100-42-5	24	10,000	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Toluene	108-88-3	100	10,000	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
trans-1,2-Dichloroethene	156-60-5	10	5,500	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	< 0.0046	< 0.0021	< 0.0029	< 0.0021	< 0.0038	< 0.0033	< 0.0030	< 0.0029	< 0.0026 [< 0.0020]
Total Xylenes	1330-20-7	1,000	9,100	NA	< 0.0023	< 0.0010	< 0.0015	< 0.0010	< 0.0019	< 0.0016	< 0.0015	< 0.0014	< 0.0013 [< 0.0010]
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	< 0.083	< 0.073	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	NA	< 0.31	< 0.21	< 0.18	< 0.19	< 0.23	< 0.25	< 0.27 J	< 0.26	< 0.21 [< 0.2]
2-Methylnaphthalene	91-57-6	1,900	190,000	NA	0.0925	< 0.041	< 0.036	< 0.039	1.4	0.0199 J	< 0.054	< 0.052	< 0.043 [< 0.04]
2-Methylphenol	95-48-7	580	190,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	0.349	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	NA	0.0453 J	< 0.041	< 0.036	< 0.039	0.127	< 0.051	< 0.054	< 0.052	0.0188 J [< 0.04]
Acenaphthylene	208-96-8	8,000	190,000	NA	0.0634	< 0.041	< 0.036	< 0.039	< 0.045	< 0.051	< 0.054	< 0.052	< 0.043 [< 0.04]
Acetophenone	98-86-2	1,200	10,000	NA	NA	< 0.21	< 0.18	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	NA	0.0702	< 0.041	< 0.036	< 0.039	0.284	0.0457 J	< 0.054	< 0.052	0.0526 [< 0.04]
Benz(a)anthracene	56-55-3	430	190,000	NA	0.17	0.0229 J	< 0.036	< 0.039	0.115	0.0427 J	0.0178 J	< 0.052	0.138 [0.0189 J]
Benzaldehyde	100-52-7	- -	- -	NA	NA	< 0.21	< 0.18	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	NA	0.2	0.0230 J	< 0.036	< 0.039	0.0677	0.0275 J	< 0.054	< 0.052	0.134 [< 0.04]
Benzo(b)fluoranthene	205-99-2	170	190,000	NA	0.207	0.0297 J	< 0.036	< 0.039	0.0997	0.0332 J	< 0.054	< 0.052	0.154 J [0.0186 J]
Benzo(g,h,i)perylene	191-24-2	180	190,000	NA	0.122	< 0.041	< 0.036	< 0.039	0.0450	< 0.051	< 0.054	< 0.052	0.0827 [< 0.04]
Benzo(k)fluoranthene	207-08-9	610	190,000	NA	0.0798	< 0.041	< 0.036	< 0.039	0.0336 J	< 0.051	< 0.054	< 0.052	0.0541 [< 0.04]
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
Butyl benzyl phthalate	85-68-7	10,000	10,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-142 6-6.5 4/25/19	S-142 7-8 4/25/19	S-144 15-17 4/24/19	S-144 22-24 4/24/19	S-146 17-19 4/25/19	S-147 12-14 4/25/19	S-147 18-20 4/25/19	S-148 16-18 4/25/19	S-149 18.5-20.5 4/25/19	S-151 3-5 4/25/19
Semi-Volatile Organic Compounds (cont'd)													
Carbazole	86-74-8	110	190,000	NA	0.0184 J	< 0.083	< 0.073	< 0.078	0.644	0.0155 J	< 0.11	< 0.1	0.0245 J [< 0.08]
Chrysene	218-01-9	230	190,000	NA	0.181	0.0172 J	< 0.036	< 0.039	0.11	0.0366 J	< 0.054	< 0.052	0.126 [0.0149 J]
Dibenz(a,h)anthracene	53-70-3	270	190,000	NA	0.0281 J	< 0.041	< 0.036	< 0.039	< 0.045	< 0.051	< 0.054	< 0.052	< 0.043 [< 0.04]
Dibenzofuran	132-64-9	310	190,000	NA	0.0292 J	< 0.083	< 0.073	< 0.078	0.224	0.0310 J	< 0.11	< 0.1	< 0.085 [< 0.08]
Diethyl phthalate	84-66-2	9,300	10,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
Di-n-butyl phthalate	84-74-2	4,900	10,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
Di-n-octyl phthalate	117-84-0	10,000	10,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
Fluoranthene	206-44-0	3,200	190,000	NA	0.284	0.0294 J	< 0.036	< 0.039	0.497	0.0951	0.0380 J	0.0236 J	0.282 J [0.0277 J]
Fluorene	86-73-7	3,800	190,000	NA	0.0544 J	< 0.041	< 0.036	< 0.039	0.356	0.0420 J	< 0.054	< 0.052	0.0211 J [< 0.04]
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	NA	0.0956	< 0.041	< 0.036	< 0.039	0.0315 J	< 0.051	< 0.054	< 0.052	0.0687 [< 0.04]
Naphthalene	91-20-3	25	190,000	NA	0.406	< 0.041	< 0.036	< 0.039	1.78	0.103	0.0754	0.0297 J	0.0122 J [< 0.04]
Pentachlorophenol	87-86-5	5	190,000	NA	< 0.25	< 0.17	< 0.15	< 0.16	< 0.18	< 0.2	< 0.22	< 0.21	< 0.17 [< 0.16]
Phenanthrene	85-01-8	10,000	190,000	NA	0.21	0.0174 J	< 0.036	< 0.039	0.4	0.138	0.0427 J	0.0218 J	0.202 J [0.0228 J]
Phenol	108-95-2	200	18,000	NA	< 0.12	< 0.083	< 0.073	< 0.078	< 0.091	< 0.1	< 0.11	< 0.1	< 0.085 [< 0.08]
Pyrene	129-00-0	2,200	190,000	NA	0.336	0.0267 J	< 0.036	< 0.039	0.538	0.0734	0.0298 J	0.0202 J	0.248 J [0.0286 J]
Total PAHs and 2-Methylnaphthalene	-	- -	- -	NA	2.65	0.166	< 0.036	< 0.039	5.88	0.657	0.204	0.0953	1.59 [0.132]
Metals													
Aluminum	7429-90-5	- -	190,000	NA	20,500	7,290 J	7,490 J	1,080	3,240	23,600	21,100	19,200	16,100 [18,500]
Antimony	7440-36-0	27	190,000	NA	1.6 J	< 2.5 J	< 2.4 J	< 2.3 J	0.88 J	0.61 J	< 3.3 J	< 3.2 J	< 2.7 J [< 4.7 J]
Arsenic	7440-38-2	29	190,000	NA	***48.7***	2.6	1.9 J	1.6 J	8.1	5.3	5.4	4.3	2.9 [2.4 J]
Barium	7440-39-3	8,200	190,000	NA	203	23.6 J	29.0 J	4.1 J	88.0	177	152	142	151 [153]
Beryllium	7440-41-7	320	190,000	NA	1.5	0.28	0.31	0.16 J	2.3	1.0	1.1	0.87	0.84 [0.91]
Cadmium	7440-43-9	38	190,000	NA	2.6	< 0.62	< 0.60	< 0.57	1.4	0.16 J	0.15 J	0.14 J	< 0.67 [0.12 J]
Calcium	7440-70-2	- -	- -	NA	4,500 J	245 J	218 J	58.7 J	939 J	3,420 J	3,160 J	3,050 J	7,430 J [1,700 J]
Chromium	7440-47-3	190,000	190,000	NA	176	9.7	13.6	5.1	8.0	45.3	46.9	39.3	33.2 [33.7]
Cobalt	7440-48-4	160	190,000	NA	21.5	7.3	3.1 J	0.87 J	42.2	10.6	11.2	10.6	12.2 [13.2]
Copper	7440-50-8	43,000	190,000	NA	148	7.2	3.2	1.1 J	80.5	11.6	14.7	9.2	46.5 [54.2]
Cyanide	57-12-5	2000	190,000	1.3 J	1.6 J	< 0.28	< 0.24	< 0.24 J	1.5 J	0.24 J	0.55 J	0.26 J	< 0.30 J [0.20 J]
Iron	7439-89-6	- -	190,000	NA	33,300	12,300	5,270	2,510	7,690	23,500	27,600	18,800	26,300 [30,400]
Lead	7439-92-1	450	190,000	NA	279 J	10.3	5.4	1.0 J	45.1 J	17.2 J	42.7 J	12.3 J	103 J [36.8 J]
Magnesium	7439-95-4	- -	- -	NA	5,090	1,820 J	1,090 J	72.2 J	179 J	5,660	5,520	5,120	8,400 [9,700]
Manganese	7439-96-5	2,000	190,000	NA	967 J	100	32.6	11.6 J	28.2 J	356 J	447 J	310 J	382 J [469 J]
Mercury	7439-97-6	10	190,000	NA	1.9 J	< 0.034 J	< 0.034 J	< 0.035 J	0.078 J	0.047 J	0.040 J	0.048 J	0.31 J [0.054 J]
Nickel	7440-02-0	650	190,000	NA	38.4	13.0	7.3	1.3 J	77.2	28.4	29.9	26.0	25.1 [32.4]
Potassium	7440-09-7	- -	- -	NA	2,280	896 J	1,100 J	120 J	228 J	2,130	2,370	1,780	7,750 [10,300]
Selenium	7782-49-2	26	190,000	NA	1.6 J	< 2.5	< 2.4	< 2.3	5.5	< 3.0	< 3.3	< 3.2	< 2.7 [< 4.7]
Silver	7440-22-4	84	190,000	NA	2.1	< 0.62	< 0.60	< 0.57	< 0.68	< 0.74	< 0.84	0.52 J	< 0.67 [< 1.2]
Sodium	7440-23-5	- -	- -	NA	189 J	< 1,200	< 1,200	< 1,100	< 1,400	315 J	257 J	332 J	173 J [190 J]
Thallium	7440-28-0	14	190,000	NA	< 1.9	< 1.2	< 1.2	< 1.1	< 1.4	< 1.5	< 1.7	< 1.6	< 2.7 [< 2.3]
Vanadium	7440-62-2	820	190,000	NA	41.3	9.6	8.8	3.9 J	7.3	41.7	41.3	39.7	36.7 [42.9]
Zinc	7440-66-6	12,000	190,000	NA	751	43.0 J	26.6 J	5.3 J	188	68.9	82.2	63.5	106 [124]

Location ID:		Soil Standards or PQLs		S-153		S-154		S-155		S-156	S-157	
Sample Depth (ft):	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	7-9	13.5-15	9-11	12-14	10-12	13-15	14-16	7-9	23-25
Date Collected:				4/26/19	4/26/19	4/26/19	4/26/19	4/26/19	4/26/19	5/3/19	5/3/19	5/3/19
Volatile Organic Compounds												
2-Butanone (MEK)	78-93-3	400	10,000	0.0139 J	0.0141 J [0.0162 J]	< 1.6	0.0257 [0.0116 J]	< 17	0.0577	0.0287 [0.0387]	0.0103 J	< 0.011
Acetone	67-64-1	10,000	10,000	0.141	0.0755 [0.0725 J]	< 1.6	0.208 [0.0716]	< 17	0.376	0.114 J [0.229]	0.0627	0.0187
Benzene	71-43-2	0.5	330	0.0087	< 0.00079 [< 0.00088]	***11.4***	0.0025 [0.0042]	***247***	0.0029	< 0.00079 [< 0.00099]	0.00099	< 0.00053
Carbon Disulfide	75-15-0	620	10,000	0.0105	< 0.0032 [< 0.0035]	0.206 J	< 0.0043 [< 0.0046]	< 3.5	< 0.0038	< 0.0032 [< 0.0040]	0.0017 J	< 0.0021
Chlorobenzene	108-90-7	10	4,600	< 0.0044	< 0.0032 [< 0.0035]	0.163 J	< 0.0043 [< 0.0046]	***40.7***	< 0.0038	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
Chloroform	67-66-3	8	110	< 0.0044	< 0.0032 [< 0.0035]	< 0.32	< 0.0043 [< 0.0046]	< 3.5	< 0.0038	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0022	< 0.0016 [< 0.0018]	< 0.16	< 0.0022 [< 0.0023]	< 1.7	< 0.0019	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
Cyclohexane	110-82-7	6,900	10,000	< 0.0044	< 0.0032 [< 0.0035]	< 0.32	< 0.0043 [< 0.0046]	< 3.5	< 0.0038	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
Dichloromethane	75-09-2	0.5	10,000	< 0.011	< 0.0079 [< 0.0088]	< 0.81	< 0.011 [< 0.011]	< 8.7	< 0.0096	0.0018 J [< 0.0099]	< 0.0065	< 0.0053
Ethylbenzene	100-41-4	70	1,000	0.0018 J	< 0.0016 [< 0.0018]	0.0949 J	0.0012 J [< 0.0023]	***76***	< 0.0019	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
Isopropylbenzene	98-82-8	2,500	10,000	< 0.0044	< 0.0032 [0.0016 J]	< 0.32	0.0018 J [< 0.0046]	2.13 J	0.0026 J	< 0.0032 [< 0.0040]	0.0021 J	< 0.0021
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0023	< 0.0016 [< 0.0018]	< 0.16	< 0.0022 [< 0.0023]	137	0.0028	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
Methyl Acetate	79-20-9	10,000	10,000	< 0.011 J	< 0.0079 [< 0.0088]	0.431 J	< 0.011 [< 0.011]	< 8.7	< 0.0096	< 0.0079 [0.0062 J]	< 0.0065	< 0.0053
Methylcyclohexane	108-87-2	- -	- -	< 0.0044	< 0.0032 [0.0015 J]	< 0.32	< 0.0043 [< 0.0046]	< 3.5	0.0046	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.0022	< 0.0016 [< 0.0018]	< 0.16	< 0.0022 [< 0.0023]	< 1.7	< 0.0019	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	0.0028	< 0.0016 [< 0.0018]	< 0.16	0.0014 J [< 0.0023]	38.4	0.0035	< 0.0016 [< 0.0020]	0.0016	< 0.0011
Styrene (Monomer)	100-42-5	24	10,000	< 0.0044	< 0.0032 [< 0.0035]	< 0.32	< 0.0043 [< 0.0046]	< 3.5	< 0.0038	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
Toluene	108-88-3	100	10,000	0.0022	0.00063 J [0.0033 J]	0.594	0.0013 J [0.00087 J]	84.4	0.0014 J	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.0022	< 0.0016 [< 0.0018]	< 0.16	< 0.0022 [< 0.0023]	< 1.7	< 0.0019	< 0.0016 [< 0.0020]	< 0.0013	< 0.0011
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 0.0044	< 0.0032 [< 0.0035]	< 0.32	< 0.0043 [< 0.0046]	< 3.5	< 0.0038	< 0.0032 [< 0.0040]	< 0.0026	< 0.0021
Total Xylenes	1330-20-7	1,000	9,100	0.0051	< 0.0016 [< 0.0018]	< 0.16	0.0014 J [< 0.0023]	175	0.0063	< 0.0016 [< 0.0020]	0.0016	< 0.0011
Semi-Volatile Organic Compounds												
1,1-Biphenyl	92-52-4	190	190,000	0.282	0.0935 J [0.0924 J]	0.222	0.115 [0.143]	23.2	0.109 J	0.0077 J [< 0.098]	0.0098 J	< 0.073
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.27	< 0.26 [< 0.24]	< 0.2	< 0.29 [< 0.3]	< 1.3	< 0.3	< 0.23 [< 0.25]	< 0.2	< 0.18
2-Methylnaphthalene	91-57-6	1,900	190,000	0.638	0.406 [0.473]	0.319	0.572 [0.638]	29.9 D	0.51	0.0144 J [0.0155 J]	0.0257 J	< 0.036
2-Methylphenol	95-48-7	580	190,000	0.0936 J	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	0.141	0.297 [0.181]	0.0360 J	0.425 [0.681]	0.382 J	0.315	< 0.093 [< 0.098]	< 0.08	< 0.073
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	4,700	190,000	2.85	0.641 [0.945]	9.54 D	1.89 [1.62]	190 D	0.809	< 0.047 [< 0.049]	0.112	< 0.036
Acenaphthylene	208-96-8	8,000	190,000	0.703	0.194 [0.251]	0.504	0.308 [0.331]	24.5	0.252	< 0.047 [< 0.049]	< 0.04	< 0.036
Acetophenone	98-86-2	1,200	10,000	0.0376 J	0.0114 J [< 0.24]	< 0.2	0.0210 J [0.0168 J]	< 1.3	0.0225 J	< 0.23 [< 0.25]	< 0.2	< 0.18
Anthracene	120-12-7	350	190,000	< 0.055	0.296 J [0.672 J]	1.61	1.08 [0.867]	178 D	0.359	< 0.047 [< 0.049]	0.0692	< 0.036
Benz(a)anthracene	56-55-3	430	190,000	0.138	0.49 J [0.994 J]	0.318	0.762 [0.741]	117 D	0.284	0.0263 J [0.0153 J]	0.0541	< 0.036
Benzaldehyde	100-52-7	- -	- -	< 0.27	< 0.26 [< 0.24]	< 0.2	< 0.29 [< 0.3]	< 1.3	< 0.3	0.0208 J [< 0.25]	0.0229 J	< 0.18
Benzo(a)pyrene	50-32-8	46	190,000	0.107	0.657 [1.06]	0.249	0.916 [0.799]	***101 D***	0.549	0.0225 J [< 0.049]	0.0511	< 0.036
Benzo(b)fluoranthene	205-99-2	170	190,000	0.134	0.638 [1.02]	0.33	0.896 [0.807]	106 D	0.46	0.0296 J [< 0.049]	0.0678	< 0.036
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.0743	0.438 [0.599]	0.16	0.551 [0.468]	48.9 D	0.434	< 0.047 [< 0.049]	0.0374 J	< 0.036
Benzo(k)fluoranthene	207-08-9	610	190,000	0.0555	0.259 [0.417]	0.105	0.326 [0.257]	19.3	0.17	< 0.047 [< 0.049]	0.0252 J	< 0.036
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.11	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.11	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-153 7-9 4/26/19	S-153 13.5-15 4/26/19	S-154 9-11 4/26/19	S-154 12-14 4/26/19	S-155 10-12 4/26/19	S-155 13-15 4/26/19	S-156 14-16 5/3/19	S-157 7-9 5/3/19	S-157 23-25 5/3/19
Semi-Volatile Organic Compounds (cont'd)												
Carbazole	86-74-8	110	190,000	1.2	0.0781 J [0.0711 J]	2.54	0.204 [0.115 J]	63 D	0.0814 J	0.0083 J [< 0.098]	< 0.08	< 0.073
Chrysene	218-01-9	230	190,000	0.151	0.564 J [1.07 J]	0.362	0.892 [0.868]	100 D	0.374	0.0252 J [< 0.049]	0.0658	< 0.036
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.055	0.112 [0.16]	0.0438	0.146 [0.119]	18.1	0.0982	< 0.047 [< 0.049]	< 0.04	< 0.036
Dibenzofuran	132-64-9	310	190,000	0.821	0.143 [0.147]	3.62	0.584 [0.505]	113 D	0.248	< 0.093 [< 0.098]	0.0239 J	< 0.073
Diethyl phthalate	84-66-2	9,300	10,000	< 0.11	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.11	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.11	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
Fluoranthene	206-44-0	3,200	190,000	0.434	0.751 J [1.77 J]	1.91	1.88 [1.81]	337 D	0.537	0.0597 [0.0286 J]	0.138	< 0.036
Fluorene	86-73-7	3,800	190,000	2.97	0.32 J [0.598 J]	8.69 D	1.4 [1.04]	186 D	0.478	0.0219 J [< 0.049]	0.0302 J	< 0.036
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.0733	0.413 [0.6]	0.158	0.499 [0.432]	43 D	0.383	< 0.047 [< 0.049]	0.0527	< 0.036
Naphthalene	91-20-3	25	190,000	8.28 D	1.22 [1.29]	3.23	1.61 [1.85]	***139 D***	1.57	0.0778 [0.115]	0.0419	< 0.036
Pentachlorophenol	87-86-5	5	190,000	< 0.22	< 0.21 [< 0.19]	< 0.16	< 0.23 [< 0.24]	< 1	< 0.24	< 0.19 [< 0.2]	< 0.16	< 0.15
Phenanthrene	85-01-8	10,000	190,000	0.326	0.925 J [2.3 J]	2.9	4.56 [3.3]	519 D	1.19	0.0652 [0.0432 J]	0.0946	< 0.036
Phenol	108-95-2	200	18,000	0.257	< 0.1 [< 0.094]	< 0.08	< 0.11 [< 0.12]	< 0.52	< 0.12	< 0.093 [< 0.098]	< 0.08	< 0.073
Pyrene	129-00-0	2,200	190,000	0.495	0.851 J [2.07 J]	1.38	2.08 [2.14]	232 D	0.632	0.0434 J [0.0220 J]	0.111	< 0.036
Total PAHs and 2-Methylnaphthalene	-	- -	- -	17.4	9.18 [16.3]	31.8	20.4 [18.1]	2,390	9.09	0.386 [0.240]	0.977	< 0.036
Metals												
Aluminum	7429-90-5	- -	190,000	27,800 J	8,140 J [13,800 J]	4,510 J	22,800 J [18,500 J]	11,600 J	22,300 J	21,800 J [24,700 J]	10,900 J	8,590 J
Antimony	7440-36-0	27	190,000	< 3.5 J	< 3.1 J [< 2.9 J]	< 2.7 J	1.2 J [< 3.7 J]	< 3.1 J	1.4 J	< 2.9 J [< 3.0 J]	2.1 J	< 2.2 J
Arsenic	7440-38-2	29	190,000	8.2 J	13.0 J [27.6 J]	5.2 J	***140 J [33.9 J]***	***34.5 J***	***78.4 J***	7.4 [4.5]	12.6	3.8
Barium	7440-39-3	8,200	190,000	236 J	89.1 [148]	58.2 J	276 J [159 J]	128 J	266 J	183 [162]	52.3	32.3
Beryllium	7440-41-7	320	190,000	4.4	0.53 [1.0]	0.43	1.7 [1.3]	0.82	1.6	1.1 [1.2]	0.62	0.51
Cadmium	7440-43-9	38	190,000	< 0.87	0.48 J [1.6]	0.19 J	3.9 [1.4]	1.8	3.0	0.28 J [0.13 J]	0.79 J	< 0.54
Calcium	7440-70-2	- -	- -	15,400	2,280 [2,630]	3,160	5,000 [3,900]	4,070	4,570	2,800 [2,730]	2,790	248 J
Chromium	7440-47-3	190,000	190,000	75.4 J	64.0 J [135 J]	28.2 J	449 J [156 J]	143 J	264 J	42.7 [47.5]	20.0	25.7
Cobalt	7440-48-4	160	190,000	39.5	8.3 [13.0]	5.4 J	26.8 [17.9]	11.5	29.1	10.9 [12.1]	9.9	7.6
Copper	7440-50-8	43,000	190,000	28.1 J	40.7 J [87.1 J]	36.1 J	220 J [98.6 J]	82.8 J	194 J	22.1 [10.1]	243	9.4
Cyanide	57-12-5	2000	190,000	2.2 J	4.9 [5.2]	5.5 J	3.2 J [1.5 J]	7.2 J	1.5 J	< 0.30 J [< 0.33 J]	0.70 J	< 0.27 J
Iron	7439-89-6	- -	190,000	41,600 J	15,800 J [22,000 J]	17,000 J	42,200 J [32,900 J]	38,700 J	50,800 J	25,700 [25,400]	54,800	13,400
Lead	7439-92-1	450	190,000	21.2 J	107 J [189 J]	55.8 J	***561 J*** [187 J]	175 J	380 J	80.3 J [14.8 J]	43.8 J	6.0 J
Magnesium	7439-95-4	- -	- -	7,630	2,590 [3,500]	1,350	5,040 [5,090]	3,590	5,010	5,160 [5,840]	792	2,070
Manganese	7439-96-5	2,000	190,000	523	354 [462]	407	1,210 [1,020]	698	1,170	402 [325]	379	111
Mercury	7439-97-6	10	190,000	0.23 J	1.1 J [0.50 J]	0.29 J	2.1 [2.4]	1.8 J	2.4 J	0.11 [< 0.043]	0.065	< 0.032
Nickel	7440-02-0	650	190,000	205	15.9 [25.7]	19.6	47.2 [33.7]	24.5	47.1	26.3 [29.6]	22.3	15.7
Potassium	7440-09-7	- -	- -	1,780	1,040 J [1,530]	501 J	2,260 [2,120]	1,440 J	2,290	1,870 [2,170]	826 J	897 J
Selenium	7782-49-2	26	190,000	< 6.9	< 3.1 [1.2 J]	< 2.7	2.3 J [1.2 J]	< 6.3	< 7.6	< 2.9 [< 3.0]	< 7.9	< 2.2
Silver	7440-22-4	84	190,000	< 1.7	< 0.78 [0.44 J]	< 0.67	2.4 [< 0.93]	0.91 J	2.2	0.52 J [0.49 J]	< 2.0	0.37 J
Sodium	7440-23-5	- -	- -	< 1,700	135 J [199 J]	123 J	335 J [267 J]	153 J	356 J	228 J [248 J]	< 1,300	< 1,100
Thallium	7440-28-0	14	190,000	< 3.5	< 1.6 [< 1.5]	< 1.3	< 3.5 [< 1.9]	< 3.1	< 3.8	< 1.4 [< 1.5]	< 3.9	< 1.1
Vanadium	7440-62-2	820	190,000	22.0	15.1 [28.4]	14.6	44.1 [38.0]	23.6	42.6	41.9 [48.1]	25.9	19.0
Zinc	7440-66-6	12,000	190,000	323 J	215 J [491 J]	100 J	1,690 J [540 J]	529 J	1,010 J	132 J [72.1 J]	451 J	35.9 J

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Standards or PQLs		S-158		S-159		S-160		S-161	S-162		S-163	S-164	TP-11	TP-13
Sample Depth (ft):		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Subsurf Soil (No Exceedances)	11-13	18-20	11-13	18-20	10-12	13-15	10-12	5-7	15-17	2-4	4-6	14	14
Date Collected:	CAS Number			4/26/19	4/26/19	4/26/19	4/26/19	5/3/19	5/3/19	5/3/19	5/3/19	5/3/19	9/19/19	9/19/19	3/7/05	3/8/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 7.3	0.0519	< 2	0.0223	< 140	0.0162 J	< 0.012	< 0.011	0.0173 J	< 0.0086	< 1.1	< 0.002	< 0.0014
Acetone	67-64-1	10,000	10,000	< 7.3	0.224	< 2	0.107	< 140	0.0683	0.0570	0.0167	0.0713	0.0193	< 1.1	0.064	< 0.0097
Benzene	71-43-2	0.5	330	< 0.36	< 0.00082	***1.13***	< 0.00065	***46.6***	< 0.00093	0.0102	0.0062	0.0174	< 0.00043	< 0.055	0.02	0.011
Carbon Disulfide	75-15-0	620	10,000	11.2	< 0.0033	0.539	< 0.0026	< 28	< 0.0037	0.0023 J	0.0013 J	< 0.0037	0.00089 J	< 0.22	0.0046	< 0.0012
Chlorobenzene	108-90-7	10	4,600	< 1.5	< 0.0033 J	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	< 0.0013	< 0.00092
Chloroform	67-66-3	8	110	< 1.5	< 0.0033	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	0.0056	0.0033
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.73	< 0.0016	< 0.2	< 0.0013	< 14	< 0.0019	< 0.0012	< 0.0011	< 0.0019	< 0.00086	< 0.11	< 0.0012	< 0.00087
Cyclohexane	110-82-7	6,900	10,000	< 1.5	< 0.0033	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	NA	NA
Dichloromethane	75-09-2	0.5	10,000	< 3.6	< 0.0082	< 1	< 0.0065	< 70	< 0.0093	< 0.0059	< 0.0055	< 0.0093	< 0.0043	< 0.55	0.018 B	0.014 B
Ethylbenzene	100-41-4	70	1,000	0.537 J	< 0.0016	0.184 J	< 0.0013	19.1	< 0.0019	< 0.0012	0.00083 J	< 0.0019	< 0.00086	0.0748 J	0.12	< 0.0014
Isopropylbenzene	98-82-8	2,500	10,000	< 1.5	< 0.0033	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.73	< 0.0016	1.02	< 0.0013	81.3	< 0.0019	< 0.0012	0.0023	< 0.0019	< 0.00086	0.102 J	0.0061	< 0.002
Methyl Acetate	79-20-9	10,000	10,000	1.05 J	< 0.0082 J	< 1	< 0.0065	< 70	< 0.0093	< 0.0059	< 0.0055	< 0.0093	< 0.0043	0.211 J	NA	NA
Methylcyclohexane	108-87-2	- -	- -	< 1.5	< 0.0033	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	< 0.73	< 0.0016	< 0.2	< 0.0013	< 14	< 0.0019	< 0.0012	< 0.0011	< 0.0019	< 0.00086	< 0.11	NA	NA
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.012	< 0.00086
o-Xylene	95-47-6	- -	- -	< 0.73	< 0.0016	0.282	< 0.0013	27.2	< 0.0019	< 0.0012	0.0023	< 0.0019	< 0.00086	< 0.11	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 1.5	< 0.0033 J	< 0.41	< 0.0026	15.5 J	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	< 0.0016	< 0.0011
Toluene	108-88-3	100	10,000	< 0.73	< 0.0016	1.52	< 0.0013	47.8	< 0.0019	0.00068 J	0.0017	0.0017 J	< 0.00086	0.0746 J	< 0.0019	< 0.0014
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.73	< 0.0016	< 0.2	< 0.0013	< 14	< 0.0019	< 0.0012	< 0.0011	< 0.0019	< 0.00086	< 0.11	< 0.00081	< 0.00059
trans-1,3-Dichloropropene	10061-02-6	- -	- -	< 1.5	< 0.0033	< 0.41	< 0.0026	< 28	< 0.0037	< 0.0024	< 0.0022	< 0.0037	< 0.0017	< 0.22	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	< 0.73	< 0.0016	1.3	< 0.0013	109	< 0.0019	< 0.0012	0.0046	< 0.0019	< 0.00086	0.102 J	NA	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	16.4 D	0.0103 J	0.959 D	< 0.094	***300 D***	0.0150 J	0.0474 J	4.09 D	0.0842 J	0.0315 J	0.0057 J	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.42	< 0.28	< 0.2	< 0.23	152 D	< 0.29	< 0.21	< 0.19	< 0.3	< 0.18	< 0.19	< 0.084	< 0.082
2-Methylnaphthalene	91-57-6	1,900	190,000	46.1 D	0.0300 J	2.55	< 0.047	1,490 D	0.0550 J	0.265	65.2 D	0.311	0.164	0.0186 J	2.1	0.58
2-Methylphenol	95-48-7	580	190,000	< 0.17	< 0.11	< 0.078	< 0.094	73.6	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.35	< 0.34
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 0.17	< 0.11	< 0.078	< 0.094	221 D	< 0.12	< 0.084	< 0.077	0.0571 J	< 0.072	< 0.076	NA	NA
4-Methylphenol	106-44-5	58	190,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.44	< 0.43
Acenaphthene	83-32-9	4,700	190,000	9.55 D	0.0231 J	0.36 D	< 0.047	344 D	0.0539 J	1.65	1.44	0.957	0.477	< 0.038	2.6	1.2
Acenaphthylene	208-96-8	8,000	190,000	44.4 D	< 0.056	< 0.039	< 0.047	1,800 D	0.0634	0.117	< 0.039	0.233	0.329	0.0687	< 0.034	< 0.033
Acetophenone	98-86-2	1,200	10,000	0.927	< 0.28	0.0664 J	< 0.23	< 4.2	< 0.29	< 0.21	< 0.19	< 0.3	0.0800 J	< 0.19	NA	NA
Anthracene	120-12-7	350	190,000	11.7 D	< 0.056	< 0.039	< 0.047	***1,950 D***	0.0844	2.97	3.19	0.919	0.818	0.175	2.3	0.54
Benz(a)anthracene	56-55-3	430	190,000	10.7 D	0.0351 J	0.17	< 0.047	***1,100 D***	0.145	0.981	0.716	0.5	1.96	0.274	3.5	0.43
Benzaldehyde	100-52-7	- -	- -	< 0.42	< 0.28	< 0.2	< 0.23	< 4.2	< 0.29	< 0.21	< 0.19	< 0.3	< 0.18	< 0.19	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	8.04	0.0322 J	0.124	< 0.047	***762 D***	0.174	0.645	0.446	0.458	1.79	0.242	2.4	0.36
Benzo(b)fluoranthene	205-99-2	170	190,000	11.2 D	0.0332 J	0.163	< 0.047	***1,050 D***	0.181	0.801	0.601	0.509	1.73	0.318	3	0.5
Benzo(g,h,i)perylene	191-24-2	180	190,000	5.25	< 0.056	0.0863	< 0.047	***429 D***	0.103	0.271	0.177	0.253	1	0.179	1.8	0.27
Benzo(k)fluoranthene	207-08-9	610	190,000	3.59 D	< 0.056	0.0602	< 0.047	396 D	0.0724	0.273	0.246	0.215	0.437	0.122	1.1	0.13
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.17	< 0.11	< 0.078	< 0.094	< 1.7	< 0.12	< 0.084	0.0513 J	< 0.12	< 0.072	< 0.076	< 0.071	0.37 B
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.17	< 0.11	< 0.078	< 0.094	< 1.7	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.036	< 0.035

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	S-158	S-158	S-159	S-159	S-160	S-160	S-161	S-162	S-162	S-163	S-164	TP-11	TP-13
Sample Depth (ft):				11-13	18-20	11-13	18-20	10-12	13-15	10-12	5-7	15-17	2-4	4-6	14	14
Date Collected:				4/26/19	4/26/19	4/26/19	4/26/19	5/3/19	5/3/19	5/3/19	5/3/19	5/3/19	9/19/19	9/19/19	3/7/05	3/8/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	2.83	0.0085 J	< 0.078	< 0.094	***828 D***	0.0265 J	0.761	< 0.077	0.463	0.189	0.0437 J	< 0.028	< 0.027
Chrysene	218-01-9	230	190,000	9.02 D	0.0455 J	0.213	< 0.047	***784 D***	0.152	1.22	0.56	0.494	2.09	0.294	4.1	0.56
Dibenz(a,h)anthracene	53-70-3	270	190,000	1.14	< 0.056	0.0258 J	< 0.047	39	0.0315 J	0.0904	0.0502	0.0666	0.283	0.0391	0.74	< 0.044
Dibenzofuran	132-64-9	310	190,000	51.5 D	< 0.11	0.56 D	< 0.094	***1,420 D***	0.0256 J	0.536	1.85	0.423	0.0834	0.0432 J	< 0.3	< 0.29
Diethyl phthalate	84-66-2	9,300	10,000	< 0.17	< 0.11	< 0.078	< 0.094	< 1.7	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.038	< 0.037
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.17	< 0.11	< 0.078	< 0.094	< 1.7	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.034	< 0.033
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.17	< 0.11	< 0.078	< 0.094	< 1.7	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.034	< 0.033
Fluoranthene	206-44-0	3,200	190,000	36.4 D	0.0577	0.278	< 0.047	***3,400 D***	0.281	2.88	3.25 D	1.38	3.05	0.644	4	1.2
Fluorene	86-73-7	3,800	190,000	51.1 D	0.0315 J	0.615 D	< 0.047	2,130 D	0.0600	1.56	2.3	0.914	0.431	0.0681	1.8	1
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	5.74	< 0.056	0.0764	< 0.047	481 D	0.102	0.288	0.21	0.258	0.894	0.204	1.3	0.18
Naphthalene	91-20-3	25	190,000	***423 D***	0.156	***29.3 D***	< 0.047	***6,610 D***	0.199	0.587	13.5 D	1.26	0.164	0.0382	6.6	10
Pentachlorophenol	87-86-5	5	190,000	< 0.34	< 0.22	< 0.16	< 0.19	< 3.3	< 0.23	< 0.17	< 0.15	< 0.24	< 0.14	< 0.15	NA	NA
Phenanthrene	85-01-8	10,000	190,000	67.8 D	0.0625	0.613	< 0.047	4,840 D	0.209	5.48 D	11.4 D	2.45	3.47	0.45	4.1	1.2
Phenol	108-95-2	200	18,000	< 0.17	< 0.11	< 0.078	< 0.094	75.9	< 0.12	< 0.084	< 0.077	< 0.12	< 0.072	< 0.076	< 0.085	< 0.082
Pyrene	129-00-0	2,200	190,000	24.5 D	0.0654	0.816	< 0.047	1,920 D	0.282	2.43	2.32	1.01	4.51 D	0.558	8.2	1.4
Total PAHs and 2-Methylnaphthalene	-	- -	- -	769	0.572	35.5	< 0.047	29,500	2.25	22.5	106	12.2	23.6	3.69	49.6	19.6
Metals																
Aluminum	7429-90-5	- -	190,000	3,230 J	12,500 J	8,420 J	22,400 J	6,170 J	21,900 J	6,860 J	12,400 J	19,900 J	6,900	12,400	NA	NA
Antimony	7440-36-0	27	190,000	< 2.5 J	< 3.3 J	0.54 J	< 2.8 J	< 2.7 J	1.2 J	< 2.6 J	2.1 J	1.8 J	< 2.3	< 2.4	5.8	< 2.4
Arsenic	7440-38-2	29	190,000	18.2 J	4.1 J	12.0 J	4.3 J	12.7	***32.8***	11.8	7.2	***41.7***	7.5	< 2.4	***32***	3.2
Barium	7440-39-3	8,200	190,000	104 J	116 J	27.0 J	172 J	48.4	145	63.0	106	208	74.5	125	380	15
Beryllium	7440-41-7	320	190,000	0.29	0.69	1.8	1.1	0.40	1.3	0.42	0.63	1.3	0.74	1.3	< 1.1	0.83
Cadmium	7440-43-9	38	190,000	0.28 J	< 0.82	0.95	0.11 J	1.1	1.4	0.40 J	0.64	2.3	< 0.58	< 0.61	1.5	< 0.71
Calcium	7440-70-2	- -	- -	10,900	3,380	2,600	2,770	2,290	4,280	1,680	52,000	20,300	3,580	2,510	NA	NA
Chromium	7440-47-3	190,000	190,000	72.7 J	27.1 J	20.4 J	44.6 J	32.9	128	40.7	26.2	191	12.7	23.7	20	< 5.9
Cobalt	7440-48-4	160	190,000	3.9 J	5.6 J	8.7	9.5	4.4 J	17.3	7.5	6.9	17.5	8.1	13.3	NA	NA
Copper	7440-50-8	43,000	190,000	127 J	11.9 J	293 J	7.4 J	31.5	81.2	31.3	57.5	135	94.7	36.1	140	11
Cyanide	57-12-5	2000	190,000	29.4 J	0.34 J	0.70 J	0.21 J	6.6 J	1.8 J	0.23 J	1.0 J	< 0.42 J	2.5	0.33	9.2	0.71
Iron	7439-89-6	- -	190,000	21,600 J	14,400 J	36,800 J	22,700 J	12,000	35,200	15,600	17,800	33,000	21,000	21,100	NA	NA
Lead	7439-92-1	450	190,000	101 J	21.4 J	79.8 J	15.5 J	108 J	151 J	69.3 J	296 J	277 J	219	13.7	***1,100***	17
Magnesium	7439-95-4	- -	- -	1,420	3,120	448 J	5,160	1,520	6,010	2,360	17,300	5,190	2,020	7,440	NA	NA
Manganese	7439-96-5	2,000	190,000	262	333	402	309	238	1,230	379	330	1,010	244	878	NA	NA
Mercury	7439-97-6	10	190,000	2.8 J	0.060 J	0.061 J	0.087 J	0.39	0.86	0.37	0.36	1.9	1.6	0.22	0.61	< 0.098
Nickel	7440-02-0	650	190,000	17.2	16.0	18.6	25.4	10.0	35.9	14.0	17.0	34.8	16.5	24.1	12	< 5.9
Potassium	7440-09-7	- -	- -	649 J	1,280 J	559 J	1,840	823 J	2,660	931 J	2,250	2,200	< 1,200	8,000	NA	NA
Selenium	7782-49-2	26	190,000	< 2.5	< 3.3	4.3 J	< 2.8	3.1	< 3.7	< 2.6	< 2.5	1.4 J	< 2.3	< 2.4	5.1	2.5
Silver	7440-22-4	84	190,000	< 0.64	< 0.82	< 1.3	< 0.69	0.55 J	1.2	< 0.65	0.49 J	1.8	< 0.58	< 1.2	< 4.5	< 2.9
Sodium	7440-23-5	- -	- -	155 J	240 J	< 1,300	255 J	109 J	346 J	< 1,300	247 J	450 J	< 1,200	< 1,200	NA	NA
Thallium	7440-28-0	14	190,000	< 1.3	< 1.6	< 2.5	< 1.4	2.0	< 1.8	< 1.3	< 1.3	< 1.9	< 1.2	< 2.4	< 2.2	< 1.4
Vanadium	7440-62-2	820	190,000	12.4	25.9	13.2	43.2	12.0	46.4	13.6	28.8	38.1	18.6	47.5	NA	NA
Zinc	7440-66-6	12,000	190,000	128 J	56.1 J	117 J	61.2 J	164 J	458 J	156 J	491 J	690 J	174	103	690	67

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-14 18 3/8/05	TP-15 5.5 3/8/05	TP-15R 5-7 4/16/19	TP-15R 10.5-12.5 4/16/19	TP-16 6 3/9/05	TP-21 8 3/10/05	TP-23 7 3/10/05	TP-25 5 3/11/05	TP-30 12 3/14/05	TP-32 6.5 3/14/05	TP-33 9 3/14/05	TP-34 4 3/14/05
Volatile Organic Compounds															
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0011	< 3.9	< 2.1	< 0.012	< 0.0016	< 0.0011 [< 0.0011]	< 0.0011	< 0.00082	< 0.0019	< 0.0011	< 8.8	< 0.0019
Acetone	67-64-1	10,000	10,000	0.033	< 4.6	< 2.1	0.0191	0.06	0.023 [0.036]	0.049	0.041	0.13	0.031	< 10	0.075
Benzene	71-43-2	0.5	330	0.0036	***43***	***4.18***	< 0.00061	0.027	0.0016 [< 0.00075]	< 0.00035	< 0.00027	< 0.0012	0.0059	< 1.1	0.1
Carbon Disulfide	75-15-0	620	10,000	< 0.00096	< 0.6	< 0.42	< 0.0025	0.005	< 0.00073 [< 0.00096]	< 0.00073	< 0.00056	< 0.0016	< 0.00088	< 1.4	0.0042
Chlorobenzene	108-90-7	10	4,600	< 0.00074	< 0.23	< 0.42	< 0.0025	< 0.0011	< 0.00028 [< 0.00074]	< 0.00028	< 0.00021	< 0.0012	< 0.00068	< 0.53	< 0.0012
Chloroform	67-66-3	8	110	0.0025	< 0.45	< 0.42	< 0.0025	< 0.00095	0.0019 [< 0.00067]	0.0018	< 0.00028	< 0.0011	< 0.00061	< 1	< 0.0011
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0007	< 0.58	< 0.21	< 0.0012	< 0.001	< 0.00051 [< 0.0007]	< 0.00051	< 0.00039	< 0.0012	< 0.00064	< 1.3	< 0.0011
Cyclohexane	110-82-7	6,900	10,000	NA	NA	0.305 J	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.015 B	***1.8 B***	< 1.1	< 0.0061	0.035 B	0.018 B [0.036 B]	0.014 B	0.015 B	0.02 B	0.0098 B	***3.2 B***	0.013 B
Ethylbenzene	100-41-4	70	1,000	0.078	20	< 0.21	< 0.0012	0.11	0.002 [< 0.0011]	< 0.00097	< 0.00073	< 0.0018	0.0017	2.7	0.018
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	< 0.42	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0055	84	0.509	< 0.0012	0.031	0.006 [< 0.0016]	< 0.0012	< 0.00088	< 0.0027	0.0022	4.7	0.012
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	< 1.1	< 0.0061	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	0.895	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	< 0.21	< 0.0012	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	0.04	26	NA	NA	0.052	0.0015 [< 0.00069]	0.0073	< 0.00019	< 0.0011	0.0014	3	0.016
o-Xylene	95-47-6	- -	- -	NA	NA	0.312	< 0.0012	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.00091	13	< 0.42	< 0.0025	< 0.0013	< 0.00022 [< 0.00091]	< 0.00022	< 0.00017	< 0.0015	< 0.00084	< 0.75	< 0.0015
Toluene	108-88-3	100	10,000	0.002	36	0.505	< 0.0012	0.015	< 0.00026 [< 0.0011]	< 0.00026	< 0.0002	< 0.0018	< 0.001	< 0.81	0.0068
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00047	< 0.58	< 0.21	< 0.0012	< 0.00067	< 0.00074 [< 0.00047]	< 0.00074	< 0.00056	< 0.00078	< 0.00043	< 1.3	< 0.00076
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	< 0.42	< 0.0025	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	0.821	< 0.0012	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	13.3 D	0.0180 J	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 21	< 550	0.495	< 0.42	< 14	< 1.1 [< 1.2]	< 1.9	< 0.86	< 0.043	< 2.1	< 100	< 0.18
2-Methylnaphthalene	91-57-6	1,900	190,000	81	1,800	33.2 D	0.0421 J	3.3 J	1.6 [1.5]	6	25	0.86	< 0.78	45	2.7
2-Methylphenol	95-48-7	580	190,000	< 13	< 340	0.233	< 0.17	< 8.7	< 0.69 [< 0.71]	< 1.2	< 0.52	< 0.18	< 1.3	< 63	1.6
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	0.635	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	< 13	< 350	NA	NA	< 9.2	< 0.72 [< 0.75]	< 1.2	< 0.55	0.28	< 1.4	< 67	3.2
Acenaphthene	83-32-9	4,700	190,000	100	890	59 D	0.148	180	1.5 [0.89]	7.3	3.9	2.2	2.9	< 4.5	1.4
Acenaphthylene	208-96-8	8,000	190,000	< 1.3	1,300	23.7 D	0.0469 J	12	0.27 [0.25]	< 0.12	< 0.052	0.22	4	< 6.4	0.46
Acetophenone	98-86-2	1,200	10,000	NA	NA	< 0.39	< 0.42	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	51	***1,100***	53 D	0.202	110	< 0.05 [1.3]	3	1.4	0.89	2.3	< 4.6	0.62
Benz(a)anthracene	56-55-3	430	190,000	26	***1,700***	67.4 D	0.446	89	0.6 [0.47]	1.8	0.2	1.4	8	< 3.6	< 0.081
Benzaldehyde	100-52-7	- -	- -	NA	NA	< 0.39	< 0.42	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	18	***1,400***	***61.5 D***	0.482	***100***	0.57 [0.39]	2	< 0.044	1.2	7.2	< 5.4	< 0.057
Benzo(b)fluoranthene	205-99-2	170	190,000	20	***1,500***	73.6 D	0.574	100	0.95 [0.69]	2.6	< 0.037	1.3	8.8	< 4.5	< 0.1
Benzo(g,h,i)perylene	191-24-2	180	190,000	6	***690***	36.4 D	0.27	47	0.38 [< 0.046]	1.4	< 0.034	0.56	2.8	< 4.1	< 0.079
Benzo(k)fluoranthene	207-08-9	610	190,000	6.6	***700***	23.5 D	0.201	30	0.3 [< 0.04]	1	< 0.03	0.57	3.2	< 3.6	< 0.092
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 7.5	< 200	< 0.16	< 0.17	< 5.2	< 0.41 [< 0.42]	< 0.69	< 0.31	< 0.036	< 0.77	< 38	< 0.15
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.97	< 26	< 0.16	< 0.17	< 0.67	< 0.052 [< 0.054]	< 0.089	< 0.04	< 0.018	< 0.099	< 4.8	< 0.078

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-14	TP-15	TP-15R	TP-15R	TP-16	TP-21	TP-23	TP-25	TP-30	TP-32	TP-33	TP-34
Sample Depth (ft):				18	5.5	5-7	10.5-12.5	6	8	7	5	12	6.5	9	4
Date Collected:				3/8/05	3/8/05	4/16/19	4/16/19	3/9/05	3/10/05	3/10/05	3/11/05	3/14/05	3/14/05	3/14/05	3/14/05
Semi-Volatile Organic Compounds (cont'd)															
Carbazole	86-74-8	110	190,000	14	***630***	28.1 D	0.105 J	27	< 0.057 [< 0.058]	< 0.095	< 0.043	< 0.014	< 0.11	< 5.2	< 0.059
Chrysene	218-01-9	230	190,000	26	***1,400***	57.3 D	0.429	110	0.87 [0.59]	2.3	0.23	1.6	9.7	< 3.8	< 0.06
Dibenz(a,h)anthracene	53-70-3	270	190,000	< 0.76	130	11.4 D	0.0811 J	11	< 0.041 [< 0.042]	< 0.069	< 0.031	0.29	0.95	< 3.8	< 0.098
Dibenzofuran	132-64-9	310	190,000	36	***1,700***	56 D	0.0695 J	51	1.3 [1.1]	< 0.43	2	0.37	< 0.49	< 24	0.6 J
Diethyl phthalate	84-66-2	9,300	10,000	< 0.7	< 18	< 0.16	< 0.17	< 0.48	< 0.038 [< 0.039]	< 0.064	< 0.029	< 0.019	< 0.071	< 3.5	< 0.081
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.54	< 14	< 0.16	< 0.17	< 0.37	< 0.029 [< 0.03]	< 0.049	< 0.022	< 0.018	< 0.055	< 2.7	< 0.074
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.89	< 23	< 0.16	< 0.17	< 0.61	< 0.048 [< 0.049]	< 0.081	< 0.037	< 0.018	< 0.091	< 4.4	< 0.074
Fluoranthene	206-44-0	3,200	190,000	100	***5,000***	198 D	0.732	230	< 0.035 [1.4]	4.1	0.52	2.8	13	< 3.3	0.6
Fluorene	86-73-7	3,800	190,000	80	2,400	105 D	0.122	120	1.2 [0.95]	8.3	4.1	1.5	2.9	< 4.1	1
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	6.4	740	40.5 D	0.298	49	0.33 [0.26]	1.6	< 0.025	0.46	3.2	< 3.1	< 0.079
Naphthalene	91-20-3	25	190,000	11	***12,000***	***255 D***	0.316	20	15 [14]	2.2	< 0.055	2	1.4	***3,600***	***47***
Pentachlorophenol	87-86-5	5	190,000	NA	NA	< 0.32	< 0.34	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	220	7,200	275 D	0.688	370	1.3 [1.1]	9.9	7.3	3.9	1.8	33	1.3
Phenol	108-95-2	200	18,000	< 12	< 320	0.682	< 0.17	< 8.4	< 0.66 [< 0.68]	< 1.1	< 0.5	< 0.043	< 1.3	< 61	3.6
Pyrene	129-00-0	2,200	190,000	82	***3,500***	136 D	0.778	220	< 0.042 [1.5]	4.3	0.95	4.3	17	< 3.8	0.6
Total PAHs and 2-Methylnaphthalene	-	- -	- -	834	43,500	1,510	5.86	1,800	24.9 [25.3]	57.8	43.6	26.1	89.2	3,680	55.7
Metals															
Aluminum	7429-90-5	- -	190,000	NA	NA	1,680 J	5,060 J	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	3.7	< 2.3	1.6 J	< 2.7 J	4.1	4 [5.7]	4.5	< 2.2	< 3.7	18	< 2.6	20
Arsenic	7440-38-2	29	190,000	***53***	4	17.0	7.0	***37***	10 [13]	***62***	< 2.2	***35***	***40***	< 2.6	< 12
Barium	7440-39-3	8,200	190,000	210	32	62.0	34.3	220	240 [240]	670	30	210	440	43	65
Beryllium	7440-41-7	320	190,000	0.96	< 0.7	0.73	0.41	< 0.91	1.2 [1.8]	0.77	< 0.65	1.6	< 0.81	< 0.79	1.9
Cadmium	7440-43-9	38	190,000	2.6	< 0.7	0.83	0.12 J	1.5	< 0.86 [< 0.88]	1.2	< 0.65	1.7	4.4	< 0.79	6.3
Calcium	7440-70-2	- -	- -	NA	NA	5,490 J	506 J	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	170	11	16.4 J	14.2 J	160	39 [49]	13	7	140	33	9.8	620
Cobalt	7440-48-4	160	190,000	NA	NA	3.5 J	5.8 J	NA	NA	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	150	17	598	21.1	120	71 [93]	140	5.5	100	210	15	260
Cyanide	57-12-5	2000	190,000	1.2	4	7.0 J	< 0.29 J	12	0.37 [< 0.37]	< 0.3	NA	2.3	16	3.9	< 0.39
Iron	7439-89-6	- -	190,000	NA	NA	20,000	12,500	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	270	58	257	50.9	330	73 [100]	***2,000***	57	190	***3,200***	64	< 31
Magnesium	7439-95-4	- -	- -	NA	NA	2,510	1,660	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	213 J	184 J	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	1.1	< 0.097	2.1 J	0.096 J	1.6	< 0.12 [< 0.12]	1.6	< 0.091	0.84	0.77	0.24	< 0.13
Nickel	7440-02-0	650	190,000	29	8.8	25.5	11.4	27	26 [34]	23	< 5.4	34	30	9.5	290
Potassium	7440-09-7	- -	- -	NA	NA	260 J	626 J	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	4.8	3.2	2.6	< 2.7	4.7	4.2 [4.7]	3.4	< 2	5.6	< 2.4	2.5	< 2.8
Silver	7440-22-4	84	190,000	< 3.7	< 2.9	< 0.64	< 0.68	< 3.8	< 3.6 [< 3.7]	< 3	< 2.7	< 4.6	< 3.4	< 3.3	< 16
Sodium	7440-23-5	- -	- -	NA	NA	144 J	< 1,400	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 1.8	< 1.4	< 1.3	< 1.4	< 1.8	< 1.7 [< 1.8]	< 1.4	< 1.3	< 2.2	< 1.6	< 1.6	< 7.5
Vanadium	7440-62-2	820	190,000	NA	NA	10.9	7.1	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	770	76	1,210 J	104 J	630	94 [160]	740	52	550	1,200	74	350

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-36 7 3/15/05	TP-37 8 3/15/05	TP-37 9 3/15/05	TP-39 9 3/16/05	TP-44R 5-7 4/22/19	TP-44R 7-9 4/22/19	TP-58 11 3/18/05	TP-59 12 3/18/05	TP-60 18 3/18/05	TP-63 8 3/21/05	TP-63R 7-9 4/18/19	TP-63R 11-13 4/18/19	TP-64 7 3/21/05
Volatile Organic Compounds																
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0013	< 0.0018	< 0.0019	< 0.001	< 1.3	< 0.012	< 0.0027	< 0.0015	< 0.0012	< 6.6	< 0.016	0.0113 J	< 0.0011
Acetone	67-64-1	10,000	10,000	0.033	0.048	0.045	0.027	< 1.3	0.0449	0.11	0.063	0.036	< 7.9	< 0.016	0.0954	0.034
Benzene	71-43-2	0.5	330	0.023	0.011	0.0061	0.17	< 0.065	0.0012	< 0.0018	< 0.00098	0.032	***230***	0.0327	0.0462	0.0024
Carbon Disulfide	75-15-0	620	10,000	< 0.0011	0.0046	0.0029	< 0.0007	< 0.26	< 0.0024	< 0.0023	< 0.0012	0.002	< 1	< 0.0032	< 0.0040	< 0.00088
Chlorobenzene	108-90-7	10	4,600	0.0029	< 0.0011	< 0.0012	< 0.00027	< 0.26	< 0.0024	< 0.0018	< 0.00097	< 0.00074	***53***	< 0.0032	< 0.0040	< 0.00068
Chloroform	67-66-3	8	110	< 0.00076	< 0.001	< 0.0011	< 0.00035	< 0.26	< 0.0024	< 0.0016	< 0.00087	< 0.00067	< 0.76	< 0.0032	< 0.0040	< 0.00061
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0008	< 0.0011	< 0.0012	< 0.00049	< 0.13	< 0.0012	< 0.0017	< 0.00091	< 0.00071	< 0.99	< 0.0016	< 0.0020	< 0.00064
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	< 0.26	< 0.0024	NA	NA	NA	NA	< 0.0032	< 0.0040	NA
Dichloromethane	75-09-2	0.5	10,000	0.015 B	0.018 B	0.021 B	0.025 B	< 0.65	< 0.0061	0.039 B	0.018 B	0.015 B	< 1.7	< 0.0079	< 0.0099	0.028 B
Ethylbenzene	100-41-4	70	1,000	0.0022	0.0023	< 0.0018	0.0082	< 0.13	< 0.0012	< 0.0026	< 0.0014	< 0.0011	***140***	< 0.0016	< 0.0020	< 0.001
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	< 0.26	< 0.0024	NA	NA	NA	NA	< 0.0032	< 0.0040	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0032	0.0063	< 0.0027	0.0095	< 0.13	< 0.0012	< 0.0039	< 0.0021	< 0.0016	430	0.01	< 0.0020	< 0.0015
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	< 0.65	< 0.0061	NA	NA	NA	NA	< 0.0079	< 0.0099	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	< 0.26	< 0.0024	NA	NA	NA	NA	< 0.0032	< 0.0040	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	< 0.13	< 0.0012	NA	NA	NA	NA	< 0.0016	< 0.0020	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.00078	0.0038	< 0.0011	0.019	NA	NA	< 0.0016	< 0.0009	< 0.00069	140	NA	NA	< 0.00063
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	< 0.13	< 0.0012	NA	NA	NA	NA	0.0055	< 0.0020	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.001	< 0.0014	< 0.0015	< 0.00021	< 0.26	< 0.0024	< 0.0022	< 0.0012	< 0.00092	***47***	< 0.0032	< 0.0040	< 0.00084
Toluene	108-88-3	100	10,000	0.0036	< 0.0017	< 0.0018	0.0047	0.0684 J	0.0023	< 0.0026	< 0.0014	< 0.0011	***140***	0.0090	0.0020	< 0.001
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00053	0.0234	< 0.00078	< 0.00071	< 0.13	< 0.0012	< 0.0011	< 0.00061	< 0.00047	< 0.99	< 0.0016	< 0.0020	< 0.00043
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	0.076	NA	NA	< 0.26	< 0.0024	NA	NA	NA	NA	< 0.0032	< 0.0040	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	< 0.0016	NA	NA	< 0.13	< 0.0012	NA	NA	NA	NA	0.0155	< 0.0020	NA
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	< 0.087	0.0067 J	NA	NA	NA	NA	0.0793 J	< 0.12	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 1.1	< 2.6	< 2.5	< 2.2	< 0.22	< 0.21	< 0.23	< 0.037	< 0.31	< 150	< 0.42	< 0.3	< 0.053
2-Methylnaphthalene	91-57-6	1,900	190,000	1.7	23	10	2.5	< 0.044	0.0147 J	0.25	0.13	2.4	***5,800***	0.15	< 0.06	0.1
2-Methylphenol	95-48-7	580	190,000	< 0.66	< 1.6	< 1.5	< 1.3	< 0.087	< 0.084	< 0.44	< 0.15	< 1.3	< 290	< 0.17	< 0.12	< 0.1
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	< 0.087	< 0.084	NA	NA	NA	NA	< 0.17	< 0.12	NA
4-Methylphenol	106-44-5	58	190,000	< 0.69	0.66 J	1.3 J	< 1.4	NA	NA	< 0.53	< 0.19	< 1.6	< 360	NA	NA	0.11 J
Acenaphthene	83-32-9	4,700	190,000	4.4	22	17	18	0.671	0.0293 J	1.6	0.88	4.5	1,200	0.871	< 0.06	0.54
Acenaphthylene	208-96-8	8,000	190,000	2.4	5	1.4	6.8	< 0.044	< 0.042	0.36	< 0.015	1	4,900	8.91 D	< 0.06	0.068
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	< 0.22	< 0.21	NA	NA	NA	NA	0.0406 J	< 0.3	NA
Anthracene	120-12-7	350	190,000	4.9	19	14	20	0.226	< 0.042	2.1	0.27	14	***4,200***	5.9	< 0.06	0.36
Benz(a)anthracene	56-55-3	430	190,000	6.9	19	16	25	0.0327 J	< 0.042	5.3	0.56	16	***4,400***	30.6 D	0.0255 J	0.28
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	< 0.22	< 0.21	NA	NA	NA	NA	< 0.42	< 0.3	NA
Benzo(a)pyrene	50-32-8	46	190,000	5.1	15	12	27	< 0.044	< 0.042	4.1	0.41	12	***3,400***	31.2 D	0.0302 J	0.25
Benzo(b)fluoranthene	205-99-2	170	190,000	7	19	15	33	0.0218 J	< 0.042	5	0.54	14	***4,700***	38.5 D	0.0324 J	0.36
Benzo(g,h,i)perylene	191-24-2	180	190,000	2.5	7.7	5.9	14	< 0.044	< 0.042	1.2	0.32	7.6	***890***	19.2 D	< 0.06	0.075
Benzo(k)fluoranthene	207-08-9	610	190,000	2.2	6.4	6	13	< 0.044	< 0.042	1.6	0.098	5.7	***1,400***	14.4 D	< 0.06	0.12
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	0.34 J	< 0.93	< 0.92	< 0.78	< 0.087	< 0.084	0.51	< 0.031	< 0.26	< 35	< 0.17	< 0.12	0.068
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.05	< 0.12	< 0.12	< 0.1	< 0.087	< 0.084	< 0.08	< 0.016	< 0.13	< 54	< 0.17	< 0.12	< 0.018

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-36	TP-37	TP-37	TP-39	TP-44R	TP-44R	TP-58	TP-59	TP-60	TP-63	TP-63R	TP-63R	TP-64
Sample Depth (ft):				7	8	9	9	5-7	7-9	11	12	18	8	7-9	11-13	7
Date Collected:				3/15/05	3/15/05	3/15/05	3/16/05	4/22/19	4/22/19	3/18/05	3/18/05	3/18/05	3/21/05	4/18/19	4/18/19	3/21/05
Semi-Volatile Organic Compounds (cont'd)																
Carbazole	86-74-8	110	190,000	1.8	10	5.8	6.4	< 0.087	< 0.084	0.64	< 0.012	4	***2,100***	0.465	< 0.12	0.15
Chrysene	218-01-9	230	190,000	6.6	19	16	25	0.0296 J	< 0.042	5.2	0.62	13	***3,400***	20.9 D	0.0277 J	0.3
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.86	2	1.5	4.8	< 0.044	< 0.042	0.5	0.11	2.4	***410***	5.45	< 0.06	< 0.023
Dibenzofuran	132-64-9	310	190,000	4.7	16	11	12	0.6	< 0.084	0.45	0.15	5.3	***4,500***	0.48	< 0.12	0.31
Diethyl phthalate	84-66-2	9,300	10,000	< 0.036	< 0.087	< 0.085	< 0.072	< 0.087	< 0.084	< 0.047	< 0.017	< 0.14	< 31	< 0.17	< 0.12	< 0.011
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.028	< 0.067	< 0.066	< 0.056	< 0.087	< 0.084	< 0.044	< 0.015	< 0.13	< 29	< 0.17	< 0.12	0.058
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.046	< 0.11	< 0.11	< 0.092	< 0.087	< 0.084	< 0.046	< 0.015	< 0.13	< 31	< 0.17	< 0.12	< 0.011
Fluoranthene	206-44-0	3,200	190,000	16	53	43	54	0.134	< 0.042	11	0.78	32	***11,000***	48.4 D	0.0403 J	0.95
Fluorene	86-73-7	3,800	190,000	7	29	21	23	1.21	< 0.042	< 0.042	0.24	8.9	***7,000***	1.22	< 0.06	0.62
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	3.2	9	7.1	16	0.0347 J	< 0.042	1.4	0.24	6.5	1,200	20.8 D	< 0.06	0.09
Naphthalene	91-20-3	25	190,000	16	***42***	16	***39***	< 0.044	< 0.042	0.46	0.52	21	***19,000***	0.581	< 0.06	0.58
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	< 0.17	< 0.17	NA	NA	NA	NA	< 0.34	< 0.24	NA
Phenanthrene	85-01-8	10,000	190,000	7.5	72	56	57	0.236	< 0.042	7	0.84	41	***15,000***	6.06	< 0.06	0.92
Phenol	108-95-2	200	18,000	< 0.63	0.88 J	1.8	< 1.3	< 0.087	< 0.084	< 0.2	< 0.038	< 0.31	< 130	< 0.17	< 0.12	< 0.045
Pyrene	129-00-0	2,200	190,000	9.7	40	30	32	0.154	< 0.042	11	1.4	31	***7,100***	39.3 D	0.0449 J	0.66
Total PAHs and 2-Methylnaphthalene	-	- -	- -	104	402	288	410	2.75	0.044	58.1	7.96	233	95,000	292	0.201	6.27
Metals																
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	4,720	5,920	NA	NA	NA	NA	3,540	20,500	NA
Antimony	7440-36-0	27	190,000	2.8	7.3	6.8	< 2.7	0.92 J	< 2.6	5.4	4.4	3.8	< 3.3	0.66 J	< 3.7 J	< 2.7
Arsenic	7440-38-2	29	190,000	12	11	9.9	10	7.0	5.9	13	18	8	< 3.3	9.4	***37.2***	8.1
Barium	7440-39-3	8,200	190,000	67	180	110	170	407	35.2	1,600	290	350	20	47.0	177	59
Beryllium	7440-41-7	320	190,000	1.6	1.9	1.4	1	0.20 J	0.35	1.9	< 0.97	< 0.8	< 0.98	0.45	1.3	< 0.81
Cadmium	7440-43-9	38	190,000	0.91	1.6	0.97	< 0.82	< 0.66	0.46 J	11	1.4	< 0.8	< 0.98	0.34 J	1.6	< 0.81
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	640 J	484 J	NA	NA	NA	NA	2,750	4,260	NA
Chromium	7440-47-3	190,000	190,000	20	27	35	12	14.3	13.5	30	14	8.7	< 8.2	10.9	157	32
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	3.4 J	4.7 J	NA	NA	NA	NA	3.0 J	18.1	NA
Copper	7440-50-8	43,000	190,000	100	600	340	54	17.8	8.4	190	54	40	< 8.2	86.9	99.8	35
Cyanide	57-12-5	2000	190,000	3.2	< 0.41	< 0.4	2	< 0.33	< 0.33	NA	NA	NA	1.2	2.8 J	0.82 J	***789***
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	9,770	11,300	NA	NA	NA	NA	14,400	34,400	NA
Lead	7439-92-1	450	190,000	210	***460***	430	150	***2,840***	18.8	***5,100***	***2,200***	330	< 8.2	142 J	194 J	81
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	1,810	1,580	NA	NA	NA	NA	579 J	5,450 J	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	95.2	83.7	NA	NA	NA	NA	42.1 J	1,250 J	NA
Mercury	7439-97-6	10	190,000	0.24	0.39	0.53	0.21	0.67 J	0.026 J	0.96	0.2	0.22	< 0.14	0.29 J	1.6 J	0.31
Nickel	7440-02-0	650	190,000	30	19	22	11	8.1	9.0	22	9.1	7.3	< 8.2	9.9	35.1	11
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	1,220 J	985 J	NA	NA	NA	NA	485 J	2,280	NA
Selenium	7782-49-2	26	190,000	3.4	4.1	4.8	3.4	< 2.7	< 2.6	3.7	3.6	2.6	< 3	1.3 J	< 3.7	2.6
Silver	7440-22-4	84	190,000	< 3.4	< 4.1	< 4	< 3.4	< 0.66	< 0.64	< 4.9	< 4	< 3.3	< 4.1	< 0.62	< 0.93	< 3.4
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	< 1,300	< 1,300	NA	NA	NA	NA	< 1,200	264 J	NA
Thallium	7440-28-0	14	190,000	< 1.6	< 2	< 1.9	< 1.6	< 1.3	< 1.3	< 2.4	< 1.9	< 1.6	< 2	< 1.2	< 1.9	< 1.6
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	8.4	12.3	NA	NA	NA	NA	13.8	41.1	NA
Zinc	7440-66-6	12,000	190,000	280	230	240	170	79.1	167	2,800	810	230	200	113	534	170

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-68A 9 3/21/05	TP-70 12 3/22/05	TP-71 10 3/22/05	TP-75 7 3/23/05	TP-78 7 3/23/05	TP-278 9 3/23/05
Volatile Organic Compounds									
2-Butanone (MEK)	78-93-3	400	10,000	< 0.0018	< 0.0018 [< 0.0024]	< 0.0018	< 0.0011	< 0.0012	< 0.001
Acetone	67-64-1	10,000	10,000	0.12	0.13 [0.14]	0.11	0.023	0.071	0.039
Benzene	71-43-2	0.5	330	< 0.0012	0.0063 [0.0088]	0.0064	< 0.00072	< 0.0008	< 0.00065
Carbon Disulfide	75-15-0	620	10,000	0.02	0.0027 [0.0038]	< 0.0015	< 0.00092	< 0.001	< 0.00083
Chlorobenzene	108-90-7	10	4,600	< 0.0011	< 0.0012 [< 0.0016]	< 0.0011	< 0.00071	< 0.00079	< 0.00064
Chloroform	67-66-3	8	110	< 0.001	< 0.0011 [< 0.0014]	< 0.001	< 0.00064	< 0.00071	< 0.00058
cis-1,2-Dichloroethene	156-59-2	7	10,000	< 0.0011	< 0.0011 [< 0.0015]	< 0.0011	< 0.00067	< 0.00074	< 0.00061
Cyclohexane	110-82-7	6,900	10,000	NA	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	0.5	10,000	0.033 B	0.019 B [0.021 B]	0.015 B	0.024 B	0.013 B	0.01 B
Ethylbenzene	100-41-4	70	1,000	< 0.0017	0.078 [0.19]	0.078	< 0.0011	< 0.0012	< 0.00096
Isopropylbenzene	98-82-8	2,500	10,000	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	0.0031	0.031 [0.078]	0.0097	< 0.0016	< 0.0017	< 0.0014
Methyl Acetate	79-20-9	10,000	10,000	NA	NA	NA	NA	NA	NA
Methylcyclohexane	108-87-2	- -	- -	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	2	9,900	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	0.0043	0.051 [0.11]	0.058	< 0.00066	< 0.00073	< 0.0006
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	10,000	< 0.0014	< 0.0015 [< 0.0019]	< 0.0014	< 0.00087	< 0.00097	< 0.0008
Toluene	108-88-3	100	10,000	0.0058	0.023 [0.039]	< 0.0017	< 0.0011	< 0.0012	< 0.00097
trans-1,2-Dichloroethene	156-60-5	10	5,500	< 0.00072	< 0.00075 [< 0.00099]	< 0.00073	< 0.00045	< 0.0005	< 0.00041
trans-1,3-Dichloropropene	10061-02-6	- -	- -	NA	NA	NA	NA	NA	NA
Total Xylenes	1330-20-7	1,000	9,100	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds									
1,1-Biphenyl	92-52-4	190	190,000	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	230	10,000	< 0.072	< 1.5 [< 5.1]	< 4.3	< 0.055	< 0.053	< 0.25
2-Methylnaphthalene	91-57-6	1,900	190,000	2.7	130 [340]	100	< 0.048	0.16	< 0.22
2-Methylphenol	95-48-7	580	190,000	< 0.14	< 2.8 [< 9.7]	< 8.1	< 0.1	< 0.1	< 0.48
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	58	190,000	0.83	< 3.4 [< 12]	< 9.9	< 0.13	< 0.12	< 0.58
Acenaphthene	83-32-9	4,700	190,000	5.4	110 [250]	140	< 0.017	0.56	0.38
Acenaphthylene	208-96-8	8,000	190,000	0.69	< 0.25 [< 0.87]	< 0.73	< 0.0094	0.12	< 0.043
Acetophenone	98-86-2	1,200	10,000	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	350	190,000	3.2	58 [150]	90	< 0.012	1.3	0.88
Benz(a)anthracene	56-55-3	430	190,000	4.8	25 [63]	41	0.11	3.2	2.8
Benzaldehyde	100-52-7	- -	- -	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	46	190,000	3.9	17 [32]	24	0.11	2.8	2.5
Benzo(b)fluoranthene	205-99-2	170	190,000	5.3	21 [42]	29	0.12	3.5	3.1
Benzo(g,h,i)perylene	191-24-2	180	190,000	0.79	4.6 [9]	7.1	0.074	1.3	0.97
Benzo(k)fluoranthene	207-08-9	610	190,000	1.6	5.3 [12]	9.3	0.067	1.1	1.1
bis(2-Ethylhexyl)phthalate	117-81-7	130	10,000	< 0.017	< 0.34 [< 1.2]	< 0.98	< 0.013	< 0.012	< 0.058
Butyl benzyl phthalate	85-68-7	10,000	10,000	< 0.025	< 0.52 [< 1.8]	< 1.5	< 0.019	< 0.019	< 0.088

Table 11
Saturated Soil Analytical Results – Detected VOCs, SVOCs, and Inorganics (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	TP-68A 9 3/21/05	TP-70 12 3/22/05	TP-71 10 3/22/05	TP-75 7 3/23/05	TP-78 7 3/23/05	TP-278 9 3/23/05
Semi-Volatile Organic Compounds (cont'd)									
Carbazole	86-74-8	110	190,000	< 0.022	21 [53]	19	< 0.017	0.55	0.31
Chrysene	218-01-9	230	190,000	5.2	29 [60]	41	0.11	3	2.9
Dibenz(a,h)anthracene	53-70-3	270	190,000	0.37	2.1 [< 2.2]	< 1.8	< 0.024	0.44	0.37
Dibenzofuran	132-64-9	310	190,000	0.61	55 [150]	64	< 0.082	0.28	< 0.37
Diethyl phthalate	84-66-2	9,300	10,000	< 0.015	< 0.3 [< 1]	< 0.87	< 0.011	< 0.011	< 0.051
Di-n-butyl phthalate	84-74-2	4,900	10,000	< 0.014	< 0.28 [< 0.98]	< 0.82	0.14	< 0.01	< 0.048
Di-n-octyl phthalate	117-84-0	10,000	10,000	< 0.015	< 0.3 [< 1]	< 0.86	< 0.011	< 0.011	< 0.05
Fluoranthene	206-44-0	3,200	190,000	8.6	98 [260]	150	0.2	6.5	5.7
Fluorene	86-73-7	3,800	190,000	4.3	98 [230]	120	< 0.01	0.58	0.36
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	190,000	0.95	5.5 [9.3]	6.6	0.074	1.2	1.2
Naphthalene	91-20-3	25	190,000	3.1	***61 [200]***	11	< 0.0089	0.18	< 0.041
Pentachlorophenol	87-86-5	5	190,000	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	10,000	190,000	11	210 [540]	310	0.11	4.7	3.9
Phenol	108-95-2	200	18,000	< 0.061	< 1.3 [< 4.3]	< 3.6	< 0.047	< 0.045	< 0.21
Pyrene	129-00-0	2,200	190,000	9.5	81 [180]	120	0.16	4.7	4.9
Total PAHs and 2-Methylnaphthalene	-	- -	- -	71.4	956 [2,380]	1,200	1.14	35.3	31.1
Metals									
Aluminum	7429-90-5	- -	190,000	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	27	190,000	6	6.2 [6.6]	6.7	< 2.8	11	4.3
Arsenic	7440-38-2	29	190,000	***58***	***46 [77]***	***83***	5.9	19	27
Barium	7440-39-3	8,200	190,000	310	64 [260]	270	140	210	150
Beryllium	7440-41-7	320	190,000	1.9	< 1.1 [1.8]	1.8	1.1	< 0.82	< 0.77
Cadmium	7440-43-9	38	190,000	3.2	4.9 [3.5]	3.6	< 0.85	1	< 0.77
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	190,000	190,000	240	62 [210]	350	31	29	11
Cobalt	7440-48-4	160	190,000	NA	NA	NA	NA	NA	NA
Copper	7440-50-8	43,000	190,000	210	640 [450]	230	22	280	120
Cyanide	57-12-5	2000	190,000	5.9	4.1 [3.8]	NA	NA	NA	NA
Iron	7439-89-6	- -	190,000	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	450	190,000	370	***640*** [450]	440	110	***1,600***	***2,500***
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	2,000	190,000	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	10	190,000	2.1	0.26 [0.97]	2.6	< 0.12	0.98	1.8
Nickel	7440-02-0	650	190,000	39	21 [44]	42	20	21	16
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	26	190,000	5.7	6.7 [7.1]	4.5	2.8	3.2	2.5
Silver	7440-22-4	84	190,000	< 4.6	< 4.7 [< 5.4]	< 4.5	< 3.5	< 3.4	< 3.2
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA
Thallium	7440-28-0	14	190,000	< 2.2	< 2.3 [< 2.6]	< 2.2	< 1.7	< 1.6	< 1.5
Vanadium	7440-62-2	820	190,000	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	12,000	190,000	1,200	1,700 [1,500]	1,200	120	750	420

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
4. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS).
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
    - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
    - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
    - Metals using USEPA SW-846 Methods 6010 and 7471.
    - Cyanide using USEPA SW-846 Method 9010 (Veritech) or 9012B (SGS).
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for subsurface soil.
11. No results exceed the PADEP non-residential direct contact MSC (for subsurface soil).
12. Italics and bolding indicates that the result exceeds the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
13. - - = No PADEP MSC.
14. - = No actual Chemical Abstracts Service (CAS) number is available.
15. Brackets indicate the reported concentration of a duplicate sample.
16. The MSCs reported for chromium is for trivalent chromium. The reported chromium results are for total chromium.
17. The MSCs reported for cyanide are for free cyanide. The reported cyanide results are for total cyanide.
18. Total polycyclic aromatic hydrocarbons (PAHs) are the sum of the 16 priority pollutant PAHs identified by the USEPA and 2-methylnaphthalene.
19. Qualifier Definitions:
    B = Analyte is an estimated value between the instrument detection limit and the Reporting Limit.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
    R = Data rejected during validation.
20. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Soil Standards or PQLs		MW-102	MW-103	PCSB-26		PCSB-27	PCSB-28		PCSB-29		PCSB-30	PCSB-34	
Sample Depth (ft): Date Collected:		S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	DC Non-Res Subsurf Soil (No Exceedances)	12-13 5/16/18	15-16 5/16/18	6 7/26/05	8 7/26/05	10.5 7/26/05	2 7/26/05	15 7/26/05	2 7/26/05	11.5 7/26/05	15 7/26/05	5 7/27/05	16.5 7/27/05
Pesticides															
4,4-DDD	72-54-8	150	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
4,4-DDE	72-55-9	220	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
4,4-DDT	50-29-3	330	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
Beta-BHC	319-85-7	1.1	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
Chlordane	57-74-9	49	190,000	NA	NA	< 0.014	< 0.014	< 0.017	< 0.011	< 0.019	< 0.011	< 0.015	< 0.019	< 0.015	< 0.016
Dieldrin	60-57-1	0.58	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
Endosulfan I	959-98-8	260	190,000	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
Endrin aldehyde	7421-93-4	- -	- -	< 0.0012	< 0.00087	< 0.0072	< 0.0071	< 0.0083	< 0.0054	< 0.0094	< 0.0054	< 0.0074	< 0.0096	< 0.0074	< 0.0079
Polychlorinated Biphenyls															
Aroclor 1016	12674-11-2	47	10,000	< 0.058	< 0.043	< 0.036	< 0.036	< 0.042	< 0.027	< 0.047	< 0.027	< 0.037	< 0.048	< 0.037	< 0.04
Aroclor 1242	53469-21-9	20	10,000	< 0.058	< 0.043	< 0.036	< 0.036	< 0.042	< 0.027	< 0.047	< 0.027	< 0.037	< 0.048	< 0.037	< 0.04
Aroclor 1254	11097-69-1	340	10,000	< 0.058	< 0.043	< 0.036	< 0.036	< 0.042	< 0.027	< 0.047	< 0.027	< 0.037	< 0.048	< 0.037	< 0.04
Aroclor 1260	11096-82-5	770	190,000	< 0.058	< 0.043	< 0.036	< 0.036	< 0.042	< 0.027	< 0.047	< 0.027	< 0.037	< 0.048	< 0.037	< 0.04
Total PCBs	-	- -	- -	< 0.058	< 0.043	< 0.036	< 0.036	< 0.042	< 0.027	< 0.047	< 0.027	< 0.037	< 0.048	< 0.037	< 0.04

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCSB-36 4 7/27/05	PCSB-36 16 7/27/05	PCSB-38 3.5 7/27/05	PCSB-38 9.5 7/27/05	PCTP-62 10.5 9/8/05	PCTP-63 10.5 9/8/05	PCTP-66 7.5 9/8/05	PCTP-66R 8-10 4/24/19	PCTP-67 8 9/12/05	PCTP-68 6 9/9/05	PCTP-69 17.5 9/9/05	PCTP-70 18 9/9/05	PCTP-71 17.5 9/9/05	PCTP-72 12 9/9/05
Pesticides																	
4,4-DDD	72-54-8	150	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
4,4-DDE	72-55-9	220	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
4,4-DDT	50-29-3	330	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
Beta-BHC	319-85-7	1.1	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
Chlordane	57-74-9	49	190,000	< 0.012	< 0.014	< 0.011	< 0.018	< 0.017	< 0.014	< 0.015	NA	< 0.015	< 0.01	< 0.012	< 0.011	< 0.011	< 0.013
Dieldrin	60-57-1	0.58	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
Endosulfan I	959-98-8	260	190,000	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
Endrin aldehyde	7421-93-4	- -	- -	< 0.006	< 0.0072	< 0.0057	< 0.0088	< 0.0083	< 0.0069	< 0.0074	< 0.0010	< 0.0074	< 0.0051	< 0.0058	< 0.0054	< 0.0054	< 0.0064
Polychlorinated Biphenyls																	
Aroclor 1016	12674-11-2	47	10,000	< 0.03	< 0.036	< 0.028	< 0.044	< 0.042	< 0.035	< 0.037	< 0.052	< 0.037	< 0.026	< 0.029	< 0.027	< 0.027	< 0.032
Aroclor 1242	53469-21-9	20	10,000	< 0.03	< 0.036	< 0.028	< 0.044	< 0.042	< 0.035	< 0.037	< 0.052	< 0.037	0.93	< 0.029	< 0.027	< 0.027	< 0.032
Aroclor 1254	11097-69-1	340	10,000	< 0.03	< 0.036	< 0.028	< 0.044	< 0.042	< 0.035	< 0.037	< 0.052	< 0.037	0.92	< 0.029	< 0.027	< 0.027	< 0.032
Aroclor 1260	11096-82-5	770	190,000	< 0.03	< 0.036	< 0.028	< 0.044	< 0.042	< 0.035	< 0.037	< 0.052	< 0.037	< 0.026	< 0.029	< 0.027	< 0.027	< 0.032
Total PCBs	-	- -	- -	< 0.03	< 0.036	< 0.028	< 0.044	< 0.042	< 0.035	< 0.037	< 0.052	< 0.037	1.85	< 0.029	< 0.027	< 0.027	< 0.032

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PCTP-73	PCTP-74	PCTP-77	PCTP-78	PCTP-79	PSSTP-03B	PSSTP-04B	PSSTP-04R		PSSTP-05B	PSSTP-06B	PSSTP-07B
				9.5 9/9/05	12.5 9/9/05	10.5 9/12/05	9.5 9/12/05	10 9/12/05	8-9 3/11/03	8-9 3/11/03	8-9 4/11/19	16-17 4/11/19	5-6 3/11/03	5-6 3/11/03	8-9 3/11/03
Pesticides															
4,4-DDD	72-54-8	150	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	< 0.004	< 0.2	< 0.00086	< 0.00074	< 0.004	< 0.0043	< 0.0043
4,4-DDE	72-55-9	220	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	0.0048	< 0.2	< 0.00086	< 0.00074	< 0.004	< 0.0043	< 0.0043
4,4-DDT	50-29-3	330	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	< 0.004	0.56	0.00097	< 0.00074	< 0.004	< 0.0043	< 0.0043
Beta-BHC	319-85-7	1.1	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	0.0063	< 0.4	< 0.00086	< 0.00074	< 0.004	< 0.043	< 0.0043
Chlordane	57-74-9	49	190,000	< 0.013	< 0.0098	< 0.015	< 0.068	< 0.013	< 0.0079	< 0.2	NA	NA	< 0.008	< 0.0085	< 0.0085
Dieldrin	60-57-1	0.58	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	< 0.004	< 0.2	< 0.00086	< 0.00074	< 0.004	< 0.0043	< 0.0043
Endosulfan I	959-98-8	260	190,000	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	< 0.004	< 0.2	0.0037 JN	< 0.00074	< 0.004	< 0.0043	< 0.0043
Endrin aldehyde	7421-93-4	- -	- -	< 0.0063	< 0.0049	< 0.0076	< 0.034	< 0.0066	< 0.004	< 0.2	< 0.00086 J	< 0.00074	< 0.004	< 0.0043	< 0.0043
Polychlorinated Biphenyls															
Aroclor 1016	12674-11-2	47	10,000	< 0.032	< 0.025	< 0.038	< 0.034	< 0.033	< 0.02	< 0.02	< 0.043	< 0.038	< 0.02	< 0.021	< 0.021
Aroclor 1242	53469-21-9	20	10,000	< 0.032	< 0.025	< 0.038	< 0.034	< 0.033	0.049	< 0.02	< 0.043	< 0.038	< 0.02	< 0.021	< 0.021
Aroclor 1254	11097-69-1	340	10,000	0.85	< 0.025	< 0.038	< 0.034	< 0.033	0.057	< 0.02	< 0.043	< 0.038	< 0.02	< 0.021	< 0.021
Aroclor 1260	11096-82-5	770	190,000	< 0.032	< 0.025	< 0.038	< 0.034	< 0.033	< 0.02	0.47	< 0.043	< 0.038	< 0.02	< 0.021	< 0.021
Total PCBs	-	- -	- -	0.85	< 0.025	< 0.038	< 0.034	< 0.033	0.106	0.47	< 0.043	< 0.038	< 0.02	< 0.021	< 0.021

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

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National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

ARCADIS Design & Consultancy for natural and built assets

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-07R 8-9 4/18/19	PSSTP-10B 8-9 3/12/03	PSSTP-10R 8-9 4/16/19	PSSTP-11B 8-9 3/12/03	PSSTP-12B 7-8 3/12/03	PSSTP-13B 7-8 3/12/03	PSSTP-14B 7-8 3/12/03	PSSTP-15B 8-9 3/12/03	PSSTP-16B 5-6 3/12/03	PSSTP-17B 8-9 3/12/03	PSSTP-18B 6-7 3/12/03
Pesticides														
4,4-DDD	72-54-8	150	190,000	< 0.00074	< 0.0056	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	0.015	< 0.0042
4,4-DDE	72-55-9	220	190,000	< 0.00074	< 0.0056	0.0011 JN	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	< 0.04	< 0.0042
4,4-DDT	50-29-3	330	190,000	< 0.00074	< 0.0056	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	0.0097	< 0.0042
Beta-BHC	319-85-7	1.1	190,000	< 0.00074	< 0.0056	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	< 0.04	0.043
Chlordane	57-74-9	49	190,000	NA	< 0.011	NA	< 0.0082	< 0.0094	< 0.0094	< 0.0095	0.032	< 0.0091	0.057	0.031
Dieldrin	60-57-1	0.58	190,000	< 0.00074	< 0.0056	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	0.0064	0.0096
Endosulfan I	959-98-8	260	190,000	< 0.00074	< 0.0056	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	< 0.04	< 0.0042
Endrin aldehyde	7421-93-4	- -	- -	< 0.00074	0.015	< 0.00079	< 0.0041	< 0.0047	< 0.0047	< 0.0048	< 0.0038	< 0.0046	< 0.04	< 0.0042
Polychlorinated Biphenyls														
Aroclor 1016	12674-11-2	47	10,000	< 0.037	< 0.028	< 0.04	< 0.021	< 0.023	< 0.023	< 0.024	< 0.019	< 0.023	< 0.02	< 0.021
Aroclor 1242	53469-21-9	20	10,000	< 0.037	< 0.028	< 0.04	< 0.021	< 0.023	< 0.023	< 0.024	< 0.02	< 0.023	< 0.02	< 0.021
Aroclor 1254	11097-69-1	340	10,000	< 0.037	< 0.028	< 0.04	< 0.021	< 0.023	< 0.023	< 0.024	< 0.02	< 0.023	0.073	< 0.021
Aroclor 1260	11096-82-5	770	190,000	< 0.037	< 0.028	< 0.04	< 0.021	< 0.023	< 0.023	< 0.024	< 0.02	< 0.023	< 0.02	< 0.021
Total PCBs	-	- -	- -	< 0.037	< 0.028	< 0.04	< 0.021	< 0.023	< 0.023	< 0.024	< 0.019	< 0.023	0.073	< 0.021

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

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Location ID: Sample Depth (ft): Date Collected:	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (No Exceedances)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	PSSTP-19B 7-8 3/12/03	PSSTP-20B 8-9 3/13/03	PSSTP-21B 8-9 3/13/03	PSSTP-22B 6-7 3/13/03	PSSTP-24B 7-8 3/13/03	PSSTP-26B 7-8 3/13/03	PSSTP-27B 5-6 3/13/03	PSSTP-28B 5-6 3/13/03	PSSTP-29B 5-6 3/13/03	PSSTP-30B 5-6 3/13/03
Pesticides													
4,4-DDD	72-54-8	150	190,000	0.073	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
4,4-DDE	72-55-9	220	190,000	0.059	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
4,4-DDT	50-29-3	330	190,000	0.043	< 0.0039	< 0.0061	< 0.0055	< 0.0058	0.015	< 0.046	0.0068	< 0.0037	< 0.0043
Beta-BHC	319-85-7	1.1	190,000	0.016	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
Chlordane	57-74-9	49	190,000	< 0.0087	< 0.0078	< 0.012	< 0.011	< 0.012	< 0.009	< 0.0091	< 0.0088	< 0.0075	< 0.0087
Dieldrin	60-57-1	0.58	190,000	0.032	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
Endosulfan I	959-98-8	260	190,000	< 0.0043	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
Endrin aldehyde	7421-93-4	- -	- -	< 0.0043	< 0.0039	< 0.0061	< 0.0055	< 0.0058	< 0.0045	< 0.046	< 0.044	< 0.0037	< 0.0043
Polychlorinated Biphenyls													
Aroclor 1016	12674-11-2	47	10,000	0.31	< 0.019	< 0.03	< 0.027	< 0.029	< 0.023	< 0.023	< 0.022	< 0.019	< 0.022
Aroclor 1242	53469-21-9	20	10,000	< 0.022	< 0.019	< 0.03	< 0.027	< 0.029	< 0.023	< 0.023	< 0.022	< 0.019	< 0.022
Aroclor 1254	11097-69-1	340	10,000	< 0.022	< 0.019	< 0.03	< 0.027	< 0.029	< 0.023	< 0.023	< 0.022	< 0.019	< 0.022
Aroclor 1260	11096-82-5	770	190,000	0.77	< 0.019	< 0.03	< 0.027	< 0.029	< 0.023	< 0.023	< 0.022	< 0.019	< 0.022
Total PCBs	-	- -	- -	1.08	< 0.019	< 0.03	< 0.027	< 0.029	< 0.023	< 0.023	< 0.022	< 0.019	< 0.022

Table 12
Saturated Soil Analytical Results – Detected Pesticides and PCBs (mg/kg)

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Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
4. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Pesticides using United States Environmental Protection Agency (USEPA) SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
10. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
    (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
    (b) The non-residential direct contact MSC for subsurface soil.
11. No results exceed the PADEP non-residential direct contact MSC (for subsurface soil) or the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
12. - - = No PADEP MSC.
13. - = No actual Chemical Abstracts Service (CAS) number is available.
14. Qualifier Definitions:
    J = Analyte is an estimated value.
    N = There is presumptive evidence to make a tentative identification of this compound.
15. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 13
Soil Analytical Statistics for Detected Compounds

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National Grid Former Philadelphia Coke Plant
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		Soil Standards or PQLs			Surface Soil Samples						Unsaturated Soil Samples		
Analyte	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	20	10,000	10,000	0/73	0/73	0/73	ND	ND	ND	1/68	0/68	0/68
1,1-Dichloroethane	75-34-3	16	1,400	1,600	0/73	0/73	0/73	ND	ND	ND	1/68	0/68	0/68
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	0/18	0/18	0/18	ND	ND	ND	1/36	0/36	0/36
1,2,4-Trichlorobenzene	120-82-1	27	3,100	10,000	0/18	0/18	0/18	ND	ND	ND	1/36	0/36	0/36
1,3-Dichlorobenzene	541-73-1	61	10,000	10,000	0/18	0/18	0/18	ND	ND	ND	1/35	0/35	0/35
1,4-Dichlorobenzene	106-46-7	10	200	230	0/18	0/18	0/18	ND	ND	ND	2/36	0/36	0/36
2-Butanone (MEK)	78-93-3	400	10,000	10,000	0/73	0/73	0/73	ND	ND	ND	5/69	0/69	0/69
Acetone	67-64-1	10,000	10,000	10,000	16/103	0/103	0/103	0.0087	0.394	PSSTP-10R (1-2)	37/76	0/76	0/76
Benzene	71-43-2	0.5	290	330	9/103	4/103	0/103	0.001	***29***	PCTP-66 (0.5)	26/74	11/74	0/74
Carbon Disulfide	75-15-0	620	10,000	10,000	3/103	0/103	0/103	0.0012	0.0061	PSSTP-05A (1-2)	19/75	0/75	0/75
Carbon Tetrachloride	56-23-5	0.5	370	430	0/73	0/73	0/73	ND	ND	ND	1/68	0/68	0/68
Chlorobenzene	108-90-7	10	4,000	4,600	0/103	0/103	0/103	ND	ND	ND	0/74	0/74	0/74
Chloroform	67-66-3	8	97	110	0/73	0/73	0/73	ND	ND	ND	3/68	0/68	0/68
cis-1,2-Dichloroethene	156-59-2	7	6,400	10,000	0/73	0/73	0/73	ND	ND	ND	1/68	0/68	0/68
Cyclohexane	110-82-7	6,900	10,000	10,000	2/18	0/18	0/18	0.158	4.89	PCSB-41R (0.5-2)	1/36	0/36	0/36
Dichloromethane	75-09-2	0.5	10,000	10,000	79/103	0/103	0/103	0.002	0.28	PSSTP-22A (1-2)	39/74	0/74	0/74
Ethylbenzene	100-41-4	70	890	1,000	3/102	0/102	0/102	0.0083	12.3	PCSB-41R (0.5-2)	13/74	0/74	0/74
Isopropylbenzene	98-82-8	2,500	10,000	10,000	1/18	0/18	0/18	0.943	0.943	PCSB-41R (0.5-2)	0/36	0/36	0/36
m&p-Xylenes	ARC-mpXyl	- -	- -	- -	6/73	0/73	0/73	0.0029	51.9	PCSB-41R (0.5-2)	19/68	0/68	0/68
Methyl Acetate	79-20-9	10,000	10,000	10,000	2/18	0/18	0/18	0.0039	0.0061	PSSTP-10R (1-2)	2/36	0/36	0/36
Methylcyclohexane	108-87-2	- -	- -	- -	2/18	0/18	0/18	0.409	8.78	PCSB-41R (0.5-2)	3/36	0/36	0/36
Methyl-tert-butylether	1634-04-4	2	8,600	9,900	0/18	0/18	0/18	ND	ND	ND	0/36	0/36	0/36
o,p-Xylene	136777-61-2	- -	- -	- -	2/55	0/55	0/55	0.1	2.2	PCTP-66 (0.5)	6/32	0/32	0/32
o-Xylene	95-47-6	- -	- -	- -	3/18	0/18	0/18	0.00085	19.1	PCSB-41R (0.5-2)	12/36	0/36	0/36
Styrene (Monomer)	100-42-5	24	10,000	10,000	1/73	0/73	0/73	2.4	2.4	PCTP-66 (0.5)	3/68	0/68	0/68
Toluene	108-88-3	100	10,000	10,000	10/103	0/103	0/103	0.0013	53.4	PCSB-41R (0.5-2)	24/76	0/76	0/76
Total Xylenes	1330-20-7	1,000	8,000	9,100	33/47	0/47	0/47	0.29	71	PCSB-41R (0.5-2)	20/44	0/44	0/44
trans-1,2-Dichloroethene	156-60-5	10	4,800	5,500	0/73	0/73	0/73	ND	ND	ND	0/68	0/68	0/68
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	0/18	0/18	0/18	ND	ND	ND	2/36	0/36	0/36
Trichloroethene	79-01-6	0.5	160	180	0/73	0/73	0/73	ND	ND	ND	2/66	0/66	0/66
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	190,000	16/18	0/18	0/18	0.0088	6.43	PCSB-41R (0.5-2)	33/36	3/36	0/36
1,2,4,5-Tetrachlorobenzene	95-94-3	16	960	190,000	0/18	0/18	0/18	ND	ND	ND	1/36	0/36	0/36
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	96,000	190,000	0/18	0/18	0/18	ND	ND	ND	1/35	0/35	0/35
2,4-Dichlorophenol	120-83-2	2	9,600	190,000	0/19	0/19	0/19	ND	ND	ND	1/38	0/38	0/38
2,4-Dimethylphenol	105-67-9	230	10,000	10,000	2/104	0/104	0/104	0.158	0.181	PSSTP-22R (0.5-2)	11/76	0/76	0/76
2-Methylnaphthalene	91-57-6	1,900	13,000	190,000	81/104	0/104	0/104	0.0173	1,300	PCTP-66 (0.5)	68/77	1/77	0/77
2-Methylphenol	95-48-7	580	160,000	190,000	3/74	0/74	0/74	0.0797	0.195	S-113 (0-1)	13/70	0/70	0/70
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	- -	5/49	0/49	0/49	0.037	0.61	S-113 (0-1)	17/44	0/44	0/44
4-Methylphenol	106-44-5	58	16,000	190,000	1/55	1/55	0/55	***180***	***180***	PCTP-66 (0.5)	2/32	0/32	0/32
4-Nitroaniline	100-01-6	17	4,600	190,000	1/49	0/49	0/49	0.17	0.17	PSSTP-09A (1-2)	0/45	0/45	0/45
Acenaphthene	83-32-9	4,700	190,000	190,000	73/104	0/104	0/104	0.0155	180	PCTP-66 (0.5)	59/77	0/77	0/77

Table 13
Soil Analytical Statistics for Detected Compounds

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Analyte	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	Surface Soil Samples: Detection Frequency	Surface Soil Samples: S-GW Exceedance Frequency	Surface Soil Samples: DC Exceedance Frequency	Surface Soil Samples: Minimum Detect	Surface Soil Samples: Maximum Detect	Surface Soil Samples: Max Detect Location and Depth	Unsaturated Soil Samples: Detection Frequency	Unsaturated Soil Samples: S-GW Exceedance Frequency	Unsaturated Soil Samples: DC Exceedance Frequency
Semi-Volatile Organic Compounds (cont'd)													
Acenaphthylene	208-96-8	8,000	190,000	190,000	81/104	0/104	0/104	0.035	2,000	PCTP-66 (0.5)	59/77	0/77	0/77
Acetophenone	98-86-2	1,200	10,000	10,000	3/18	0/18	0/18	0.0245	0.128	S-113 (0-1)	14/36	0/36	0/36
Anthracene	120-12-7	350	190,000	190,000	91/104	1/104	0/104	0.044	***1,800***	PCTP-66 (0.5)	69/77	7/77	0/77
Benz(a)anthracene	56-55-3	430	130	190,000	102/104	1/104	3/104	0.0283	***1,800***	PCTP-66 (0.5)	68/77	5/77	0/77
Benzaldehyde	100-52-7	- -	- -	- -	7/18	0/18	0/18	0.0111	0.212	S-119 (0-1)	5/36	0/36	0/36
Benzo(a)pyrene	50-32-8	46	12	190,000	102/104	9/104	18/104	0.0339	***1,300***	PCTP-66 (0.5)	67/77	10/77	0/77
Benzo(b)fluoranthene	205-99-2	170	76	190,000	104/104	3/104	8/104	0.0478	***1,600***	PCTP-66 (0.5)	70/77	10/77	0/77
Benzo(g,h,i)perylene	191-24-2	180	190,000	190,000	99/104	1/104	0/104	0.0281	***850***	PCTP-66 (0.5)	66/77	5/77	0/77
Benzo(k)fluoranthene	207-08-9	610	76	190,000	97/104	1/104	2/104	0.046	***690***	PCTP-66 (0.5)	65/77	1/77	0/77
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	10,000	56/104	0/104	0/104	0.0385	1.7	PSSTP-09A (1-2)	23/77	0/77	0/77
Butyl benzyl phthalate	85-68-7	10,000	10,000	10,000	13/104	0/104	0/104	0.045	0.7	PCTP-64 (0.5)	5/77	0/77	0/77
Caprolactam	105-60-2	- -	- -	- -	0/18	0/18	0/18	ND	ND	ND	1/36	0/36	0/36
Carbazole	86-74-8	110	4,600	190,000	85/104	2/104	0/104	0.0116	***970***	PCTP-66 (0.5)	62/77	8/77	0/77
Chrysene	218-01-9	230	760	190,000	103/104	1/104	1/104	0.0272	***1,500***	PCTP-66 (0.5)	69/77	8/77	0/77
Dibenz(a,h)anthracene	53-70-3	270	22	190,000	91/104	0/104	3/104	0.0326	270	PCTP-66 (0.5)	62/77	0/77	0/77
Dibenzofuran	132-64-9	310	3,200	190,000	87/104	1/104	0/104	0.0199	***1,600***	PCTP-66 (0.5)	65/77	7/77	0/77
Diethyl phthalate	84-66-2	9,300	10,000	10,000	3/74	0/74	0/74	0.041	0.064	PCSB-60 (0.5)	5/71	0/71	0/71
Dimethyl phthalate	131-11-3	- -	- -	- -	0/74	0/74	0/74	ND	ND	ND	1/71	0/71	0/71
Di-n-butyl phthalate	84-74-2	4,900	10,000	10,000	30/104	0/104	0/104	0.0187	0.42	PSSTP-07A (1-2)	10/77	0/77	0/77
Di-n-octyl phthalate	117-84-0	10,000	10,000	10,000	2/104	0/104	0/104	0.047	0.076	PSSTP-15A (1-2)	3/77	0/77	0/77
Fluoranthene	206-44-0	3,200	130,000	190,000	104/104	1/104	0/104	0.0452	***3,800***	PCTP-66 (0.5)	71/77	2/77	0/77
Fluorene	86-73-7	3,800	130,000	190,000	81/104	0/104	0/104	0.0204	2,600	PCTP-66 (0.5)	67/77	1/77	0/77
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	190,000	99/104	0/104	3/104	0.0286	750	PCTP-66 (0.5)	68/77	0/77	0/77
Naphthalene	91-20-3	25	760	190,000	86/104	4/104	2/104	0.02565	***6,000***	PCTP-66 (0.5)	69/77	15/77	0/77
Pentachlorophenol	87-86-5	5	230	190,000	0/49	0/49	0/49	ND	ND	ND	1/44	0/44	0/44
Phenanthrene	85-01-8	10,000	190,000	190,000	101/104	0/104	0/104	0.0215	7,700	PCTP-66 (0.5)	71/77	1/77	0/77
Phenol	108-95-2	200	16,000	18,000	14/104	1/104	0/104	0.0737	***210***	PCTP-66 (0.5)	21/77	1/77	0/77
Pyrene	129-00-0	2,200	96,000	190,000	103/104	1/104	0/104	0.0413	***4,400***	PCTP-66 (0.5)	71/77	1/77	0/77
Total PAHs and 2-Methylnaphthalene	-	- -	- -	- -	104/104	0/104	0/104	0.105	38,500	PCTP-66 (0.5)	73/77	0/77	0/77
Metals													
Aluminum	7429-90-5	- -	190,000	190,000	19/19	0/19	0/19	1,140	13,500	PSSTP-04R (1-2)	39/39	0/39	0/39
Antimony	7440-36-0	27	1,300	190,000	47/104	0/104	0/104	0.56	20.6	PCSB-41R (0.5-2)	32/77	1/77	0/77
Arsenic	7440-38-2	29	61	190,000	98/104	23/104	13/104	2.4	***170***	PSSTP-30A (1-2)	75/77	8/77	0/77
Barium	7440-39-3	8,200	190,000	190,000	100/104	0/104	0/104	7.1	780	PCSB-36 (0.5)	77/77	0/77	0/77
Beryllium	7440-41-7	320	6,400	190,000	38/104	0/104	0/104	0.24	8.1	PSSTP-23A (1-2)	42/77	0/77	0/77
Cadmium	7440-43-9	38	1,600	190,000	42/104	0/104	0/104	0.1	4.1	PCTP-67 (0.5)	32/77	0/77	0/77
Calcium	7440-70-2	- -	- -	- -	19/19	0/19	0/19	430	41,400	S-163 (0.5-2)	38/39	0/39	0/39
Chromium	7440-47-3	190,000	190,000	190,000	93/104	0/104	0/104	1.6	162	PCSB-26R (0.5-2)	74/77	0/77	0/77
Cobalt	7440-48-4	160	960	190,000	16/19	0/19	0/19	0.6	56.7	PCSB-26R (0.5-2)	36/39	0/39	0/39
Copper	7440-50-8	43,000	120,000	190,000	103/104	0/104	0/104	6.7	1,400	PCTP-73 (0.5)	76/77	0/77	0/77
Cyanide	57-12-5	200	1,900	190,000	36/49	0/49	0/49	0.14	125	S-113 (0-1)	46/54	1/54	0/54

Analyte	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	Surface Soil Samples: Detection Frequency	Surface Soil Samples: S-GW Exceedance Frequency	Surface Soil Samples: DC Exceedance Frequency	Surface Soil Samples: Minimum Detect	Surface Soil Samples: Maximum Detect	Surface Soil Samples: Max Detect Location and Depth	Unsaturated Soil Samples: Detection Frequency	Unsaturated Soil Samples: S-GW Exceedance Frequency	Unsaturated Soil Samples: DC Exceedance Frequency
Metals (cont'd)													
Iron	7439-89-6	- -	190,000	190,000	19/19	0/19	0/19	3,720	93,300	PCSB-26R (0.5-2)	39/39	0/39	0/39
Lead	7439-92-1	450	1,000	190,000	102/104	30/104	12/104	6.9	***14,000***	PCSB-36 (0.5)	75/77	14/77	0/77
Magnesium	7439-95-4	- -	- -	- -	19/19	0/19	0/19	297	15,400	S-163 (0.5-2)	37/39	0/39	0/39
Manganese	7439-96-5	2,000	150,000	190,000	19/19	0/19	0/19	11.1	1,710	S-163 (0.5-2)	39/39	0/39	0/39
Mercury	7439-97-6	10	510	190,000	84/104	1/104	0/104	0.03	***17***	PCSB-26 (0.5)	65/76	0/76	0/76
Nickel	7440-02-0	650	64,000	190,000	95/104	0/104	0/104	1.6	243	PCSB-26R (0.5-2)	75/77	0/77	0/77
Potassium	7440-09-7	- -	- -	- -	16/19	0/19	0/19	462	2,550	PSSTP-22R (0.5-2)	34/39	0/39	0/39
Selenium	7782-49-2	26	16,000	190,000	37/104	0/104	0/104	0.74	6.4	PCSB-58 (0.5)	32/77	1/77	0/77
Silver	7440-22-4	84	16,000	190,000	4/104	0/104	0/104	0.22	2.4	PCSB-26R (0.5-2)	9/77	0/77	0/77
Sodium	7440-23-5	- -	- -	- -	10/19	0/19	0/19	119.5	665	PCSB-30R (0.5-2)	14/39	0/39	0/39
Thallium	7440-28-0	14	32	190,000	0/104	0/104	0/104	ND	ND	ND	1/77	0/77	0/77
Vanadium	7440-62-2	820	220	190,000	19/19	0/19	0/19	4.1	41.3	S-163 (0.5-2)	39/39	0/39	0/39
Zinc	7440-66-6	12,000	190,000	190,000	102/104	0/104	0/104	7.9	6,300	PCSB-36 (0.5)	73/77	0/77	0/77
Pesticides													
4,4-DDD	72-54-8	150	380	380	15/93	0/93	0/93	0.00205	0.086	PSSTP-30A (1-2)	3/17	0/17	0/17
4,4-DDE	72-55-9	220	270	270	23/93	0/93	0/93	0.002	0.15	PCSB-41 (0.5)	4/17	0/17	0/17
4,4-DDT	50-29-3	330	270	270	42/93	0/93	0/93	0.0052	0.48	PSSTP-12A (1-2)	5/17	0/17	0/17
Aldrin	309-00-2	2.4	5.4	5.4	2/93	0/93	0/93	0.0074	0.0152	PSSTP-04R (1-2)	1/17	0/17	0/17
Beta-BHC	319-85-7	1.1	51	51	1/93	0/93	0/93	0.012	0.012	PSSTP-05A (1-2)	1/17	0/17	0/17
Chlordane	57-74-9	49	260	260	17/82	0/82	0/82	0.016	4.5	PCTP-78 (0.5)	3/13	0/13	0/13
Dieldrin	60-57-1	0.58	- -	- -	12/93	0/93	0/93	0.0043	0.18	PSSTP-17A (1-2)	2/17	0/17	0/17
Endosulfan I	959-98-8	260	19,000	19,000	1/93	0/93	0/93	0.012	0.012	PSSTP-04A (1-2)	2/17	0/17	0/17
Endosulfan II	33213-65-9	260	19,000	19,000	3/93	0/93	0/93	0.016	0.04	PSSTP-05A (1-2)	0/17	0/17	0/17
Endosulfan sulfate	1031-07-8	70	19,000	19,000	6/93	0/93	0/93	0.0083	0.088	PSSTP-22A (1-2)	1/17	0/17	0/17
Endrin	72-20-8	5.5	960	960	2/93	0/93	0/93	0.0057	0.015	PSSTP-30A (1-2)	3/17	0/17	0/17
Endrin aldehyde	7421-93-4	- -	- -	- -	7/93	0/93	0/93	0.0071	0.32	PSSTP-26A (1-2)	1/17	0/17	0/17
Endrin ketone	53494-70-5	- -	- -	- -	1/93	0/93	0/93	0.0091	0.0091	PCTP-73R (0-0.2)	1/17	0/17	0/17
Heptachlor	76-44-8	0.68	20	190,000	0/93	0/93	0/93	ND	ND	ND	1/17	0/17	0/17
Heptachlor epoxide	1024-57-3	1.1	10	10	5/93	0/93	0/93	0.001095	0.012	PSSTP-04A (1-2)	2/17	0/17	0/17
Methoxychlor	72-43-5	630	16,000	16,000	1/93	0/93	0/93	0.014	0.014	PSSTP-28A (1-2)	0/17	0/17	0/17
Toxaphene	8001-35-2	1.2	83	83	1/93	0/93	0/93	0.02	0.02	PSSTP-05A (1-2)	0/17	0/17	0/17
trans-chlordane	5103-74-2	- -	- -	- -	2/11	0/11	0/11	0.00059	0.00135	PSSTP-07R (0.5-2)	1/4	0/4	0/4
Polychlorinated Biphenyls													
Aroclor 1016	12674-11-2	47	46	46	0/101	0/101	0/101	ND	ND	ND	0/17	0/17	0/17
Aroclor 1242	53469-21-9	20	46	46	2/101	0/101	0/101	0.12	0.12	PSSTP-03A (1-2), PSSTP-04A (1-2)	3/17	0/17	0/17
Aroclor 1248	12672-29-6	81	46	46	6/101	0/101	0/101	0.053	1.7	PCSB-56 (0.5)	0/17	0/17	0/17
Aroclor 1254	11097-69-1	340	46	46	22/101	0/101	0/101	0.0256	7.9	PCTP-73 (0.5)	2/17	0/17	0/17
Aroclor 1260	11096-82-5	770	46	46	44/101	0/101	0/101	0.046	1	PCSB-37 (0.5)	5/17	0/17	0/17
Aroclor 1262	37324-23-5	- -	- -	- -	1/17	0/17	0/17	0.2925	0.2925	PCTP-66R (0-0.5)	0/4	0/4	0/4
Total PCBs	-	- -	- -	- -	68/101	0/101	0/101	0.0256	7.9	PCTP-73 (0.5)	8/17	0/17	0/17

Analyte	CAS Number	Soil Standards or PQLs: S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	Soil Standards or PQLs: DC Non-Res Surf Soil (Exceedances Shaded)	Soil Standards or PQLs: DC Non-Res Subsurf Soil (No Exceedances)	Unsaturated Soil Samples (cont'd): Minimum Detect	Unsaturated Soil Samples (cont'd): Maximum Detect	Unsaturated Soil Samples (cont'd): Max Detect Location and Depth	Saturated Soil Samples: Detection Frequency	Saturated Soil Samples: S-GW Exceedance Frequency	Saturated Soil Samples: DC Exceedance Frequency	Saturated Soil Samples: Minimum Detect	Saturated Soil Samples: Maximum Detect	Saturated Soil Samples: Max Detect Location and Depth
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	20	10,000	10,000	0.00082	0.00082	S-129 (2-4)	0/329	0/329	0/329	ND	ND	ND
1,1-Dichloroethane	75-34-3	16	1,400	1,600	0.00052	0.00052	S-129 (2-4)	0/329	0/329	0/329	ND	ND	ND
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	0.0019	0.0019	PSSTP-01R (5-6)	0/119	0/119	0/119	ND	ND	ND
1,2,4-Trichlorobenzene	120-82-1	27	3,100	10,000	0.606	0.606	S-172 (5-7)	0/119	0/119	0/119	ND	ND	ND
1,3-Dichlorobenzene	541-73-1	61	10,000	10,000	0.12	0.12	S-172 (5-7)	0/119	0/119	0/119	ND	ND	ND
1,4-Dichlorobenzene	106-46-7	10	200	230	0.002	0.407	S-172 (5-7)	0/119	0/119	0/119	ND	ND	ND
2-Butanone (MEK)	78-93-3	400	10,000	10,000	0.006	0.0403	S-133 (2-4)	50/329	0/329	0/329	0.0033	0.117	PCTP-17R (9-11)
Acetone	67-64-1	10,000	10,000	10,000	0.011	1.96	S-168 (6-8)	231/354	0/354	0/354	0.0053	0.495	PCTP-17R (9-11)
Benzene	71-43-2	0.5	290	330	0.00086	***103***	S-161 (5-7)	124/353	21/353	0/353	0.00047	***247***	S-155 (10-12)
Carbon Disulfide	75-15-0	620	10,000	10,000	0.00083	8.42	MW-108 (5-7)	83/353	0/353	0/353	0.00089	51	S-108 (15-17)
Carbon Tetrachloride	56-23-5	0.5	370	430	0.0012	0.0012	S-110 (2-4)	0/329	0/329	0/329	ND	ND	ND
Chlorobenzene	108-90-7	10	4,000	4,600	ND	ND	ND	9/353	4/353	0/353	0.0021	***53***	TP-63 (8)
Chloroform	67-66-3	8	97	110	0.0018	0.0056	PCTP-14 (2.5)	39/329	0/329	0/329	0.0013	0.0097	PCTP-23 (10)
cis-1,2-Dichloroethene	156-59-2	7	6,400	10,000	0.0016	0.0016	PCTP-80 (8)	1/329	0/329	0/329	0.0018	0.0018	PCSB-40 (4)
Cyclohexane	110-82-7	6,900	10,000	10,000	0.0054	0.0054	MW-108 (10-12)	9/120	0/120	0/120	0.00062	0.305	TP-15R (5-7)
Dichloromethane	75-09-2	0.5	10,000	10,000	0.0011	0.29	PCSB-48 (4)	234/353	5/353	0/353	0.0009	***3.2***	TP-33 (9)
Ethylbenzene	100-41-4	70	890	1,000	0.00079	6.52	S-161 (5-7)	78/353	3/353	0/353	0.00071	***180***	PCTP-42 (13.5)
Isopropylbenzene	98-82-8	2,500	10,000	10,000	ND	ND	ND	25/120	0/120	0/120	0.001	6.37	PCTP-66R (8-10)
m&p-Xylenes	ARC-mpXyl	- -	- -	- -	0.0015	93.5	S-106 (2-4)	83/329	0/329	0/329	0.0011	430	TP-63 (8)
Methyl Acetate	79-20-9	10,000	10,000	10,000	0.0022	4.74	S-168 (6-8)	12/120	0/120	0/120	0.0021	3.14	S-108 (15-17)
Methylcyclohexane	108-87-2	- -	- -	- -	0.0016	0.0148	MW-108 (5-7)	26/120	0/120	0/120	0.0013	1.21	PCTP-17R (9-11)
Methyl-tert-butylether	1634-04-4	2	8,600	9,900	ND	ND	ND	1/120	0/120	0/120	0.00092	0.00092	S-113B (10-12)
o,p-Xylene	136777-61-2	- -	- -	- -	0.0016	23	PCTP-12 (3)	45/209	0/209	0/209	0.0014	140	TP-63 (8)
o-Xylene	95-47-6	- -	- -	- -	0.00095	35.3	S-106 (2-4)	31/120	0/120	0/120	0.0013	42.6	MW-111 (11-13)
Styrene (Monomer)	100-42-5	24	10,000	10,000	4.8	20.4	S-106 (2-4)	6/329	2/329	0/329	4.5	***47***	TP-63 (8)
Toluene	108-88-3	100	10,000	10,000	0.00035	75	PCTP-12 (3)	97/353	1/353	0/353	0.00032	***140***	TP-63 (8)
Total Xylenes	1330-20-7	1,000	8,000	9,100	0.0025	129	S-106 (2-4)	63/146	0/146	0/146	0.0013	175	S-155 (10-12)
trans-1,2-Dichloroethene	156-60-5	10	4,800	5,500	ND	ND	ND	2/328	0/328	0/328	0.0025	0.0234	TP-37 (8)
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	5.558	248.8	PCTP-12 (3)	2/121	0/121	0/121	0.0025	0.076	TP-37 (8)
Trichloroethene	79-01-6	0.5	160	180	5.668	253.6	PCTP-12 (3)	0/327	0/327	0/327	ND	ND	ND
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	190	11,000	190,000	0.0138	***331***	S-106 (2-4)	84/114	1/114	0/114	0.0054	***300***	S-160 (10-12)
1,2,4,5-Tetrachlorobenzene	95-94-3	16	960	190,000	0.0185	0.0185	S-172 (5-7)	0/114	0/114	0/114	ND	ND	ND
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	96,000	190,000	0.0291	0.0291	S-133 (2-4)	0/113	0/113	0/113	ND	ND	ND
2,4-Dichlorophenol	120-83-2	2	9,600	190,000	0.0642	0.0642	S-172 (5-7)	0/120	0/120	0/120	ND	ND	ND
2,4-Dimethylphenol	105-67-9	230	10,000	10,000	0.0772	185	S-106 (2-4)	30/353	0/353	0/353	0.062	152	S-160 (10-12)
2-Methylnaphthalene	91-57-6	1,900	13,000	190,000	0.0109	***5,500***	PCTP-12 (3)	258/354	3/354	0/354	0.0114	***7,200***	PCTP-46 (10.5)
2-Methylphenol	95-48-7	580	160,000	190,000	0.0716	189	S-106 (2-4)	40/329	0/329	0/329	0.0305	73.6	S-160 (10-12)
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	- -	0.0533	476	S-106 (2-4)	56/144	0/144	0/144	0.036	221	S-160 (10-12)
4-Methylphenol	106-44-5	58	16,000	190,000	0.071	0.17	PCTP-65 (7.5)	53/209	0/209	0/209	0.047	5.9	PCSB-23 (8.5)
4-Nitroaniline	100-01-6	17	4,600	190,000	ND	ND	ND	0/145	0/145	0/145	ND	ND	ND
Acenaphthene	83-32-9	4,700	190,000	190,000	0.043	1,300	PCTP-12 (3)	247/354	0/354	0/354	0.0147	1,200	TP-63 (8)

Table 13
Soil Analytical Statistics for Detected Compounds

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

		Soil Standards or PQLs			Unsaturated Soil Samples (cont'd)			Saturated Soil Samples					
Analyte	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Minimum Detect	Maximum Detect	Max Detect Location and Depth	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth
Semi-Volatile Organic Compounds (cont'd)													
Acenaphthylene	208-96-8	8,000	190,000	190,000	0.0363	1,600	PCTP-12 (3)	188/354	0/354	0/354	0.0231	4,900	TP-63 (8)
Acetophenone	98-86-2	1,200	10,000	10,000	0.0105	13.3	PSSTP-04R (7-8)	18/114	0/114	0/114	0.0111	0.927	S-158 (11-13)
Anthracene	120-12-7	350	190,000	190,000	0.0285	***3,000***	PCTP-12 (3)	260/354	7/354	0/354	0.033	***6,900***	PCTP-17 (8)
Benz(a)anthracene	56-55-3	430	130	190,000	0.0165	***2,800***	PCTP-12 (3)	294/354	6/354	0/354	0.0114	***5,500***	PCTP-17 (8)
Benzaldehyde	100-52-7	- -	- -	- -	0.022	0.0406	PCTP-01R (5-7)	7/114	0/114	0/114	0.0149	0.103	S-114 (23-25)
Benzo(a)pyrene	50-32-8	46	12	190,000	0.03	***1,800***	PCTP-12 (3)	302/354	20/354	0/354	0.02	***3,800***	PCTP-17 (8)
Benzo(b)fluoranthene	205-99-2	170	76	190,000	0.0192	***2,000***	PCTP-12 (3)	287/354	9/354	0/354	0.0218	***4,700***	TP-63 (8)
Benzo(g,h,i)perylene	191-24-2	180	190,000	190,000	0.038	***620***	PCTP-12 (3)	265/354	7/354	0/354	0.0203	***1,500***	PCTP-17 (8)
Benzo(k)fluoranthene	207-08-9	610	76	190,000	0.046	***730***	PCTP-12 (3)	253/354	4/354	0/354	0.0196	***1,700***	PCTP-17 (8)
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	10,000	0.049	8.5	PSSTP-02B (5-6)	87/354	0/354	0/354	0.0365	64	PCTP-22 (4.5)
Butyl benzyl phthalate	85-68-7	10,000	10,000	10,000	0.0454	1.6	PCSB-58 (2)	2/354	0/354	0/354	0.0586	0.25	PCTP-60 (2)
Caprolactam	105-60-2	- -	- -	- -	0.125	0.125	PCTP-01R (5-7)	0/114	0/114	0/114	ND	ND	ND
Carbazole	86-74-8	110	4,600	190,000	0.0214	***1,500***	PCTP-12 (3)	200/354	8/354	0/354	0.0067	***3,100***	PCTP-17 (8)
Chrysene	218-01-9	230	760	190,000	0.0398	***1,800***	PCTP-12 (3)	290/354	9/354	0/354	0.0172	***5,500***	PCTP-17 (8)
Dibenz(a,h)anthracene	53-70-3	270	22	190,000	0.052	210	PCTP-12 (3)	203/354	2/354	0/354	0.0202	***610***	PCTP-17 (8)
Dibenzofuran	132-64-9	310	3,200	190,000	0.0258	***3,700***	PCTP-12 (3)	228/354	8/354	0/354	0.0215	***5,300***	PCTP-17 (8)
Diethyl phthalate	84-66-2	9,300	10,000	10,000	0.041	0.066	PCTP-37 (3)	13/330	0/330	0/330	0.048	0.16	PC-B14 (15-17)
Dimethyl phthalate	131-11-3	- -	- -	- -	0.0206	0.0206	PCTP-01R (5-7)	0/330	0/330	0/330	ND	ND	ND
Di-n-butyl phthalate	84-74-2	4,900	10,000	10,000	0.045	0.68	PCTP-14 (2.5)	66/354	0/354	0/354	0.041	35	PCTP-22 (4.5)
Di-n-octyl phthalate	117-84-0	10,000	10,000	10,000	0.048	1.5	PSSTP-02B (5-6)	3/354	0/354	0/354	0.053	13	PCTP-22 (4.5)
Fluoranthene	206-44-0	3,200	130,000	190,000	0.0232	***7,500***	PCTP-12 (3)	307/354	5/354	0/354	0.0168	***15,000***	PCTP-17 (8)
Fluorene	86-73-7	3,800	130,000	190,000	0.023	***5,200***	PCTP-12 (3)	248/354	3/354	0/354	0.0201	***8,200***	PCTP-17 (8)
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	190,000	0.0316	620	PCTP-12 (3)	260/354	0/354	0/354	0.0286	1,600	PCTP-17 (8)
Naphthalene	91-20-3	25	760	190,000	0.0197	***29,000***	PCTP-12 (3)	276/354	35/354	0/354	0.0122	***31,000***	PCTP-17 (8), PCTP-46 (10.5)
Pentachlorophenol	87-86-5	5	230	190,000	0.447	0.447	S-133 (2-4)	1/144	0/144	0/144	0.197	0.197	S-129 (10-12)
Phenanthrene	85-01-8	10,000	190,000	190,000	0.053	***14,000***	PCTP-12 (3)	301/354	3/354	0/354	0.016	***24,000***	PCTP-17 (8)
Phenol	108-95-2	200	16,000	18,000	0.049	***296***	S-106 (2-4)	59/354	0/354	0/354	0.0232	75.9	S-160 (10-12)
Pyrene	129-00-0	2,200	96,000	190,000	0.0347	***5,900***	PCTP-12 (3)	308/354	4/354	0/354	0.0131	***11,000***	PCTP-17 (8)
Total PAHs and 2-Methylnaphthalene	-	- -	- -	- -	0.085	83,600	PCTP-12 (3)	334/354	0/354	0/354	0.044	132,000	PCTP-17 (8)
Metals													
Aluminum	7429-90-5	- -	190,000	190,000	1,090	22,355	S-108 (2-4)	113/113	0/113	0/113	864	27,800	S-153 (7-9)
Antimony	7440-36-0	27	1,300	190,000	0.65	***33***	PCTP-12 (3)	104/346	2/346	0/346	0.53	***92***	PCTP-09 (7)
Arsenic	7440-38-2	29	61	190,000	2.2	***170***	S-105 (2-4)	309/346	70/346	0/346	1.6	***140***	PCTP-19 (6)
Barium	7440-39-3	8,200	190,000	190,000	13	1,200	TP-44 (4)	340/346	0/346	0/346	4.1	4,700	PCTP-28 (7)
Beryllium	7440-41-7	320	6,400	190,000	0.31	6.2	S-167 (7-9)	191/346	0/346	0/346	0.16	9.5	PSSTP-04R (16-17)
Cadmium	7440-43-9	38	1,600	190,000	0.11	15	PCSB-30 (2)	149/346	0/346	0/346	0.073	11	TP-58 (11)
Calcium	7440-70-2	- -	- -	- -	176	86,800	PSSTP-01R (5-6)	112/113	0/113	0/113	58.7	164,000	MW-102 (12-13)
Chromium	7440-47-3	190,000	190,000	190,000	4.1	791	PSSTP-04R (7-8)	337/346	0/346	0/346	3.7	620	TP-34 (4)
Cobalt	7440-48-4	160	960	190,000	2.9	21.3	S-167 (7-9)	107/113	0/113	0/113	0.56	65.2	PSSTP-04R (16-17)
Copper	7440-50-8	43,000	120,000	190,000	4.9	3,200	PCTP-12 (3)	340/346	0/346	0/346	1.1	6,200	PCSB-08 (10.5)
Cyanide	57-12-5	200	1,900	190,000	0.13	340	PCTP-12 (3)	168/230	2/230	0/230	0.18	789	TP-64 (7)

		Soil Standards or PQLs			Unsaturated Soil Samples (cont'd)			Saturated Soil Samples					
Analyte	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Minimum Detect	Maximum Detect	Max Detect Location and Depth	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth
Metals (cont'd)													
Iron	7439-89-6	- -	190,000	190,000	2,860	71,400	PSSTP-04R (7-8)	113/113	0/113	0/113	1650	124,000	PSSTP-04R (16-17)
Lead	7439-92-1	450	1,000	190,000	6.3	***9,600***	TP-44 (4)	335/346	45/346	0/346	1	***62,000***	PCTP-28 (7)
Magnesium	7439-95-4	- -	- -	- -	218	12,500	PCTP-47R (4-7)	112/113	0/113	0/113	72.2	141,000	MW-102 (12-13)
Manganese	7439-96-5	2,000	150,000	190,000	16.4	852	S-127 (2-4)	113/113	0/113	0/113	8.7	1,380	S-128 (10-12)
Mercury	7439-97-6	10	510	190,000	0.032	5.6	PSSTP-23B (7-8)	234/345	1/345	0/345	0.018	***31***	PCTP-68 (6)
Nickel	7440-02-0	650	64,000	190,000	5.7	164	PSSTP-04R (7-8)	335/346	1/346	0/346	0.76	***2,480***	PSSTP-04R (16-17)
Potassium	7440-09-7	- -	- -	- -	44.4	2,770	MW-108 (10-12)	103/113	0/113	0/113	113	9,760	PCTP-17R (24-15)
Selenium	7782-49-2	26	16,000	190,000	0.94	***29***	PCSB-30 (2)	170/346	0/346	0/346	0.79	19	PCTP-68 (6)
Silver	7440-22-4	84	16,000	190,000	0.25	6	PCSB-30 (2)	36/346	0/346	0/346	0.19	2.5	S-128 (13-15), S-130 (13-15)
Sodium	7440-23-5	- -	- -	- -	95.1	300	S-127 (2-4)	62/113	0/113	0/113	102	1,400	S-128 (10-12)
Thallium	7440-28-0	14	32	190,000	1.7	1.7	S-106 (2-4)	6/346	0/346	0/346	0.82	4.3	PCTP-09 (7)
Vanadium	7440-62-2	820	220	190,000	6.8	137	S-106 (2-4)	113/113	0/113	0/113	3.8	70.6	PCTP-17R (18-20)
Zinc	7440-66-6	12,000	190,000	190,000	13	3,900	PCSB-30 (2)	343/346	0/346	0/346	3.9	4,900	PCTP-09 (7)
Pesticides													
4,4-DDD	72-54-8	150	380	380	0.029	0.14	PSSTP-9B (6-7)	2/59	0/59	0/59	0.015	0.073	PSSTP-19B (7-8)
4,4-DDE	72-55-9	220	270	270	0.011	0.049	PSSTP-1B (5-6)	3/59	0/59	0/59	0.0011	0.059	PSSTP-19B (7-8)
4,4-DDT	50-29-3	330	270	270	0.0068	0.2	PSSTP-8B (6-7)	6/59	0/59	0/59	0.00097	0.56	PSSTP-04B (8-9)
Aldrin	309-00-2	2.4	5.4	5.4	0.0159	0.0159	PSSTP-1R (5-6)	0/59	0/59	0/59	ND	ND	ND
Beta-BHC	319-85-7	1.1	51	51	0.012	0.012	PSSTP-1B (5-6)	3/59	0/59	0/59	0.0063	0.043	PSSTP-18B (6-7)
Chlordane	57-74-9	49	260	260	0.068	1.2	PSSTP-8B (6-7)	3/52	0/52	0/52	0.031	0.057	PSSTP-17B (8-9)
Dieldrin	60-57-1	0.58	- -	- -	0.0198	0.024	PSSTP-2B (5-6)	3/59	0/59	0/59	0.0064	0.032	PSSTP-19B (7-8)
Endosulfan I	959-98-8	260	19,000	19,000	0.0121	0.049	PSSTP-8B (6-7)	1/59	0/59	0/59	0.0037	0.0037	PSSTP-04R (8-9)
Endosulfan II	33213-65-9	260	19,000	19,000	ND	ND	ND	0/59	0/59	0/59	ND	ND	ND
Endosulfan sulfate	1031-07-8	70	19,000	19,000	0.082	0.082	PSSTP-23B (7-8)	0/59	0/59	0/59	ND	ND	ND
Endrin	72-20-8	5.5	960	960	0.028	0.073	PSSTP-23B (7-8)	0/59	0/59	0/59	ND	ND	ND
Endrin aldehyde	7421-93-4	- -	- -	- -	0.1	0.1	PSSTP-2B (5-6)	1/59	0/59	0/59	0.015	0.015	PSSTP-10B (8-9)
Endrin ketone	53494-70-5	- -	- -	- -	0.0255	0.0255	PSSTP-1R (5-6)	0/59	0/59	0/59	ND	ND	ND
Heptachlor	76-44-8	0.68	20	190,000	0.0158	0.0158	PSSTP-1R (5-6)	0/59	0/59	0/59	ND	ND	ND
Heptachlor epoxide	1024-57-3	1.1	10	10	0.0074	0.0377	PSSTP-1R (5-6)	0/59	0/59	0/59	ND	ND	ND
Methoxychlor	72-43-5	630	16,000	16,000	ND	ND	ND	0/59	0/59	0/59	ND	ND	ND
Toxaphene	8001-35-2	1.2	83	83	ND	ND	ND	0/59	0/59	0/59	ND	ND	ND
trans-chlordane	5103-74-2	- -	- -	- -	0.012	0.012	PSSTP-1R (5-6)	0/7	0/7	0/7	ND	ND	ND
Polychlorinated Biphenyls													
Aroclor 1016	12674-11-2	47	46	46	ND	ND	ND	1/59	0/59	0/59	0.31	0.31	PSSTP-19B (7-8)
Aroclor 1242	53469-21-9	20	46	46	0.17	1.2	PSSTP-8B (6-7)	2/59	0/59	0/59	0.049	0.93	PCTP-68 (6)
Aroclor 1248	12672-29-6	81	46	46	ND	ND	ND	0/59	0/59	0/59	ND	ND	ND
Aroclor 1254	11097-69-1	340	46	46	0.2	1.51	PSSTP-1R (5-6)	4/59	0/59	0/59	0.057	0.92	PCTP-68 (6)
Aroclor 1260	11096-82-5	770	46	46	0.14	13	PSSTP-1B (5-6)	2/59	0/59	0/59	0.47	0.77	PSSTP-19B (7-8)
Aroclor 1262	37324-23-5	- -	- -	- -	ND	ND	ND	0/7	0/7	0/7	ND	ND	ND
Total PCBs	-	- -	- -	- -	0.2	13	PSSTP-1B (5-6)	6/59	0/59	0/59	0.073	1.85	PCTP-68 (6)

		Soil Standards or PQLs			All Soil Samples					
Analyte	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth
Volatile Organic Compounds										
1,1,1-Trichloroethane	71-55-6	20	10,000	10,000	1/470	0/470	0/470	0.00082	0.00082	S-129 (2-4)
1,1-Dichloroethane	75-34-3	16	1,400	1,600	1/470	0/470	0/470	0.00052	0.00052	S-129 (2-4)
1,2,3-Trichlorobenzene	87-61-6	- -	- -	- -	1/173	0/173	0/173	0.0019	0.0019	PSSTP-01R (5-6)
1,2,4-Trichlorobenzene	120-82-1	27	3,100	10,000	1/173	0/173	0/173	0.606	0.606	S-172 (5-7)
1,3-Dichlorobenzene	541-73-1	61	10,000	10,000	1/172	0/172	0/172	0.12	0.12	S-172 (5-7)
1,4-Dichlorobenzene	106-46-7	10	200	230	2/173	0/173	0/173	0.002	0.407	S-172 (5-7)
2-Butanone (MEK)	78-93-3	400	10,000	10,000	55/471	0/471	0/471	0.0033	0.117	PCTP-17R (9-11)
Acetone	67-64-1	10,000	10,000	10,000	284/533	0/533	0/533	0.0053	1.96	S-168 (6-8)
Benzene	71-43-2	0.5	290	330	159/530	36/530	0/530	0.00047	***247***	S-155 (10-12)
Carbon Disulfide	75-15-0	620	10,000	10,000	105/531	0/531	0/531	0.00083	51	S-108 (15-17)
Carbon Tetrachloride	56-23-5	0.5	370	430	1/470	0/470	0/470	0.0012	0.0012	S-110 (2-4)
Chlorobenzene	108-90-7	10	4,000	4,600	9/530	4/530	0/530	0.0021	***53***	TP-63 (8)
Chloroform	67-66-3	8	97	110	42/470	0/470	0/470	0.0013	0.0097	PCTP-23 (10)
cis-1,2-Dichloroethene	156-59-2	7	6,400	10,000	2/470	0/470	0/470	0.0016	0.0018	PCSB-40 (4)
Cyclohexane	110-82-7	6,900	10,000	10,000	12/174	0/174	0/174	0.00062	4.89	PCSB-41R (0.5-2)
Dichloromethane	75-09-2	0.5	10,000	10,000	352/530	5/530	0/530	0.0009	***3.2***	TP-33 (9)
Ethylbenzene	100-41-4	70	890	1,000	94/529	3/529	0/529	0.00071	***180***	PCTP-42 (13.5)
Isopropylbenzene	98-82-8	2,500	10,000	10,000	26/174	0/174	0/174	0.001	6.37	PCTP-66R (8-10)
m&p-Xylenes	ARC-mpXyl	- -	- -	- -	108/470	0/470	0/470	0.0011	430	TP-63 (8)
Methyl Acetate	79-20-9	10,000	10,000	10,000	16/174	0/174	0/174	0.0021	4.74	S-168 (6-8)
Methylcyclohexane	108-87-2	- -	- -	- -	31/174	0/174	0/174	0.0013	8.78	PCSB-41R (0.5-2)
Methyl-tert-butylether	1634-04-4	2	8,600	9,900	1/174	0/174	0/174	0.00092	0.00092	S-113B (10-12)
o,p-Xylene	136777-61-2	- -	- -	- -	53/296	0/296	0/296	0.0014	140	TP-63 (8)
o-Xylene	95-47-6	- -	- -	- -	46/174	0/174	0/174	0.00085	42.6	MW-111 (11-13)
Styrene (Monomer)	100-42-5	24	10,000	10,000	10/470	2/470	0/470	2.4	***47***	TP-63 (8)
Toluene	108-88-3	100	10,000	10,000	131/532	1/532	0/532	0.00032	***140***	TP-63 (8)
Total Xylenes	1330-20-7	1,000	8,000	9,100	116/237	0/237	0/237	0.0013	175	S-155 (10-12)
trans-1,2-Dichloroethene	156-60-5	10	4,800	5,500	2/469	0/469	0/469	0.0025	0.0234	TP-37 (8)
trans-1,3-Dichloropropene	10061-02-6	- -	- -	- -	4/175	0/175	0/175	0.0025	248.8	PCTP-12 (3)
Trichloroethene	79-01-6	0.5	160	180	2/466	0/466	0/466	5.668	253.6	PCTP-12 (3)
Semi-Volatile Organic Compounds										
1,1-Biphenyl	92-52-4	190	11,000	190,000	133/168	4/168	0/168	0.0054	***331***	S-106 (2-4)
1,2,4,5-Tetrachlorobenzene	95-94-3	16	960	190,000	1/168	0/168	0/168	0.0185	0.0185	S-172 (5-7)
2,3,4,6-Tetrachlorophenol	58-90-2	5,500	96,000	190,000	1/166	0/166	0/166	0.0291	0.0291	S-133 (2-4)
2,4-Dichlorophenol	120-83-2	2	9,600	190,000	1/177	0/177	0/177	0.0642	0.0642	S-172 (5-7)
2,4-Dimethylphenol	105-67-9	230	10,000	10,000	43/533	0/533	0/533	0.062	185	S-106 (2-4)
2-Methylnaphthalene	91-57-6	1,900	13,000	190,000	407/535	4/535	0/535	0.0109	***7,200***	PCTP-46 (10.5)
2-Methylphenol	95-48-7	580	160,000	190,000	56/473	0/473	0/473	0.0305	189	S-106 (2-4)
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	- -	78/237	0/237	0/237	0.036	476	S-106 (2-4)
4-Methylphenol	106-44-5	58	16,000	190,000	56/296	1/296	0/296	0.047	***180***	PCTP-66 (0.5)
4-Nitroaniline	100-01-6	17	4,600	190,000	1/239	0/239	0/239	0.17	0.17	PSSTP-09A (1-2)
Acenaphthene	83-32-9	4,700	190,000	190,000	379/535	0/535	0/535	0.0147	1,200	TP-63 (8)

Table 13
Soil Analytical Statistics for Detected Compounds

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Analyte	CAS Number	Soil Standards or PQLs			All Soil Samples					
		S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth
Semi-Volatile Organic Compounds (cont'd)										
Acenaphthylene	208-96-8	8,000	190,000	190,000	328/535	0/535	0/535	0.0231	4,900	TP-63 (8)
Acetophenone	98-86-2	1,200	10,000	10,000	35/168	0/168	0/168	0.0105	13.3	PSSTP-04R (7-8)
Anthracene	120-12-7	350	190,000	190,000	420/535	15/535	0/535	0.0285	***6,900***	PCTP-17 (8)
Benz(a)anthracene	56-55-3	430	130	190,000	464/535	12/535	3/535	0.0114	***5,500***	PCTP-17 (8)
Benzaldehyde	100-52-7	- -	- -	- -	19/168	0/168	0/168	0.0111	0.212	S-119 (0-1)
Benzo(a)pyrene	50-32-8	46	12	190,000	471/535	39/535	18/535	0.02	***3,800***	PCTP-17 (8)
Benzo(b)fluoranthene	205-99-2	170	76	190,000	461/535	22/535	8/535	0.0192	***4,700***	TP-63 (8)
Benzo(g,h,i)perylene	191-24-2	180	190,000	190,000	430/535	13/535	0/535	0.0203	***1,500***	PCTP-17 (8)
Benzo(k)fluoranthene	207-08-9	610	76	190,000	415/535	6/535	2/535	0.0196	***1,700***	PCTP-17 (8)
bis(2-Ethylhexyl)phthalate	117-81-7	130	6,500	10,000	166/535	0/535	0/535	0.0365	64	PCTP-22 (4.5)
Butyl benzyl phthalate	85-68-7	10,000	10,000	10,000	20/535	0/535	0/535	0.045	1.6	PCSB-58 (2)
Caprolactam	105-60-2	- -	- -	- -	1/168	0/168	0/168	0.125	0.125	PCTP-01R (5-7)
Carbazole	86-74-8	110	4,600	190,000	347/535	18/535	0/535	0.0067	***3,100***	PCTP-17 (8)
Chrysene	218-01-9	230	760	190,000	462/535	18/535	1/535	0.0172	***5,500***	PCTP-17 (8)
Dibenz(a,h)anthracene	53-70-3	270	22	190,000	356/535	2/535	3/535	0.0202	***610***	PCTP-17 (8)
Dibenzofuran	132-64-9	310	3,200	190,000	380/535	16/535	0/535	0.0199	***5,300***	PCTP-17 (8)
Diethyl phthalate	84-66-2	9,300	10,000	10,000	21/475	0/475	0/475	0.041	0.16	PC-B14 (15-17)
Dimethyl phthalate	131-11-3	- -	- -	- -	1/475	0/475	0/475	0.0206	0.0206	PCTP-01R (5-7)
Di-n-butyl phthalate	84-74-2	4,900	10,000	10,000	106/535	0/535	0/535	0.0187	35	PCTP-22 (4.5)
Di-n-octyl phthalate	117-84-0	10,000	10,000	10,000	8/535	0/535	0/535	0.047	13	PCTP-22 (4.5)
Fluoranthene	206-44-0	3,200	130,000	190,000	482/535	8/535	0/535	0.0168	***15,000***	PCTP-17 (8)
Fluorene	86-73-7	3,800	130,000	190,000	396/535	4/535	0/535	0.0201	***8,200***	PCTP-17 (8)
Indeno(1,2,3-cd)pyrene	193-39-5	22,000	76	190,000	427/535	0/535	3/535	0.0286	1,600	PCTP-17 (8)
Naphthalene	91-20-3	25	760	190,000	431/535	54/535	2/535	0.0122	***31,000***	PCTP-17 (8), PCTP-46 (10.5)
Pentachlorophenol	87-86-5	5	230	190,000	2/237	0/237	0/237	0.197	0.447	S-133 (2-4)
Phenanthrene	85-01-8	10,000	190,000	190,000	473/535	4/535	0/535	0.016	***24,000***	PCTP-17 (8)
Phenol	108-95-2	200	16,000	18,000	94/535	2/535	0/535	0.0232	***296***	S-106 (2-4)
Pyrene	129-00-0	2,200	96,000	190,000	482/535	6/535	0/535	0.0131	***11,000***	PCTP-17 (8)
Total PAHs and 2-Methylnaphthalene	-	- -	- -	- -	511/535	0/535	0/535	0.044	132,000	PCTP-17 (8)
Metals										
Aluminum	7429-90-5	- -	190,000	190,000	171/171	0/171	0/171	864	27,800	S-153 (7-9)
Antimony	7440-36-0	27	1,300	190,000	183/527	3/527	0/527	0.53	***92***	PCTP-09 (7)
Arsenic	7440-38-2	29	61	190,000	482/527	101/527	13/527	1.6	***170***	PSSTP-30A (1-2)
Barium	7440-39-3	8,200	190,000	190,000	517/527	0/527	0/527	4.1	4,700	PCTP-28 (7)
Beryllium	7440-41-7	320	6,400	190,000	271/527	0/527	0/527	0.16	9.5	PSSTP-04R (16-17)
Cadmium	7440-43-9	38	1,600	190,000	223/527	0/527	0/527	0.073	15	PCSB-30 (2)
Calcium	7440-70-2	- -	- -	- -	169/171	0/171	0/171	58.7	164,000	MW-102 (12-13)
Chromium	7440-47-3	190,000	190,000	190,000	504/527	0/527	0/527	1.6	791	PSSTP-04R (7-8)
Cobalt	7440-48-4	160	960	190,000	159/171	0/171	0/171	0.56	65.2	PSSTP-04R (16-17)
Copper	7440-50-8	43,000	120,000	190,000	519/527	0/527	0/527	1.1	6,200	PCSB-08 (10.5)
Cyanide	57-12-5	200	1,900	190,000	250/333	3/333	0/333	0.13	789	TP-64 (7)

Table 13
Soil Analytical Statistics for Detected Compounds

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

		Soil Standards or PQLs			All Soil Samples					
Analyte	CAS Number	S-GW Used Aquifer TDS≤ 2,500 Non-Res (Exceedances Bolded & Italicized)	DC Non-Res Surf Soil (Exceedances Shaded)	DC Non-Res Subsurf Soil (No Exceedances)	Detection Frequency	S-GW Exceedance Frequency	DC Exceedance Frequency	Minimum Detect	Maximum Detect	Max Detect Location and Depth
Metals (cont'd)										
Iron	7439-89-6	- -	190,000	190,000	171/171	0/171	0/171	1,650	124,000	PSSTP-04R (16-17)
Lead	7439-92-1	450	1,000	190,000	512/527	89/527	12/527	1	***62,000***	PCTP-28 (7)
Magnesium	7439-95-4	- -	- -	- -	168/171	0/171	0/171	72.2	141,000	MW-102 (12-13)
Manganese	7439-96-5	2,000	150,000	190,000	171/171	0/171	0/171	8.7	1,710	S-163 (0.5-2)
Mercury	7439-97-6	10	510	190,000	383/525	2/525	0/525	0.018	***31***	PCTP-68 (6)
Nickel	7440-02-0	650	64,000	190,000	505/527	1/527	0/527	0.76	***2,480***	PSSTP-04R (16-17)
Potassium	7440-09-7	- -	- -	- -	153/171	0/171	0/171	44.4	9,760	PCTP-17R (24-15)
Selenium	7782-49-2	26	16,000	190,000	239/527	1/527	0/527	0.74	***29***	PCSB-30 (2)
Silver	7440-22-4	84	16,000	190,000	49/527	0/527	0/527	0.19	6	PCSB-30 (2)
Sodium	7440-23-5	- -	- -	- -	86/171	0/171	0/171	95.1	1,400	S-128 (10-12)
Thallium	7440-28-0	14	32	190,000	7/527	0/527	0/527	0.82	4.3	PCTP-09 (7)
Vanadium	7440-62-2	820	220	190,000	171/171	0/171	0/171	3.8	137	S-106 (2-4)
Zinc	7440-66-6	12,000	190,000	190,000	518/527	0/527	0/527	3.9	6,300	PCSB-36 (0.5)
Pesticides										
4,4-DDD	72-54-8	150	380	380	20/169	0/169	0/169	0.00205	0.14	PSSTP-9B (6-7)
4,4-DDE	72-55-9	220	270	270	30/169	0/169	0/169	0.0011	0.15	PCSB-41 (0.5)
4,4-DDT	50-29-3	330	270	270	53/169	0/169	0/169	0.00097	0.56	PSSTP-04B (8-9)
Aldrin	309-00-2	2.4	5.4	5.4	3/169	0/169	0/169	0.0074	0.0159	PSSTP-1R (5-6)
Beta-BHC	319-85-7	1.1	51	51	5/169	0/169	0/169	0.0063	0.043	PSSTP-18B (6-7)
Chlordane	57-74-9	49	260	260	23/147	0/147	0/147	0.016	4.5	PCTP-78 (0.5)
Dieldrin	60-57-1	0.58	- -	- -	17/169	0/169	0/169	0.0043	0.18	PSSTP-17A (1-2)
Endosulfan I	959-98-8	260	19,000	19,000	4/169	0/169	0/169	0.0037	0.049	PSSTP-8B (6-7)
Endosulfan II	33213-65-9	260	19,000	19,000	3/169	0/169	0/169	0.016	0.04	PSSTP-05A (1-2)
Endosulfan sulfate	1031-07-8	70	19,000	19,000	7/169	0/169	0/169	0.0083	0.088	PSSTP-22A (1-2)
Endrin	72-20-8	5.5	960	960	5/169	0/169	0/169	0.0057	0.073	PSSTP-23B (7-8)
Endrin aldehyde	7421-93-4	- -	- -	- -	9/169	0/169	0/169	0.0071	0.32	PSSTP-26A (1-2)
Endrin ketone	53494-70-5	- -	- -	- -	2/169	0/169	0/169	0.0091	0.0255	PSSTP-1R (5-6)
Heptachlor	76-44-8	0.68	20	190,000	1/169	0/169	0/169	0.0158	0.0158	PSSTP-1R (5-6)
Heptachlor epoxide	1024-57-3	1.1	10	10	7/169	0/169	0/169	0.001095	0.0377	PSSTP-1R (5-6)
Methoxychlor	72-43-5	630	16,000	16,000	1/169	0/169	0/169	0.014	0.014	PSSTP-28A (1-2)
Toxaphene	8001-35-2	1.2	83	83	1/169	0/169	0/169	0.02	0.02	PSSTP-05A (1-2)
trans-chlordane	5103-74-2	- -	- -	- -	3/22	0/22	0/22	0.00059	0.012	PSSTP-1R (5-6)
Polychlorinated Biphenyls										
Aroclor 1016	12674-11-2	47	46	46	1/177	0/177	0/177	0.31	0.31	PSSTP-19B (7-8)
Aroclor 1242	53469-21-9	20	46	46	7/177	0/177	0/177	0.049	1.2	PSSTP-8B (6-7)
Aroclor 1248	12672-29-6	81	46	46	6/177	0/177	0/177	0.053	1.7	PCSB-56 (0.5)
Aroclor 1254	11097-69-1	340	46	46	28/177	0/177	0/177	0.0256	7.9	PCTP-73 (0.5)
Aroclor 1260	11096-82-5	770	46	46	51/177	0/177	0/177	0.046	13	PSSTP-1B (5-6)
Aroclor 1262	37324-23-5	- -	- -	- -	1/28	0/28	0/28	0.2925	0.2925	PCTP-66R (0-0.5)
Total PCBs	-	- -	- -	- -	82/177	0/177	0/177	0.0256	13	PSSTP-1B (5-6)

Notes:

1. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 6010 and 7471.
   - Cyanide using USEPA SW-846 Method 9010 or 9012B.
   - Pesticides using USEPA SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
2. Only compounds detected in one or more samples are shown in this table.
3. Analytes detected in sample are shown in black font and analytes that are not detected are shown in gray font.
4. For purposes of this statistical analysis, field duplicate results are averaged with their parent sample and the average is counted as one sample. If the resulting average is a minimum or maximum concentration, it is reported as such. If either the parent or duplicate result is non-detect while the other is detected, only the detected concentration is used. If either the parent or the duplicate exceed an MCS, it is reported as such.
5. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
6. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSCs) established in Title 25 of the Pennsylvania Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) updated on August 27, 2016, and include:
   (a) The soil to groundwater MSCs for a non-residential used aquifer with total dissolved solids (TDS) less than or equal to 2,500 parts per million (ppm). The higher of the 100 X groundwater MSC or generic value is used.
   (b) The non-residential direct contact MSC for surface and subsurface soil.
7. No results exceed the PADEP non-residential direct contact MSC (for subsurface soil).
8. Shading indicates that the result exceeds the PADEP non-residential direct contact MSC (for surface soil). Shading is only used if the result is for a surface soil sample.
9. Italics and bolding indicates that the result exceeds the PADEP soil to groundwater MSC (for a non-residential used aquifer with TDS ≤ 2,500 ppm).
10. - - = No PADEP MSC.
11. - = No actual Chemical Abstracts Service (CAS) number is available.
12. ND = Not detected.
13. The MSCs reported for chromium is for trivalent chromium. The reported chromium results are for total chromium.
14. The MSCs reported for cyanide are for free cyanide. The reported cyanide results are for total cyanide.
15. Rejected data was not counted for total number of samples collected.
16. Total polycyclic aromatic hydrocarbons (PAHs) are the sum of the 16 priority pollutant PAHs identified by the USEPA and 2-methylnaphthalene.
17. Data qualifiers are not presented in this table.
18. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 14
Hydropunch Groundwater Analytical Results (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCHP-01 3/24/05	PCHP-02 3/25/05	PCHP-03 3/24/05	PCHP-04 3/25/05	PCHP-05 3/25/05	PCHP-06 3/25/05	PCHP-07 3/25/05
Volatile Organic Compounds										
Benzene	71-43-2	5	5	< 0.24	< 0.24	***290***	< 0.24	< 0.24 [< 0.24]	< 0.24	< 0.24
Carbon Disulfide	75-15-0	1,500	6,200	64	< 0.51	49	57	25 [30]	24	27
Ethylbenzene	100-41-4	700	700	< 0.67	< 0.67	2.6	< 0.67	< 0.67 [< 0.67]	< 0.67	< 0.67
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.81	< 0.81	5.1	< 0.81	< 0.81 [< 0.81]	< 0.81	< 0.81
o,p-Xylene	136777-61-2	- -	- -	< 0.17	< 0.17	5.5	< 0.17	< 0.17 [< 0.17]	< 0.17	< 0.17
Toluene	108-88-3	1,000	1,000	< 0.18	< 0.18	6.3	< 0.18	< 0.18 [< 0.18]	< 0.18	< 0.18
Semi-Volatile Organic Compounds										
2,4-Dimethylphenol	105-67-9	830	2,300	2.3	< 0.91	2.9	< 0.93	< 0.96 [< 0.91]	< 0.91	< 0.92
2-Methylnaphthalene	91-57-6	170	470	< 1.9	< 1.8	11	< 1.9	< 1.9 [< 1.8]	< 1.8	< 1.9
Acenaphthene	83-32-9	2,500	3,800	1.2	< 0.18	16	< 0.18	3.9 [3.9]	< 0.18	< 0.18
Acenaphthylene	208-96-8	2,500	7,000	< 0.17	< 0.16	7.8	< 0.17	< 0.17 [< 0.16]	< 0.16	< 0.16
Anthracene	120-12-7	66	66	< 0.22	< 0.21	8.4	< 0.22	< 0.22 [< 0.21]	< 0.21	< 0.21
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.15	< 0.15	***6***	< 0.15	< 0.16 [< 0.15]	< 0.15	< 0.15
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.18	< 0.18	***4.6***	< 0.18	< 0.19 [< 0.18]	< 0.18	< 0.18
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.31	< 0.3	***6.3***	< 0.31	< 0.32 [< 0.3]	< 0.3	< 0.3
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.16	< 0.15	***2.8***	< 0.16	< 0.16 [< 0.15]	< 0.15	< 0.16
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.39	< 0.38	***1.8***	< 0.38	< 0.4 [< 0.38]	< 0.38	< 0.38
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.71	< 0.68	2.1	< 0.7	< 0.72 [< 0.68]	< 0.68	< 0.69
Carbazole	86-74-8	37	170	< 0.21	< 0.21	30	< 0.21	< 0.22 [< 0.21]	< 0.21	< 0.21
Chrysene	218-01-9	1.9	1.9	< 0.32	< 0.31	***5.1***	< 0.31	< 0.32 [< 0.31]	< 0.31	< 0.31
Dibenzofuran	132-64-9	42	120	< 1.4	< 1.4	8.1	< 1.4	< 1.5 [< 1.4]	< 1.4	< 1.4
Fluoranthene	206-44-0	260	260	< 0.18	1.3	23	< 0.18	< 0.19 [< 0.18]	< 0.18	1.2
Fluorene	86-73-7	1,700	1,900	< 0.27	< 0.26	16	< 0.26	< 0.27 [< 0.26]	< 0.26	< 0.26
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.19	< 0.18	***2.5***	< 0.19	< 0.19 [< 0.18]	< 0.18	< 0.18
Naphthalene	91-20-3	100	100	< 0.11	< 0.1	3.8	< 0.11	< 0.11 [< 0.1]	< 0.1	1.7
Phenanthrene	85-01-8	1,100	1,100	< 0.25	< 0.24	18	< 0.24	< 0.25 [1.2]	< 0.24	< 0.24
Phenol	108-95-2	2,000	2,000	< 1.8	< 1.8	10	< 1.8	< 1.9 [< 1.8]	< 1.8	< 1.8
Pyrene	129-00-0	130	130	< 0.25	1.1	16	< 0.25	< 0.26 [< 0.25]	< 0.25	1.8
Metals (Totals)										
Antimony	7440-36-0	6	6	< 15	***110***	***34***	< 15	< 15 [< 15]	***500***	***77***
Arsenic	7440-38-2	10	10	***63***	***400***	***77***	***40***	< 7.5 [< 7.5]	***190***	***160***
Barium	7440-39-3	2,000	2,000	400	1,900	1,000	220	69 [78]	***36,000***	***7,800***
Beryllium	7440-41-7	4	4	< 4	***17***	***5.8***	< 4	< 4 [< 4]	***7.3***	***8.4***
Cadmium	7440-43-9	5	5	< 3.5	***15***	***14***	< 3.5	< 3.5 [< 3.5]	***28***	***43***
Chromium	7440-47-3	100	100	***350***	***490***	***290***	***180***	< 50 [< 50]	***1,100***	***520***
Copper	7440-50-8	1,000	1,000	270	***2,500***	***4,200***	93	< 50 [< 50]	***18,000***	***2,500***
Cyanide, amenable	ARC-CYAM	200	200	0.059	0.46	6.8	< 0.01	0.16 [0.13]	22	0.031
Lead	7439-92-1	5	5	***380***	***5,200***	***10,000***	***74***	< 4 [< 4]	***15,000***	***70,000***
Mercury	7439-97-6	2	2	1.7	***35***	***120***	< 0.7	< 0.7 [< 0.7]	***24***	***4.6***
Nickel	7440-02-0	100	100	***120***	***380***	***170***	72	< 50 [< 50]	***310***	***240***
Selenium	7782-49-2	50	50	< 40	***61***	43	< 40	< 40 [< 40]	< 40	< 40
Zinc	7440-66-6	2,000	2,000	1,100	***3,200***	***5,000***	310	< 50 [< 50]	***15,000***	***16,000***

Notes:
1. Samples were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated.
2. Samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey for the following:
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Metals using USEPA SW-846 Methods 200.7 and 245.1.
3. Only compounds detected in one or more samples are shown in this table.
4. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
5. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
6. Shading indicates an exceedance of Pennsylvania Department of Environmental Protection's (PADEP's) non-residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L).
7. Italics and bolding indicates an exceedance of PADEP's Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L.
8. - - = No PADEP Groundwater Standard.
9. The groundwater standards reported for cyanide are for free cyanide. The reported cyanide results are for amenable cyanide.
10. Data have not been validated.

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	MW-102 5/31/18	MW-103 5/31/18	MW-104 5/30/18	MW-107 5/30/18	MW-108 10/4/19	MW-109 10/4/19	MW-110 10/4/19	MW-111 10/4/19	MW-112 10/4/19	MW-113 10/4/19	MW-5 3/19/18
Volatile Organic Compounds														
1,2-Dichlorobenzene	95-50-1	600	600	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	67-64-1	38,000	110,000	< 10 [< 10]	< 10	< 10	< 10	< 10 [< 10]	< 10	< 10	8.6 J	< 10	< 10	< 10 UJ
Benzene	71-43-2	5	5	< 0.50 [< 0.50]	< 0.50	< 0.50	< 0.50	< 0.50 [< 0.50]	< 0.50	< 0.50	***686 D***	< 0.50	< 0.50	< 0.50
Chlorobenzene	108-90-7	100	100	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	67-66-3	80	80	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	28.3
Dichloromethane	75-09-2	5	5	< 2.0 [< 2.0]	< 2.0	< 2.0	< 2.0	< 2.0 [< 2.0]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	100-41-4	700	700	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	24.3	< 1.0	< 1.0	< 1.0
Isopropylbenzene	98-82-8	840	3,500	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	72.9	< 1.0	< 1.0	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	< 1.0 [< 1.0]	< 1.0	< 1.0	***20.7***	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o,p-Xylene	136777-61-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	95-47-6	- -	- -	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	36.5	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	9.4	< 1.0	< 1.0	< 1.0
Tetrachloroethene	127-18-4	5	5	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.1
Toluene	108-88-3	1,000	1,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	90.4 J	< 1.0	< 1.0	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	109	< 1.0	< 1.0	< 1.0
Trichloroethene	79-01-6	5	5	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	***6.1***
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	91	430	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	< 1.0 [< 1.0]	0.39 J	0.35 J	20.7	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	105-67-9	830	2,300	< 5.9 [< 6.3]	< 5.9	< 4.8	< 5.3	< 5.0 [< 5.0]	< 4.8	< 4.8	241 D	< 5.0	< 5.0	< 5.0
2,4-Dinitrotoluene	121-14-2	2.4	11	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	< 1.0 [< 1.0]	< 0.96	< 0.95	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	91-57-6	170	470	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	0.77 J [0.67 J]	1.5	1.2	97.8 J	< 1.0	< 1.0	< 1.0
2-Methylphenol	95-48-7	2,100	5,800	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	177 DJ	< 2.0	< 2.0	< 2.0
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	212 D	< 2.0	< 2.0	< 2.0
4-Methylphenol	106-44-5	210	580	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	2,500	3,800	< 1.2 [< 1.3]	< 1.2	0.92 J	< 1.1	< 1.0 [< 1.0]	1.2	0.19 J	87.7	1.4	< 1.0	0.78 J
Acenaphthylene	208-96-8	2,500	7,000	< 1.2 [< 1.3]	< 1.2	< 0.95	0.46 J	< 1.0 [< 1.0]	1.2	0.72 J	80.2	< 1.0	< 1.0	< 1.0
Acetophenone	98-86-2	4,200	12,000	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	0.25 J	< 1.9	2.1	0.27 J	< 2.0	< 2.0
Anthracene	120-12-7	66	66	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	0.37 J [0.43 J]	1.1	0.26 J	16.1	0.22 J	0.33 J	< 1.0
Benz(a)anthracene	56-55-3	0.32	4.9	< 1.2 [< 1.3]	< 1.2	< 0.95	***1.3***	< 1.0 [< 1.0]	< 0.96	< 0.95	***3.6***	< 1.0	< 1.0	< 1.0
Benzo(a)pyrene	50-32-8	0.2	0.2	< 1.2 [< 1.3]	< 1.2	< 0.95	***1.2***	< 1.0 [< 1.0]	< 0.96	< 0.95	***2.6***	< 1.0	< 1.0	< 1.0
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 1.2 [< 1.3]	< 1.2	< 0.95	***1.7***	< 1.0 [< 1.0]	< 0.96	< 0.95	***2.9***	< 1.0	< 1.0	< 1.0
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 1.2 [< 1.3]	< 1.2	< 0.95	***0.95 J***	< 1.0 [< 1.0]	< 0.96	< 0.95	***1.4***	< 1.0	< 1.0	< 1.0
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 1.2 [< 1.3]	< 1.2	< 0.95	***0.53 J***	< 1.0 [< 1.0]	< 0.96	< 0.95	***1.3***	< 1.0	< 1.0	< 1.0
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 2.4 **[11.3]**	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	< 2.0	< 2.0	< 2.0	< 2.0
Butyl benzyl phthalate	85-68-7	380	1,800	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	< 2.0	1.7 J	< 2.0	< 2.0
Carbazole	86-74-8	37	170	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	0.85 J [0.91 J]	2.2	1.6	***189 DJ***	< 1.0	< 1.0	< 1.0
Chrysene	218-01-9	1.9	1.9	< 1.2 [< 1.3]	< 1.2	< 0.95	1.1	< 1.0 [< 1.0]	< 0.96	< 0.95	***3.2 J***	< 1.0	< 1.0	< 1.0
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	< 1.0 [< 1.0]	< 0.96	< 0.95	***0.42 J***	< 1.0	< 1.0	< 1.0
Dibenzofuran	132-64-9	42	120	< 5.9 [< 6.3]	< 5.9	< 4.8	< 5.3	0.48 J [0.40 J]	2.0 J	0.85 J	***64.2***	< 5.0	< 5.0	< 5.0

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	MW-102 5/31/18	MW-103 5/31/18	MW-104 5/30/18	MW-107 5/30/18	MW-108 10/4/19	MW-109 10/4/19	MW-110 10/4/19	MW-111 10/4/19	MW-112 10/4/19	MW-113 10/4/19	MW-5 3/19/18
Semi-Volatile Organic Compounds (cont'd)														
Diethyl phthalate	84-66-2	33,000	93,000	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	< 2.0	< 2.0	< 2.0	< 2.0
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	< 2.0	< 2.0	< 2.0	< 2.0
Fluoranthene	206-44-0	260	260	< 1.2 [< 1.3]	< 1.2	0.57 J	2.6	0.36 J [0.26 J]	1.2	0.25 J	22.9 J	< 1.0	< 1.0	< 1.0
Fluorene	86-73-7	1,700	1,900	< 1.2 [< 1.3]	< 1.2	0.48 J	< 1.1	0.99 J [0.90 J]	4.2	0.96	75.2	0.28 J	< 1.0	< 1.0
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 1.2 [< 1.3]	< 1.2	< 0.95	***0.74 J***	< 1.0 [< 1.0]	< 0.96	< 0.95	***1.4***	< 1.0	< 1.0	< 1.0
Naphthalene	91-20-3	100	100	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	7.2 [5.8]	8.8	15.5	***973 D***	< 1.0	< 1.0 UB	< 1.0
Phenanthrene	85-01-8	1,100	1,100	< 1.2 [< 1.3]	< 1.2	< 0.95	0.98 J	1.3 [1.1]	7.7	< 0.95	136 DJ	< 1.0	0.20 J	< 1.0
Phenol	108-95-2	2,000	2,000	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	80.2	< 2.0	< 2.0	< 2.0
Pyrene	129-00-0	130	130	< 1.2 [< 1.3]	< 1.2	0.57 J	2.0	0.22 J [< 1.0]	0.71 J	< 0.95	15.5 J	< 1.0	< 1.0	< 1.0
Pesticides														
4,4-DDT	50-29-3	2.1	5.5	< 0.0067 [< 0.0067]	< 0.0067	< 0.0067	< 0.0067	NA	NA	NA	NA	NA	NA	< 0.0067
Dieldrin	60-57-1	0.046	0.21	< 0.0067 [< 0.0067]	< 0.0067	< 0.0067	< 0.0067	NA	NA	NA	NA	NA	NA	< 0.0067
trans-chlordane	5103-74-2	- -	- -	< 0.0067 [< 0.0067]	< 0.0067	< 0.0067	< 0.0067	NA	NA	NA	NA	NA	NA	< 0.0067
Polychlorinated Biphenyls														
Total PCBs	-	- -	- -	< 0.33 [< 0.33]	< 0.33	< 0.33	< 0.33	NA	NA	NA	NA	NA	NA	< 0.33

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		MW-6	PCMW-01			PCMW-02 / MW-106*			PCMW-03		PCMW-04		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	3/22/18	11/1/05	1/30/06	3/19/18	11/1/05	1/30/06	5/29/18	11/2/05	1/30/06	11/2/05	1/30/06	3/19/18
Volatile Organic Compounds															
1,2-Dichlorobenzene	95-50-1	600	600	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 10	< 5.6	< 5.6	< 10 UJ	< 5.6 [< 5.6]	< 5.6	< 10	< 5.6	< 5.6	< 5.6	< 5.6	< 10 UJ
Benzene	71-43-2	5	5	< 0.50	< 0.14	< 0.14	< 0.50	< 0.14 [< 0.14]	< 0.14	< 0.50	< 0.14	< 0.14	< 0.14	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	100	< 1.0	< 0.37	< 0.17	< 1.0	< 0.37 [< 0.37]	< 0.17	< 1.0	< 0.37	< 0.17	< 0.37	< 0.17	< 1.0
Chloroform	67-66-3	80	80	< 1.0	< 0.36	< 0.4	< 1.0	< 0.36 [< 0.36]	< 0.4	< 1.0	< 0.36	< 0.4	< 0.36	< 0.4	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 1.0	< 0.3	< 0.34	< 1.0	< 0.3 [< 0.3]	< 0.34	< 1.0	1.7	1.1	< 0.3	< 0.34	< 1.0
Dichloromethane	75-09-2	5	5	< 2.0	< 0.49	< 1.2	< 2.0	< 0.49 [< 0.49]	2.7	< 2.0	< 0.49	2.3	< 0.49	1.8	< 2.0
Ethylbenzene	100-41-4	700	700	< 1.0	< 0.34	< 0.31	< 1.0	< 0.34 [< 0.34]	< 0.31	< 1.0	< 0.34	< 0.31	< 0.34	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	3,500	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 1.0	< 0.54	< 0.49	< 1.0	< 0.54 [< 0.54]	< 0.49	< 1.0	< 0.54	< 0.49	< 0.54	< 0.49	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	4.8
o,p-Xylene	136777-61-2	- -	- -	NA	< 0.14	< 0.21	NA	< 0.14 [< 0.14]	< 0.21	NA	< 0.14	< 0.21	< 0.14	< 0.21	NA
o-Xylene	95-47-6	- -	- -	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 1.0 UJ	< 0.22	< 0.21	< 1.0	< 0.22 [< 0.22]	< 0.21	< 1.0	< 0.22	< 0.21	< 0.22	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	5	< 1.0	< 0.28	< 0.46	< 1.0	< 0.28 [< 0.28]	< 0.46	< 1.0	< 0.28	< 0.46	< 0.28	< 0.46	< 1.0
Toluene	108-88-3	1,000	1,000	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22 [< 0.22]	< 0.21	< 1.0	< 0.22	< 0.21	< 0.22	< 0.21	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 1.0	< 0.37	< 0.76	< 1.0	< 0.37 [< 0.37]	< 0.76	< 1.0	< 0.37	< 0.76	< 0.37	< 0.76	< 1.0
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	430	< 0.98	NA	NA	< 1.1	NA	NA	< 1.0	NA	NA	NA	NA	< 1.1
2,4-Dimethylphenol	105-67-9	830	2,300	< 4.9	< 0.85	< 0.85	< 5.3	< 0.85 [< 0.85]	< 0.85	< 5.0	< 0.85	< 0.85	< 0.85	< 0.85	< 5.3
2,4-Dinitrotoluene	121-14-2	2.4	11	< 0.98	NA	NA	< 1.1	NA	NA	< 1.0	NA	NA	NA	NA	< 1.1
2-Methylnaphthalene	91-57-6	170	470	< 0.98	< 1.7	< 1.7	< 1.1	< 1.7 [< 1.7]	< 1.7	< 1.0	< 1.7	< 1.7	< 1.7	< 1.7	< 1.1
2-Methylphenol	95-48-7	2,100	5,800	< 2.0	< 3.7	< 3.7	< 2.1	< 3.7 [< 3.7]	< 3.7	< 2.0	< 3.7	< 3.7	< 3.7	< 3.7	< 2.1
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	< 2.0	NA	NA	< 2.1	NA	NA	< 2.0	NA	NA	NA	NA	< 2.1
4-Methylphenol	106-44-5	210	580	NA	< 3.7	< 3.7	NA	< 3.7 [< 3.7]	< 3.7	NA	< 3.7	< 3.7	< 3.7	< 3.7	NA
Acenaphthene	83-32-9	2,500	3,800	1.6	< 0.16	1	< 1.1	< 0.16 [< 0.16]	< 0.16	< 1.0	< 0.16	< 0.16	< 0.16	< 0.16	< 1.1
Acenaphthylene	208-96-8	2,500	7,000	< 0.98	< 0.15	< 0.15	< 1.1	< 0.15 [< 0.15]	< 0.15	< 1.0	< 0.15	< 0.15	< 0.15	< 0.15	< 1.1
Acetophenone	98-86-2	4,200	12,000	< 2.0	NA	NA	< 2.1	NA	NA	< 2.0	NA	NA	NA	NA	< 2.1
Anthracene	120-12-7	66	66	< 0.98	< 0.2	< 0.2	< 1.1	< 0.2 [< 0.2]	< 0.2	< 1.0	< 0.2	< 0.2	< 0.2	< 0.2	< 1.1
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.98	< 0.14	< 0.14	< 1.1	< 0.14 [< 0.14]	< 0.14	< 1.0	< 0.14	< 0.14	< 0.14	< 0.14	< 1.1
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.98	< 0.17	< 0.17	< 1.1	< 0.17 [< 0.17]	< 0.17	< 1.0	< 0.17	< 0.17	< 0.17	< 0.17	< 1.1
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.98	< 0.28	< 0.28	< 1.1	< 0.28 [< 0.28]	< 0.28	< 1.0	< 0.28	< 0.28	< 0.28	< 0.28	< 1.1
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.98	< 0.14	< 0.14	< 1.1	< 0.14 [< 0.14]	< 0.14	< 1.0	< 0.14	< 0.14	< 0.14	< 0.14	< 1.1
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.98	< 0.35	< 0.35	< 1.1	< 0.35 [< 0.35]	< 0.35	< 1.0	< 0.35	< 0.35	< 0.35	< 0.35	< 1.1
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 2.0	< 0.63	< 0.63	< 2.1	< 0.63 [< 0.63]	< 0.63	< 2.0	< 0.63	< 0.63	< 0.63	< 0.63	< 2.1
Butyl benzyl phthalate	85-68-7	380	1,800	< 2.0	< 0.27	< 0.27	< 2.1	< 0.27 [< 0.27]	< 0.27	< 2.0	< 0.27	< 0.27	< 0.27	< 0.27	< 2.1
Carbazole	86-74-8	37	170	< 0.98	< 0.19	< 0.19	< 1.1	< 0.19 [< 0.19]	< 0.19	< 1.0	< 0.19	< 0.19	< 0.19	< 0.19	< 1.1
Chrysene	218-01-9	1.9	1.9	< 0.98	< 0.28	< 0.28	< 1.1	< 0.28 [< 0.28]	< 0.28	< 1.0	< 0.28	< 0.28	< 0.28	< 0.28	< 1.1
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.98	< 0.18	< 0.18	< 1.1	< 0.18 [< 0.18]	< 0.18	< 1.0	< 0.18	< 0.18	< 0.18	< 0.18	< 1.1
Dibenzofuran	132-64-9	42	120	< 4.9	< 1.3	< 1.3	< 5.3	< 1.3 [< 1.3]	< 1.3	< 5.0	< 1.3	< 1.3	< 1.3	< 1.3	< 5.3

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	MW-6 3/22/18	PCMW-01 11/1/05	PCMW-01 1/30/06	PCMW-01 3/19/18	PCMW-02 / MW-106* 11/1/05	PCMW-02 / MW-106* 1/30/06	PCMW-02 / MW-106* 5/29/18	PCMW-03 11/2/05	PCMW-03 1/30/06	PCMW-04 11/2/05	PCMW-04 1/30/06	PCMW-04 3/19/18
Semi-Volatile Organic Compounds (cont'd)															
Diethyl phthalate	84-66-2	33,000	93,000	< 2.0	< 0.24	< 0.24	< 2.1	< 0.24 [< 0.24]	< 0.24	< 2.0	< 0.24	< 0.24	< 0.24	< 0.24	< 2.1
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 2.0	< 0.2	< 0.2	< 2.1	< 0.2 [< 0.2]	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 2.1
Fluoranthene	206-44-0	260	260	< 0.98	< 0.16	< 0.16	< 1.1	< 0.16 [< 0.16]	< 0.16	< 1.0	< 0.16	< 0.16	< 0.16	< 0.16	< 1.1
Fluorene	86-73-7	1,700	1,900	< 0.98	< 0.24	< 0.24	< 1.1	< 0.24 [< 0.24]	< 0.24	< 1.0	< 0.24	< 0.24	< 0.24	< 0.24	< 1.1
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.98	< 0.17	< 0.17	< 1.1	< 0.17 [< 0.17]	< 0.17	< 1.0	< 0.17	< 0.17	< 0.17	< 0.17	< 1.1
Naphthalene	91-20-3	100	100	< 0.98	< 0.097	< 0.097	< 1.1	< 0.097 [< 0.097]	< 0.097	< 1.0	< 0.097	< 0.097	< 0.097	< 0.097	< 1.1
Phenanthrene	85-01-8	1,100	1,100	< 0.98	< 0.22	1.7	< 1.1	< 0.22 [< 0.22]	< 0.22	< 1.0	< 0.22	< 0.22	< 0.22	< 0.22	< 1.1
Phenol	108-95-2	2,000	2,000	< 2.0	< 1.7	< 1.7	< 2.1	< 1.7 [< 1.7]	< 1.7	< 2.0	< 1.7	< 1.7	< 1.7	< 1.7	< 2.1
Pyrene	129-00-0	130	130	< 0.98	< 0.23	< 0.23	< 1.1	< 0.23 [< 0.23]	< 0.23	< 1.0	< 0.23	< 0.23	< 0.23	< 0.23	< 1.1
Pesticides															
4,4-DDT	50-29-3	2.1	5.5	< 0.0067	< 0.05	< 0.05	< 0.0073	< 0.05 [< 0.05]	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.05	0.084	< 0.0067
Dieldrin	60-57-1	0.046	0.21	< 0.0067	< 0.05	< 0.05	< 0.0073	< 0.05 [< 0.05]	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.05	< 0.05	< 0.0067
trans-chlordane	5103-74-2	- -	- -	< 0.0067	NA	NA	< 0.0073	NA	NA	< 0.0067	NA	NA	NA	NA	0.0045 J
Polychlorinated Biphenyls															
Total PCBs	-	- -	- -	< 0.33	< 0.25	< 0.25	< 0.36	< 0.25 [< 0.25]	< 0.25	< 0.33	< 0.25	< 0.25	< 0.25	< 0.25	< 0.33

Location:		Groundwater Standards		PCMW-05			PCMW-06			PCMW-07		PCMW-08S		PCMW-08D		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/2/05	1/31/06	3/23/18	11/3/05	1/31/06	3/23/18	11/3/05	1/31/06	11/3/05	3/22/18	11/4/05	1/31/06	3/22/18
Volatile Organic Compounds																
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 5.6	< 5.6	< 10 [< 10]	< 5.6	< 5.6	< 10	< 5.6	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ
Benzene	71-43-2	5	5	< 0.14	< 0.14	< 0.50 [< 0.50]	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	100	< 0.37	< 0.17	< 1.0 [< 1.0]	< 0.37	< 0.17	< 1.0	< 0.37	< 0.37	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0
Chloroform	67-66-3	80	80	< 0.36	< 0.4	< 1.0 [< 1.0]	< 0.36	< 0.4	< 1.0	< 0.36	< 0.36	< 0.36	< 1.0	< 0.36	< 0.36	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.3	< 0.34	< 1.0 [< 1.0]	< 0.3	< 0.34	< 1.0	< 0.3	< 0.3	< 0.3	< 1.0	< 0.3	< 0.3	< 1.0
Dichloromethane	75-09-2	5	5	< 0.49	1.6	< 2.0 [< 2.0]	< 0.49	1.3	< 2.0	< 0.49	< 0.49	< 0.49	< 2.0	< 0.49	< 0.49	< 2.0
Ethylbenzene	100-41-4	700	700	< 0.34	< 0.31	< 1.0 [< 1.0]	< 0.34	< 0.31	< 1.0	< 0.34	< 0.34	< 0.34	< 1.0	< 0.34	< 0.34	< 1.0
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.54	< 0.49	< 1.0 [< 1.0]	< 0.54	< 0.49	< 1.0	< 0.54	< 0.54	< 0.54	< 1.0	< 0.54	< 0.54	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
o,p-Xylene	136777-61-2	- -	- -	< 0.14	< 0.21	NA	< 0.14	< 0.21	NA	< 0.14	< 0.14	< 0.14	NA	< 0.14	< 0.14	NA
o-Xylene	95-47-6	- -	- -	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 0.22	< 0.21	< 1.0 [< 1.0]	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0
Tetrachloroethene	127-18-4	5	5	< 0.28	< 0.46	< 1.0 [< 1.0]	< 0.28	< 0.46	< 1.0	< 0.28	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0
Toluene	108-88-3	1,000	1,000	< 0.22	< 0.21	< 1.0 [< 1.0]	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 0.37	< 0.76	< 1.0 [< 1.0]	< 0.37	< 0.76	< 1.0	< 0.37	< 0.37	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 1.0 [< 1.1]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 5.2 [< 5.4]	< 0.85	< 0.85	< 5.0	< 0.85	< 0.85	< 0.85	< 5.0	< 0.85	< 0.85	< 5.1
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 1.0 [< 1.1]	NA	NA	< 1.0	NA	NA	NA	< 1.0	NA	NA	< 1.0
2-Methylnaphthalene	91-57-6	170	470	34	8.1	< 1.0 [< 1.1]	< 1.7	< 1.7	< 1.0	< 1.7	< 1.7	< 1.7	< 1.0	< 1.7	< 1.7	< 1.0
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.7	< 2.1 [< 2.2]	4.8	< 3.7	< 2.0	< 3.7	< 3.7	< 3.7	< 2.0	< 3.7	< 3.7	< 2.0
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	4.3 [4.6]	NA	NA	< 2.0	NA	NA	NA	< 2.0	NA	NA	< 2.0
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	NA	3.3 J	< 3.7	NA	< 3.7	< 3.7	< 3.7	NA	< 3.7	< 3.7	NA
Acenaphthene	83-32-9	2,500	3,800	3.8	1.3	< 1.0 [< 1.1]	< 0.16	< 0.16	< 1.0	< 0.16	< 0.16	< 0.16	< 1.0	1.8	1.6	3.9
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 1.0 [< 1.1]	< 0.15	< 0.15	< 1.0	< 0.15	< 0.15	< 0.15	< 1.0	< 0.15	< 0.15	< 1.0
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 2.1 [< 2.2]	NA	NA	< 2.0	NA	NA	NA	< 2.0	NA	NA	< 2.0
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 1.0 [< 1.1]	< 0.2	< 0.2	< 1.0	< 0.2	< 0.2	< 0.2	< 1.0	< 0.2	< 0.2	< 1.0
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 1.0 [< 1.1]	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 1.0
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 1.0 [< 1.1]	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 1.0 [< 1.1]	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.14	< 1.0 [< 1.1]	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 1.0
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.35	< 1.0 [< 1.1]	< 0.35	< 0.35	< 1.0	< 0.35	< 0.35	< 0.35	< 1.0	< 0.35	< 0.35	< 1.0
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.63	< 2.1 [< 2.2]	< 0.63	< 0.63	< 2.0	< 0.63	< 0.63	< 0.63	< 2.0	< 0.63	< 0.63	< 2.0
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 2.1 [< 2.2]	< 0.27	< 0.27	< 2.0	< 0.27	< 0.27	< 0.27	< 2.0	< 0.27	< 0.27	< 2.0
Carbazole	86-74-8	37	170	< 0.19	< 0.19	< 1.0 [< 1.1]	< 0.19	< 0.19	< 1.0	< 0.19	< 0.19	< 0.19	< 1.0	< 0.19	< 0.19	< 1.0
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.28	< 1.0 [< 1.1]	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 1.0 [< 1.1]	< 0.18	< 0.18	< 1.0	< 0.18	< 0.18	< 0.18	< 1.0	< 0.18	< 0.18	< 1.0
Dibenzofuran	132-64-9	42	120	2.4	< 1.3	< 5.2 [< 5.4]	< 1.3	< 1.3	< 5.0	< 1.3	< 1.3	< 1.3	< 5.0	< 1.3	< 1.3	< 5.1

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		PCMW-05			PCMW-06			PCMW-07		PCMW-08S		PCMW-08D		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/2/05	1/31/06	3/23/18	11/3/05	1/31/06	3/23/18	11/3/05	1/31/06	11/3/05	3/22/18	11/4/05	1/31/06	3/22/18
Semi-Volatile Organic Compounds (cont'd)																
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 2.1 [< 2.2]	< 0.24	< 0.24	< 2.0	< 0.24	< 0.24	< 0.24	< 2.0	< 0.24	< 0.24	1.0 J
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 2.1 [< 2.2]	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 2.0
Fluoranthene	206-44-0	260	260	< 0.16	< 0.16	< 1.0 [< 1.1]	< 0.16	< 0.16	< 1.0	< 0.16	< 0.16	< 0.16	< 1.0	< 0.16	< 0.16	< 1.0
Fluorene	86-73-7	1,700	1,900	2.9	1.5	< 1.0 [< 1.1]	< 0.24	< 0.24	< 1.0	< 0.24	< 0.24	< 0.24	< 1.0	< 0.24	< 0.24	< 1.0
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 1.0 [< 1.1]	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0
Naphthalene	91-20-3	100	100	< 0.097	< 0.097	< 1.0 [< 1.1]	4	< 0.097	< 1.0	< 0.097	< 0.097	< 0.097	< 1.0	< 0.097	< 0.097	< 1.0
Phenanthrene	85-01-8	1,100	1,100	< 0.22	< 0.22	< 1.0 [< 1.1]	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0
Phenol	108-95-2	2,000	2,000	< 1.7	< 1.7	< 2.1 [< 2.2]	2	< 1.7	< 2.0	< 1.7	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0
Pyrene	129-00-0	130	130	< 0.23	< 0.23	< 1.0 [< 1.1]	< 0.23	< 0.23	< 1.0	< 0.23	< 0.23	< 0.23	< 1.0	< 0.23	< 0.23	< 1.0
Pesticides																
4,4-DDT	50-29-3	2.1	5.5	< 0.05	0.089	< 0.0067 [< 0.0067]	0.14	0.066	< 0.0067	< 0.05	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0069
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.0067 [< 0.0067]	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0069
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0067 [< 0.0067]	NA	NA	< 0.0067	NA	NA	NA	< 0.0067	NA	NA	< 0.0069
Polychlorinated Biphenyls																
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.33 [< 0.33]	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.34

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-09S 11/4/05	PCMW-09S 1/31/06	PCMW-09S 3/19/18	PCMW-09D 11/7/05	PCMW-09D 1/31/06	PCMW-10S 11/7/05	PCMW-10S 2/1/06	PCMW-10S 3/22/18	PCMW-10D 11/7/05	PCMW-10D 2/1/06	PCMW-10D 3/22/18	PCMW-11S 11/7/05	PCMW-11S 2/2/06	PCMW-11S 3/23/18
Volatile Organic Compounds																	
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 5.6	< 5.6	< 10 UJ	< 4	< 5.6	< 4	< 5.6	< 10	< 4	< 5.6	< 10 UJ	< 4	< 5.6	< 10
Benzene	71-43-2	5	5	< 0.14	< 0.14	< 0.50	< 0.43	< 0.14	< 0.43	***11***	< 0.50	< 0.43	< 0.14	< 0.50	< 0.43	< 0.14	0.23 J
Chlorobenzene	108-90-7	100	100	< 0.37	< 0.37	< 1.0	< 0.2	< 0.37	< 0.2	< 0.37	< 1.0	< 0.2	< 0.37	0.28 J	< 0.2	< 0.37	< 1.0
Chloroform	67-66-3	80	80	< 0.36	< 0.36	< 1.0	< 0.38	< 0.36	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.3	< 0.3	< 1.0	< 0.5	< 0.3	< 0.5	< 0.3	< 1.0	< 0.5	< 0.3	< 1.0	< 0.5	< 0.3	< 1.0
Dichloromethane	75-09-2	5	5	< 0.49	< 0.49	< 2.0	< 0.87	< 0.49	< 0.87	< 0.49	< 2.0	< 0.87	1	< 2.0	< 0.87	< 0.49	< 2.0
Ethylbenzene	100-41-4	700	700	< 0.34	< 0.34	< 1.0	< 0.49	< 0.34	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.54	< 0.54	< 1.0	< 0.86	< 0.54	< 0.86	< 0.54	< 1.0	< 0.86	< 0.54	< 1.0	< 0.86	< 0.54	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	0.80 J	NA	NA	< 1.0
o,p-Xylene	136777-61-2	- -	- -	< 0.14	< 0.14	NA	< 0.55	< 0.14	< 0.55	< 0.14	NA	< 0.55	< 0.14	NA	< 0.55	< 0.14	NA
o-Xylene	95-47-6	- -	- -	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 0.22	< 0.22	< 1.0	< 0.29	< 0.22	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0
Tetrachloroethene	127-18-4	5	5	< 0.28	< 0.28	< 1.0	< 0.31	< 0.28	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0
Toluene	108-88-3	1,000	1,000	< 0.22	< 0.22	< 1.0	< 0.31	< 0.22	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 0.37	< 0.37	< 1.0	< 0.36	< 0.37	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0
Semi-Volatile Organic Compounds																	
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 1.1	NA	NA	NA	NA	< 1.1	NA	NA	< 1.0	NA	NA	< 1.1
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 5.3	< 0.85	< 0.85	< 0.85	7	< 5.6	< 0.85	< 0.85	< 5.0	< 0.85	< 0.89	< 5.6
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 1.1	NA	NA	NA	NA	< 1.1	NA	NA	< 1.0	NA	NA	< 1.1
2-Methylnaphthalene	91-57-6	170	470	< 1.7	< 1.7	< 1.1	3.9	< 1.7	< 1.7	< 1.7	< 1.1	< 1.7	< 1.7	< 1.0	< 1.7	< 1.8	< 1.1
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.7	< 2.1	< 3.7	< 3.7	< 3.7	< 3.7	< 2.2	< 3.7	< 3.7	< 2.0	< 3.7	< 3.9	< 2.2
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 2.1	NA	NA	NA	NA	< 2.2	NA	NA	< 2.0	NA	NA	< 2.2
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	NA	< 3.7	< 3.7	< 3.7	< 3.7	NA	< 3.7	< 3.7	NA	< 3.7	< 3.9	NA
Acenaphthene	83-32-9	2,500	3,800	< 0.16	< 0.16	< 1.1	5.2	3.6	9.9	9.7	< 1.1	1.1	< 0.16	< 1.0	2.8	1.1	< 1.1
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 1.1	< 0.15	< 0.15	9.5	9.1	< 1.1	< 0.15	< 0.15	< 1.0	< 0.15	< 0.16	< 1.1
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 2.1	NA	NA	NA	NA	< 2.2	NA	NA	< 2.0	NA	NA	< 2.2
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 1.1	< 0.2	< 0.2	< 0.2	< 0.2	< 1.1	< 0.2	< 0.2	< 1.0	< 0.2	< 0.21	< 1.1
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 1.1	< 0.14	***2***	< 0.14	< 0.14	< 1.1	< 0.14	< 0.14	< 1.0	< 0.14	< 0.15	< 1.1
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 1.1	< 0.17	***1.7***	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.1
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 1.1	< 0.28	***2.5***	< 0.28	< 0.28	< 1.1	< 0.28	< 0.28	< 1.0	< 0.28	< 0.29	< 1.1
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.14	< 1.1	< 0.14	< 0.14	< 0.14	< 0.14	< 1.1	< 0.14	< 0.14	< 1.0	< 0.14	< 0.15	< 1.1
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.35	< 1.1	< 0.35	< 0.35	< 0.35	< 0.35	< 1.1	< 0.35	< 0.35	< 1.0	< 0.35	< 0.37	< 1.1
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	1.3	< 2.1	< 0.63	2.7	< 0.63	< 0.63	< 2.2	< 0.63	< 0.63	< 2.0	< 0.63	< 0.67	< 2.2
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 2.1	< 0.27	< 0.27	< 0.27	< 0.27	< 2.2	< 0.27	< 0.27	< 2.0	< 0.27	< 0.29	< 2.2
Carbazole	86-74-8	37	170	< 0.19	< 0.19	< 1.1	< 0.19	< 0.19	7.2	17	< 1.1	< 0.19	< 0.19	< 1.0	< 0.19	< 0.2	< 1.1
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.28	< 1.1	< 0.28	***2***	< 0.28	< 0.28	< 1.1	< 0.28	< 0.28	< 1.0	< 0.28	< 0.3	< 1.1
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 1.1	< 0.18	< 0.18	< 0.18	< 0.18	< 1.1	< 0.18	< 0.18	< 1.0	< 0.18	< 0.19	< 1.1
Dibenzofuran	132-64-9	42	120	< 1.3	< 1.3	< 5.3	< 1.3	< 1.3	8.4	9.6	< 5.6	< 1.3	< 1.3	< 5.0	< 1.3	< 1.4	< 5.6

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-09S			PCMW-09D		PCMW-10S			PCMW-10D			PCMW-11S		
Date Collected:				11/4/05	1/31/06	3/19/18	11/7/05	1/31/06	11/7/05	2/1/06	3/22/18	11/7/05	2/1/06	3/22/18	11/7/05	2/2/06	3/23/18
Semi-Volatile Organic Compounds (cont'd)																	
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 2.1	< 0.24	< 0.24	< 0.24	< 0.24	< 2.2	< 0.24	< 0.24	< 2.0	< 0.24	< 0.25	< 2.2
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 2.1	< 0.2	< 0.2	< 0.2	< 0.2	< 2.2	< 0.2	< 0.2	< 2.0	< 0.2	< 0.21	< 2.2
Fluoranthene	206-44-0	260	260	< 0.16	< 0.16	< 1.1	< 0.16	4.5	< 0.16	< 0.16	< 1.1	< 0.16	< 0.16	< 1.0	< 0.16	< 0.17	< 1.1
Fluorene	86-73-7	1,700	1,900	< 0.24	< 0.24	< 1.1	1.4	1.3	9.9	11	< 1.1	< 0.24	< 0.24	< 1.0	< 0.24	< 0.25	< 1.1
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 1.0	< 0.17	< 0.18	< 1.1
Naphthalene	91-20-3	100	100	< 0.097	1.2	< 1.1	17	1.2	< 0.097	< 0.097	< 1.1	< 0.097	< 0.097	< 1.0	< 0.097	< 0.1	< 1.1
Phenanthrene	85-01-8	1,100	1,100	< 0.22	< 0.22	< 1.1	2	2.9	1.4	< 0.22	< 1.1	< 0.22	< 0.22	< 1.0	< 0.22	1.1	< 1.1
Phenol	108-95-2	2,000	2,000	< 1.7	< 1.7	< 2.1	< 1.7	< 1.7	< 1.7	< 1.7	< 2.2	< 1.7	< 1.7	< 2.0	1.4 J	1.5 J	< 2.2
Pyrene	129-00-0	130	130	< 0.23	< 0.23	< 1.1	< 0.23	3.5	< 0.23	< 0.23	< 1.1	< 0.23	< 0.23	< 1.0	< 0.23	< 0.24	< 1.1
Pesticides																	
4,4-DDT	50-29-3	2.1	5.5	< 0.05	< 0.05	< 0.0071	< 0.05	< 0.05	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0067
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.0071	< 0.05	< 0.05	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0067
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0071	NA	NA	NA	NA	< 0.0067	NA	NA	< 0.0067	NA	NA	< 0.0067
Polychlorinated Biphenyls																	
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.36	< 0.25	< 0.25	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.33

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: / Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-11D 11/8/05	PCMW-11D 2/2/06	PCMW-211 2/2/06	PCMW-12S 11/8/05	PCMW-12S 2/1/06	PCMW-12D 11/8/05	PCMW-12D 2/1/06	PCMW-212 2/1/06	PCMW-13S 11/9/05	PCMW-13S 2/2/06	PCMW-13D 11/9/05	PCMW-13D 2/2/06
Volatile Organic Compounds															
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	38,000	110,000	< 4	< 5.6	< 5.6	< 4	< 5.6	< 4	< 5.6	< 5.6	< 4	< 5.6	< 4	< 5.6
Benzene	71-43-2	5	5	< 0.43	< 0.14	< 0.14	< 0.43	< 0.14	< 0.43	< 0.14	< 0.14	< 0.43	< 0.14	< 0.43	< 0.14
Chlorobenzene	108-90-7	100	100	< 0.2	< 0.37	< 0.37	< 0.2	< 0.17	< 0.2	< 0.17	< 0.17	< 0.2	< 0.17	< 0.2	< 0.17
Chloroform	67-66-3	80	80	< 0.38	< 0.36	< 0.36	< 0.38	< 0.4	< 0.38	< 0.4	< 0.4	< 0.38	< 0.4	< 0.38	< 0.4
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.5	< 0.3	< 0.3	< 0.5	< 0.34	< 0.5	< 0.34	< 0.34	< 0.5	< 0.34	< 0.5	< 0.34
Dichloromethane	75-09-2	5	5	< 0.87	< 0.49	< 0.49	< 0.87	< 1.2	< 0.87	< 1.2	< 1.2	< 0.87	< 1.2	< 0.87	< 1.2
Ethylbenzene	100-41-4	700	700	< 0.49	< 0.34	< 0.34	< 0.49	< 0.31	< 0.49	< 0.31	< 0.31	< 0.49	< 0.31	< 0.49	< 0.31
Isopropylbenzene	98-82-8	840	3,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.86	< 0.54	< 0.54	< 0.86	< 0.49	< 0.86	< 0.49	< 0.49	< 0.86	< 0.49	< 0.86	< 0.49
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o,p-Xylene	136777-61-2	- -	- -	< 0.55	< 0.14	< 0.14	< 0.55	< 0.21	< 0.55	< 0.21	< 0.21	< 0.55	< 0.21	< 0.55	< 0.21
o-Xylene	95-47-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	100	100	< 0.29	< 0.22	< 0.22	< 0.29	< 0.21	< 0.29	< 0.21	< 0.21	< 0.29	< 0.21	< 0.29	< 0.21
Tetrachloroethene	127-18-4	5	5	***37***	4	< 0.28	< 0.31	< 0.46	< 0.31	< 0.46	< 0.46	< 0.31	< 0.46	< 0.31	< 0.46
Toluene	108-88-3	1,000	1,000	< 0.31	< 0.22	< 0.22	< 0.31	< 0.21	< 0.31	< 0.21	< 0.21	< 0.31	< 0.21	< 0.31	< 0.21
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	5	5	< 0.36	< 0.37	< 0.37	< 0.36	< 0.76	< 0.36	< 0.76	< 0.76	< 0.36	< 0.76	< 0.36	< 0.76
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	430	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 0.89	< 0.85	< 0.85	< 0.85	< 0.85	< 0.85	< 0.85	< 0.85	< 0.85	< 0.85
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	170	470	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.7	< 3.9	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	< 3.9	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7	< 3.7
Acenaphthene	83-32-9	2,500	3,800	< 0.16	28	1.2	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Acetophenone	98-86-2	4,200	12,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 0.29	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.35	< 0.37	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.63	< 0.67	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 0.29	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
Carbazole	86-74-8	37	170	< 0.19	< 0.19	< 0.2	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.28	< 0.3	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 0.19	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Dibenzofuran	132-64-9	42	120	1.8	< 1.3	< 1.4	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-11D 11/8/05	PCMW-11D 2/2/06	PCMW-211 2/2/06	PCMW-12S 11/8/05	PCMW-12S 2/1/06	PCMW-12D 11/8/05	PCMW-12D 2/1/06	PCMW-212 2/1/06	PCMW-13S 11/9/05	PCMW-13S 2/2/06	PCMW-13D 11/9/05	PCMW-13D 2/2/06
Semi-Volatile Organic Compounds (cont'd)															
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 0.25	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluoranthene	206-44-0	260	260	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Fluorene	86-73-7	1,700	1,900	< 0.24	< 0.24	1.2	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 0.18	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
Naphthalene	91-20-3	100	100	< 0.097	< 0.097	< 0.1	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097
Phenanthrene	85-01-8	1,100	1,100	< 0.22	< 0.22	1.3	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Phenol	108-95-2	2,000	2,000	30	25	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7
Pyrene	129-00-0	130	130	< 0.23	< 0.23	< 0.24	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Pesticides															
4,4-DDT	50-29-3	2.1	5.5	0.17	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
trans-chlordane	5103-74-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls															
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-14S / MW-101* 11/9/05	PCMW-14S / MW-101* 2/3/06	PCMW-14S / MW-101* 5/30/18	PCMW-14D 11/9/05	PCMW-14D 2/3/06	PCMW-15S 11/10/05	PCMW-15S 2/3/06	PCMW-15S 3/20/18	PCMW-15D 11/10/05	PCMW-15D 2/3/06	PCMW-15D 3/20/18
Volatile Organic Compounds														
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 40	< 56	< 10	< 4 [< 4]	< 5.6	< 4	< 5.6	< 10 UJ	< 4	< 5.6	< 10 UJ
Benzene	71-43-2	5	5	***580***	***1,200***	3.8	< 0.43 [< 0.43]	< 0.14	***67***	***54***	0.20 J	< 0.43	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	100	< 2	< 1.7	< 1.0	< 0.2 [< 0.2]	< 0.17	< 0.2	< 0.17	< 1.0	< 0.2	< 0.17	< 1.0
Chloroform	67-66-3	80	80	< 3.8	< 4	< 1.0	< 0.38 [< 0.38]	< 0.4	< 0.38	< 0.4	< 1.0	< 0.38	< 0.4	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 5	< 3.4	< 1.0	< 0.5 [< 0.5]	< 0.34	< 0.5	< 0.34	< 1.0	< 0.5	< 0.34	< 1.0
Dichloromethane	75-09-2	5	5	< 8.7	< 12	< 2.0	< 0.87 [< 0.87]	< 1.2	< 0.87	< 1.2	< 2.0	< 0.87	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	< 4.9	< 3.1	0.23 J	< 0.49 [< 0.49]	< 0.31	< 0.49	< 0.31	< 1.0	< 0.49	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 8.6	< 4.9	0.59 J	< 0.86 [< 0.86]	< 0.49	< 0.86	< 0.49	< 1.0	< 0.86	< 0.49	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
o,p-Xylene	136777-61-2	- -	- -	< 5.5	< 2.1	NA	< 0.55 [< 0.55]	< 0.21	< 0.55	< 0.21	NA	< 0.55	< 0.21	NA
o-Xylene	95-47-6	- -	- -	NA	NA	1.7	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 2.9	< 2.1	< 1.0	< 0.29 [< 0.29]	< 0.21	< 0.29	< 0.21	< 1.0	< 0.29	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	5	< 3.1	< 4.6	< 1.0	< 0.31 [< 0.31]	< 0.46	< 0.31	< 0.46	< 1.0	< 0.31	< 0.46	< 1.0
Toluene	108-88-3	1,000	1,000	< 3.1	< 2.1	< 1.0	< 0.31 [< 0.31]	< 0.21	1.3	< 0.21	< 1.0	< 0.31	< 0.21	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	2.3	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 3.6	< 7.6	< 1.0	< 0.36 [< 0.36]	< 0.76	< 0.36	< 0.76	< 1.0	< 0.36	< 0.76	< 1.0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 5.0	< 0.85 [< 0.85]	< 0.85	1.9	3.1	< 5.0	< 0.87	< 0.85	< 5.0
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0
2-Methylnaphthalene	91-57-6	170	470	1.1 J	1.2 J	< 1.0	< 1.7 [< 1.7]	< 1.7	< 1.7	< 1.7	< 1.0	13	< 1.7	< 1.0
2-Methylphenol	95-48-7	2,100	5,800	15	8.1	< 2.0	< 3.7 [< 3.7]	< 3.7	< 3.7	< 3.7	< 2.0	2 J	< 3.7	< 2.0
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 2.0	NA	NA	NA	NA	< 2.0	NA	NA	< 2.0
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	NA	< 3.7 [< 3.7]	< 3.7	< 3.7	< 3.7	NA	1 J	< 3.7	NA
Acenaphthene	83-32-9	2,500	3,800	1.7	2	0.76 J	< 0.16 [< 0.16]	< 0.16	4.8	6.4	< 1.0	11	7.6	< 1.0
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 1.0	< 0.15 [< 0.15]	< 0.15	< 0.15	< 0.15	< 1.0	< 0.16	< 0.15	< 1.0
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 2.0	NA	NA	NA	NA	< 2.0	NA	NA	< 2.0
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 1.0	< 0.2 [< 0.2]	< 0.2	< 0.2	< 0.2	< 1.0	1.1	< 0.2	< 1.0
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 1.0	< 0.14 [< 0.14]	< 0.14	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 1.0
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 1.0	< 0.17 [< 0.17]	< 0.17	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 1.0	< 0.28 [< 0.28]	< 0.28	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.14	< 1.0	< 0.14 [< 0.14]	< 0.14	< 0.14	< 0.14	< 1.0	< 0.15	< 0.14	< 1.0
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.35	< 1.0	< 0.35 [< 0.35]	< 0.35	< 0.35	< 0.35	< 1.0	< 0.36	< 0.35	< 1.0
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.63	< 2.0	< 0.63 [< 0.63]	< 0.63	< 0.63	< 0.63	< 2.0	< 0.65	< 0.63	< 2.0
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 2.0	< 0.27 [< 0.27]	< 0.27	< 0.27	< 0.27	< 2.0	< 0.28	< 0.27	< 2.0
Carbazole	86-74-8	37	170	1.6	1.4	0.70 J	< 0.19 [< 0.19]	< 0.19	1.6	2.1	< 1.0	2.1	1.6	< 1.0
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.28	< 1.0	< 0.28 [< 0.28]	< 0.28	< 0.28	< 0.28	< 1.0	< 0.29	< 0.28	< 1.0
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 1.0	< 0.18 [< 0.18]	< 0.18	< 0.18	< 0.18	< 1.0	< 0.19	< 0.18	< 1.0
Dibenzofuran	132-64-9	42	120	< 1.3	< 1.3	0.44 J	< 1.3 [< 1.3]	< 1.3	< 1.3	1.6	< 5.0	3.1	2.5	< 5.0

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-14S / MW-101*			PCMW-14D		PCMW-15S			PCMW-15D		
Date Collected:				11/9/05	2/3/06	5/30/18	11/9/05	2/3/06	11/10/05	2/3/06	3/20/18	11/10/05	2/3/06	3/20/18
Semi-Volatile Organic Compounds (cont'd)														
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 2.0	< 0.24 [< 0.24]	< 0.24	< 0.24	< 0.24	< 2.0	< 0.24	< 0.24	< 2.0
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 2.0	< 0.2 [< 0.2]	< 0.2	21	< 0.2	< 2.0	< 0.21	< 0.2	< 2.0
Fluoranthene	206-44-0	260	260	< 0.16	1.5	0.44 J	< 0.16 [< 0.16]	< 0.16	1.8	1.3	< 1.0	< 0.17	< 0.16	< 1.0
Fluorene	86-73-7	1,700	1,900	1.5	2	0.85 J	< 0.24 [< 0.24]	< 0.24	< 0.24	1.2	< 1.0	5.3	4.3	< 1.0
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 1.0	< 0.17 [< 0.17]	< 0.17	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0
Naphthalene	91-20-3	100	100	5	4.9	1.9	< 0.097 [< 0.097]	< 0.097	5.8	15	< 1.0	62	9.9	< 1.0
Phenanthrene	85-01-8	1,100	1,100	3.9	4.9	1.1	< 0.22 [< 0.22]	< 0.22	< 0.22	1.6	< 1.0	7.1	5.7	< 1.0
Phenol	108-95-2	2,000	2,000	1.2 J	2.5	< 2.0	< 1.7 [< 1.7]	< 1.7	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0
Pyrene	129-00-0	130	130	< 0.23	1.1	< 1.0	< 0.23 [< 0.23]	< 0.23	1.2	1	< 1.0	< 0.23	< 0.23	< 1.0
Pesticides														
4,4-DDT	50-29-3	2.1	5.5	< 0.05	< 0.05	< 0.0067	< 0.05 [< 0.05]	< 0.05	< 0.05	< 0.05	< 0.0068	< 0.05	< 0.05	< 0.0069
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.0067	< 0.05 [< 0.05]	< 0.05	< 0.05	< 0.05	< 0.0068	< 0.05	< 0.05	< 0.0069
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0067	NA	NA	NA	NA	< 0.0068	NA	NA	< 0.0069
Polychlorinated Biphenyls														
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.33	< 0.25 [< 0.25]	< 0.25	< 0.25	< 0.25	< 0.34	< 0.25	< 0.25	< 0.34

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-16S / MW-105*			PCMW-16D			PCMW-17S			PCMW-17D		
				11/10/05	2/1/06	5/30/18	11/10/05	2/1/06	3/19/18	11/11/05	2/3/06	3/22/18	11/11/05	2/3/06	3/22/18
Volatile Organic Compounds															
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 4	< 5.6	< 10	< 4	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ
Benzene	71-43-2	5	5	1.2	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50	***9.7***	***11***	1.1	< 0.14	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	100	< 0.2	< 0.37	< 1.0	1.1	3.7	1.4	< 0.37	< 0.17	< 1.0	< 0.37	< 0.17	< 1.0
Chloroform	67-66-3	80	80	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0	< 0.36	< 0.4	< 1.0	< 0.36	< 0.4	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.5	< 0.3	< 1.0	< 0.5	< 0.3	< 1.0	< 0.3	< 0.34	< 1.0	< 0.3	< 0.34	< 1.0
Dichloromethane	75-09-2	5	5	< 0.87	1.1	< 2.0	< 0.87	< 0.49	< 2.0	< 0.49	< 1.2	< 2.0	< 0.49	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0	2.5	22	< 1.0	< 0.34	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.86	< 0.54	< 1.0	< 0.86	< 0.54	< 1.0	< 0.54	1.4	< 1.0	< 0.54	< 0.49	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
o,p-Xylene	136777-61-2	- -	- -	< 0.55	< 0.14	NA	< 0.55	< 0.14	NA	1.2	3.3	NA	< 0.14	< 0.21	NA
o-Xylene	95-47-6	- -	- -	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	5	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0	< 0.28	< 0.46	< 1.0	< 0.28	< 0.46	< 1.0
Toluene	108-88-3	1,000	1,000	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0	< 0.37	< 0.76	< 1.0	< 0.37	< 0.76	< 1.0
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 0.95	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.1
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 4.8	< 0.89	< 0.85	< 5.0	< 0.85	< 0.85	< 5.1	< 0.85	< 0.85	< 5.6
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 0.95	NA	NA	***13.3 J***	NA	NA	< 1.0	NA	NA	< 1.1
2-Methylnaphthalene	91-57-6	170	470	< 1.7	< 1.7	< 0.95	< 1.8	< 1.7	< 1.0	20	48	< 1.0	< 1.7	< 1.7	< 1.1
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.7	< 1.9	< 3.9	< 3.7	< 2.0	< 3.7	< 3.7	< 2.0	< 3.7	< 3.7	< 2.2
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 1.9	NA	NA	< 2.0	NA	NA	< 2.0	NA	NA	< 2.2
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	NA	< 3.9	< 3.7	NA	< 3.7	< 3.7	NA	< 3.7	< 3.7	NA
Acenaphthene	83-32-9	2,500	3,800	4.2	< 0.16	1.3	< 0.17	< 0.16	< 1.0	41	70	1.2	1.6	1.1	< 1.1
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 0.95	< 0.16	< 0.15	< 1.0	1.2	4.9	< 1.0	< 0.15	< 0.15	< 1.1
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 1.9	NA	NA	< 2.0	NA	NA	< 2.0	NA	NA	< 2.2
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 0.95	< 0.21	< 0.2	< 1.0	2.4	4.1	< 1.0	< 0.2	< 0.2	< 1.1
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	***3.3***	< 0.95	< 0.15	< 0.14	< 1.0	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 1.1
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	***3.2***	< 0.95	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.1
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	***4.1***	< 0.95	< 0.29	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.1
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	***1.7***	< 0.95	< 0.15	< 0.14	< 1.0	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 1.1
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	***1.4***	< 0.95	< 0.37	< 0.35	< 1.0	< 0.35	< 0.35	< 1.0	< 0.35	< 0.35	< 1.1
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.63	< 1.9	< 0.67	< 0.63	< 2.0	3.8	< 0.63	< 2.0	< 0.63	< 0.63	< 2.2
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 1.9	< 0.29	< 0.27	< 2.0	< 0.27	< 0.27	< 2.0	< 0.27	< 0.27	< 2.2
Carbazole	86-74-8	37	170	< 0.19	< 0.19	< 0.95	< 0.2	< 0.19	< 1.0	17	***51***	< 1.0	< 0.19	< 0.19	< 1.1
Chrysene	218-01-9	1.9	1.9	< 0.28	***3.1***	< 0.95	< 0.3	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.1
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 0.95	< 0.19	< 0.18	< 1.0	< 0.18	< 0.18	< 1.0	< 0.18	< 0.18	< 1.1
Dibenzofuran	132-64-9	42	120	< 1.3	< 1.3	< 4.8	< 1.4	< 1.3	< 5.0	8.3	28	< 5.1	< 1.3	< 1.3	< 5.6

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-16S / MW-105*: 11/10/05	PCMW-16S / MW-105*: 2/1/06	PCMW-16S / MW-105*: 5/30/18	PCMW-16D: 11/10/05	PCMW-16D: 2/1/06	PCMW-16D: 3/19/18	PCMW-17S: 11/11/05	PCMW-17S: 2/3/06	PCMW-17S: 3/22/18	PCMW-17D: 11/11/05	PCMW-17D: 2/3/06	PCMW-17D: 3/22/18
Semi-Volatile Organic Compounds (cont'd)															
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 1.9	< 0.25	< 0.24	< 2.0	< 0.24	< 0.24	< 2.0	< 0.24	< 0.24	< 2.2
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 1.9	< 0.21	< 0.2	< 2.0	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 2.2
Fluoranthene	206-44-0	260	260	< 0.16	1.8	0.45 J	< 0.17	< 0.16	< 1.0	2.8	3.2	< 1.0	< 0.16	< 0.16	< 1.1
Fluorene	86-73-7	1,700	1,900	< 0.24	< 0.24	< 0.95	< 0.25	< 0.24	< 1.0	17	39	0.76 J	1.1	< 0.24	< 1.1
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	***1.5***	< 0.95	< 0.18	< 0.17	< 1.0	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 1.1
Naphthalene	91-20-3	100	100	< 0.097	< 0.097	< 0.95	< 0.1	< 0.097	< 1.0	7.6	41	< 1.0	6.3	< 0.097	< 1.1
Phenanthrene	85-01-8	1,100	1,100	< 0.22	< 0.22	< 0.95	< 0.23	< 0.22	< 1.0	13	25	< 1.0	< 0.22	1.1	< 1.1
Phenol	108-95-2	2,000	2,000	< 1.7	< 1.7	< 1.9	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.2
Pyrene	129-00-0	130	130	< 0.23	1.5	0.47 J	< 0.24	< 0.23	< 1.0	2.1	1.9	< 1.0	< 0.23	< 0.23	< 1.1
Pesticides															
4,4-DDT	50-29-3	2.1	5.5	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	< 0.0069	< 0.05	< 0.05	< 0.0069
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.0067	< 0.05	< 0.05	0.038	< 0.05	< 0.05	< 0.0069	< 0.05	< 0.05	0.046
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0067	NA	NA	< 0.0067	NA	NA	< 0.0069	NA	NA	< 0.0069
Polychlorinated Biphenyls															
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.33	< 0.25	< 0.25	< 0.34	< 0.25	< 0.25	< 0.34

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		PCMW-18S			PCMW-18D			PCMW-19S			PCMW-19D		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/11/05	2/2/06	3/23/18	11/11/05	2/2/06	3/23/18	11/14/05	2/2/06	3/22/18	11/14/05	2/2/06	3/22/18
Volatile Organic Compounds															
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	0.71 J	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]
Acetone	67-64-1	38,000	110,000	< 5.6	< 5.6	< 10	< 5.6	< 5.6	< 10	< 4	< 5.6	< 10	< 4	< 5.6	< 10 [< 10]
Benzene	71-43-2	5	5	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50 [< 0.50]
Chlorobenzene	108-90-7	100	100	< 0.37	< 0.17	< 1.0	< 0.37	< 0.37	< 1.0	< 0.2	< 0.37	< 1.0	< 0.2	< 0.37	< 1.0 [< 1.0]
Chloroform	67-66-3	80	80	2.6	< 0.4	< 1.0	2	1.8	12.3	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0 [< 1.0]
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.3	< 0.34	< 1.0	< 0.3	< 0.3	< 1.0	< 0.5	< 0.3	< 1.0	< 0.5	< 0.3	< 1.0 [< 1.0]
Dichloromethane	75-09-2	5	5	< 0.49	< 1.2	< 2.0	< 0.49	< 0.49	< 2.0	< 0.87	< 0.49	< 2.0	< 0.87	< 0.49	< 2.0 [< 2.0]
Ethylbenzene	100-41-4	700	700	< 0.34	< 0.31	< 1.0	< 0.34	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0 [< 1.0]
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.54	< 0.49	< 1.0	< 0.54	< 0.54	< 1.0	< 0.86	< 0.54	< 1.0	< 0.86	< 0.54	< 1.0 [< 1.0]
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]
o,p-Xylene	136777-61-2	- -	- -	< 0.14	< 0.21	NA	< 0.14	< 0.14	NA	< 0.55	< 0.14	NA	< 0.55	< 0.14	NA
o-Xylene	95-47-6	- -	- -	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]
Styrene (Monomer)	100-42-5	100	100	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0 [< 1.0]
Tetrachloroethene	127-18-4	5	5	< 0.28	< 0.46	< 1.0	2.5	< 0.28	1.5	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0 [< 1.0]
Toluene	108-88-3	1,000	1,000	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0 [< 1.0]
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]
Trichloroethene	79-01-6	5	5	< 0.37	< 0.76	< 1.0	< 0.37	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0 [< 1.0]
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 1.1	NA	NA	< 1.1	NA	NA	< 0.95	NA	NA	< 0.98 [< 0.95]
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.86	< 5.6	< 0.85	< 0.87	< 5.6	< 0.85	< 0.85	< 4.8	< 0.85	< 0.94	< 4.9 [< 4.8]
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 1.1	NA	NA	< 1.1	NA	NA	< 0.95	NA	NA	< 0.98 [< 0.95]
2-Methylnaphthalene	91-57-6	170	470	< 1.7	< 1.7	< 1.1	< 1.7	< 1.8	< 1.1	< 1.7	< 1.7	< 0.95	< 1.7	< 1.9	< 0.98 [< 0.95]
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.8	< 2.2	< 3.7	< 3.8	< 2.2	< 3.7	< 3.7	< 1.9	< 3.7	< 4.1	< 2.0 [< 1.9]
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 2.2	NA	NA	< 2.2	NA	NA	< 1.9	NA	NA	< 2.0 [< 1.9]
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.8	NA	< 3.7	< 3.8	NA	< 3.7	< 3.7	NA	< 3.7	< 4.1	NA
Acenaphthene	83-32-9	2,500	3,800	< 0.16	< 0.17	< 1.1	< 0.16	< 0.17	< 1.1	< 0.16	< 0.16	< 0.95	< 0.16	< 0.18	< 0.98 [< 0.95]
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 1.1	< 0.15	< 0.16	< 1.1	< 0.15	< 0.15	< 0.95	< 0.15	< 0.17	< 0.98 [< 0.95]
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 2.2	NA	NA	< 2.2	NA	NA	< 1.9	NA	NA	< 2.0 [< 1.9]
Anthracene	120-12-7	66	66	< 0.2	< 0.2	< 1.1	< 0.2	< 0.2	< 1.1	< 0.2	< 0.2	< 0.95	< 0.2	< 0.22	< 0.98 [< 0.95]
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 1.1	< 0.14	< 0.14	< 1.1	< 0.14	< 0.14	< 0.95	< 0.14	< 0.15	< 0.98 [< 0.95]
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 0.95	< 0.17	< 0.18	< 0.98 [< 0.95]
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 1.1	< 0.28	< 0.29	< 1.1	< 0.28	< 0.28	< 0.95	< 0.28	< 0.31	< 0.98 [< 0.95]
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.15	< 1.1	< 0.14	< 0.15	< 1.1	< 0.14	< 0.14	< 0.95	< 0.14	< 0.16	< 0.98 [< 0.95]
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.36	< 1.1	< 0.35	< 0.36	< 1.1	< 0.35	< 0.35	< 0.95	< 0.35	< 0.39	< 0.98 [< 0.95]
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.65	3.7	< 0.63	< 0.65	< 2.2	1.4	< 0.63	< 1.9	< 0.63	< 0.71	< 2.0 [< 1.9]
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.28	< 2.2	< 0.27	< 0.28	< 2.2	< 0.27	< 0.27	< 1.9	< 0.27	< 0.3	< 2.0 [< 1.9]
Carbazole	86-74-8	37	170	< 0.19	< 0.2	< 1.1	< 0.19	< 0.2	< 1.1	< 0.19	< 0.19	< 0.95	< 0.19	< 0.21	< 0.98 [< 0.95]
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.29	< 1.1	< 0.28	< 0.29	< 1.1	< 0.28	< 0.28	< 0.95	< 0.28	< 0.32	< 0.98 [< 0.95]
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.19	< 1.1	< 0.18	< 0.19	< 1.1	< 0.18	< 0.18	< 0.95	< 0.18	< 0.2	< 0.98 [< 0.95]
Dibenzofuran	132-64-9	42	120	< 1.3	< 1.3	< 5.6	< 1.3	< 1.3	< 5.6	< 1.3	< 1.3	< 4.8	< 1.3	< 1.4	< 4.9 [< 4.8]

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

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National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		PCMW-18S			PCMW-18D			PCMW-19S			PCMW-19D		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/11/05	2/2/06	3/23/18	11/11/05	2/2/06	3/23/18	11/14/05	2/2/06	3/22/18	11/14/05	2/2/06	3/22/18
Semi-Volatile Organic Compounds (cont'd)															
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 2.2	< 0.24	< 0.24	< 2.2	< 0.24	< 0.24	< 1.9	< 0.24	< 0.26	< 2.0 [< 1.9]
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.21	< 2.2	< 0.2	< 0.21	< 2.2	< 0.2	< 0.2	< 1.9	< 0.2	< 0.22	< 2.0 [< 1.9]
Fluoranthene	206-44-0	260	260	< 0.16	< 0.17	< 1.1	< 0.16	< 0.17	< 1.1	< 0.16	< 0.16	< 0.95	< 0.16	< 0.18	< 0.98 [< 0.95]
Fluorene	86-73-7	1,700	1,900	< 0.24	< 0.24	< 1.1	< 0.24	< 0.25	< 1.1	< 0.24	< 0.24	< 0.95	< 0.24	< 0.27	< 0.98 [< 0.95]
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 1.1	< 0.17	< 0.17	< 0.95	< 0.17	< 0.19	< 0.98 [< 0.95]
Naphthalene	91-20-3	100	100	< 0.097	< 0.099	< 1.1	< 0.097	< 0.1	< 1.1	< 0.097	< 0.097	< 0.95	< 0.097	< 0.11	< 0.98 [< 0.95]
Phenanthrene	85-01-8	1,100	1,100	< 0.22	< 0.23	< 1.1	< 0.22	< 0.23	< 1.1	< 0.22	< 0.22	< 0.95	< 0.22	< 0.25	< 0.98 [< 0.95]
Phenol	108-95-2	2,000	2,000	< 1.7	< 1.7	< 2.2	< 1.7	< 1.7	< 2.2	< 1.7	< 1.7	< 1.9	< 1.7	< 1.8	< 2.0 [< 1.9]
Pyrene	129-00-0	130	130	< 0.23	< 0.23	< 1.1	< 0.23	< 0.24	< 1.1	< 0.23	< 0.23	< 0.95	< 0.23	< 0.25	< 0.98 [< 0.95]
Pesticides															
4,4-DDT	50-29-3	2.1	5.5	< 0.05	< 0.05	< 0.0069	< 0.05	< 0.05	< 0.0068	< 0.05	< 0.05	< 0.0067	< 0.051	< 0.05	< 0.0069 [< 0.0069]
Dieldrin	60-57-1	0.046	0.21	< 0.05	< 0.05	< 0.0069	< 0.05	< 0.05	< 0.0068	< 0.05	< 0.05	< 0.0067	< 0.051	< 0.05	< 0.0069 [< 0.0069]
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0069	NA	NA	< 0.0068	NA	NA	< 0.0067	NA	NA	< 0.0069 [< 0.0069]
Polychlorinated Biphenyls															
Total PCBs	-	- -	- -	< 0.25	< 0.25	< 0.34	< 0.25	< 0.25	< 0.34	< 0.25	< 0.25	< 0.33	< 0.26	< 0.25	< 0.34 [< 0.33]

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: / Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-20S 11/14/05	PCMW-20S 2/1/06	PCMW-20S 3/22/18	PCMW-20D 11/14/05	PCMW-20D 2/1/06	PCMW-20D 3/22/18
Volatile Organic Compounds									
1,2-Dichlorobenzene	95-50-1	600	600	NA	NA	< 1.0	NA	NA	< 1.0
Acetone	67-64-1	38,000	110,000	< 4	< 5.6	< 10	< 4	< 5.6	< 10
Benzene	71-43-2	5	5	< 0.43	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	100	< 0.2	< 0.17	< 1.0	< 0.2	< 0.17	< 1.0
Chloroform	67-66-3	80	80	< 0.38	< 0.4	< 1.0	< 0.38	< 0.4	< 1.0
cis-1,2-Dichloroethene	156-59-2	70	70	< 0.5	< 0.34	< 1.0	< 0.5	< 0.34	< 1.0
Dichloromethane	75-09-2	5	5	< 0.87	< 1.2	< 2.0	< 0.87	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	< 0.49	< 0.31	< 1.0	< 0.49	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	3,500	NA	NA	< 1.0	NA	NA	< 1.0
m&p-Xylenes	ARC-mpXyl	- -	- -	< 0.86	< 0.49	< 1.0	< 0.86	< 0.49	< 1.0
Methyl-tert-butyl ether	1634-04-4	20	20	NA	NA	< 1.0	NA	NA	< 1.0
o,p-Xylene	136777-61-2	- -	- -	< 0.55	< 0.21	NA	< 0.55	< 0.21	NA
o-Xylene	95-47-6	- -	- -	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	100	< 0.29	< 0.21	< 1.0	< 0.29	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	5	< 0.31	< 0.46	< 1.0	< 0.31	< 0.46	< 1.0
Toluene	108-88-3	1,000	1,000	< 0.31	< 0.21	< 1.0	< 0.31	< 0.21	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	NA	NA	< 1.0	NA	NA	< 1.0
Trichloroethene	79-01-6	5	5	< 0.36	< 0.76	< 1.0	< 0.36	< 0.76	< 1.0
Semi-Volatile Organic Compounds									
1,1-Biphenyl	92-52-4	91	430	NA	NA	< 1.0	NA	NA	< 0.98
2,4-Dimethylphenol	105-67-9	830	2,300	< 0.85	< 0.85	< 5.0	< 0.85	< 0.85	< 4.9
2,4-Dinitrotoluene	121-14-2	2.4	11	NA	NA	< 1.0	NA	NA	< 0.98
2-Methylnaphthalene	91-57-6	170	470	2	< 1.7	< 1.0	< 1.7	< 1.7	< 0.98
2-Methylphenol	95-48-7	2,100	5,800	< 3.7	< 3.7	< 2.0	< 3.7	< 3.7	< 2.0
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	NA	NA	< 2.0	NA	NA	< 2.0
4-Methylphenol	106-44-5	210	580	< 3.7	< 3.7	NA	< 3.7	< 3.7	NA
Acenaphthene	83-32-9	2,500	3,800	3.9	< 0.16	< 1.0	< 0.16	< 0.16	< 0.98
Acenaphthylene	208-96-8	2,500	7,000	< 0.15	< 0.15	< 1.0	< 0.15	< 0.15	< 0.98
Acetophenone	98-86-2	4,200	12,000	NA	NA	< 2.0	NA	NA	< 2.0
Anthracene	120-12-7	66	66	1.4	< 0.2	< 1.0	< 0.2	< 0.2	< 0.98
Benz(a)anthracene	56-55-3	0.32	4.9	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 0.98
Benzo(a)pyrene	50-32-8	0.2	0.2	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 0.98
Benzo(b)fluoranthene	205-99-2	0.19	1.2	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 0.98
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	< 0.14	< 0.14	< 1.0	< 0.14	< 0.14	< 0.98
Benzo(k)fluoranthene	207-08-9	0.19	0.55	< 0.35	< 0.35	< 1.0	< 0.35	< 0.35	< 0.98
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	< 0.63	< 0.63	< 2.0	< 0.63	< 0.63	< 2.0
Butyl benzyl phthalate	85-68-7	380	1,800	< 0.27	< 0.27	< 2.0	< 0.27	< 0.27	< 2.0
Carbazole	86-74-8	37	170	< 0.19	< 0.19	< 1.0	< 0.19	< 0.19	< 0.98
Chrysene	218-01-9	1.9	1.9	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 0.98
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	< 0.18	< 0.18	< 1.0	< 0.18	< 0.18	< 0.98
Dibenzofuran	132-64-9	42	120	1.2 J	< 1.3	< 5.0	< 1.3	< 1.3	< 4.9

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-20S 11/14/05	PCMW-20S 2/1/06	PCMW-20S 3/22/18	PCMW-20D 11/14/05	PCMW-20D 2/1/06	PCMW-20D 3/22/18
Semi-Volatile Organic Compounds (cont'd)									
Diethyl phthalate	84-66-2	33,000	93,000	< 0.24	< 0.24	< 2.0	< 0.24	< 0.24	< 2.0
Di-n-butyl phthalate	84-74-2	4,200	12,000	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 2.0
Fluoranthene	206-44-0	260	260	2.4	< 0.16	< 1.0	< 0.16	< 0.16	< 0.98
Fluorene	86-73-7	1,700	1,900	2.4	< 0.24	< 1.0	< 0.24	< 0.24	< 0.98
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	< 0.17	< 0.17	< 1.0	< 0.17	< 0.17	< 0.98
Naphthalene	91-20-3	100	100	< 0.097	< 0.097	< 1.0	< 0.097	< 0.097	< 0.98
Phenanthrene	85-01-8	1,100	1,100	5.1	< 0.22	< 1.0	< 0.22	< 0.22	< 0.98
Phenol	108-95-2	2,000	2,000	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0
Pyrene	129-00-0	130	130	2	< 0.23	< 1.0	< 0.23	< 0.23	< 0.98
Pesticides									
4,4-DDT	50-29-3	2.1	5.5	< 0.057	< 0.05	< 0.0067	< 0.054	< 0.05	< 0.0067
Dieldrin	60-57-1	0.046	0.21	< 0.057	< 0.05	< 0.0067	< 0.054	< 0.05	< 0.0067
trans-chlordane	5103-74-2	- -	- -	NA	NA	< 0.0067	NA	NA	< 0.0067
Polychlorinated Biphenyls									
Total PCBs	-	- -	- -	< 0.29	< 0.25	< 0.33	< 0.27	< 0.25	< 0.33

Table 15
Groundwater Analytical Results – Detected VOCs, SVOCs, Pesticides, and PCBs (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. 2005 and 2006 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
3. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
4. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Pesticides using USEPA SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
5. Only compounds detected in one or more samples are shown in this table.
6. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
7. NA = Not Analyzed.
8. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
9. Shading indicates an exceedance of Pennsylvania Department of Environmental Protection's (PADEP's) non-residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L).
10. Italics and bolding indicates an exceedance of PADEP's Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L.
11. - - = No PADEP MSC.
12. - = No actual Chemical Abstracts Service (CAS) number is available.
13. * indicates that the groundwater monitoring well was installed to replace the missing historical well also listed in the monitoring well ID.
14. Brackets indicate the reported concentration of a duplicate sample.
15. Qualifier Definitions:
    B = The compound has been found in the sample as well as its associated blank.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
16. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 16
Groundwater Analytical Results – TDS and Detected Total Inorganics (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

ARCADIS Design & Consultancy for natural and built assets

Location:	CAS Number	Groundwater Standards		MW-102	MW-103	MW-104	MW-107		MW-108	MW-109	MW-110	MW-111	MW-112	MW-113	MW-5
Date Collected:		Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	5/31/18	5/31/18	5/30/18	5/30/18	3/28/19	10/4/19	10/4/19	10/4/19	10/4/19	10/4/19	10/4/19	3/19/18
General Chemistry															
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	560,000	908,000 [916,000]	NA	NA	710,000	NA	NA	NA
Metals (Totals)															
Aluminum	7429-90-5	- -	- -	661 [275]	< 200	1,080	1,570	NA	< 200 [< 200]	< 200	< 200	6,890	< 200	< 200	< 200
Antimony	7440-36-0	6	6	< 6.0 [< 6.0]	< 6.0	< 6.0	< 6.0	NA	< 6.0 [< 6.0]	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Arsenic	7440-38-2	10	10	6.7 [6.6]	< 3.0	4.1	9.4	NA	< 3.0 [< 3.0]	< 3.0	5.0	***26.8***	5.2	< 3.0	3.7
Barium	7440-39-3	2,000	2,000	352 [350]	< 200	< 200	242	NA	< 200 [< 200]	< 200	< 200	250	< 200	< 200	< 200
Beryllium	7440-41-7	4	4	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	NA	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	7440-43-9	5	5	< 3.0 [< 3.0]	< 3.0	< 3.0	< 3.0	NA	< 3.0 [< 3.0]	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Calcium	7440-70-2	- -	- -	103,000 [103,000]	151,000	60,200	104,000	NA	186,000 [178,000]	149,000	178,000	72,500	123,000	105,000	29,800
Chromium	7440-47-3	100	100	< 10 [< 10]	< 10	< 10	< 10	NA	< 10 [< 10]	< 10	< 10	46.8	< 10	< 10	< 10
Copper	7440-50-8	1,000	1,000	< 10 [< 10]	< 10	< 10	16.8	NA	< 10 [< 10]	< 10	< 10	38.5	< 10	< 10	< 10
Cyanide	57-12-5	- -	- -	< 10 UJ [< 10 UJ]	< 10	670	< 10	NA	31 J [34 J]	11 J	14 J	140 J	180 J	380 J	< 10 UJ
Iron	7439-89-6	- -	- -	3,560 [2,900]	3,100	2,900	17,100	NA	12,500 [12,200]	28,000	18,900	19,200	3,630	25,600	14,100
Lead	7439-92-1	5	5	4.8 [< 3.0]	***15.9***	***7.7***	***206***	NA	***81.7 [82.7]***	< 3.0	< 3.0	***87.9***	< 3.0	< 3.0	4.2
Magnesium	7439-95-4	- -	- -	74,200 [74,900]	114,000	10,800	44,200	NA	80,900 [79,100]	83,300	82,100	38,600	73,300	29,900	15,500
Manganese	7439-96-5	300	300	***383 [370]***	***542***	***639***	***1,120***	NA	***719 [699]***	***1,660***	***1,430***	958	***5,840***	***1,060***	***326***
Mercury	7439-97-6	2	2	< 0.20 [< 0.20]	< 0.20	< 0.20	< 0.20	NA	< 0.20 [< 0.20]	< 0.20	< 0.20	0.42	< 0.20	< 0.20	< 0.20
Nickel	7440-02-0	100	100	< 10 [< 10]	< 10	< 10	< 10	NA	< 10 [< 10]	< 10	< 10	11.5	< 10	< 10	< 10
Potassium	7440-09-7	- -	- -	14,900 [15,000]	21,500	< 10,000	16,400	NA	17,000 [16,600]	17,700	16,500	20,900	< 10,000	< 10,000	< 10,000
Selenium	7782-49-2	50	50	< 10 [< 10]	< 10	< 10	< 10	NA	< 10 [< 10]	< 10	< 10	< 10	< 10	< 10	< 10
Sodium	7440-23-5	- -	- -	47,600 [47,800]	62,100	< 10,000	12,000	NA	20,500 [20,000]	37,900	32,800	110,000	33,600	13,200	< 10,000
Zinc	7440-66-6	2,000	2,000	< 20 [< 20]	< 20	34.1	135	NA	< 20 [< 20]	< 20	< 20	173	< 20	< 20	< 20

Table 16
Groundwater Analytical Results – TDS and Detected Total Inorganics (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	MW-6	PCMW-01			PCMW-02 / MW-106*			PCMW-03		PCMW-04			
Date Collected:				3/22/18	11/1/05	1/30/06	3/19/18	11/1/05	1/30/06	5/29/18	11/2/05	1/30/06	11/2/05	1/30/06	3/19/18	5/30/18
General Chemistry																
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																
Aluminum	7429-90-5	- -	- -	< 200	NA	NA	< 200	NA	NA	781	NA	NA	NA	NA	209	< 200
Antimony	7440-36-0	6	6	< 6.0	< 6	< 6	< 6.0	< 6 [< 6]	< 6	< 6.0	< 6	< 6	< 6	< 6	< 6.0	< 6.0
Arsenic	7440-38-2	10	10	< 3.0	< 7.5	< 7.5	< 3.0	< 7.5 [< 7.5]	< 7.5	< 3.0	< 7.5	< 7.5	8.1	< 7.5	6.3	3.7
Barium	7440-39-3	2,000	2,000	< 200	86	80	< 200	110 [120]	99	< 200	87	72	130	150	< 200	< 200
Beryllium	7440-41-7	4	4	< 1.0	< 4	< 4	< 1.0	< 4 [< 4]	< 4	< 1.0	< 4	< 4	< 4	< 4	< 1.0	< 1.0
Cadmium	7440-43-9	5	5	< 3.0	< 3.5	< 3.5	< 3.0	< 3.5 [< 3.5]	< 3.5	< 3.0	< 3.5	< 3.5	< 3.5	< 3.5	< 3.0	< 3.0
Calcium	7440-70-2	- -	- -	71,100	NA	NA	72,200	NA	NA	59,100	NA	NA	NA	NA	119,000	97,200
Chromium	7440-47-3	100	100	< 10	< 50	< 50	< 10	< 50 [< 50]	< 50	< 10	< 50	< 50	< 50	< 50	< 10	< 10
Copper	7440-50-8	1,000	1,000	< 10	< 50	< 50	< 10	< 50 [< 50]	< 50	< 10	< 50	< 50	< 50	< 50	23.5	14.9
Cyanide	57-12-5	- -	- -	10 J	NA	NA	< 10 UJ	NA	NA	< 10	NA	NA	NA	NA	< 10 UJ	NA
Iron	7439-89-6	- -	- -	12,300	NA	NA	7,790	NA	NA	20,500	NA	NA	NA	NA	7,130	8,270
Lead	7439-92-1	5	5	3.0	***6.7***	< 4	< 3.0	***13 [12]***	***12***	***94.4***	< 4	< 4	4.2	< 4	***17.8***	***9.0***
Magnesium	7439-95-4	- -	- -	20,200	NA	NA	19,300	NA	NA	27,300	NA	NA	NA	NA	37,400	33,900
Manganese	7439-96-5	300	300	***948***	NA	NA	***863***	NA	NA	***1,030***	NA	NA	NA	NA	***654***	***593***
Mercury	7439-97-6	2	2	< 0.20	< 0.7	< 0.7	< 0.20	< 0.7 [< 7.0]	< 0.7	< 0.20	< 0.7	< 0.7	< 0.7	< 0.7	< 0.20	< 0.20
Nickel	7440-02-0	100	100	< 10	< 50	< 50	< 10	< 50 [< 50]	< 50	< 10	< 50	< 50	< 50	< 50	< 10	< 10
Potassium	7440-09-7	- -	- -	< 10,000	NA	NA	< 10,000	NA	NA	< 10,000	NA	NA	NA	NA	< 10,000	13,700
Selenium	7782-49-2	50	50	< 10	< 40	< 40	< 10	< 40 [< 40]	< 40	< 10	< 40	< 40	< 40	< 40	< 10	< 10
Sodium	7440-23-5	- -	- -	< 10,000	NA	NA	14,100	NA	NA	14,200	NA	NA	NA	NA	< 10,000	< 10,000
Zinc	7440-66-6	2,000	2,000	< 20	190	< 50	34.6	57 [58]	< 50	41.6	< 50	84	< 50	< 50	58.0	< 20

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-05					PCMW-06				PCMW-07	
Date Collected:				11/2/05	1/31/06	3/23/18	5/30/18	3/28/19	11/3/05	1/31/06	3/23/18	5/30/18	11/3/05	1/31/06
General Chemistry														
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	600,000 [750,000]	NA	NA	NA	NA	NA	NA
Metals (Totals)														
Aluminum	7429-90-5	- -	- -	NA	NA	< 200 [< 200]	< 200	NA	NA	NA	< 200	< 200	NA	NA
Antimony	7440-36-0	6	6	< 6	< 6	< 6.0 [< 6.0]	< 6.0	NA	< 6	< 6	< 6.0	< 6.0	***6.4***	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	3.4 [3.7]	4.2	NA	***13***	< 7.5	3.2	< 3.0	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	410	250	240 [238]	318	NA	240	270	< 200	227	64	66
Beryllium	7440-41-7	4	4	< 4	< 4	< 1.0 [< 1.0]	< 1.0	NA	< 4	< 4	< 1.0	< 1.0	< 4	< 4
Cadmium	7440-43-9	5	5	< 3.5	< 3.5	< 3.0 [< 3.0]	< 3.0	NA	< 3.5	< 3.5	< 3.0	< 3.0	< 3.5	< 3.5
Calcium	7440-70-2	- -	- -	NA	NA	104,000 [104,000]	159,000	NA	NA	NA	72,100	82,900	NA	NA
Chromium	7440-47-3	100	100	< 50	< 50	< 10 [< 10]	< 10	NA	< 50	< 50	< 10	< 10	< 50	< 50
Copper	7440-50-8	1,000	1,000	< 50	< 50	27.4 [28.6]	28.4	NA	< 50	< 50	16.9	< 10	< 50	< 50
Cyanide	57-12-5	- -	- -	NA	NA	< 10 [< 10 UJ]	NA	NA	NA	NA	< 10 UJ	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	3,130 [3,090]	2,990	NA	NA	NA	1,030	912	NA	NA
Lead	7439-92-1	5	5	***13***	***75***	***112 [110]***	***80.1***	NA	***66***	***32***	***42.3***	***24.1***	***6.2***	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	11,300 [11,200]	14,600	NA	NA	NA	8,070	8,650	NA	NA
Manganese	7439-96-5	300	300	NA	NA	157 [160]	***360***	NA	NA	NA	48.9	45.4	NA	NA
Mercury	7439-97-6	2	2	< 0.7	< 0.7	< 0.40 [< 0.20]	< 0.20	NA	< 0.7	< 0.7	< 0.20	< 0.20	< 0.7	< 0.7
Nickel	7440-02-0	100	100	< 50	***250***	***450 [465]***	***524***	NA	< 50	< 50	< 10	< 10	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	< 10,000 [< 10,000]	< 10,000	NA	NA	NA	< 10,000	< 10,000	NA	NA
Selenium	7782-49-2	50	50	< 40	< 40	< 10 [< 10]	< 10	NA	< 40	< 40	< 10	< 10	< 40	< 40
Sodium	7440-23-5	- -	- -	NA	NA	< 10,000 [< 10,000]	< 10,000	NA	NA	NA	< 10,000	< 10,000	NA	NA
Zinc	7440-66-6	2,000	2,000	250	***2,400***	***2,680 [2,700]***	***2,070***	NA	460	170	158	117	< 50	< 50

Table 16
Groundwater Analytical Results – TDS and Detected Total Inorganics (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: / Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-08S 11/3/05	PCMW-08S 3/22/18	PCMW-08S 5/31/18	PCMW-08D 11/4/05	PCMW-08D 1/31/06	PCMW-08D 3/22/18	PCMW-09S 11/4/05	PCMW-09S 1/31/06	PCMW-09S 3/19/18	PCMW-09S 5/31/18	PCMW-09D 11/7/05	PCMW-09D 1/31/06	PCMW-10S 11/7/05	PCMW-10S 2/1/06	PCMW-10S 3/22/18
General Chemistry																		
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																		
Aluminum	7429-90-5	- -	- -	NA	< 200	< 200	NA	NA	< 1,000	NA	NA	275	< 200	NA	NA	NA	NA	< 200
Antimony	7440-36-0	6	6	< 6	***9.9***	6.0	< 6	< 6	< 30	< 6	< 6	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6.0
Arsenic	7440-38-2	10	10	***160***	3.4	***34.6***	8.7	< 7.5	< 15	8.4	< 7.5	***19.2***	7.4	< 7.5	***32***	***20***	***16***	< 9.0
Barium	7440-39-3	2,000	2,000	< 50	< 200	< 200	340	390	< 1,000	66	63	< 200	< 200	300	1,100	< 50	< 50	< 200
Beryllium	7440-41-7	4	4	< 4	< 1.0	< 1.0	< 4	< 4	< 5.0	< 4	< 4	< 1.0	< 1.0	< 4	***5.1***	< 4	< 4	< 1.0
Cadmium	7440-43-9	5	5	4.5	< 3.0	< 3.0	< 3.5	< 3.5	< 15	< 3.5	< 3.5	< 3.0	< 3.0	< 3.5	< 3.5	< 3.5	< 3.5	< 3.0
Calcium	7440-70-2	- -	- -	NA	170,000	155,000	NA	NA	63,500	NA	NA	186,000	169,000	NA	NA	NA	NA	299,000
Chromium	7440-47-3	100	100	< 50	< 10	< 10	< 50	< 50	< 50	< 50	< 50	< 10	< 10	< 50	< 50	< 50	< 50	< 10
Copper	7440-50-8	1,000	1,000	< 50	< 10	< 10	< 50	< 50	< 50	< 50	< 50	24.5	< 10	< 50	79	< 50	< 50	15.2
Cyanide	57-12-5	- -	- -	NA	18 J	NA	NA	NA	60 J	NA	NA	< 10 UJ	NA	NA	NA	NA	NA	< 10 UJ
Iron	7439-89-6	- -	- -	NA	163	9,500	NA	NA	165,000	NA	NA	6,760	6,170	NA	NA	NA	NA	462
Lead	7439-92-1	5	5	***89***	***5.3***	***12.6***	< 4	< 4	< 15	< 4	***14***	***21.2***	***5.3***	< 4	***170***	< 4	< 4	< 9.0
Magnesium	7439-95-4	- -	- -	NA	149,000	126,000	NA	NA	26,800	NA	NA	101,000	100,000	NA	NA	NA	NA	165,000
Manganese	7439-96-5	300	300	NA	41.7	***676***	NA	NA	***6,640***	NA	NA	***515***	***488***	NA	NA	NA	NA	125
Mercury	7439-97-6	2	2	< 0.7	< 0.20	< 0.20	< 0.7	< 0.7	< 0.60	< 0.7	< 0.7	< 0.20	< 0.20	< 0.7	< 0.7	< 0.7	< 0.7	< 0.20
Nickel	7440-02-0	100	100	< 50	< 10	< 10	< 50	< 50	< 50	< 50	< 50	20.0	11.3	< 50	< 50	< 50	< 50	< 10
Potassium	7440-09-7	- -	- -	NA	17,400	17,900	NA	NA	< 50,000	NA	NA	13,600	11,800	NA	NA	NA	NA	20,700
Selenium	7782-49-2	50	50	< 40	11.9	< 10	< 40	< 40	< 50	< 40	< 40	11.3	< 10	< 40	< 40	< 40	< 40	< 10
Sodium	7440-23-5	- -	- -	NA	13,900	16,400	NA	NA	79,000	NA	NA	21,900	18,300	NA	NA	NA	NA	14,700
Zinc	7440-66-6	2,000	2,000	54	48.2	57.1	< 50	< 50	< 100	< 50	< 50	85.2	24.6	< 50	300	< 50	560	88.6

ARCADIS Design & Consultancy for natural and built assets

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-10D			PCMW-11S			PCMW-211	PCMW-11D		PCMW-12S		PCMW-12D		PCMW-212	PCMW-13S	
Date Collected:				11/7/05	2/1/06	3/22/18	11/7/05	2/2/06	3/23/18	2/2/06	11/8/05	2/2/06	11/8/05	2/1/06	11/8/05	2/1/06	2/1/06	11/9/05	2/2/06
General Chemistry																			
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																			
Aluminum	7429-90-5	- -	- -	NA	NA	1,740	NA	NA	226	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	6	6	< 6	< 6	< 30	< 6	< 6	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	***6.4***	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	< 15	9	< 7.5	6.3	8	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	660	560	< 1,000	92	68	< 200	67	180	220	53	< 50	90	110	< 50	62	63
Beryllium	7440-41-7	4	4	< 4	< 4	< 5.0	< 4	< 4	< 1.0	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Cadmium	7440-43-9	5	5	< 3.5	< 3.5	< 15	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5
Calcium	7440-70-2	- -	- -	NA	NA	92,400	NA	NA	203,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	7440-47-3	100	100	< 50	< 50	< 50	< 50	< 50	< 10	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Copper	7440-50-8	1,000	1,000	< 50	< 50	< 50	< 50	< 50	23.4	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Cyanide	57-12-5	- -	- -	NA	NA	350 J	NA	NA	< 10 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	64,600	NA	NA	40,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	< 15	< 4	< 4	< 3.0	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	38,000	NA	NA	96,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	***7,650***	NA	NA	***1,300***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	7439-97-6	2	2	< 0.7	< 0.7	< 0.60	< 0.7	< 0.7	< 0.20	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Nickel	7440-02-0	100	100	< 50	< 50	< 50	< 50	< 50	68.3	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	< 50,000	NA	NA	13,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	50	50	< 40	< 40	< 50	< 40	< 40	< 10	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Sodium	7440-23-5	- -	- -	NA	NA	103,000	NA	NA	19,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	< 50	< 50	< 100	< 50	< 50	233	< 50	< 50	< 50	< 50	190	< 50	110	170	< 50	98

Table 16
Groundwater Analytical Results – TDS and Detected Total Inorganics (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: / Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-13D 11/9/05	PCMW-13D 2/2/06	PCMW-14S / MW-101* 11/9/05	PCMW-14S / MW-101* 2/3/06	PCMW-14S / MW-101* 5/30/18	PCMW-14D 11/9/05	PCMW-14D 2/3/06	PCMW-15S 11/10/05	PCMW-15S 2/3/06	PCMW-15S 3/20/18	PCMW-15D 11/10/05	PCMW-15D 2/3/06	PCMW-15D 3/20/18	PCMW-16S / MW-105* 11/10/05	PCMW-16S / MW-105* 2/1/06	PCMW-16S / MW-105* 5/30/18
General Chemistry																			
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																			
Aluminum	7429-90-5	- -	- -	NA	NA	NA	NA	508	NA	NA	NA	NA	267	NA	NA	< 200	NA	NA	< 200
Antimony	7440-36-0	6	6	< 6	< 6	< 6	< 6	< 6.0	< 6 [< 6]	< 6	< 6	< 6	< 6.0	< 6	< 6	< 6.0	6	< 6	< 6.0
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	< 7.5	< 7.5	< 3.0	7.9 [9.4]	< 7.5	***12***	8	< 15	***13***	***12***	***27.3***	< 7.5	< 7.5	< 3.0
Barium	7440-39-3	2,000	2,000	< 50	< 50	100	86	543	75 [73]	110	110	78	< 200	110	92	< 200	54	< 50	< 200
Beryllium	7440-41-7	4	4	< 4	< 4	< 4	< 4	< 1.0	< 4 [< 4]	< 4	< 4	< 4	< 1.0	< 4	< 4	< 1.0	< 4	< 4	< 1.0
Cadmium	7440-43-9	5	5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.0	< 3.5 [< 3.5]	< 3.5	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 3.0
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	112,000	NA	NA	NA	NA	210,000	NA	NA	124,000	NA	NA	242,000
Chromium	7440-47-3	100	100	< 50	< 50	< 50	< 50	< 10	< 50 [< 50]	< 50	< 50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 10
Copper	7440-50-8	1,000	1,000	< 50	< 50	< 50	< 50	12.2	< 50 [< 50]	< 50	< 50	< 50	< 10	< 50	< 50	< 10	< 50	52	< 10
Cyanide	57-12-5	- -	- -	NA	NA	NA	NA	200	NA	NA	NA	NA	210 J	NA	NA	20 J	NA	NA	110
Iron	7439-89-6	- -	- -	NA	NA	NA	NA	2,600	NA	NA	NA	NA	10,300	NA	NA	26,800	NA	NA	42,600
Lead	7439-92-1	5	5	< 4	< 4	***5.2***	***13***	***60.7***	< 4 [< 4]	< 4	***39***	4.2	< 15	< 4	< 4	< 3.0	***5.5***	***17***	< 15
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	63,000	NA	NA	NA	NA	135,000	NA	NA	49,600	NA	NA	42,500
Manganese	7439-96-5	300	300	NA	NA	NA	NA	156	NA	NA	NA	NA	***5,290***	NA	NA	***5,070***	NA	NA	***2,330***
Mercury	7439-97-6	2	2	< 0.7	< 0.7	< 0.7	< 0.7	< 0.20	< 0.7 [< 0.7]	< 0.7	< 0.7	< 0.7	0.29	< 0.7	< 0.7	< 0.20	< 0.7	< 0.7	< 0.20
Nickel	7440-02-0	100	100	< 50	< 50	< 50	< 50	< 10	< 50 [< 50]	< 50	< 50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 10
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	< 10,000	NA	NA	NA	NA	< 10,000	NA	NA	13,300	NA	NA	< 10,000
Selenium	7782-49-2	50	50	< 40	< 40	< 40	< 40	< 10	< 40 [< 40]	< 40	< 40	< 40	< 10	< 40	< 40	< 10	< 40	< 40	< 10
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	37,000	NA	NA	NA	NA	90,300	NA	NA	54,800	NA	NA	14,600
Zinc	7440-66-6	2,000	2,000	< 50	81	< 50	< 50	54.5	< 50 [< 50]	< 50	53	< 50	25.9	< 50	< 50	< 20	< 50	150	< 20

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-16D				PCMW-17S			PCMW-17D			PCMW-18S			PCMW-18D		
Date Collected:				11/10/05	2/1/06	3/19/18	3/28/19	11/11/05	2/3/06	3/22/18	11/11/05	2/3/06	3/22/18	11/11/05	2/2/06	3/23/18	11/11/05	2/2/06	3/23/18
General Chemistry																			
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	440,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																			
Aluminum	7429-90-5	- -	- -	NA	NA	343	NA	NA	NA	1,020	NA	NA	1,170	NA	NA	< 200	NA	NA	9,320
Antimony	7440-36-0	6	6	< 6	< 6	< 6.0	NA	< 6	< 6	< 6.0	< 6	< 6	< 6.0	< 6	< 6	< 6.0	< 6	< 6	< 30
Arsenic	7440-38-2	10	10	***45***	***51***	***93.5***	NA	***12***	< 7.5	< 15	***17***	8.6	< 3.0	< 7.5	< 7.5	4.9	< 7.5	< 7.5	< 15
Barium	7440-39-3	2,000	2,000	53	< 50	< 200	NA	98	70	< 200	64	50	< 200	< 50	< 50	< 200	< 50	< 50	< 1,000
Beryllium	7440-41-7	4	4	< 4	< 4	< 1.0	NA	< 4	< 4	< 1.0	< 4	< 4	< 1.0	< 4	< 4	< 1.0	< 4	< 4	< 5.0
Cadmium	7440-43-9	5	5	< 3.5	< 3.5	< 3.0	NA	< 3.5	< 3.5	3.3	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 15
Calcium	7440-70-2	- -	- -	NA	NA	51,800	NA	NA	NA	188,000	NA	NA	58,900	NA	NA	217,000	NA	NA	48,300
Chromium	7440-47-3	100	100	< 50	< 50	< 10	NA	50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 50
Copper	7440-50-8	1,000	1,000	< 50	< 50	< 10	NA	< 50	< 50	30.6	< 50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 50
Cyanide	57-12-5	- -	- -	NA	NA	< 10 UJ	NA	NA	NA	< 10 UJ	NA	NA	< 10 UJ	NA	NA	< 10 UJ	NA	NA	12 J
Iron	7439-89-6	- -	- -	NA	NA	61,600	NA	NA	NA	22,100	NA	NA	5,830	NA	NA	2,960	NA	NA	245,000
Lead	7439-92-1	5	5	< 4	< 4	< 3.0	NA	***54***	< 4	< 15	< 4	< 4	< 3.0	< 4	< 4	< 3.0	< 4	< 4	< 15
Magnesium	7439-95-4	- -	- -	NA	NA	28,900	NA	NA	NA	34,500	NA	NA	32,000	NA	NA	77,600	NA	NA	< 25,000
Manganese	7439-96-5	300	300	NA	NA	***3,610***	NA	NA	NA	***2,120***	NA	NA	***4,750***	NA	NA	***4,430***	NA	NA	***611***
Mercury	7439-97-6	2	2	< 0.7	< 0.7	< 0.20	NA	< 0.7	< 0.7	< 0.20	< 0.7	< 0.7	< 0.20	< 0.7	< 0.7	< 0.20	< 0.7	< 0.7	< 0.60
Nickel	7440-02-0	100	100	< 50	< 50	< 10	NA	< 50	< 50	93.4	< 50	< 50	< 10	< 50	< 50	< 10	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	< 10,000	NA	NA	NA	< 10,000	NA	NA	< 10,000	NA	NA	95,000	NA	NA	< 50,000
Selenium	7782-49-2	50	50	< 40	< 40	< 10	NA	< 40	< 40	< 10	< 40	< 40	< 10	< 40	< 40	< 10	< 40	< 40	< 50
Sodium	7440-23-5	- -	- -	NA	NA	61,300	NA	NA	NA	11,100	NA	NA	50,100	NA	NA	49,100	NA	NA	58,500
Zinc	7440-66-6	2,000	2,000	< 50	< 50	< 20	NA	120	< 50	1,130	< 50	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100

Table 16
Groundwater Analytical Results – TDS and Detected Total Inorganics (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		PCMW-19S				PCMW-19D			PCMW-20S			PCMW-20D		
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/14/05	2/2/06	3/22/18	5/29/18	11/14/05	2/2/06	3/22/18	11/14/05	2/1/06	3/22/18	11/14/05	2/1/06	3/22/18
General Chemistry																
Total Dissolved Solids	ARC-TDS	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (Totals)																
Aluminum	7429-90-5	- -	- -	NA	NA	393	< 200	NA	NA	1,440 [1,130]	NA	NA	< 200	NA	NA	996
Antimony	7440-36-0	6	6	< 6	< 6	< 6.0	< 6.0	< 6	< 6	< 6.0 [< 6.0]	< 6	< 6	< 6.0	< 6	< 6	< 6.0
Arsenic	7440-38-2	10	10	***45***	***32***	***33.2***	***38.1***	***12***	***16***	***13.4 [12.8]***	***16***	< 7.5	< 3.0	***25***	***18***	***17.4***
Barium	7440-39-3	2,000	2,000	160	120	< 200	< 200	62	58	< 200 [< 200]	170	71	< 200	< 50	< 50	< 200
Beryllium	7440-41-7	4	4	< 4	< 4	< 1.0	< 1.0	< 4	< 4	< 1.0 [< 1.0]	< 4	< 4	< 1.0	< 4	< 4	< 1.0
Cadmium	7440-43-9	5	5	< 3.5	< 3.5	< 3.0	< 3.0	< 3.5	< 3.5	< 3.0 [< 3.0]	< 3.5	< 3.5	< 3.0	< 3.5	< 3.5	< 3.0
Calcium	7440-70-2	- -	- -	NA	NA	87,800	81,300	NA	NA	83,900 [81,800]	NA	NA	31,300	NA	NA	28,300
Chromium	7440-47-3	100	100	< 50	< 50	< 10	< 10	< 50	< 50	< 10 [< 10]	68	< 50	< 10	< 50	< 50	< 10
Copper	7440-50-8	1,000	1,000	< 50	< 50	< 10	< 10	< 50	< 50	< 10 [< 10]	88	< 50	< 10	< 50	< 50	< 10
Cyanide	57-12-5	- -	- -	NA	NA	< 10 UJ	NA	NA	NA	< 10 UJ [< 10 UJ]	NA	NA	< 10 UJ	NA	NA	120 J
Iron	7439-89-6	- -	- -	NA	NA	12,700	12,000	NA	NA	21,300 [20,100]	NA	NA	7,420	NA	NA	8,400
Lead	7439-92-1	5	5	***5.9***	< 4	***11.5***	***7.3***	< 4	< 4	3.5 [< 3.0]	***180***	< 4	4.0	< 4	< 4	< 3.0
Magnesium	7439-95-4	- -	- -	NA	NA	15,800	15,000	NA	NA	35,900 [34,900]	NA	NA	< 5,000	NA	NA	13,900
Manganese	7439-96-5	300	300	NA	NA	***1,300***	***1,210***	NA	NA	***5,690 [5,530]***	NA	NA	***613***	NA	NA	***641***
Mercury	7439-97-6	2	2	< 0.7	< 0.7	< 0.20	< 0.20	< 0.7	< 0.7	< 0.20 [< 0.20]	0.83	< 0.7	< 0.20	< 0.7	< 0.7	< 0.40
Nickel	7440-02-0	100	100	< 50	< 50	< 10	< 10	< 50	< 50	11.9 [11.7]	< 50	< 50	< 10	< 50	< 50	< 10
Potassium	7440-09-7	- -	- -	NA	NA	< 10,000	< 10,000	NA	NA	< 10,000 [< 10,000]	NA	NA	< 10,000	NA	NA	< 10,000
Selenium	7782-49-2	50	50	< 40	< 40	< 10	< 10	< 40	< 40	< 10 [< 10]	< 40	< 40	< 10	< 40	< 40	< 10
Sodium	7440-23-5	- -	- -	NA	NA	< 10,000	< 10,000	NA	NA	34,600 [33,400]	NA	NA	< 10,000	NA	NA	241,000
Zinc	7440-66-6	2,000	2,000	< 50	< 50	23.2	< 20	< 50	< 50	< 20 [< 20]	250	240	42.4	< 50	100	< 20

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. 2005 and 2006 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
3. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS).
4. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Total dissolved solids using American Society for Testing and Materials Method SM2540 C-11.
   - Metals using United States Environmental Protection Agency (USEPA) SW-846 Methods 200.7 (Veritech), 245.1 (Veritech), 6010 (SGS), and 7470 (SGS).
   - Total cyanide using USEPA Method 335.1 (Veritech) or 335.4 (SGS).
5. Only compounds detected in one or more samples are shown in this table.
6. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
7. NA = Not Analyzed.
8. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
9. Shading indicates an exceedance of Pennsylvania Department of Environmental Protection's (PADEP's) non-residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L).
10. Italics and bolding indicates an exceedance of PADEP's Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L.
11. - - = No PADEP MSC.
12. * indicates that the groundwater monitoring well was installed to replace the missing historical well also listed in the monitoring well ID.
13. The groundwater standards reported for cyanide are for free cyanide. The reported groundwater results are for total cyanide.
14. Brackets indicate the reported concentration of a duplicate sample.
15. Qualifier Definition:
    J = Analyte is an estimated value.
16. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	MW-107	MW-108	MW-109	MW-110	MW-111	MW-112	MW-113	PCMW-01		PCMW-02		PCMW-03	
Date Collected:				3/28/19	10/4/19	10/4/19	10/4/19	10/4/19	10/4/19	10/4/19	11/1/05	1/30/06	11/1/05	1/30/06	11/2/05	1/30/06
Antimony	7440-36-0	6	6	< 6.0	< 6.0 [< 6.0]	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6 [< 6]	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 3.0	< 3.0 [< 3.0]	< 3.0	< 3.0	8.7	4.3	< 3.0	< 7.5	< 7.5	< 7.5 [< 7.5]	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	159 J	< 200 [< 200]	< 200	< 200	< 200	< 200	< 200	75	< 50	< 50 [< 50]	< 50	66	62
Calcium	7440-70-2	- -	- -	106,000	191,000 [189,000]	144,000	179,000	69,100	122,000	104,000	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	< 50	< 50 [< 50]	< 50	< 50	< 50	< 50	< 50	NA	NA	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	621	224 [197]	1,860	2,680	208	240	7,660	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 3.0	< 3.0 [< 3.0]	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 4	< 4	< 4 [< 4]	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	43,200	83,000 [82,100]	83,700	83,700	37,300	72,800	29,700	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	***1,190***	***710 [701]***	***1,520***	***1,390***	***730***	***5,570***	***1,010***	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 10	< 10 [< 10]	< 10	< 10	< 10	< 10	< 10	< 50	< 50	< 50 [< 50]	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	8,700 J	18,500 [18,100]	17,900	16,900	20,400	< 10,000	< 10,000	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	14,300	22,000 [21,700]	38,100	33,300	110,000	33,300	13,100	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	2.0 J	< 50 [< 50]	< 50	< 50	< 50	< 50	< 50	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	< 20	< 20 [< 20]	< 20	< 20	< 20	< 20	< 20	170	< 50	< 50 [< 50]	< 50	< 50	65

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-04 11/2/05	PCMW-04 1/30/06	PCMW-05 11/2/05	PCMW-05 1/31/06	PCMW-05 3/28/19	PCMW-06 11/3/05	PCMW-06 1/31/06	PCMW-07 11/3/05	PCMW-07 1/31/06	PCMW-08S 11/3/05	PCMW-08D 11/4/05	PCMW-08D 1/31/06	PCMW-09S 11/4/05	PCMW-09S 1/31/06
Antimony	7440-36-0	6	6	< 6	< 6	< 6	< 6	< 6.0 [< 6.0]	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	< 7.5	< 7.5	< 3.0 [< 3.0]	< 7.5	< 7.5	< 7.5	< 7.5	***21***	< 7.5	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	92	99	210	160	365 [360]	140	190	< 50	< 50	< 50	200	210	58	< 50
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	76,700 [76,200]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	NA	NA	99.6 J [99.0 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	< 4	< 4	2.9 J [1.9 J]	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	9,710 [9,830]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	NA	NA	182 [186]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 50	< 50	< 50	***210***	85.5 [80.9]	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	2,880 J [2,890 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	3,790 J [3,800 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	NA	NA	NA	NA	< 50 [< 50]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	< 50	< 50	57	1,800	27.2 [28.2]	450	120	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-09D		PCMW-10S		PCMW-10D			PCMW-11S		PCMW-11D		PCMW-211	PCMW-12S		PCMW-12D	
Date Collected:				11/7/05	1/31/06	11/7/05	2/1/06	11/7/05	2/1/06	7/27/18	11/7/05	2/2/06	11/8/05	2/2/06	2/2/06	11/8/05	2/1/06	11/8/05	2/1/06
Antimony	7440-36-0	6	6	< 6	< 6	< 6	< 6	< 6	< 6	NA	***7.8***	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	NA	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	170	83	< 50	< 50	360	210	NA	51	< 50	110	130	< 50	50	< 50	< 50	62
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	NA	NA	NA	NA	4.1 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	< 4	< 4	< 4	< 4	NA	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 50	< 50	< 50	< 50	< 50	< 50	NA	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	< 50	< 50	< 50	410	< 50	66	NA	< 50	< 50	< 50	< 50	< 50	< 50	110	< 50	170

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-212	PCMW-13S		PCMW-13D		PCMW-14S		PCMW-14D		PCMW-15S			PCMW-15D		PCMW-16S	
Date Collected:				2/1/06	11/9/05	2/2/06	11/9/05	2/2/06	11/9/05	2/3/06	11/9/05	2/3/06	11/10/05	2/3/06	7/27/18	11/10/05	2/3/06	11/10/05	2/1/06
Antimony	7440-36-0	6	6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6 [< 6]	< 6	< 6	< 6	NA	< 6	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	7.9 [< 7.5]	< 7.5	< 7.5	< 7.5	NA	< 7.5	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	< 50	50	61	< 50	< 50	93	87	65 [62]	56	54	< 50	NA	65	52	< 50	< 50
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.2 J [9.0 J]	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4 [< 4]	< 4	< 4	< 4	NA	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50 [< 50]	< 50	< 50	< 50	NA	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	94	< 50	100	< 50	81	< 50	< 50	< 50 [< 50]	< 50	< 50	< 50	NA	< 50	< 50	< 50	120

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Groundwater Standards		PCMW-16D				PCMW-17S		PCMW-17D		PCMW-18S		PCMW-18D		PCMW-19S		PCMW-19D	
Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	11/10/05	2/1/06	5/30/18	3/28/19	11/11/05	2/3/06	11/11/05	2/3/06	11/11/05	2/2/06	11/11/05	2/2/06	11/14/05	2/2/06	11/14/05	2/2/06
Antimony	7440-36-0	6	6	< 6	< 6	NA	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	NA	5.8	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	< 7.5	***11***	< 7.5	< 7.5	< 7.5
Barium	7440-39-3	2,000	2,000	< 50	< 50	NA	34.6 J	< 50	52	55	< 50	< 50	< 50	< 50	< 50	110	110	< 50	< 50
Calcium	7440-70-2	- -	- -	NA	NA	NA	46,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	NA	NA	NA	2.8 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	9.1 J [18.0 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	NA	27,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	NA	< 3.0	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	24,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	NA	***3,130***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 50	< 50	NA	< 10	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	NA	2,730 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	56,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	NA	NA	NA	***4.5 J***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	< 50	< 50	NA	< 20	< 50	< 50	< 50	< 50	< 50	< 50	70	< 50	< 50	< 50	< 50	< 50

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Date Collected:	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	PCMW-20S 11/14/05	PCMW-20S 2/1/06	PCMW-20D 11/14/05	PCMW-20D 2/1/06
Antimony	7440-36-0	6	6	< 6	< 6	< 6	< 6
Arsenic	7440-38-2	10	10	< 7.5	< 7.5	***11***	7.7
Barium	7440-39-3	2,000	2,000	81	74	< 50	< 50
Calcium	7440-70-2	- -	- -	NA	NA	NA	NA
Cobalt	7440-48-4	13	35	NA	NA	NA	NA
Cyanide, free	ARC-Cnfree	200	200	NA	NA	NA	NA
Iron	7439-89-6	- -	- -	NA	NA	NA	NA
Lead	7439-92-1	5	5	< 4	< 4	< 4	< 4
Magnesium	7439-95-4	- -	- -	NA	NA	NA	NA
Manganese	7439-96-5	300	300	NA	NA	NA	NA
Nickel	7440-02-0	100	100	< 50	< 50	< 50	< 50
Potassium	7440-09-7	- -	- -	NA	NA	NA	NA
Sodium	7440-23-5	- -	- -	NA	NA	NA	NA
Vanadium	7440-62-2	2.9	8.2	NA	NA	NA	NA
Zinc	7440-66-6	2,000	2,000	61	240	< 50	100

Table 17
Groundwater Analytical Results – Detected Dissolved Inorganics & Free Cyanide (mg/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. 2005 and 2006 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey (Veritech).
3. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey (SGS), except free cyanide samples which were analyzed by TestAmerica of Amherst, New York.
4. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Dissolved metals using United States Environmental Protection Agency (USEPA) SW-846 Methods 200.7 (Veritech), 245.1 (Veritech), 6010 (SGS), and 7470 (SGS).
   - Free cyanide using USEPA Method 9016.
5. Only compounds detected in one or more samples are shown in this table.
6. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
7. NA = Not Analyzed.
8. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
9. Shading indicates an exceedance of Pennsylvania Department of Environmental Protection's (PADEP's) non-residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L).
10. Italics and bolding indicates an exceedance of PADEP's Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L.
11. - - = No PADEP MSC.
12. Brackets indicate the reported concentration of a duplicate sample.
13. Qualifier Definition:
    J = Analyte is an estimated value.
14. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 18
Groundwater Analytical Statistics for Detected Compounds

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Analyte	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	Detection Frequency	Res Exceedance Frequency	Non-Res Exceedance Frequency	Minimum Detection	Maximum Detection	Max Detection Location and Date
Volatile Organic Compounds									
1,2-Dichlorobenzene	95-50-1	600	600	1/36	0/36	0/36	0.71	0.71	PCMW-18S (3/23/18)
Acetone	67-64-1	38,000	110,000	1/103	0/103	0/103	8.6	8.6	MW-111 (10/4/19)
Benzene	71-43-2	5	5	13/103	8/103	8/103	0.2	***1,200***	PCMW-14S (2/3/06)
Chlorobenzene	108-90-7	100	100	4/103	0/103	0/103	0.28	3.7	PCMW-16D (2/1/06)
Chloroform	67-66-3	80	80	4/103	0/103	0/103	1.8	12.3	PCMW-18D (3/23/18)
cis-1,2-Dichloroethene	156-59-2	70	70	3/103	0/103	0/103	1.1	28.3	MW-5 (3/19/18)
Dichloromethane	75-09-2	5	5	7/103	0/103	0/103	1	2.7	PCMW-02 (1/30/06)
Ethylbenzene	100-41-4	700	700	4/103	0/103	0/103	0.23	24.3	MW-111 (10/4/19)
Isopropylbenzene	98-82-8	840	3,500	1/36	0/36	0/36	1.2	1.2	MW-111 (10/4/19)
m&p-Xylenes	ARC-mpXyl	- -	- -	3/103	0/103	0/103	0.59	72.9	MW-111 (10/4/19)
Methyl-tert-butylether	1634-04-4	20	20	3/36	1/36	1/36	0.8	***20.7***	MW-107 (5/30/18)
o,p-Xylene	136777-61-2	- -	- -	2/67	0/67	0/67	1.2	3.3	PCMW-17S (2/3/06)
o-Xylene	95-47-6	- -	- -	2/36	0/36	0/36	1.7	36.5	MW-111 (10/4/19)
Styrene (Monomer)	100-42-5	100	100	1/103	0/103	0/103	9.4	9.4	MW-111 (10/4/19)
Tetrachloroethene	127-18-4	5	5	5/103	1/103	1/103	1.1	***37***	PCMW-11D (11/8/05)
Toluene	108-88-3	1,000	1,000	2/103	0/103	0/103	1.3	90.4	MW-111 (10/4/19)
Total Xylenes	1330-20-7	10,000	10,000	2/36	0/36	0/36	2.3	109	MW-111 (10/4/19)
Trichloroethene	79-01-6	5	5	1/103	1/103	1/103	***6.1***	***6.1***	MW-5 (3/19/18)
Semi-Volatile Organic Compounds									
1,1-Biphenyl	92-52-4	91	430	3/36	0/36	0/36	0.35	20.7	MW-111 (10/4/19)
2,4-Dimethylphenol	105-67-9	830	2,300	4/103	0/103	0/103	1.9	241	MW-111 (10/4/19)
2,4-Dinitrotoluene	121-14-2	2.4	11	1/36	1/36	1/36	***13.3***	***13.3***	PCMW-16D (3/19/18)
2-Methylnaphthalene	91-57-6	170	470	13/103	0/103	0/103	0.72	97.8	MW-111 (10/4/19)
2-Methylphenol	95-48-7	2,100	5,800	5/103	0/103	0/103	2	177	MW-111 (10/4/19)
3-Methylphenol, 4-Methylphenol	65794-96-9	- -	- -	2/36	0/36	0/36	4.45	212	MW-111 (10/4/19)
4-Methylphenol	106-44-5	210	580	2/67	0/67	0/67	1	3.3	PCMW-06 (11/3/05)
Acenaphthene	83-32-9	2,500	3,800	37/103	0/103	0/103	0.19	87.7	MW-111 (10/4/19)
Acenaphthylene	208-96-8	2,500	7,000	8/103	0/103	0/103	0.46	80.2	MW-111 (10/4/19)
Acetophenone	98-86-2	4,200	12,000	3/36	0/36	0/36	0.25	2.1	MW-111 (10/4/19)
Anthracene	120-12-7	66	66	10/103	0/103	0/103	0.22	16.1	MW-111 (10/4/19)
Benz(a)anthracene	56-55-3	0.32	4.9	4/103	4/103	0/103	1.3	***3.6***	MW-111 (10/4/19)
Benzo(a)pyrene	50-32-8	0.2	0.2	4/103	4/103	4/103	***1.2***	***3.2***	PCMW-16S (2/1/06)
Benzo(b)fluoranthene	205-99-2	0.19	1.2	4/103	4/103	4/103	***1.7***	***4.1***	PCMW-16S (2/1/06)
Benzo(g,h,i)perylene	191-24-2	0.26	0.26	3/103	3/103	3/103	***0.95***	***1.7***	PCMW-16S (2/1/06)
Benzo(k)fluoranthene	207-08-9	0.19	0.55	3/103	3/103	2/103	***0.53***	***1.4***	PCMW-16S (2/1/06)
bis(2-Ethylhexyl)phthalate	117-81-7	6	6	6/103	1/103	1/103	1.3	***11.3***	MW-102 (5/31/18)
Butyl benzyl phthalate	85-68-7	380	1,800	1/103	0/103	0/103	1.7	1.7	MW-112 (10/4/19)
Carbazole	86-74-8	37	170	15/103	2/103	1/103	0.7	***189***	MW-111 (10/4/19)
Chrysene	218-01-9	1.9	1.9	4/103	3/103	3/103	1.1	***3.2***	MW-111 (10/4/19)
Dibenz(a,h)anthracene	53-70-3	0.055	0.6	1/103	1/103	0/103	***0.42***	***0.42***	MW-111 (10/4/19)
Dibenzofuran	132-64-9	42	120	15/103	1/103	0/103	0.44	***64.2***	MW-111 (10/4/19)

Analyte	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	Detection Frequency	Res Exceedance Frequency	Non-Res Exceedance Frequency	Minimum Detection	Maximum Detection	Max Detection Location and Date
Semi-Volatile Organic Compounds (cont'd)									
Diethyl phthalate	84-66-2	33,000	93,000	1/103	0/103	0/103	1	1	PCMW-08D (3/22/18)
Di-n-butyl phthalate	84-74-2	4,200	12,000	1/103	0/103	0/103	21	21	PCMW-15S (11/10/05)
Fluoranthene	206-44-0	260	260	16/103	0/103	0/103	0.25	22.9	MW-111 (10/4/19)
Fluorene	86-73-7	1,700	1,900	24/103	0/103	0/103	0.28	75.2	MW-111 (10/4/19)
Indeno(1,2,3-cd)pyrene	193-39-5	0.19	2.8	3/103	3/103	0/103	***0.74***	***1.5***	PCMW-16S (2/1/06)
Naphthalene	91-20-3	100	100	18/103	1/103	1/103	1.2	***973***	MW-111 (10/4/19)
Phenanthrene	85-01-8	1,100	1,100	21/103	0/103	0/103	0.2	136	MW-111 (10/4/19)
Phenol	108-95-2	2,000	2,000	8/103	0/103	0/103	1.2	80.2	MW-111 (10/4/19)
Pyrene	129-00-0	130	130	14/103	0/103	0/103	0.22	15.5	MW-111 (10/4/19)
Pesticides									
4,4-DDT	50-29-3	2.1	5.5	5/97	0/97	0/97	0.066	0.17	PCMW-11D (11/8/05)
Dieldrin	60-57-1	0.046	0.21	2/97	0/97	0/97	0.038	0.046	PCMW-17D (3/22/18)
trans-chlordane	5103-74-2	- -	- -	1/30	0/30	0/30	0.0045	0.0045	PCMW-04 (3/19/18)
Polychlorinated Biphenyls									
Aroclor 1268	11100-14-4	- -	- -	0/28	0/28	0/28	ND	ND	ND
Metals (Totals)									
Aluminum	7429-90-5	- -	- -	18/42	0/42	0/42	209	9,320	PCMW-18D (3/23/18)
Antimony	7440-36-0	6	6	5/109	3/109	3/109	6	***9.9***	PCMW-08S (3/22/18)
Arsenic	7440-38-2	10	10	51/109	28/109	28/109	3.2	***160***	PCMW-08S (11/3/05)
Barium	7440-39-3	2,000	2,000	59/109	0/109	0/109	50	1,100	PCMW-09D (1/31/06)
Beryllium	7440-41-7	4	4	1/109	1/109	1/109	***5.1***	***5.1***	PCMW-09D (1/31/06)
Cadmium	7440-43-9	5	5	2/109	0/109	0/109	3.3	4.5	PCMW-08S (11/3/05)
Calcium	7440-70-2	- -	- -	42/42	0/42	0/42	28,300	299,000	PCMW-10S (3/22/18)
Chromium	7440-47-3	100	100	3/109	0/109	0/109	46.8	68	PCMW-20S (11/14/05)
Copper	7440-50-8	1,000	1,000	15/109	0/109	0/109	12.2	88	PCMW-20S (11/14/05)
Cyanide	57-12-5	- -	- -	17/36	0/36	0/36	10	670	MW-104 (5/30/18)
Iron	7439-89-6	- -	- -	42/42	0/42	0/42	163	245,000	PCMW-18D (3/23/18)
Lead	7439-92-1	5	5	45/109	38/109	38/109	3	***206***	MW-107 (5/30/18)
Magnesium	7439-95-4	- -	- -	40/42	0/42	0/42	8,070	165,000	PCMW-10S (3/22/18)
Manganese	7439-96-5	300	300	42/42	36/42	36/42	41.7	***7,650***	PCMW-10D (3/22/18)
Mercury	7439-97-6	2	2	3/109	0/109	0/109	0.29	0.83	PCMW-20S (11/14/05)
Nickel	7440-02-0	100	100	9/109	3/109	3/109	11.3	***524***	PCMW-05 (5/30/18)
Potassium	7440-09-7	- -	- -	16/42	0/42	0/42	11,800	95,000	PCMW-18S (3/23/18)
Selenium	7782-49-2	50	50	2/109	0/109	0/109	11.3	11.9	PCMW-08S (3/22/18)
Sodium	7440-23-5	- -	- -	30/42	0/42	0/42	11,100	241,000	PCMW-20D (3/22/18)
Zinc	7440-66-6	2,000	2,000	42/109	3/109	3/109	23.2	***2,690***	PCMW-05 (3/23/18)
Metals (Dissolved)									
Antimony	7440-36-0	6	6	1/76	1/76	1/76	***7.8***	***7.8***	PCMW-11S (11/7/05)
Arsenic	7440-38-2	10	10	8/76	3/76	3/76	4.3	***21***	PCMW-08S (11/3/05)
Barium	7440-39-3	2,000	2,000	39/76	0/76	0/76	34.6	362.5	PCMW-05 (3/28/19)
Calcium	7440-70-2	- -	- -	9/9	0/9	0/9	46,700	190,000	MW-108 (10/4/19)
Cobalt	7440-48-4	13	35	1/9	0/9	0/9	2.8	2.8	PCMW-16D (3/28/19)

Table 18
Groundwater Analytical Statistics for Detected Compounds

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Analyte	CAS Number	Groundwater Standards: Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Groundwater Standards: Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)	Detection Frequency	Res Exceedance Frequency	Non-Res Exceedance Frequency	Minimum Detection	Maximum Detection	Max Detection Location and Date
Metals (Dissolved) (cont'd)									
Cyanide, Free	ARC-Cnfree	200	200	3/3	0/3	0/3	4.1	13.55	PCMW-16D (3/28/19)
Iron	7439-89-6	- -	- -	9/9	0/9	0/9	99.3	27,100	PCMW-16D (3/28/19)
Lead	7439-92-1	5	5	1/76	0/76	0/76	2.4	2.4	PCMW-05 (3/28/19)
Magnesium	7439-95-4	- -	- -	9/9	0/9	0/9	9,770	83,700	MW-109 (10/4/19), MW-110 (10/4/19)
Manganese	7439-96-5	300	300	9/9	8/9	8/9	184	***5,570***	MW-112 (10/4/19)
Nickel	7440-02-0	100	100	2/76	1/76	1/76	83.2	***210***	PCMW-05 (1/31/06)
Potassium	7440-09-7	- -	- -	7/9	0/9	0/9	2,730	20,400	MW-111 (10/4/19)
Sodium	7440-23-5	- -	- -	9/9	0/9	0/9	3,795	110,000	MW-111 (10/4/19)
Vanadium	7440-62-2	2.9	8.2	2/9	1/9	0/9	2	***4.5***	PCMW-16D (3/28/19)
Zinc	7440-66-6	2,000	2,000	19/76	0/76	0/76	27.7	1,800	PCMW-05 (1/31/06)
General Chemistry									
Total Dissolved Solids	ARC-TDS	- -	- -	5/5	0/5	0/5	440,000	912,000	MW-108 (10/4/19)

Notes:

1. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
   - Pesticides using USEPA SW-846 Method 8081.
   - Polychlorinated biphenyls (PCBs) using USEPA SW-846 Method 8082.
   - Metals using USEPA SW-846 Methods 200.7, 245.1, 6010, and 7470. Dissolved metals were analyzed using the same methodology but were filtered prior to analysis.
   - Total cyanide using USEPA Method 335.1 or 335.4.
   - Free cyanide using USEPA SW-846 Method 9016.
   - Total dissolved solids using American Society for Testing and Materials Method SM2540 C-11.
2. Only compounds detected in one or more samples are shown in this table.
3. For purposes of this statistical analysis, field duplicate results are averaged with their parent sample and the average is counted as one sample. If the resulting average is a minimum or maximum concentration, it is reported as such. If either the parent or duplicate result is non-detect while the other is detected, only the detected concentration is used.
4. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
5. Shading indicates an exceedance of Pennsylvania Department of Environmental Protection's (PADEP's) non-residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L).
6. Italics and bolding indicates an exceedance of PADEP's Residential MSCs for Used Aquifers containing TDS ≤ 2,500 mg/L.
7. - - = No PADEP MSC.
8. ND = Not detected.
9. The groundwater standards reported for cyanide are for free cyanide.
10. Hydropunch results have not been included in this table.
11. Data qualifiers are not presented in this table.
12. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 19
Historical Soil Vapor Sampling Results for Detected Constituents

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National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Soil Vapor Screening Values		Ambient	PCSV-01	PCSV-02	PCSV-03	PCSV-04	PCSV-05	PCSV-06	PCSV-07	PCSV-08	PCSV-09	PCSV-10
Sample Depth(ft):		Residential SV_{SS} (Exceedances Bolded & Italicized)	Nonresidential SV_{SS} (No Exceedances)		5	4.5	2	1.5	2	4.5	2	3	3.5	3
Date Collected:	CAS Number			12/1/2006	1/6/2006	1/6/2006	1/9/2006	1/9/2006	1/9/2006	1/6/2006	1/9/2006	1/6/2006	1/6/2006	1/6/2006
Detected SG1 Target List Analytical Parameters (ug/m3)														
1,1,1-Trichloroethane	71-55-6	20,000	2,800,000	19	< 4.5	< 4.5	< 4.6	< 4.5	< 4.6	< 4.6	< 4.4	< 4.7	< 4.4 [< 4.5]	< 4.5
1,2,4-Trimethylbenzene	95-63-6	280	3,900	< 4	< 4	< 4	< 4.1	< 4	< 4.1	< 4.1	< 4	< 4.2	7.6 [5.6]	< 4
1,3,5-Trimethylbenzene	108-67-8	280	3,900	< 4	< 4	< 4	< 4.1	< 4	< 4.1	< 4.1	< 4	< 4.2	5.8 [4.8]	< 4
1,4-Dioxane	123-91-1	120	2,000	< 12	< 12	< 12	< 12	< 12	< 12	< 12	< 12	< 12	< 12 [< 12]	< 12
2-Butanone (MEK)	78-93-3	20,000	2,800,000	< 2.4	< 2.4	< 2.4	< 2.5	3.1	< 2.5	< 2.5	< 2.4	2.9	15 [14]	3.1
4-Methyl-2-Pentanone	108-10-1	120,000	1,700,000	< 3.3	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.3	< 3.5	< 3.3 [< 3.4]	< 3.4
Acetone	67-64-1	1,200,000	17,000,000	13	< 7.8	< 7.8	8.8	15	< 8	< 8	24	18	140 [130]	21
Benzene	71-43-2	120	2,000	< 2.6	< 2.6	< 2.6	3.9	10	4.1	< 2.7	< 2.6	5.4	< 2.6 [< 2.6]	< 2.6
Carbon Disulfide	75-15-0	28,000	390,000	< 2.5	< 2.6	< 2.6	54	690	< 2.6	< 2.6	< 2.5	18	< 2.5 [< 2.6]	< 2.6
Chloroform	67-66-3	41	680	< 3.9	< 4	< 4	< 4.1	< 4	< 4.1	< 4.1	< 3.9	< 4.2	< 3.9 [< 4]	< 4
cis-1,2-Dichloroethene	156-59-2	- -	- -	< 3.2	< 3.2	< 3.2	< 3.3	< 3.2	< 3.3	< 3.3	< 3.2	< 3.4	< 3.2 [< 3.2]	< 3.2
Dichloromethane	75-09-2	24,000	340,000	< 2.8	< 2.8	< 2.8	< 2.9	< 2.8	< 2.9	< 2.9	< 2.8	< 3	< 2.8 [< 2.8]	< 2.8
Ethylbenzene	100-41-4	370	6,300	< 3.5	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.5	< 3.7	< 3.5 [< 3.6]	< 3.6
Hexane	110-54-3	28,000	390,000	< 2.8	< 2.9	< 2.9	3.2	< 2.9	< 3	< 3	< 2.8	< 3	< 2.8 [< 2.9]	< 2.9
Methyl-tert-butylether	1634-04-4	3,600	61,000	< 2.9	< 3J	< 3J	< 3	< 3	< 3	< 3J	22	< 3.1J	21 J [19 J]	< 3J
N-Propylbenzene	103-65-1	40,000	560,000	< 4	< 4	< 4	< 4.1	< 4	< 4.1	< 4.1	< 4	< 4.2	< 4 [< 4]	< 4
Tetrachloroethene	127-18-4	1,600	22,000	< 5.5	240	< 5.6	< 5.7	< 5.6	< 5.7	< 5.7	< 5.5	< 5.8	< 5.5 [< 5.6]	5.8
Toluene	108-88-3	200,000	2,800,000	7.5	< 3.1	< 3.1	4.3	3.2	< 3.2	< 3.2	8.6	< 3.2	< 3 [< 3.1]	< 3.1
Trichloroethene	79-01-6	80	1,100	< 4.3	< 4.4	< 4.4	< 4.5	< 4.4	< 4.5	< 4.5	< 4.3	< 4.6	< 4.3 [< 4.4]	< 4.4
Detected SG2 Target List Analytical Parameters (ppbv)														
4-Bromofluorobenzene	460-00-4	- -	- -	25	23	24	25	25	25	22	25	23	25 [23]	23
4-Ethyltoluene	622-96-8	- -	- -	< 4	< 4	< 4	< 4.1	< 4	< 4.1	< 4.1	10	< 4.2	7.3 [5.8]	< 4
Carbon Dioxide	124-38-9	- -	- -	0.041	5.2	2.1	1.4	0.81	1.1	4.9	1.1	2.9	0.25 [0.24]	0.58
CFC-11	75-69-4	28,000	390,000	4.7	400	< 4.6	< 4.7	< 4.6	< 4.7	17	6.9	< 4.8	< 4.5 [< 4.6]	11
CFC-12	75-71-8	4,000	56,000	< 4	18	< 4	< 4.2	< 4	< 4.2	< 4.2	< 4	< 4.2	< 4 [< 4]	4.1
Cyclohexane	110-82-7	240,000	3,400,000	< 2.8	< 2.8	< 2.8	10	< 2.8	< 2.9	< 2.9	< 2.8	< 2.9	< 2.8 [< 2.8]	< 2.8
Ethanol	64-17-5	- -	- -	11	< 6.2	< 6.2	< 6.3	< 6.2	< 6.3	< 6.3	< 6.1	< 6.4	7.3 [6.5]	< 6.2
Isopropyl alcohol	67-63-0	- -	- -	< 7.9	< 8.1	< 8.1	< 8.2	< 8.1	< 8.2	< 8.2	< 7.9	< 8.4	< 7.9 [< 8.1]	< 8.1
m&p-Xylenes	ARC-mpXyl	- -	- -	< 3.5	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	10	< 3.7	< 3.5 [< 3.6]	< 3.6
Methane	74-82-8	- -	- -	0.0002	< 0.00016	< 0.00016	< 0.00017	0.0002	< 0.00017	< 0.00017	0.0058	0.00023	0.00022 [0.00021]	0.0002
Methyl N-Butyl Ketone	591-78-6	1,200	17,000	< 13	< 13	< 13	< 14	< 13	< 14	< 14	< 13	< 14	< 13 [< 13]	< 13
N-Heptane	142-82-5	- -	- -	< 3.3	< 3.4	< 3.4	3.8	< 3.4	< 3.4	< 3.4	< 3.3	< 3.5	< 3.3 [< 3.4]	< 3.4
Nitrogen	7727-37-9	- -	- -	79	83	79	83	83	78	88	80	84	78 [78]	78
o,p-Xylene	136777-61-2	- -	- -	< 3.5	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	4.4	< 3.7	< 3.5 [< 3.6]	< 3.6
Oxygen	7782-44-7	- -	- -	21	12	19	16	16	21	7	19	13	22 [22]	21
Tetrahydrofuran	109-99-9	480	8,100	<2.4	<2.4	<2.4	<2.5	<2.4	<2.5	<2.5	3.1	<2.5	2.8 [2.5]	<2.4

Table 19
Historical Soil Vapor Sampling Results for Detected Constituents

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Location ID:		Soil Vapor Screening Values		PCSV-11	PCSV-12	PCSV-13	PCSV-14	PCSV-15	PCSV-16	PCSV-17	PCSV-18	PCSV-20	PCSV-21	PCSV-22
Sample Depth(ft):	CAS	Residential SV_{SS} (Exceedances Bolded & Italicized)	Nonresidential SV_{SS} (No Exceedances)	3	3	3	3	3	1	2	1	1	1	1
Date Collected:	Number			1/9/2006	1/9/2006	1/10/2006	1/10/2006	1/11/2006	1/12/2006	1/11/2006	1/12/2006	1/12/2006	1/12/2006	1/12/2006
Detected SG1 Target List Analytical Parameters (ug/m3)														
1,1,1-Trichloroethane	71-55-6	20,000	2,800,000	< 4.6	< 4.6	< 4.3	< 30	< 4.2	< 4.9	< 4.3	< 4.5	< 4.7	< 4.5	< 4.7 [< 4.3]
1,2,4-Trimethylbenzene	95-63-6	280	3,900	52	< 4.1	11	< 28	< 3.8	21	< 3.9	< 4	< 4.2	< 4	< 4.2 [< 3.9]
1,3,5-Trimethylbenzene	108-67-8	280	3,900	15	4.4	8.3	< 28	< 3.8	19	< 3.9	< 4	< 4.2	< 4	< 4.2 [< 3.9]
1,4-Dioxane	123-91-1	120	2,000	***440***	< 12	< 11	< 81	< 11	< 13	< 11	< 12	< 12	< 12	< 12 [< 11]
2-Butanone (MEK)	78-93-3	20,000	2,800,000	360	3.4	< 2.3	< 16	< 2.3	< 2.6	11	< 2.4	< 2.5	< 2.4	< 2.5 [< 2.3]
4-Methyl-2-Pentanone	108-10-1	120,000	1,700,000	410	< 3.4	< 3.2	< 23	< 3.2	< 3.7	< 3.2	< 3.4	< 3.5	< 3.4	< 3.5 [< 3.2]
Acetone	67-64-1	1,200,000	17,000,000	210	18	7.7	< 53	< 7.4	< 8.5	53	11	< 8.1	< 7.8	< 8.1 [< 7.5]
Benzene	71-43-2	120	2,000	8.9	8.3	< 2.5	< 18	< 2.5	< 2.8	< 2.5	< 2.6	< 2.7	< 2.6	< 2.7 [< 2.5]
Carbon Disulfide	75-15-0	28,000	390,000	12	32	< 2.5	19	< 2.4	< 2.8	4	21	< 2.7	< 2.6	4 [3.4]
Chloroform	67-66-3	41	680	8.1	< 4.1	< 3.8	< 27	< 3.8	< 4.4	< 3.8	< 4	< 4.2	< 4	< 4.2 [< 3.8]
cis-1,2-Dichloroethene	156-59-2	- -	- -	3.3	< 3.3	< 3.1	< 22	< 3.1	< 3.5	< 3.1	< 3.2	< 3.4	< 3.2	< 3.4 [< 3.1]
Dichloromethane	75-09-2	24,000	340,000	< 2.9	< 2.9	< 2.7	< 19	< 2.7	< 3.1	< 2.7	< 2.8	< 3	< 2.8	7.9 [5.7]
Ethylbenzene	100-41-4	370	6,300	21	< 3.6	< 3.4	< 24	< 3.4	4.5	< 3.4	< 3.6	< 3.7	< 3.6	< 3.7 [< 3.4]
Hexane	110-54-3	28,000	390,000	< 3	< 3	< 2.8	< 20	< 2.7	< 3.2	< 2.8	< 2.9	< 3	< 2.9	< 3 [< 2.8]
Methyl-tert-butylether	1634-04-4	3,600	61,000	< 3	5	17	< 20	< 2.8	16	5.5	5.6	< 3.1	5.6	6.5 [6.1]
N-Propylbenzene	103-65-1	40,000	560,000	5.3	< 4.1	< 3.9	< 28	< 3.8	< 4.4	< 3.9	< 4	< 4.2	< 4	< 4.2 [< 3.9]
Tetrachloroethene	127-18-4	1,600	22,000	46	< 5.7	< 5.4	< 38	6.7	< 6.1	< 5.4	< 5.6	< 5.8	< 5.6	< 5.8 [< 5.4]
Toluene	108-88-3	200,000	2,800,000	67	4.6	5.5	< 21	7.8	13	< 3	< 3.1	< 3.2	< 3.1	< 3.2 [< 3]
Trichloroethene	79-01-6	80	1,100	< 4.5	< 4.5	< 4.2	< 30	4.6	< 4.8	< 4.2	< 4.4	< 4.6	< 4.4	< 4.6 [< 4.2]
Detected SG2 Target List Analytical Parameters (ppbv)														
4-Bromofluorobenzene	460-00-4	- -	- -	25	25	25	25	25	25	25	24	25	26	25 [26]
4-Ethyltoluene	622-96-8	- -	- -	24	< 4.1	12	< 28	< 3.8	28	< 3.9	< 4	< 4.2	< 4	< 4.2 [< 3.9]
Carbon Dioxide	124-38-9	- -	- -	2.6	1.6	0.16	0.15	3.7	0.4	0.052	0.25	1	0.1	0.79 [0.79]
CFC-11	75-69-4	28,000	390,000	< 4.7	< 4.7	< 4.4	8,000	22	< 5	< 4.4	< 4.6	< 4.8	< 4.6	65 [70]
CFC-12	75-71-8	4,000	56,000	< 4.2	< 4.2	< 3.9	< 28	< 3.8	< 4.4	< 3.9	< 4	< 4.2	< 4	4.4 [4.6]
Cyclohexane	110-82-7	240,000	3,400,000	8.2	8.6	< 2.7	< 19	< 2.7	< 3.1	< 2.7	< 2.8	< 2.9	< 2.8	< 2.9 [< 2.7]
Ethanol	64-17-5	- -	- -	9.3	< 6.3	< 6	< 42	< 5.8	< 6.7	< 6	< 6.2	< 6.4	< 6.2	< 6.4 [< 6]
Isopropyl alcohol	67-63-0	- -	- -	28	< 8.2	< 7.8	< 55	< 7.6	< 8.8	< 7.8	< 8.1	< 8.4	< 8.1	< 8.4 [< 7.8]
m&p-Xylenes	ARC-mpXyl	- -	- -	120	5.5	8.4	< 24	< 3.4	20	< 3.4	< 3.6	< 3.7	< 3.6	< 3.7 [< 3.4]
Methane	74-82-8	- -	- -	< 0.00017	0.00054	< 0.00016	0.00089	< 0.00016	< 0.00018	< 0.00016	0.00019	< 0.00017	0.00017	0.014 [0.015]
Methyl N-Butyl Ketone	591-78-6	1,200	17,000	29	< 14	< 13	< 92	< 13	< 15	< 13	< 13	< 14	< 13	< 14 [< 13]
N-Heptane	142-82-5	- -	- -	< 3.4	< 3.4	< 3.2	< 23	< 3.2	< 3.7	< 3.2	< 3.4	< 3.5	< 3.4	< 3.5 [< 3.2]
Nitrogen	7727-37-9	- -	- -	80	85	79	91	82	80	80	79	80	86	79 [80]
o,p-Xylene	136777-61-2	- -	- -	58	< 3.6	3.9	< 24	< 3.4	10	< 3.4	< 3.6	< 3.7	< 3.6	< 3.7 [< 3.4]
Oxygen	7782-44-7	- -	- -	17	13	21	8.6	14	20	20	21	19	14	20 [19]
Tetrahydrofuran	109-99-9	480	8,100	29	<2.5	<2.3	<16	<2.3	<2.6	<2.3	<2.4	<2.5	<2.4	<2.5 [<2.3]

Table 19
Historical Soil Vapor Sampling Results for Detected Constituents

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Notes:

1. Samples were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated.
2. Soil samples were analyzed by Air Toxics LTD, located in Folsom, California for the following:
   - Volatile organic compounds and naphthalene using the Modified EPA Compendium Method TO-15 and GC/MS in the full scan mode.
   - Methane and fixed gases using modified ASTM Method D-1946 and GC/FID or GC/TCD.
3. Only compounds detected in one or more samples are shown in this table.
4. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
5. Concentrations reported in micrograms per cubic meter (ug/m^3) or part per billion by volume (ppbv).
6. Soil vapor screening values for residential and non-residential, sub-slab, soil gas (SV_{SS}) obtained from the Pennsylvania Department of Environmental Protection (PADEP) Land Recycling Program Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2, published on November 19, 2016 and effective January 18, 2017.
7. No result exceed the non-residential SV_{SS} screening value.
8. Italics and bolding indicates that the result exceeds the residential SVSS screening value.
9. Brackets indicate the reported concentration of a duplicate sample.
10. - - = No soil vapor screening value.
11. Data have not been validated.

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

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Location ID:		Res VI Standard (Exceedances Bolded & Italicized)	Non-Res VI Standard (Exceedances Shaded)	MW-103	MW-108		PCSB-17	PCSB-26	PCSB-26R	PCSB-27		PCSB-28	PCSB-29
Sample Depth (ft):				6-7	5-7	10-12	4	0.5	0.5-2	0.5	1.5	0.5	0.5
Date Collected:	CAS Number			5/16/18	9/24/19	9/24/19	3/17/05	7/26/05	4/19/19	7/26/05	7/26/05	7/26/05	7/26/05
Volatile Organic Compounds													
Acetone	67-64-1	430	4,700	0.0380 J	< 85	0.0163 J	0.048	0.034	0.0087 J	< 0.013	< 0.006	< 0.013	< 0.0059
Benzene	71-43-2	0.13	0.13	< 0.00051	***9.98***	< 0.0012	***0.17***	< 0.00083	< 0.00058	< 0.0013	< 0.00058	< 0.0012	< 0.00057
2-Butanone (MEK)	78-93-3	76	1,100	< 0.01	< 85	< 0.024	< 0.0013	< 0.0013	< 0.012	< 0.002	< 0.00089	< 0.0019	< 0.00087
Carbon Disulfide	75-15-0	130	530	< 0.0020	8.42 J	< 0.0047	0.0019	< 0.0011	< 0.0023	< 0.0016	< 0.00074	< 0.0015	< 0.00072
Carbon Tetrachloride	56-23-5	0.26	0.26	< 0.0020	< 17	< 0.0047	< 0.0014	< 0.0014	< 0.0023	< 0.0021	< 0.00096	< 0.002	< 0.00094
Chlorobenzene	108-90-7	6.1	6.1	< 0.0020	< 17	< 0.0047 UJ	< 0.00081	< 0.00082	< 0.0023	< 0.0013	< 0.00057	< 0.0012	< 0.00056
Chloroform	67-66-3	2	2	< 0.0020	< 17	< 0.0047	< 0.00073	< 0.00074	< 0.0023	< 0.0011	< 0.00052	< 0.0011	< 0.0005
Cyclohexane	110-82-7	1,700	6,900	< 0.0020	< 17	0.0054	NA	NA	< 0.0023	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	10	< 0.0010	< 8.5	R	NA	NA	< 0.0012	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	3.9	< 0.0010	< 8.5	< 0.0024	< 0.0012	< 0.0012	< 0.0012	< 0.0019	< 0.00086	< 0.0018	< 0.00084
Dichloromethane	75-09-2	0.076	1.5	0.0035 J	< 43	< 0.012	0.014 B	0.018 B	< 0.0058	0.021 B	0.013 B	0.017 B	0.013 B
Ethylbenzene	100-41-4	46	46	< 0.0010	< 8.5	< 0.0024 UJ	0.0092	< 0.0012	< 0.0012	< 0.0019	< 0.00085	< 0.0018	< 0.00083
Isopropylbenzene	98-82-8	600	2,500	< 0.0020	< 17	< 0.0047	NA	NA	< 0.0023	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	1.4	< 0.0010	< 8.5	< 0.0024	NA	NA	< 0.0012	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	79	< 0.0020	< 17	< 0.0047 UJ	< 0.001	< 0.001	< 0.0023	< 0.0016	< 0.0007	< 0.0015	< 0.00069
Toluene	108-88-3	44	44	< 0.0010	12.5	< 0.0024 UJ	0.16	< 0.0012	< 0.0012	< 0.0019	< 0.00086	< 0.0018	< 0.00084
1,2,4-Trichlorobenzene	120-82-1	27	27	< 0.0051	< 43	< 0.012	NA	NA	< 0.0058	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	7.4	< 0.0020	< 17	< 0.0047	< 0.0004	< 0.0004	< 0.0023	< 0.00063	< 0.00028	< 0.00059	< 0.00028
Total Xylenes	1330-20-7	990	990	< 0.0010	51.3	0.0040 J	NA	NA	< 0.0012	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	190	0.0223 J	***310 D***	0.0439 J	NA	NA	< 0.077	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	1,900	0.0604	***1,610 D***	0.27	250	0.12	< 0.038	0.73	< 0.065	0.78	0.072
Naphthalene	91-20-3	25	25	0.189	***8,500 D***	1.06	***1,200***	0.16	< 0.038	1.2	< 0.0037	0.69	0.054
Phenol	108-95-2	380	7,900	< 0.081	24.8	< 0.09	< 16	< 0.058	< 0.077	< 0.3	< 0.063	< 0.06	< 0.061

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PCSB-30		PCSB-30R	PCSB-31	PCSB-32		PCSB-33	PCSB-34	PCSB-35	PCSB-36	PCSB-37	PCSB-38
Sample Depth (ft):			0.5	2	0.5-2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Date Collected:			7/26/05	7/26/05	4/19/19	7/28/05	7/28/05	8/1/05	7/28/05	7/27/05	8/2/05	7/27/05	8/3/05	7/27/05
Volatile Organic Compounds														
Acetone	67-64-1	430	< 0.006	< 0.008	0.0252	< 0.0074	NA	< 0.0072	< 0.0066	< 0.0064	0.018	< 0.0062	< 0.0059	< 0.0065
Benzene	71-43-2	0.13	< 0.00057	< 0.00077	< 0.00092	< 0.00071	NA	< 0.00069	< 0.00064	< 0.00061	< 0.00053	< 0.00059	< 0.00057	< 0.00062
2-Butanone (MEK)	78-93-3	76	< 0.00088	< 0.0012	< 0.018	< 0.0011	NA	< 0.0011	< 0.00097	< 0.00094	< 0.00081	< 0.00091	< 0.00087	< 0.00095
Carbon Disulfide	75-15-0	130	< 0.00073	< 0.00098	< 0.0037 UJ	< 0.0009	NA	< 0.00088	< 0.00081	< 0.00078	< 0.00068	< 0.00076	< 0.00072	< 0.00079
Carbon Tetrachloride	56-23-5	0.26	< 0.00095	< 0.0013	< 0.0037	< 0.0012	NA	< 0.0011	< 0.0011	< 0.001	< 0.00088	< 0.00099	< 0.00094	< 0.001
Chlorobenzene	108-90-7	6.1	< 0.00056	< 0.00076	< 0.0037	< 0.0007	NA	< 0.00068	< 0.00063	< 0.00061	< 0.00052	< 0.00058	< 0.00056	< 0.00061
Chloroform	67-66-3	2	< 0.00051	< 0.00069	< 0.0037	< 0.00063	NA	< 0.00061	< 0.00057	< 0.00055	< 0.00047	< 0.00053	< 0.0005	< 0.00055
Cyclohexane	110-82-7	1,700	NA	NA	< 0.0037	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	NA	NA	< 0.0018 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.00085	< 0.0011	< 0.0018	< 0.0011	NA	< 0.001	< 0.00095	< 0.00091	< 0.00079	< 0.00088	< 0.00084	< 0.00092
Dichloromethane	75-09-2	0.076	0.0058 B	0.017 B	< 0.0092	0.038 B	NA	0.021 B	0.028 B	0.0093 B	0.011 B	0.0067 B	0.0023 B	0.009 B
Ethylbenzene	100-41-4	46	< 0.00084	< 0.0011	< 0.0018	< 0.001	NA	< 0.001	< 0.00093	< 0.0009	< 0.00078	< 0.00087	< 0.00083	< 0.00091
Isopropylbenzene	98-82-8	600	NA	NA	< 0.0037	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	< 0.0018	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.0007	< 0.00094	< 0.0037	< 0.00086	NA	< 0.00084	< 0.00078	< 0.00075	< 0.00065	< 0.00072	< 0.00069	< 0.00076
Toluene	108-88-3	44	< 0.00085	< 0.0011	< 0.0018	< 0.001	NA	< 0.001	< 0.00094	< 0.00091	< 0.00079	< 0.00088	< 0.00084	< 0.00092
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	< 0.0092	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.00028	< 0.00038	< 0.0037	< 0.00035	NA	< 0.00034	< 0.00031	< 0.0003	< 0.00026	< 0.00029	< 0.00028	< 0.0003
Total Xylenes	1330-20-7	990	NA	NA	< 0.0018	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	40	NA	NA	< 0.089	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.36	< 0.086	< 0.045	< 0.079	< 0.076	NA	0.14	0.74	0.11 J	1.3	3.8	0.13
Naphthalene	91-20-3	25	0.42	< 0.0049	< 0.045	< 0.0045	< 0.0043	NA	0.067	1	< 0.024	1.8	2.1	0.13
Phenol	108-95-2	380	< 0.057	< 0.083	< 0.089	< 0.077	< 0.073	NA	< 0.069	< 0.31	< 0.16	< 0.3	< 0.17	< 0.067

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PCSB-39 0.5 7/27/05	PCSB-40 0.5 7/28/05	PCSB-41 0.5 7/28/05	PCSB-41R 0.5-2 4/22/19	PCSB-42 0.5 8/1/05	PCSB-43 0.5 8/1/05	PCSB-44 0.5 8/3/05	PCSB-45 0.5 8/3/05	PCSB-46 0.5 7/27/05	PCSB-46 4 7/27/05
Volatile Organic Compounds												
Acetone	67-64-1	430	< 0.0069	< 0.0071	< 0.0058	< 1.4	< 0.0055 [< 0.0056]	< 0.0056	0.028	0.036 [0.022]	< 0.006	< 0.006
Benzene	71-43-2	0.13	< 0.00066	< 0.00068	< 0.00055	***6.32***	< 0.00053 [< 0.00054]	< 0.00054	< 0.00053	< 0.00054 [< 0.00054]	< 0.00058	< 0.00057
2-Butanone (MEK)	78-93-3	76	< 0.001	< 0.001	< 0.00085	< 1.4	< 0.0008 [< 0.00082]	< 0.00083	< 0.00081	< 0.00082 [< 0.00083]	< 0.00089	< 0.00088
Carbon Disulfide	75-15-0	130	< 0.00084	< 0.00087	< 0.00071	< 0.28	< 0.00067 [< 0.00068]	< 0.00069	< 0.00068	< 0.00068 [< 0.00069]	< 0.00074	< 0.00073
Carbon Tetrachloride	56-23-5	0.26	< 0.0011	< 0.0011	< 0.00092	< 0.28	< 0.00087 [< 0.00089]	< 0.0009	< 0.00088	< 0.00089 [< 0.0009]	< 0.00096	< 0.00095
Chlorobenzene	108-90-7	6.1	< 0.00065	< 0.00067	< 0.00055	< 0.28	< 0.00052 [< 0.00053]	< 0.00053	< 0.00052	< 0.00053 [< 0.00053]	< 0.00057	< 0.00056
Chloroform	67-66-3	2	< 0.00059	< 0.0006	< 0.00049	< 0.28	< 0.00047 [< 0.00048]	< 0.00048	< 0.00047	< 0.00048 [< 0.00048]	< 0.00052	< 0.00051
Cyclohexane	110-82-7	1,700	NA	NA	NA	4.89	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	< 0.14	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.00098	< 0.001	< 0.00082	< 0.14	< 0.00078 [< 0.0008]	< 0.00081	< 0.00079	< 0.0008 [< 0.00081]	< 0.00086	< 0.00085
Dichloromethane	75-09-2	0.076	0.018 B	0.036 B	0.011 B	< 0.7	0.014 B [0.014 B]	0.014 B	0.01 B	0.012 B [0.009 B]	0.015 B	0.014 B
Ethylbenzene	100-41-4	46	< 0.00097	< 0.00099	< 0.00081	12.3	< 0.00077 [< 0.00079]	< 0.00079	< 0.00078	< 0.00079 [< 0.00079]	< 0.00085	< 0.00084
Isopropylbenzene	98-82-8	600	NA	NA	NA	0.943	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	< 0.14	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.00081	< 0.00083	< 0.00067	< 0.28	< 0.00064 [< 0.00065]	< 0.00066	< 0.00065	< 0.00065 [< 0.00066]	< 0.0007	< 0.0007
Toluene	108-88-3	44	< 0.00098	< 0.001	< 0.00082	***53.4 D***	< 0.00078 [< 0.00079]	< 0.0008	< 0.00079	< 0.00079 [< 0.0008]	< 0.00086	< 0.00085
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	< 0.7	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.00032	< 0.00033	< 0.00027	< 0.28	< 0.00026 [< 0.00026]	< 0.00026	< 0.00026	< 0.00026 [< 0.00026]	< 0.00028	< 0.00028
Total Xylenes	1330-20-7	990	NA	NA	NA	71	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds												
1,1-Biphenyl	92-52-4	40	NA	NA	NA	6.43 D	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.56	< 0.076	0.47	22.8 D	0.11 [< 0.036]	1.4	0.093	0.68 [0.52]	1.3	< 0.064
Naphthalene	91-20-3	25	0.27	< 0.0043	0.59	14.1 D	0.08 [< 0.0067]	0.59	0.1	0.25 [0.25]	0.86	< 0.0036
Phenol	108-95-2	380	< 0.072	< 0.073	< 0.28	< 0.081	< 0.034 [< 0.035]	< 0.16	< 0.057	< 0.053 [< 0.054]	< 0.058	< 0.062

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PCSB-47		PCSB-48		PCSB-49	PCSB-50	PCSB-51		PCSB-52	PCSB-53		PCSB-54	PCSB-55
Sample Depth (ft):			0.5	4	0.5	4	0.5	0.5	0.5	3	0.5	0.5	3.5	0.5	0.5
Date Collected:			8/3/05	8/3/05	8/3/05	8/3/05	8/3/05	8/3/05	8/3/05	8/3/05	8/2/05	8/1/05	8/1/05	8/3/05	8/3/05
Volatile Organic Compounds															
Acetone	67-64-1	430	0.036	0.18	0.3	< 0.44	0.019	< 0.41	< 0.0056	0.05	< 0.0057	< 0.0057	0.023	< 0.0062	0.024
Benzene	71-43-2	0.13	< 0.00055	< 0.0028	< 0.0027	< 0.033	< 0.00053	< 0.031	< 0.00054	< 0.00072	< 0.00055	< 0.00055	< 0.00057	< 0.0006	< 0.00055
2-Butanone (MEK)	78-93-3	76	< 0.00085	< 0.0043	< 0.0041	< 0.062	< 0.00081	< 0.058	< 0.00082	< 0.0011	< 0.00084	< 0.00084	< 0.00088	< 0.00092	< 0.00085
Carbon Disulfide	75-15-0	130	< 0.00071	< 0.0036	< 0.0034	< 0.053	< 0.00068	< 0.049	< 0.00068	< 0.00092	< 0.0007	< 0.0007	< 0.00073	< 0.00076	< 0.00071
Carbon Tetrachloride	56-23-5	0.26	< 0.00092	< 0.0047	< 0.0045	< 0.034	< 0.00088	< 0.032	< 0.00089	< 0.0012	< 0.00091	< 0.00091	< 0.00095	< 0.001	< 0.00092
Chlorobenzene	108-90-7	6.1	< 0.00055	< 0.0028	< 0.0026	< 0.027	< 0.00052	< 0.026	< 0.00053	< 0.00071	< 0.00054	< 0.00054	< 0.00056	< 0.00059	< 0.00055
Chloroform	67-66-3	2	< 0.00049	< 0.0025	< 0.0024	< 0.031	< 0.00047	< 0.029	< 0.00048	< 0.00064	< 0.00049	< 0.00049	< 0.00051	< 0.00053	< 0.00049
Cyclohexane	110-82-7	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.00082	< 0.0042	< 0.004	< 0.044	< 0.00079	< 0.041	< 0.0008	< 0.0011	< 0.00081	< 0.00081	< 0.00085	< 0.00089	< 0.00082
Dichloromethane	75-09-2	0.076	0.008 B	0.06 B	0.07 B	***0.29 B***	0.01 B	***0.22 B***	0.0026 B	0.0038 B	0.013 B	0.017 B	0.016 B	0.0024 B	0.014 B
Ethylbenzene	100-41-4	46	< 0.00081	< 0.0041	< 0.0039	< 0.064	< 0.00078	< 0.06	< 0.00079	< 0.0011	< 0.0008	< 0.0008	< 0.00084	< 0.00088	< 0.00081
Isopropylbenzene	98-82-8	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.00067	< 0.0034	< 0.0033	< 0.014	< 0.00065	< 0.013	< 0.00065	< 0.00087	< 0.00067	< 0.00067	< 0.0007	< 0.00073	< 0.00067
Toluene	108-88-3	44	< 0.00082	< 0.0042	< 0.004	< 0.021	< 0.00079	< 0.02	< 0.00079	< 0.0011	< 0.00081	< 0.00081	< 0.00085	< 0.00089	< 0.00082
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.00027	< 0.0014	< 0.0013	< 0.027	< 0.00026	< 0.025	< 0.00026	< 0.00035	< 0.00027	< 0.00027	< 0.00028	< 0.00029	< 0.00027
Total Xylenes	1330-20-7	990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.18	14	< 0.06	3.7	< 0.059	1.4	0.33	0.24	0.35	1.5	1.8	1.3	0.46
Naphthalene	91-20-3	25	0.17	< 0.018	< 0.0034	< 0.074	< 0.0034	0.98	0.36	0.18	0.22	0.8	2.2	1.3	0.54
Phenol	108-95-2	380	< 0.06	< 0.31	< 0.058	< 1.3	< 0.057	< 0.054	< 0.16	< 0.072	< 0.16	< 0.16	< 0.17	< 0.18	< 0.055

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Res VI Standard	PCSB-56		PCSB-57		PCSB-58		PCSB-59	PCSB-60	PCTP-01	PCTP-01R	PCTP-02
Sample Depth (ft):			0.5	2	0.5	2.5	0.5	5	0.5	0.5	6	5-7	5
Date Collected:	CAS Number	(Exceedances Bolded & Italicized)	8/15/05	8/15/05	8/15/05	8/15/05	8/15/05	8/15/05	8/15/05	8/15/05	2/8/05	4/5/19	2/8/05
Volatile Organic Compounds													
Acetone	67-64-1	430	< 0.006	< 0.0069	< 0.006	< 0.0061	< 0.0058	< 0.0069	< 0.0058	0.02 [0.019]	0.044	0.142 J	0.068
Benzene	71-43-2	0.13	< 0.00057	< 0.00066	< 0.00058	< 0.00059	< 0.00056	< 0.00066	< 0.00056	< 0.00055 [< 0.00055]	< 0.00019	R	< 0.00018
2-Butanone (MEK)	78-93-3	76	< 0.00088	< 0.001	< 0.00089	< 0.0009	< 0.00086	< 0.001	< 0.00086	< 0.00085 [< 0.00085]	< 0.0029	0.0179 J	< 0.0028
Carbon Disulfide	75-15-0	130	< 0.00073	< 0.00084	< 0.00074	< 0.00075	< 0.00071	< 0.00084	< 0.00071	< 0.00071 [< 0.00071]	< 0.00034	0.0053 J	< 0.00033
Carbon Tetrachloride	56-23-5	0.26	< 0.00095	< 0.0011	< 0.00096	< 0.00098	< 0.00093	< 0.0011	< 0.00093	< 0.00092 [< 0.00092]	< 0.00049	R	< 0.00048
Chlorobenzene	108-90-7	6.1	< 0.00056	< 0.00065	< 0.00057	< 0.00058	< 0.00055	< 0.00065	< 0.00055	< 0.00055 [< 0.00055]	< 0.00044	R	< 0.00043
Chloroform	67-66-3	2	< 0.00051	< 0.00059	< 0.00052	< 0.00052	< 0.0005	< 0.00059	< 0.0005	< 0.00049 [< 0.00049]	< 0.00098	R	< 0.00095
Cyclohexane	110-82-7	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	R	NA
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0020 J	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.00085	< 0.00098	< 0.00086	< 0.00087	< 0.00083	< 0.00098	< 0.00083	< 0.00082 [< 0.00082]	< 0.00047	R	< 0.00046
Dichloromethane	75-09-2	0.076	0.041 B	0.048 B	0.034 B	0.035 B	0.018 B	0.03 B	0.019 B	0.018 B [0.017 B]	0.016 B	R	0.016 B
Ethylbenzene	100-41-4	46	< 0.00084	< 0.00097	< 0.00085	< 0.00086	< 0.00082	< 0.00097	< 0.00082	< 0.00081 [< 0.00081]	< 0.00066	R	< 0.00065
Isopropylbenzene	98-82-8	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	R	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	R	NA
Styrene (Monomer)	100-42-5	24	< 0.0007	< 0.00081	< 0.0007	< 0.00071	< 0.00068	< 0.00081	< 0.00068	< 0.00067 [< 0.00067]	< 0.00018	R	< 0.00017
Toluene	108-88-3	44	< 0.00085	< 0.00098	< 0.00086	< 0.00087	< 0.00083	< 0.00098	< 0.00083	< 0.00082 [< 0.00082]	< 0.00033	0.00072 J	< 0.00032
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	R	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.00028	< 0.00032	< 0.00028	< 0.00029	< 0.00027	< 0.00032	< 0.00027	< 0.00027 [< 0.00027]	< 0.00055	R	< 0.00053
Total Xylenes	1330-20-7	990	NA	NA	NA	NA	NA	NA	NA	NA	NA	R	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0526 J	NA
2-Methylnaphthalene	91-57-6	680	0.11	0.12	0.38	0.25	0.68	0.58	0.43	0.55 [0.49]	< 2.1	0.142	0.62
Naphthalene	91-20-3	25	0.13	0.35	0.88	0.55	0.8	0.49	0.24	0.3 [0.27]	6.6	0.266	0.74
Phenol	108-95-2	380	< 0.057	< 0.066	< 0.17	< 0.18	< 0.056	< 0.066	< 0.056	< 0.055 [< 0.055]	< 3.4	< 0.078	< 0.11

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS	Res VI	PCTP-02R	PCTP-12	PCTP-12R	PCTP-14	PCTP-16	PCTP-17R	PCTP-18	PCTP-36	PCTP-37	PCTP-47	PCTP-47R	PCTP-58
Sample Depth (ft):		Standard	4-6	3	2-4	2.5	2	5-6	6	6	3	6	5-7	2
Date Collected:	Number	(Exceedances Bolded & Italicized)	4/5/19	2/9/05	4/12/19	3/3/05	2/10/05	4/15/19	2/16/05	2/18/05	2/17/05	2/17/05	4/9/19	2/24/05
Volatile Organic Compounds														
Acetone	67-64-1	430	0.0110 J	< 4.9	0.0672	< 0.01	< 0.003	< 7.9	< 0.0028	< 0.0072	0.023	< 0.0096	0.0259	< 0.0042
Benzene	71-43-2	0.13	R	***59***	0.0073	< 0.00074	< 0.00028	***1.23***	< 0.00026	< 0.00051	< 0.00033	< 0.00069	< 0.00058	< 0.0003
2-Butanone (MEK)	78-93-3	76	R	< 22	< 0.011	< 0.0023	< 0.0044	< 7.9	< 0.0041	< 0.0016	< 0.001	< 0.0021	< 0.012	< 0.00093
Carbon Disulfide	75-15-0	130	R	< 0.92	< 0.0023	< 0.0015	< 0.00051	< 1.6	< 0.00048	0.0057	< 0.00069	< 0.0014	0.0012 J	< 0.00063
Carbon Tetrachloride	56-23-5	0.26	R	< 0.91	< 0.0023	< 0.0027	< 0.00074	< 1.6	< 0.00069	< 0.0019	< 0.0012	< 0.0025	< 0.0023	< 0.0011
Chlorobenzene	108-90-7	6.1	R	< 0.97	< 0.0023	< 0.00059	< 0.00067	< 1.6	< 0.00063	< 0.00041	< 0.00027	< 0.00055	< 0.0023	< 0.00024
Chloroform	67-66-3	2	R	< 2.1	< 0.0023	0.0056	< 0.0015	< 1.6	0.0018	< 0.00053	< 0.00034	< 0.00071	< 0.0023	< 0.00031
Cyclohexane	110-82-7	1,700	R	NA	< 0.0023	NA	NA	< 1.6	NA	NA	NA	NA	< 0.0023	NA
1,4-Dichlorobenzene	106-46-7	10	R	NA	< 0.0011	NA	NA	< 0.79	NA	NA	NA	NA	< 0.0012	NA
1,1-Dichloroethane	75-34-3	0.75	R	< 1.6	< 0.0011	< 0.0014	< 0.00071	< 0.79	< 0.00067	< 0.00098	< 0.00063	< 0.0013	< 0.0012	< 0.00058
Dichloromethane	75-09-2	0.076	R	< 1.8	< 0.0056	0.05 B	0.013 B	< 3.9	0.021 B	0.021 B	0.012 B	0.028 B	< 0.0058	0.0095 B
Ethylbenzene	100-41-4	46	R	5.8	< 0.0011	< 0.002	< 0.001	< 0.79	< 0.00094	< 0.0014	< 0.00091	< 0.0019	< 0.0012	< 0.00083
Isopropylbenzene	98-82-8	600	R	NA	< 0.0023	NA	NA	< 1.6	NA	NA	NA	NA	< 0.0023	NA
Methyl-tert-butylether	1634-04-4	0.28	R	NA	< 0.0011	NA	NA	< 0.79	NA	NA	NA	NA	< 0.0012	NA
Styrene (Monomer)	100-42-5	24	R	4.8	< 0.0023	< 0.00046	< 0.00026	< 1.6	< 0.00025	< 0.00032	< 0.00021	< 0.00043	< 0.0023	< 0.00019
Toluene	108-88-3	44	R	***75***	0.0016	< 0.00055	< 0.0005	1.65	< 0.00047	< 0.00038	< 0.00025	< 0.00051	< 0.0012	< 0.00023
1,2,4-Trichlorobenzene	120-82-1	27	R	NA	< 0.0056	NA	NA	< 3.9	NA	NA	NA	NA	< 0.0058	NA
1,1,1-Trichloroethane	71-55-6	7.2	R	< 1.1	< 0.0023	< 0.0014	< 0.00082	< 1.6	< 0.00078	< 0.00096	< 0.00062	< 0.0013	< 0.0023	< 0.00057
Total Xylenes	1330-20-7	990	R	NA	< 0.0011	NA	NA	5.62	NA	NA	NA	NA	< 0.0012	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	40	< 0.073	NA	0.599	NA	NA	8.64 D	NA	NA	NA	NA	0.0138 J	NA
2-Methylnaphthalene	91-57-6	680	< 0.036	***5,500***	2.41	0.41 J	0.33 J	56.2 D	0.14	< 0.07	0.15	0.047 J	0.0417	0.65
Naphthalene	91-20-3	25	< 0.036	***29,000***	9.89	1.4	0.43	***146 D***	0.25	< 0.0084	0.2	0.48	0.0707	0.77
Phenol	108-95-2	380	< 0.073	< 520	0.257 J	< 0.28	< 0.55	2.79	< 0.12	< 0.028	< 0.031	< 0.029	< 0.076	< 0.11

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Res VI Standard	PCTP-61		PCTP-62	PCTP-63	PCTP-64		PCTP-65		PCTP-66
Sample Depth (ft):	CAS	(Exceedances	0.5	7.5	0.5	0.5	0.5	7	0.5	7.5	0.5
Date Collected:	Number	Bolded & Italicized)	9/8/05	9/8/05	9/8/05	9/8/05	9/8/05	9/8/05	9/8/05	9/8/05	9/8/05
Volatile Organic Compounds											
Acetone	67-64-1	430	< 0.0038 [< 0.006]	< 0.0057	< 0.0038	< 0.0036	< 0.0059	0.042	< 0.0059	0.043	< 0.79
Benzene	71-43-2	0.13	< 0.00027 [< 0.00057]	< 0.00055	< 0.00027	< 0.00026	< 0.00057	< 0.00061	< 0.00057	< 0.00068	***29***
2-Butanone (MEK)	78-93-3	76	< 0.00084 [< 0.00088]	< 0.00084	< 0.00083	< 0.00079	< 0.00087	< 0.00093	< 0.00087	< 0.001	< 0.11
Carbon Disulfide	75-15-0	130	< 0.00057 [< 0.00073]	< 0.0007	< 0.00057	< 0.00054	< 0.00072	< 0.00077	< 0.00072	< 0.00087	< 0.095
Carbon Tetrachloride	56-23-5	0.26	< 0.001 [< 0.00095]	< 0.00091	< 0.001	< 0.00096	< 0.00094	< 0.001	< 0.00094	< 0.0011	< 0.06
Chlorobenzene	108-90-7	6.1	< 0.00022 [< 0.00056]	< 0.00054	< 0.00022	< 0.00021	< 0.00056	< 0.0006	< 0.00056	< 0.00067	< 0.049
Chloroform	67-66-3	2	< 0.00029 [< 0.00051]	< 0.00049	< 0.00028	< 0.00027	< 0.0005	< 0.00054	< 0.0005	< 0.0006	< 0.056
Cyclohexane	110-82-7	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.00053 [< 0.00085]	< 0.00081	< 0.00052	< 0.00049	< 0.00084	< 0.0009	< 0.00084	< 0.001	< 0.079
Dichloromethane	75-09-2	0.076	0.011 B [0.019 B]	0.01 B	0.0095 B	0.0078 B	0.0087 B	0.014 B	0.011 B	0.0086 B	< 0.22
Ethylbenzene	100-41-4	46	< 0.00076 [< 0.00084]	< 0.0008	< 0.00075	< 0.00071	< 0.00083	< 0.00089	< 0.00083	< 0.00099	< 0.12
Isopropylbenzene	98-82-8	600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.00017 [< 0.0007]	< 0.00067	< 0.00017	< 0.00016	< 0.00069	< 0.00074	< 0.00069	< 0.00083	2.4
Toluene	108-88-3	44	< 0.00021 [< 0.00085]	< 0.00081	< 0.0002	< 0.00019	< 0.00084	< 0.0009	< 0.00084	< 0.001	22
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.00052 [< 0.00028]	< 0.00027	< 0.00051	< 0.00048	< 0.00028	< 0.0003	< 0.00028	< 0.00033	< 0.048
Total Xylenes	1330-20-7	990	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds											
1,1-Biphenyl	92-52-4	40	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.13 [0.09]	< 0.061	5.8	< 0.45	< 0.48	0.11	< 0.14	1.4	***1,300***
Naphthalene	91-20-3	25	0.12 [0.1]	< 0.0035	12	< 0.083	0.43	0.98	0.28	3.3	***6,000***
Phenol	108-95-2	380	< 0.057 [< 0.057]	< 0.059	< 1.7	< 0.53	< 0.56	0.12	< 0.17	< 0.068	210

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Res VI Standard	PCTP-66R		PCTP-66R-HC		PCTP-67	PCTP-68	PCTP-69	PCTP-70	PCTP-71	PCTP-72	PCTP-73
Sample Depth (ft):	CAS	(Exceedances	0-0.5	0.5-2	0-2	2-4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Date Collected:	Number	Bolded & Italicized)	4/24/19	4/24/19	4/4/19	4/4/19	9/12/05	9/9/05	9/9/05	9/9/05	9/9/05	9/9/05	9/9/05
Volatile Organic Compounds													
Acetone	67-64-1	430	< 0.02 [0.0199]	< 0.012	R	R	< 0.0059 [< 0.0058]	< 0.028	< 0.0056	< 0.0059	< 0.0055	< 0.0039	< 0.0038
Benzene	71-43-2	0.13	< 0.0010 [< 0.00095]	< 0.00062	R	R	< 0.00057 [< 0.00056]	0.006	< 0.00054	< 0.00057	< 0.00053	< 0.00028	< 0.00027
2-Butanone (MEK)	78-93-3	76	< 0.02 [< 0.019]	< 0.012	R	R	< 0.00087 [< 0.00086]	< 0.0041	< 0.00082	< 0.00087	< 0.0008	< 0.00085	< 0.00083
Carbon Disulfide	75-15-0	130	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.00072 [< 0.00071]	< 0.0034	< 0.00068	< 0.00072	< 0.00067	< 0.00058	< 0.00057
Carbon Tetrachloride	56-23-5	0.26	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.00094 [< 0.00093]	< 0.0045	< 0.00089	< 0.00094	< 0.00087	< 0.001	< 0.001
Chlorobenzene	108-90-7	6.1	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.00056 [< 0.00055]	< 0.0026	< 0.00053	< 0.00056	< 0.00052	< 0.00022	< 0.00022
Chloroform	67-66-3	2	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.0005 [< 0.0005]	< 0.0024	< 0.00048	< 0.0005	< 0.00047	< 0.00029	< 0.00028
Cyclohexane	110-82-7	1,700	< 0.0041 [< 0.0038]	< 0.0025	R	R	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	< 0.0020 [< 0.0019]	< 0.0012	R	R	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.0020 [< 0.0019]	< 0.0012	R	R	< 0.00084 [< 0.00083]	< 0.004	< 0.0008	< 0.00084	< 0.00078	< 0.00053	< 0.00052
Dichloromethane	75-09-2	0.076	< 0.01 [< 0.0095]	< 0.0062	R	R	0.0048 B [0.0065 B]	0.03 B	0.0075 B	0.013 B	0.0058 B	0.0091 B	0.01 B
Ethylbenzene	100-41-4	46	< 0.0020 [< 0.0019]	< 0.0012	R	R	< 0.00083 [< 0.00082]	0.0083	< 0.00079	< 0.00083	< 0.00077	< 0.00077	< 0.00075
Isopropylbenzene	98-82-8	600	< 0.0041 [< 0.0038]	< 0.0025	R	R	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	< 0.0020 [< 0.0019]	< 0.0012	R	R	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.00069 [< 0.00068]	< 0.0033	< 0.00065	< 0.00069	< 0.00064	< 0.00017	< 0.00017
Toluene	108-88-3	44	< 0.0020 [< 0.0019]	< 0.0012	R	0.0687 J	< 0.00084 [< 0.00083]	0.022	< 0.00079	< 0.00084	< 0.00078	< 0.00021	< 0.0002
1,2,4-Trichlorobenzene	120-82-1	27	< 0.01 [< 0.0095]	< 0.0062	R	R	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.0041 [< 0.0038]	< 0.0025	R	R	< 0.00028 [< 0.00027]	< 0.0013	< 0.00026	< 0.00028	< 0.00026	< 0.00052	< 0.00051
Total Xylenes	1330-20-7	990	< 0.0020 [< 0.0019]	< 0.0012	R	R	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	0.226 J [4.33 J]	0.0185 J	0.211	0.677	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.486 J [10.5 J]	0.106	0.502	1.96	0.13 J [0.16]	230	0.16	< 0.048	0.057	0.075	0.06
Naphthalene	91-20-3	25	0.782 J [11.2]	0.0294 J	0.643	1.76	0.21 [0.15]	***1,900***	0.56	0.043	0.18	0.14	0.14
Phenol	108-95-2	380	0.0364 J [0.111 J]	< 0.07	< 0.079	< 0.069	< 0.17 [< 0.12]	< 23	< 0.058	< 0.056	< 0.052	< 0.058	< 0.056

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

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Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PCTP-73R	PCTP-74	PCTP-75		PCTP-75R	PCTP-76		PCTP-77	PCTP-78	PCTP-79	PCTP-80	PSSTP-01A
Sample Depth (ft):			0-0.5	0.5	0.5	11	10-12	0.5	6.5	0.5	0.5	0.5	8	1-2
Date Collected:			4/10/19	9/9/05	9/9/05	9/9/05	4/11/19	9/12/05	9/12/05	9/12/05	9/12/05	9/12/05	9/12/05	3/11/03
Volatile Organic Compounds														
Acetone	67-64-1	430	< 0.012	< 0.0058	< 0.0055	0.11	0.0523	< 0.0057	< 0.0038	< 0.0037	< 0.0036	< 0.0036	0.041	< 0.022
Benzene	71-43-2	0.13	< 0.00061	< 0.00055	< 0.00053	***2.8***	< 0.0011	< 0.00055	< 0.00027	< 0.00026	< 0.00026	< 0.00026	< 0.00029	0.0059
2-Butanone (MEK)	78-93-3	76	< 0.012	< 0.00085	< 0.0008	< 0.0044	< 0.021	< 0.00084	< 0.00082	< 0.00081	< 0.0008	< 0.0008	< 0.00088	NA
Carbon Disulfide	75-15-0	130	< 0.0025	< 0.00071	< 0.00067	< 0.0037	< 0.0042	< 0.0007	< 0.00056	< 0.00055	< 0.00054	< 0.00054	< 0.0006	< 0.056
Carbon Tetrachloride	56-23-5	0.26	< 0.0025	< 0.00092	< 0.00087	< 0.0048	< 0.0042	< 0.00091	< 0.001	< 0.00098	< 0.00097	< 0.00097	< 0.0011	NA
Chlorobenzene	108-90-7	6.1	< 0.0025	< 0.00055	< 0.00052	< 0.0028	< 0.0042	< 0.00054	< 0.00022	< 0.00021	< 0.00021	< 0.00021	< 0.00023	< 0.056
Chloroform	67-66-3	2	< 0.0025	< 0.00049	< 0.00047	< 0.0025	< 0.0042	< 0.00049	< 0.00028	< 0.00027	< 0.00027	< 0.00027	< 0.0003	NA
Cyclohexane	110-82-7	1,700	< 0.0025	NA	NA	NA	< 0.0042	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	< 0.0012	NA	NA	NA	< 0.0021	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.0012	< 0.00082	< 0.00078	< 0.0043	< 0.0021	< 0.00081	< 0.00051	< 0.0005	< 0.0005	< 0.0005	< 0.00055	NA
Dichloromethane	75-09-2	0.076	< 0.0061	0.0048 B	0.0034 B	0.03 B	< 0.011	0.013 B	0.01 B	0.01 B	0.011 B	0.009 B	0.015 B	0.0072 B
Ethylbenzene	100-41-4	46	< 0.0012	< 0.00081	< 0.00077	2.4	< 0.0021	< 0.0008	< 0.00074	< 0.00073	< 0.00072	< 0.00072	< 0.00079	< 11
Isopropylbenzene	98-82-8	600	< 0.0025	NA	NA	NA	< 0.0042	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	< 0.0012	NA	NA	NA	< 0.0021	NA	NA	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.0025	< 0.00067	< 0.00064	< 0.0035	< 0.0042	< 0.00067	< 0.00017	< 0.00016	< 0.00016	< 0.00016	< 0.00018	NA
Toluene	108-88-3	44	< 0.0012	< 0.00082	< 0.00078	0.028	< 0.0021	< 0.00081	< 0.0002	< 0.0002	< 0.00019	< 0.00019	< 0.00022	0.0015
1,2,4-Trichlorobenzene	120-82-1	27	< 0.0061	NA	NA	NA	< 0.011	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.0025	< 0.00027	< 0.00026	< 0.0014	< 0.0042	< 0.00027	< 0.0005	< 0.00049	< 0.00049	< 0.00049	< 0.00054	NA
Total Xylenes	1330-20-7	990	< 0.0012	NA	NA	NA	< 0.0021	NA	NA	NA	NA	NA	NA	0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	40	0.0131 J	NA	NA	NA	0.0255 J	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.0404 J	< 0.062	0.12	340	0.0866	0.097	1.4	0.91	0.044 J	< 0.14	0.25	0.22 J
Naphthalene	91-20-3	25	0.0552	0.071	0.27	***2,700***	0.184	0.084	1.4	1.6	0.064	< 0.025	0.6	0.36 J
Phenol	108-95-2	380	< 0.085	< 0.06	< 0.057	< 43	< 0.091	< 0.059	< 1.1	< 0.59	< 0.059	< 0.16	< 0.18	1.5

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PSSTP-01B	PSSTP-01R	PSSTP-02A	PSSTP-02B	PSSTP-03A	PSSTP-04A	PSSTP-04R		PSSTP-05A	PSSTP-06A	PSSTP-07A
Sample Depth (ft):			5-6	5-6	1-2	5-6	1-2	1-2	1-2	7-8	1-2	1-2	1-2
Date Collected:			3/11/03	4/10/19	3/11/03	3/11/03	3/11/03	3/11/03	4/11/19	4/11/19	3/11/03	3/11/03	3/11/03
Volatile Organic Compounds													
Acetone	67-64-1	430	< 0.024	0.0668	< 0.023	0.08	< 0.024	< 0.023	0.0232	< 190	< 0.024	< 0.025	< 0.025
Benzene	71-43-2	0.13	0.0073 B	< 0.00083	0.0082 B	< 0.0013	< 0.0012	< 0.0011 UB	< 0.00052	***16.9***	< 0.12	< 0.0013	< 0.0012
2-Butanone (MEK)	78-93-3	76	NA	< 0.017	NA	NA	NA	NA	< 0.01	< 190	NA	NA	NA
Carbon Disulfide	75-15-0	130	< 0.0059	0.0048	< 0.0057	< 0.0065	< 0.006	< 0.0057	< 0.0021	< 38	0.0061	< 0.0063	< 0.0062
Carbon Tetrachloride	56-23-5	0.26	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
Chlorobenzene	108-90-7	6.1	< 5	< 0.0033	< 0.0057	< 0.0065	< 0.006	< 0.0057	< 0.0021	< 38	< 0.0059	< 0.0063	< 0.0062
Chloroform	67-66-3	2	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
Cyclohexane	110-82-7	1,700	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	NA	< 0.0017	NA	NA	NA	NA	< 0.0010	< 19	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	NA	< 0.0017	NA	NA	NA	NA	< 0.0010	< 19	NA	NA	NA
Dichloromethane	75-09-2	0.076	0.0073 B	< 0.0083	0.0082 B	0.0085 B	0.0097 B	0.0076 B	< 0.0052	< 94	0.067 B	0.0046 JB	0.0099 B
Ethylbenzene	100-41-4	46	< 0.0012	< 0.0017	< 0.0011	< 0.0013	< 0.0012	< 0.0011	< 0.0010	< 19	< 0.0012	< 0.0013	< 0.0012
Isopropylbenzene	98-82-8	600	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	NA	< 0.0017	NA	NA	NA	NA	< 0.0010	< 19	NA	NA	NA
Styrene (Monomer)	100-42-5	24	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
Toluene	108-88-3	44	< 0.0012	< 0.0017	< 0.0011	< 13	< 0.0012	< 0.0011	< 0.0010	34.5	0.0013	< 0.0013	< 0.0012
1,2,4-Trichlorobenzene	120-82-1	27	NA	< 0.0083	NA	NA	NA	NA	< 0.0052	< 94	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	NA	< 0.0033	NA	NA	NA	NA	< 0.0021	< 38	NA	NA	NA
Total Xylenes	1330-20-7	990	0	< 0.0017	0	0.0089 J	0	0	< 0.0010	100	0.0067 B	0	0
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	NA	0.262	NA	NA	NA	NA	0.0462 J	***301 D***	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.34 J	0.861	< 1.9	1.3	0.35 J	3.7 J	0.0951	***1,780 D***	1.4	0.054 J	< 4.2
Naphthalene	91-20-3	25	0.37 J	0.577	< 1.9	3	0.5 J	9 J	0.16	***9,350 D***	2.5 J	0.23 J	0.48 J
Phenol	108-95-2	380	< 1.5	0.183 J	< 1.4	2.6	< 1.5	1.7	< 0.075	69 D	< 1.5	< 0.42	< 1.6

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: Sample Depth (ft): Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PSSTP-07R 0.5-2 4/18/19	PSSTP-08A 1-2 3/11/03	PSSTP-08B 6-7 3/11/03	PSSTP-09A 1-2 3/12/03	PSSTP-09B 6-7 3/12/03	PSSTP-10A 1-2 3/12/03	PSSTP-10R 1-2 4/16/19	PSSTP-11A 1-2 3/12/03	PSSTP-12A 1-2 3/12/03	PSSTP-13A 1-2 3/12/03
Volatile Organic Compounds												
Acetone	67-64-1	430	< 0.01 [0.0095 J]	< 0.025	< 0.027	< 0.026	< 0.025	< 0.023	0.394	< 0.023	< 0.024	< 0.022
Benzene	71-43-2	0.13	0.00089 J [0.0034 J]	< 0.0012	0.0028	< 0.0013	< 0.0012	< 0.0011	< 0.00063	< 0.0011	< 0.0012	< 0.0011
2-Butanone (MEK)	78-93-3	76	< 0.01 [< 0.011]	NA	NA	NA	NA	NA	< 0.013	NA	NA	NA
Carbon Disulfide	75-15-0	130	< 0.0021 [< 0.0023]	< 0.0062	< 0.0067	< 0.0065	< 0.0062	< 0.0057	< 0.0025	< 0.0057	< 0.006	0.0012 J
Carbon Tetrachloride	56-23-5	0.26	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
Chlorobenzene	108-90-7	6.1	< 0.0021 [< 0.0023]	< 0.0062	< 0.67	< 0.0065	< 5	< 0.0057	< 0.0025	< 0.0057	< 0.006	< 0.0056
Chloroform	67-66-3	2	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
Cyclohexane	110-82-7	1,700	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	10	< 0.0010 [< 0.0011]	NA	NA	NA	NA	NA	< 0.0013	NA	NA	NA
1,1-Dichloroethane	75-34-3	0.75	< 0.0010 [< 0.0011]	NA	NA	NA	NA	NA	< 0.0013	NA	NA	NA
Dichloromethane	75-09-2	0.076	< 0.0052 [< 0.0057]	0.0057 JB	0.0053 JB	0.0041 JB	0.0023 JB	0.0036 JB	< 0.0063	0.0046 JB	< 0.006	0.0035 JB
Ethylbenzene	100-41-4	46	< 0.0010 [< 0.0011]	< 0.012	< 0.0013	< 0.0013	< 0.0012	< 0.0011	< 0.0013	< 0.0011	< 0.0012	<
Isopropylbenzene	98-82-8	600	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
Methyl-tert-butylether	1634-04-4	0.28	< 0.0010 [< 0.0011]	NA	NA	NA	NA	NA	< 0.0013	NA	NA	NA
Styrene (Monomer)	100-42-5	24	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
Toluene	108-88-3	44	< 0.0010 [< 0.0011]	< 0.0012	0.0015	< 0.0013	< 0.0012	< 0.0011	< 0.0013	< 0.0011	< 0.0012	< 0.0011
1,2,4-Trichlorobenzene	120-82-1	27	< 0.0052 [< 0.0057]	NA	NA	NA	NA	NA	< 0.0063	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 0.0021 [< 0.0023]	NA	NA	NA	NA	NA	< 0.0025	NA	NA	NA
Total Xylenes	1330-20-7	990	< 0.0010 [< 0.0011]	0	0	0	0	0	< 0.0013	0	0	0
Semi-Volatile Organic Compounds												
1,1-Biphenyl	92-52-4	40	0.0107 J [0.0085 J]	NA	NA	NA	NA	NA	0.0132 J	NA	NA	NA
2-Methylnaphthalene	91-57-6	680	0.0195 J [0.0151 J]	0.86 J	0.19 J	< 0.43	0.21 J	< 0.38	0.0273 J	0.06 J	1.9 J	< 0.37
Naphthalene	91-20-3	25	0.0321 J [0.0192 J]	4.7	0.26 J	< 0.43	0.37 J	< 0.38	0.0813	0.11 J	3.5 J	< 0.37
Phenol	108-95-2	380	< 0.083 [< 0.075]	< 1.5	< 1.3	< 0.43	1.6	< 0.38	< 0.074	1.7	< 1.5	< 0.37

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:		Res VI Standard	PSSTP-14A	PSSTP-15A	PSSTP-16A	PSSTP-17A	PSSTP-18A	PSSTP-19A	PSSTP-20A	PSSTP-21A	PSSTP-22A	PSSTP-22R	
Sample Depth (ft):	CAS	(Exceedances	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	0.5-2	4-6
Date Collected:	Number	Bolded & Italicized)	3/12/03	3/12/03	3/12/03	3/12/03	3/12/03	3/12/03	3/13/03	3/13/03	3/13/03	4/24/19	4/24/19
Volatile Organic Compounds													
Acetone	67-64-1	430	< 0.029	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.023	< 0.025	< 2.9	< 0.013	< 1.5
Benzene	71-43-2	0.13	< 0.0014	< 0.0012	< 0.0012	< 0.012	< 0.0012	< 0.0012	< 0.0012	< 0.0013	***0.68***	0.0010	***0.482***
2-Butanone (MEK)	78-93-3	76	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.013	< 1.5
Carbon Disulfide	75-15-0	130	< 0.0071	< 0.0061	< 0.0061	< 0.006	< 0.0059	< 0.006	< 0.0058	< 0.0063	< 0.73	0.0012 J	< 0.3
Carbon Tetrachloride	56-23-5	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
Chlorobenzene	108-90-7	6.1	< 0.0071	< 0.0061	< 0.0061	< 0.006	< 0.0059	< 0.006	< 0.0058	< 0.0063	< 0.73	< 0.0026	< 0.3
Chloroform	67-66-3	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
Cyclohexane	110-82-7	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0013	< 0.15
1,1-Dichloroethane	75-34-3	0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0013	< 0.15
Dichloromethane	75-09-2	0.076	< 0.0071	0.002 JB	0.0021 JB	0.0021 JB	< 0.0059	< 0.006	0.0072 B	0.0052 JB	***0.28 J***	< 0.0064	< 0.76
Ethylbenzene	100-41-4	46	< 0.0014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0013	< 0.15	< 0.0013	0.17
Isopropylbenzene	98-82-8	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0013	< 0.15
Styrene (Monomer)	100-42-5	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
Toluene	108-88-3	44	< 0.0014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0013	0.9	0.0016	1.09
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0064	< 0.76
1,1,1-Trichloroethane	71-55-6	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0026	< 0.3
Total Xylenes	1330-20-7	990	0	0	0	0	JB	0	0	0	1.22	0.0038	4.31
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.99	6.85 D
2-Methylnaphthalene	91-57-6	680	< 0.48	0.35 J	0.051 J	0.14 J	0.076 J	< 0.4	0.092 J	0.82	11 J	10.9 D	31.9 D
Naphthalene	91-20-3	25	0.11 J	1.9	0.08 J	0.77	0.17 J	< 0.4	0.16 J	1.7	21	18.5 D	***103 D***
Phenol	108-95-2	380	< 0.48	< 0.41	< 0.41	< 0.4	< 0.39	< 0.4	< 0.39	1.6	1.7	0.212	0.115

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	PSSTP-23A	PSSTP-23B	PSSTP-24A	PSSTP-25A	PSSTP-25B	PSSTP-26A	PSSTP-27A	PSSTP-28A	PSSTP-29A	PSSTP-30A	S-105
Sample Depth (ft):			1-2	7-8	1-2	1-2	7-8	1-2	1-2	1-2	1-2	1-2	2-4
Date Collected:			3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	3/13/03	4/12/19
Volatile Organic Compounds													
Acetone	67-64-1	430	< 0.024	< 0.022	< 0.024	< 0.024	< 0.027	< 0.024	< 0.023	< 0.11	< 0.022	< 0.026	0.0214
Benzene	71-43-2	0.13	< 0.0012	< 0.0011	< 0.0012	< 0.0012	< 0.0013	< 0.012	< 0.0012	< 0.0057	< 0.0011	< 0.0013	< 0.00062
2-Butanone (MEK)	78-93-3	76	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.012
Carbon Disulfide	75-15-0	130	< 0.006	< 0.0056	< 0.006	< 0.0061	< 0.0067	< 0.0061	< 0.0058	< 0.029	< 0.0056	< 0.0066	< 0.0025
Carbon Tetrachloride	56-23-5	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
Chlorobenzene	108-90-7	6.1	< 0.006	< 0.0056	< 0.006	< 0.0061	< 5	< 0.0061	< 0.0058	< 0.029	< 0.0056	< 0.0066	< 0.0025
Chloroform	67-66-3	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
Cyclohexane	110-82-7	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
1,4-Dichlorobenzene	106-46-7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0012
1,1-Dichloroethane	75-34-3	0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0012
Dichloromethane	75-09-2	0.076	0.0095 B	0.0049 JB	0.0053 JB	0.0056 JB	0.0077 B	0.0091 B	0.0035 JB	0.035 B	0.0043 JB	< 0.0046 UJB	< 0.0062
Ethylbenzene	100-41-4	46	< 0.0012	< 0.0011	< 0.0012	< 0.0012	< 0.0013	< 0.0012	< 0.0012	0.0095	< 0.0011	< 0.0013	< 0.0012
Isopropylbenzene	98-82-8	600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
Methyl-tert-butylether	1634-04-4	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0012
Styrene (Monomer)	100-42-5	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
Toluene	108-88-3	44	< 0.0012	< 0.0011	< 0.0012	< 0.0012	< 0.0013	< 0.0012	< 0.0012	0.012	< 0.0011	< 0.0013	< 0.0012
1,2,4-Trichlorobenzene	120-82-1	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0062
1,1,1-Trichloroethane	71-55-6	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0025
Total Xylenes	1330-20-7	990	0	0	0	0	0	0	0	0.048	0	0	< 0.0012
Semi-Volatile Organic Compounds													
1,1-Biphenyl	92-52-4	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0737 J
2-Methylnaphthalene	91-57-6	680	< 0.4	0.4 J	0.24 J	< 8.1	0.26 J	0.35 J	2 J	17	0.5 J	4.8	0.269
Naphthalene	91-20-3	25	< 0.4	1.4 J	0.66 J	1.8 J	0.32 J	0.77 J	< 19	7.9	0.63 J	2.4	0.411
Phenol	108-95-2	380	1.6	< 1.4	< 1.2	2	1.7	< 1.2	< 1.5	2.5	< 1.1	< 1.3	< 0.075

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	S-106 2-4 4/12/19	S-107 2-4 4/23/19	S-108 2-4 4/15/19	S-109 2-4 4/15/19	S-110 2-4 4/12/19	S-111 2-4 4/23/19	S-113 0-1 4/23/19	S-113B 1-3 4/24/19	S-114 2-4 4/15/19	S-119 0-1 4/12/19	S-120 0-1 4/24/19	S-121 0-1 4/12/19
Volatile Organic Compounds														
Acetone	67-64-1	430	< 27	< 0.016	0.127 J [0.0125 J]	0.0379	0.0265	< 0.013	< 0.016	< 2.5	0.0281	0.0428	< 0.028	< 0.023
Benzene	71-43-2	0.13	***48.9***	< 0.00082	0.0017 J [0.0020]	0.00086 J	< 0.00077	< 0.00064	< 0.00082	***0.935***	< 0.00059	< 0.00097	< 0.0014	< 0.0012
2-Butanone (MEK)	78-93-3	76	< 27	< 0.016	< 0.016 [< 0.015]	< 0.019	< 0.015	< 0.013	< 0.016	< 2.5	< 0.012	< 0.019	< 0.028	< 0.023
Carbon Disulfide	75-15-0	130	3.72 J	< 0.0033	0.0063 J [0.0052]	0.0049	0.0015 J	0.0013 J	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Carbon Tetrachloride	56-23-5	0.26	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	0.0012 J	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Chlorobenzene	108-90-7	6.1	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Chloroform	67-66-3	2	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Cyclohexane	110-82-7	1,700	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
1,4-Dichlorobenzene	106-46-7	10	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	< 0.25	< 0.0012	< 0.0019	< 0.0028 UJ	< 0.0023
1,1-Dichloroethane	75-34-3	0.75	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	< 0.25	< 0.0012	< 0.0019	< 0.0028	< 0.0023
Dichloromethane	75-09-2	0.076	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0082	< 1.3	< 0.0059	< 0.0097	< 0.014	< 0.012
Ethylbenzene	100-41-4	46	3.85	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	< 0.25	< 0.0012	< 0.0019	< 0.0028	< 0.0023
Isopropylbenzene	98-82-8	600	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Methyl-tert-butylether	1634-04-4	0.28	< 2.7	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	< 0.25	< 0.0012	< 0.0019	< 0.0028	< 0.0023
Styrene (Monomer)	100-42-5	24	20.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Toluene	108-88-3	44	***67***	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	0.546	< 0.0012	< 0.0019	< 0.0028	< 0.0023
1,2,4-Trichlorobenzene	120-82-1	27	< 14	< 0.0082	< 0.0080 [< 0.0077]	< 0.0095	< 0.0077	< 0.0064	< 0.0082	< 1.3	< 0.0059	< 0.0097	< 0.014	< 0.012
1,1,1-Trichloroethane	71-55-6	7.2	< 5.4	< 0.0033	< 0.0032 [< 0.0031]	< 0.0038	< 0.0031	< 0.0026	< 0.0033	< 0.5	< 0.0024	< 0.0039	< 0.0055	< 0.0047
Total Xylenes	1330-20-7	990	129	< 0.0016	< 0.0016 [< 0.0015]	< 0.0019	< 0.0015	< 0.0013	< 0.0016	0.29	< 0.0012	< 0.0019	< 0.0028	< 0.0023
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	40	***331***	0.143	0.0701 J [0.0711 J]	0.438	0.0423 J	0.101	1.2	0.177 J	< 0.076 UB	0.0202 J	0.0109 J	0.0090 J
2-Methylnaphthalene	91-57-6	680	***1,760***	0.359	0.236 [0.246]	1.2	0.249	0.447	2.99	0.522 J	0.0109 J	0.0629	0.0360 J	0.0209 J
Naphthalene	91-20-3	25	***7,730***	0.627	0.968 [1.23]	1.91	0.22	1.47	7.76	1.08 J	0.0197 J	0.127	0.114	0.0591
Phenol	108-95-2	380	296	< 0.074	0.0922 [0.122]	0.635	< 0.076	0.0490 J	0.646	< 0.16	< 0.076	< 0.086	< 0.074	< 0.089

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	S-122 0-1 4/12/19	S-127 2-4 4/17/19	S-128 2-4 4/18/19	S-129 2-4 4/18/19	S-130 2-4 4/17/19	S-132 2-4 4/17/19	S-133 2-4 4/17/19	S-146 14-16 4/25/19	S-148 8-10 4/25/19	S-149 8-10 4/25/19	S-151 0.5-2 4/25/19	S-156 3-5 5/3/19	S-156 7.5-9.5 5/3/19
Volatile Organic Compounds															
Acetone	67-64-1	430	< 0.011	< 1.2 [< 1.5]	< 0.015	0.0552	< 0.018	< 0.014	0.447	0.0250	< 37	< 10	< 2.8	< 2.8	0.0587
Benzene	71-43-2	0.13	< 0.00055	***0.134 J [0.365 J]***	0.0252	0.0012	0.0176	< 0.00068	< 0.00067	< 0.00042	***4.01***	***2.31***	< 0.14	***0.368***	0.0010
2-Butanone (MEK)	78-93-3	76	< 0.011	< 1.2 [< 1.5]	< 0.015	< 0.013	< 0.018	< 0.014	0.0403	< 0.0084	< 37	< 10	< 2.8	< 2.8	0.0082 J
Carbon Disulfide	75-15-0	130	< 0.0022	< 0.24 [< 0.29]	< 0.0029	0.0013 J	0.0017 J	< 0.0027	0.0095	0.00083 J	6.43 J	5.32	< 0.57	< 0.55	< 0.0025
Carbon Tetrachloride	56-23-5	0.26	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Chlorobenzene	108-90-7	6.1	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Chloroform	67-66-3	2	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Cyclohexane	110-82-7	1,700	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
1,4-Dichlorobenzene	106-46-7	10	< 0.0011	< 0.12 [< 0.15]	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.28	< 0.0012
1,1-Dichloroethane	75-34-3	0.75	< 0.0011	< 0.12 [< 0.15]	< 0.0015	0.00052 J	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1 UJ	< 0.28	< 0.28	< 0.0012
Dichloromethane	75-09-2	0.076	< 0.0055	< 0.61 [< 0.73]	< 0.0073	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 1.4	< 0.0062
Ethylbenzene	100-41-4	46	< 0.0011	< 0.12 [< 0.15]	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	3.52 J	1.51	< 0.28	< 0.28	< 0.0012
Isopropylbenzene	98-82-8	600	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Methyl-tert-butylether	1634-04-4	0.28	< 0.0011	< 0.12 [< 0.15]	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	< 3.7	< 1	< 0.28	< 0.28	< 0.0012
Styrene (Monomer)	100-42-5	24	< 0.0022	< 0.24 [< 0.29]	< 0.0029	< 0.0025	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Toluene	108-88-3	44	< 0.0011	0.143 J [0.36 J]	0.0010 J	< 0.0013	0.0015 J	< 0.0014	< 0.0013	0.00035 J	2.31 J	1.8	< 0.28	0.424	< 0.0012
1,2,4-Trichlorobenzene	120-82-1	27	< 0.0055	< 0.61 [< 0.73]	< 0.0073	< 0.0063	< 0.0091	< 0.0068	< 0.0067	< 0.0042	< 18	< 5.1	< 1.4	< 1.4	< 0.0062
1,1,1-Trichloroethane	71-55-6	7.2	< 0.0022	< 0.24 [< 0.29]	< 0.0029	0.00082 J	< 0.0036	< 0.0027	< 0.0027	< 0.0017	< 7.4	< 2	< 0.57	< 0.55	< 0.0025
Total Xylenes	1330-20-7	990	< 0.0011	0.632 J [1.3 J]	< 0.0015	< 0.0013	< 0.0018	< 0.0014	< 0.0013	< 0.00084	12.5	4.26	< 0.28	0.568	< 0.0012
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	40	0.0088 J	9.32 D [14.7 D]	0.0685 J	0.0479 J	0.0980	0.195	< 0.079 UB	NA	NA	NA	NA	***72.1 D***	0.0322 J
2-Methylnaphthalene	91-57-6	680	0.0226 J	41.1 DJ [64.3 D]	0.237	0.159	0.592	1.28	0.0745	< 0.039	495 D	37.3 D	22.1 D	312 D	0.0935
Naphthalene	91-20-3	25	0.0505	***168 D [278 D]***	0.51	0.352	6.71 D	2.99	0.157	< 0.039	***2,640 D***	***228 D***	***100 D***	***1,830 D***	1.07
Phenol	108-95-2	380	< 0.079	0.338 J [0.72 J]	< 0.079	< 0.074	0.647	0.196	< 0.079	< 0.078	37.3 D	0.795	0.0928 J	2.72	< 0.087

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

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Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location ID: / Sample Depth (ft): / Date Collected:	CAS Number	Res VI Standard (Exceedances Bolded & Italicized)	S-161 5-7 5/3/19	S-163 0.5-2 9/19/19	S-167 7-9 9/20/19	S-168 6-8 9/19/19	S-171 5-7 9/19/19	S-172 5-7 9/19/19	S-173 5-7 9/19/19	TP-30 2 3/14/05	TP-35 4 3/15/05	TP-44 4 3/16/05	TP-44R 3-5 4/22/19	TP-64 3 3/21/05
Volatile Organic Compounds														
Acetone	67-64-1	430	< 100	< 1.7	0.0446	1.96	0.0242	< 1.1	0.217	0.019	0.053	0.064	< 2	0.028
Benzene	71-43-2	0.13	***103***	< 0.087	< 0.00045	***1.84***	< 0.00050	< 0.056	< 0.00061	< 0.00061	***0.51***	0.0018	***0.494***	< 0.00072
2-Butanone (MEK)	78-93-3	76	< 100	< 1.7	0.0060 J	< 1.5	< 0.0099	< 1.1	0.0191	< 0.00094	< 0.0013	< 0.001	< 2	< 0.0011
Carbon Disulfide	75-15-0	130	< 21	< 0.35	< 0.0018	0.185 J	< 0.0020	< 0.22	0.0020 J	< 0.00078	< 0.0011	< 0.00071	< 0.4	< 0.00092
Carbon Tetrachloride	56-23-5	0.26	< 21	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.001	< 0.0015	< 0.0013	< 0.4	< 0.0012
Chlorobenzene	108-90-7	6.1	< 21	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.00061	< 0.00087	< 0.00027	< 0.4	< 0.00071
Chloroform	67-66-3	2	< 21	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.00055	< 0.00078	< 0.00035	< 0.4	< 0.00064
Cyclohexane	110-82-7	1,700	< 21	0.158 J	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	NA	NA	NA	< 0.4	NA
1,4-Dichlorobenzene	106-46-7	10	< 10	< 0.17	< 0.00089	< 0.15	< 0.00099	0.407	< 0.0012	NA	NA	NA	< 0.2	NA
1,1-Dichloroethane	75-34-3	0.75	< 10	< 0.17	< 0.00089	< 0.15	< 0.00099	< 0.11	< 0.0012	< 0.00091	< 0.0013	< 0.00065	< 0.2	< 0.0011
Dichloromethane	75-09-2	0.076	< 51	< 0.87	0.0011 J	< 0.77	< 0.0050	< 0.56	< 0.0061	0.011 B	0.013 B	0.025 B	< 1	0.026 B
Ethylbenzene	100-41-4	46	6.52 J	< 0.17	< 0.00089	0.216	< 0.00099	< 0.11	0.00079 J	< 0.0009	0.39	0.019	2.29	< 0.0011
Isopropylbenzene	98-82-8	600	< 21	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	NA	NA	NA	< 0.4	NA
Methyl-tert-butylether	1634-04-4	0.28	< 10	< 0.17	< 0.00089	< 0.15	< 0.00099	< 0.11	< 0.0012	NA	NA	NA	< 0.2	NA
Styrene (Monomer)	100-42-5	24	11 J	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.00075	< 0.0011	< 0.00021	< 0.4	< 0.00088
Toluene	108-88-3	44	40.8	0.311	< 0.00089	0.465	< 0.00099	< 0.11	< 0.0012	< 0.00091	0.011	0.0099	1.04	< 0.0011
1,2,4-Trichlorobenzene	120-82-1	27	< 51	< 0.87	< 0.0045	< 0.77	< 0.0050	0.606	< 0.0061	NA	NA	NA	< 1	NA
1,1,1-Trichloroethane	71-55-6	7.2	< 21	< 0.35	< 0.0018	< 0.31	< 0.0020	< 0.22	< 0.0025	< 0.0003	< 0.00043	< 0.00064	< 0.4	< 0.00035
Total Xylenes	1330-20-7	990	79.7	0.447	< 0.00089	0.315	< 0.00099	< 0.11	0.0025	NA	NA	NA	3.3	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	40	***51.9 D***	3.19	0.0543 J	0.0602 J	0.0445 J	0.0328 J	0.0588 J	NA	NA	NA	0.227	NA
2-Methylnaphthalene	91-57-6	680	155 D	15.3	0.199	0.163	0.173	0.0943	0.19	0.049 J	23	24	4.11	13
Naphthalene	91-20-3	25	***854 D***	***37.2 D***	0.513	0.347	0.406	0.605	0.453	0.24	***130***	11	1.42	***43***
Phenol	108-95-2	380	0.455	0.404	< 0.077	< 0.078	< 0.073	< 0.075	< 0.074	< 0.028	< 4	< 2.6	< 0.083	< 3.9

Table 20
Detected Unsaturated Soil Analytical Results Compared to VI Standards (mg/kg)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Notes:

1. Samples prior to 2019 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2019 were collected by Arcadis on the dates indicated.
2. Sample depth is reported in feet below ground surface.
3. 2003 and 2005 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
4. 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
5. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
6. Only compounds with a vapor intrusion standard are presented in this table.
7. Only compounds detected in one or more samples are presented in this table.
8. Only surface soil samples or unsaturated soil samples are presented in this table.
9. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
10. NA = Not Analyzed.
11. Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
12. Soil standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Technical Guidance Manual for Vapor Intrusion (VI) into Buildings from Groundwater and Soil Under Act 2 dated November 19, 2016.
13. Shading indicates that the result exceeds the PADEP statewide health standard vapor intrusion screening value for non-residential soil.
14. Italics and bolding indicates that the result exceeds the PADEP statewide health standard vapor intrusion screening value for residential soil.
15. Brackets indicate the reported concentration of a duplicate sample.
16. Qualifier Definitions:
    B = Analyte is an estimated value between the instrument detection limit and the Reporting Limit.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
    R = Data rejected during validation.
17. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: / Highest Groundwater Surface (ft bgs): / Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	MW-102 8.51 5/31/18	MW-103 8.23 5/31/18	MW-104 4.26 5/30/18	MW-107 3.02 5/30/18	MW-108 10.96 10/4/19	MW-109 7.21 10/4/19	MW-110 4.95 10/4/19	MW-111 10.23 10/4/19	MW-112 5.31 10/4/19	MW-113 10.05 10/4/19
Volatile Organic Compounds														
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 10 [< 10]	< 10	< 10	< 10	< 10 [< 10]	< 10	< 10	8.6 J	< 10	< 10
Benzene	71-43-2	5	23	350	< 0.50 [< 0.50]	< 0.50	< 0.50	< 0.50	< 0.50 [< 0.50]	< 0.50	< 0.50	***686 D***	< 0.50	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	67-66-3	80	80	180	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 2.0 [< 2.0]	< 2.0	< 2.0	< 2.0	< 2.0 [< 2.0]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	24.3	< 1.0	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	< 1.0 [< 1.0]	< 1.0	< 1.0	***20.7***	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	9.4	< 1.0	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	90.4 J	< 1.0	< 1.0
Trichloroethene	79-01-6	5	9	110	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	< 1.0 [< 1.0]	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]	< 1.0	< 1.0	109	< 1.0	< 1.0
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	91	91	970	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	< 1.0 [< 1.0]	0.39 J	0.35 J	20.7	< 1.0	< 1.0
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	0.77 J [0.67 J]	1.5	1.2	97.8 J	< 1.0	< 1.0
Naphthalene	91-20-3	100	100	1,300	< 1.2 [< 1.3]	< 1.2	< 0.95	< 1.1	7.2 [5.8]	8.8	15.5	***973 D***	< 1.0	< 1.0 UB
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 2.4 [< 2.5]	< 2.4	< 1.9	< 2.1	< 2.0 [< 2.0]	< 1.9	< 1.9	80.2	< 2.0	< 2.0

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Used Aquifer TDS≤2,500 Res	Res VI Standard	Non-Res VI Standard	MW-5	MW-6	PCMW-01			PCMW-02 / MW-106*			PCMW-03	
Highest Groundwater Surface (ft bgs):		(Exceedances Shaded if GW <5 ft bgs)	(Exceedances Bolded & Italicized if GW >5 ft bgs)	(Exceedances Shaded if GW >5 ft bgs)	4.56	2.69	3.21			2.33		1.97	2.13	
Date Collected:	CAS Number				3/19/18	3/22/18	11/1/05	1/30/06	3/19/18	11/1/05	1/30/06	5/29/18	11/2/05	1/30/06
Volatile Organic Compounds														
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 10 UJ	< 10	< 5.6	< 5.6	< 10 UJ	< 5.6 [< 5.6]	< 5.6	< 10	< 5.6	< 5.6
Benzene	71-43-2	5	23	350	< 0.50	< 0.50	< 0.14	< 0.14	< 0.50	< 0.14 [< 0.14]	< 0.14	< 0.50	< 0.14	< 0.14
Chlorobenzene	108-90-7	100	760	9,600	< 1.0	< 1.0	< 0.37	< 0.17	< 1.0	< 0.37 [< 0.37]	< 0.17	< 1.0	< 0.37	< 0.17
Chloroform	67-66-3	80	80	180	< 1.0	< 1.0	< 0.36	< 0.4	< 1.0	< 0.36 [< 0.36]	< 0.4	< 1.0	< 0.36	< 0.4
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	< 1.0	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA
Dichloromethane	75-09-2	5	7,600	95,000	< 2.0	< 2.0	< 0.49	< 1.2	< 2.0	< 0.49 [< 0.49]	2.7	< 2.0	< 0.49	2.3
Ethylbenzene	100-41-4	700	700	860	< 1.0	< 1.0	< 0.34	< 0.31	< 1.0	< 0.34 [< 0.34]	< 0.31	< 1.0	< 0.34	< 0.31
Isopropylbenzene	98-82-8	840	1,900	24,000	< 1.0	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	< 1.0	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 1.0	< 1.0 UJ	< 0.22	< 0.21	< 1.0	< 0.22 [< 0.22]	< 0.21	< 1.0	< 0.22	< 0.21
Tetrachloroethene	127-18-4	5	110	1,300	1.1	< 1.0	< 0.28	< 0.46	< 1.0	< 0.28 [< 0.28]	< 0.46	< 1.0	< 0.28	< 0.46
Toluene	108-88-3	1,000	34,000	430,000	< 1.0	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22 [< 0.22]	< 0.21	< 1.0	< 0.22	< 0.21
Trichloroethene	79-01-6	5	9	110	***6.1***	< 1.0	< 0.37	< 0.76	< 1.0	< 0.37 [< 0.37]	< 0.76	< 1.0	< 0.37	< 0.76
Total Xylenes	1330-20-7	10,000	10,000	12,000	< 1.0	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	91	91	970	< 1.0	< 0.98	NA	NA	< 1.1	NA	NA	< 1.0	NA	NA
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.0	< 0.98	< 1.7	< 1.7	< 1.1	< 1.7 [< 1.7]	< 1.7	< 1.0	< 1.7	< 1.7
Naphthalene	91-20-3	100	100	1,300	< 1.0	< 0.98	< 0.097	< 0.097	< 1.1	< 0.097 [< 0.097]	< 0.097	< 1.0	< 0.097	< 0.097
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 2.0	< 2.0	< 1.7	< 1.7	< 2.1	< 1.7 [< 1.7]	< 1.7	< 2.0	< 1.7	< 1.7

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Used Aquifer TDS≤2,500 Res	Res VI Standard	Non-Res VI Standard	PCMW-04			PCMW-05			PCMW-06			PCMW-07	
Highest Groundwater Surface (ft bgs):		(Exceedances Shaded if GW <5 ft bgs)	(Exceedances Bolded & Italicized if GW >5 ft bgs)	(Exceedances Shaded if GW >5 ft bgs)	3.08			1.78			2.45			3.24	
Date Collected:	CAS Number				11/2/05	1/30/06	3/19/18	11/2/05	1/31/06	3/23/18	11/3/05	1/31/06	3/23/18	11/3/05	1/31/06
Volatile Organic Compounds															
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 [< 10]	< 5.6	< 5.6	< 10	< 5.6	< 5.6
Benzene	71-43-2	5	23	350	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50 [< 0.50]	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14
Chlorobenzene	108-90-7	100	760	9,600	< 0.37	< 0.17	< 1.0	< 0.37	< 0.17	< 1.0 [< 1.0]	< 0.37	< 0.17	< 1.0	< 0.37	< 0.37
Chloroform	67-66-3	80	80	180	< 0.36	< 0.4	< 1.0	< 0.36	< 0.4	< 1.0 [< 1.0]	< 0.36	< 0.4	< 1.0	< 0.36	< 0.36
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA
Dichloromethane	75-09-2	5	7,600	95,000	< 0.49	1.8	< 2.0	< 0.49	1.6	< 2.0 [< 2.0]	< 0.49	1.3	< 2.0	< 0.49	< 0.49
Ethylbenzene	100-41-4	700	700	860	< 0.34	< 0.31	< 1.0	< 0.34	< 0.31	< 1.0 [< 1.0]	< 0.34	< 0.31	< 1.0	< 0.34	< 0.34
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	4.8	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0 [< 1.0]	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22
Tetrachloroethene	127-18-4	5	110	1,300	< 0.28	< 0.46	< 1.0	< 0.28	< 0.46	< 1.0 [< 1.0]	< 0.28	< 0.46	< 1.0	< 0.28	< 0.28
Toluene	108-88-3	1,000	34,000	430,000	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0 [< 1.0]	< 0.22	< 0.21	< 1.0	< 0.22	< 0.22
Trichloroethene	79-01-6	5	9	110	< 0.37	< 0.76	< 1.0	< 0.37	< 0.76	< 1.0 [< 1.0]	< 0.37	< 0.76	< 1.0	< 0.37	< 0.37
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	< 1.1	NA	NA	< 1.0 [< 1.1]	NA	NA	< 1.0	NA	NA
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.7	< 1.1	34	8.1	< 1.0 [< 1.1]	< 1.7	< 1.7	< 1.0	< 1.7	< 1.7
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 0.097	< 1.1	< 0.097	< 0.097	< 1.0 [< 1.1]	4	< 0.097	< 1.0	< 0.097	< 0.097
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 2.1	< 1.7	< 1.7	< 2.1 [< 2.2]	2	< 1.7	< 2.0	< 1.7	< 1.7

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	PCMW-08S		PCMW-08D			PCMW-09S			PCMW-09D		PCMW-10S		
Highest Groundwater Surface (ft bgs):					7.11		15.01			7.01			15.06		6.59		
Date Collected:					11/3/05	3/22/18	11/4/05	1/31/06	3/22/18	11/4/05	1/31/06	3/19/18	11/7/05	1/31/06	11/7/05	2/1/06	3/22/18
Volatile Organic Compounds																	
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ	< 4	< 5.6	< 4	< 5.6	< 10
Benzene	71-43-2	5	23	350	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50	< 0.43	< 0.14	< 0.43	11	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0	< 0.2	< 0.37	< 0.2	< 0.37	< 1.0
Chloroform	67-66-3	80	80	180	< 0.36	< 1.0	< 0.36	< 0.36	< 1.0	< 0.36	< 0.36	< 1.0	< 0.38	< 0.36	< 0.38	< 0.36	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 0.49	< 2.0	< 0.49	< 0.49	< 2.0	< 0.49	< 0.49	< 2.0	< 0.87	< 0.49	< 0.87	< 0.49	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.34	< 1.0	< 0.34	< 0.34	< 1.0	< 0.34	< 0.34	< 1.0	< 0.49	< 0.34	< 0.49	< 0.34	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0	< 0.29	< 0.22	< 0.29	< 0.22	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0	< 0.28	< 0.28	< 1.0	< 0.31	< 0.28	< 0.31	< 0.28	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0	< 0.22	< 0.22	< 1.0	< 0.31	< 0.22	< 0.31	< 0.22	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0	< 0.37	< 0.37	< 1.0	< 0.36	< 0.37	< 0.36	< 0.37	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	< 1.0
Semi-Volatile Organic Compounds																	
1,1-Biphenyl	92-52-4	91	91	970	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.1	NA	NA	NA	NA	< 1.1
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.0	< 1.7	< 1.7	< 1.0	< 1.7	< 1.7	< 1.1	3.9	< 1.7	< 1.7	< 1.7	< 1.1
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 1.0	< 0.097	< 0.097	< 1.0	< 0.097	1.2	< 1.1	17	1.2	< 0.097	< 0.097	< 1.1
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.1	< 1.7	< 1.7	< 1.7	< 1.7	< 2.2

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	PCMW-10D			PCMW-11S			PCMW-11D		PCMW-211	PCMW-12S	
Highest Groundwater Surface (ft bgs):					11.83			7.38			15.08		NA	0.78	
Date Collected:					11/7/05	2/1/06	3/22/18	11/7/05	2/2/06	3/23/18	11/8/05	2/2/06	2/2/06	11/8/05	2/1/06
Volatile Organic Compounds															
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 4	< 5.6	< 10 UJ	< 4	< 5.6	< 10	< 4	< 5.6	< 5.6	< 4	< 5.6
Benzene	71-43-2	5	23	350	< 0.43	< 0.14	< 0.50	< 0.43	< 0.14	0.23 J	< 0.43	< 0.14	< 0.14	< 0.43	< 0.14
Chlorobenzene	108-90-7	100	760	9,600	< 0.2	< 0.37	0.28 J	< 0.2	< 0.37	< 1.0	< 0.2	< 0.37	< 0.37	< 0.2	< 0.17
Chloroform	67-66-3	80	80	180	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 0.36	< 0.38	< 0.4
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	NA
Dichloromethane	75-09-2	5	7,600	95,000	< 0.87	1	< 2.0	< 0.87	< 0.49	< 2.0	< 0.87	< 0.49	< 0.49	< 0.87	< 1.2
Ethylbenzene	100-41-4	700	700	860	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 0.34	< 0.49	< 0.31
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	NA
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	0.80 J	NA	NA	< 1.0	NA	NA	NA	NA	NA
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 0.22	< 0.29	< 0.21
Tetrachloroethene	127-18-4	5	110	1,300	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0	37	4	< 0.28	< 0.31	< 0.46
Toluene	108-88-3	1,000	34,000	430,000	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 0.22	< 0.31	< 0.21
Trichloroethene	79-01-6	5	9	110	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 0.37	< 0.36	< 0.76
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	< 1.0	NA	NA	< 1.1	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.7	< 1.0	< 1.7	< 1.8	< 1.1	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 0.097	< 1.0	< 0.097	< 0.1	< 1.1	< 0.097	< 0.097	< 0.1	< 0.097	< 0.097
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 2.0	1.4 J	1.5 J	< 2.2	30	25	< 1.7	< 1.7	< 1.7

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	PCMW-12D		PCMW-212	PCMW-13S		PCMW-13D		PCMW-14S / MW-101*		
Highest Groundwater Surface (ft bgs):					10.35		NA	6.34		10.23		4.40		4.82
Date Collected:					11/8/05	2/1/06	2/1/06	11/9/05	2/2/06	11/9/05	2/2/06	11/9/05	2/3/06	5/30/18
Volatile Organic Compounds														
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 4	< 5.6	< 5.6	< 4	< 5.6	< 4	< 5.6	< 40	< 56	< 10
Benzene	71-43-2	5	23	350	< 0.43	< 0.14	< 0.14	< 0.43	< 0.14	< 0.43	< 0.14	***580***	***1,200***	3.8
Chlorobenzene	108-90-7	100	760	9,600	< 0.2	< 0.17	< 0.17	< 0.2	< 0.17	< 0.2	< 0.17	< 2	< 1.7	< 1.0
Chloroform	67-66-3	80	80	180	< 0.38	< 0.4	< 0.4	< 0.38	< 0.4	< 0.38	< 0.4	< 3.8	< 4	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 0.87	< 1.2	< 1.2	< 0.87	< 1.2	< 0.87	< 1.2	< 8.7	< 12	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.49	< 0.31	< 0.31	< 0.49	< 0.31	< 0.49	< 0.31	< 4.9	< 3.1	0.23 J
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.29	< 0.21	< 0.21	< 0.29	< 0.21	< 0.29	< 0.21	< 2.9	< 2.1	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 0.31	< 0.46	< 0.46	< 0.31	< 0.46	< 0.31	< 0.46	< 3.1	< 4.6	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.31	< 0.21	< 0.21	< 0.31	< 0.21	< 0.31	< 0.21	< 3.1	< 2.1	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.36	< 0.76	< 0.76	< 0.36	< 0.76	< 0.36	< 0.76	< 3.6	< 7.6	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.3
Semi-Volatile Organic Compounds														
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	1.1 J	1.2 J	< 1.0
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	5	4.9	1.9
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	1.2 J	2.5	< 2.0

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:					PCMW-14D		PCMW-15S			PCMW-15D			PCMW-16S / MW-105*		
Highest Groundwater Surface (ft bgs):		Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	10.85		5.73			13.31			4.93		6.55
Date Collected:	CAS Number				11/9/05	2/3/06	11/10/05	2/3/06	3/20/18	11/10/05	2/3/06	3/20/18	11/10/05	2/1/06	5/30/18
Volatile Organic Compounds															
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 4 [< 4]	< 5.6	< 4	< 5.6	< 10 UJ	< 4	< 5.6	< 10 UJ	< 4	< 5.6	< 10
Benzene	71-43-2	5	23	350	< 0.43 [< 0.43]	< 0.14	***67***	***54***	0.20 J	< 0.43	< 0.14	< 0.50	1.2	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	< 0.2 [< 0.2]	< 0.17	< 0.2	< 0.17	< 1.0	< 0.2	< 0.17	< 1.0	< 0.2	< 0.37	< 1.0
Chloroform	67-66-3	80	80	180	< 0.38 [< 0.38]	< 0.4	< 0.38	< 0.4	< 1.0	< 0.38	< 0.4	< 1.0	< 0.38	< 0.36	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 0.87 [< 0.87]	< 1.2	< 0.87	< 1.2	< 2.0	< 0.87	< 1.2	< 2.0	< 0.87	1.1	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.49 [< 0.49]	< 0.31	< 0.49	< 0.31	< 1.0	< 0.49	< 0.31	< 1.0	< 0.49	< 0.34	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.29 [< 0.29]	< 0.21	< 0.29	< 0.21	< 1.0	< 0.29	< 0.21	< 1.0	< 0.29	< 0.22	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 0.31 [< 0.31]	< 0.46	< 0.31	< 0.46	< 1.0	< 0.31	< 0.46	< 1.0	< 0.31	< 0.28	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.31 [< 0.31]	< 0.21	1.3	< 0.21	< 1.0	< 0.31	< 0.21	< 1.0	< 0.31	< 0.22	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.36 [< 0.36]	< 0.76	< 0.36	< 0.76	< 1.0	< 0.36	< 0.76	< 1.0	< 0.36	< 0.37	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Semi-Volatile Organic Compounds															
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 0.95
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7 [< 1.7]	< 1.7	< 1.7	< 1.7	< 1.0	13	< 1.7	< 1.0	< 1.7	< 1.7	< 0.95
Naphthalene	91-20-3	100	100	1,300	< 0.097 [< 0.097]	< 0.097	5.8	15	< 1.0	62	9.9	< 1.0	< 0.097	< 0.097	< 0.95
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7 [< 1.7]	< 1.7	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 1.9

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

ARCADIS Design & Consultancy for natural and built assets

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Used Aquifer TDS≤2,500 Res	Res VI Standard	Non-Res VI Standard	PCMW-16D			PCMW-17S			PCMW-17D			PCMW-18S		
Highest Groundwater Surface (ft bgs):		(Exceedances Shaded if GW <5 ft bgs)	(Exceedances Bolded & Italicized if GW >5 ft bgs)	(Exceedances Shaded if GW >5 ft bgs)	9.58			1.51			9.64			14.98		
Date Collected:	CAS Number				11/10/05	2/1/06	3/19/18	11/11/05	2/3/06	3/22/18	11/11/05	2/3/06	3/22/18	11/11/05	2/2/06	3/23/18
Volatile Organic Compounds																
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 4	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10 UJ	< 5.6	< 5.6	< 10
Benzene	71-43-2	5	23	350	< 0.43	< 0.14	< 0.50	***9.7***	***11***	1.1	< 0.14	< 0.14	< 0.50	< 0.14	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	1.1	3.7	1.4	< 0.37	< 0.17	< 1.0	< 0.37	< 0.17	< 1.0	< 0.37	< 0.17	< 1.0
Chloroform	67-66-3	80	80	180	< 0.38	< 0.36	< 1.0	< 0.36	< 0.4	< 1.0	< 0.36	< 0.4	< 1.0	2.6	< 0.4	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	0.71 J
Dichloromethane	75-09-2	5	7,600	95,000	< 0.87	< 0.49	< 2.0	< 0.49	< 1.2	< 2.0	< 0.49	< 1.2	< 2.0	< 0.49	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.49	< 0.34	< 1.0	2.5	22	< 1.0	< 0.34	< 0.31	< 1.0	< 0.34	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.29	< 0.22	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 0.31	< 0.28	< 1.0	< 0.28	< 0.46	< 1.0	< 0.28	< 0.46	< 1.0	< 0.28	< 0.46	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.31	< 0.22	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0	< 0.22	< 0.21	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.36	< 0.37	< 1.0	< 0.37	< 0.76	< 1.0	< 0.37	< 0.76	< 1.0	< 0.37	< 0.76	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.1	NA	NA	< 1.1
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.8	< 1.7	< 1.0	20	48	< 1.0	< 1.7	< 1.7	< 1.1	< 1.7	< 1.7	< 1.1
Naphthalene	91-20-3	100	100	1,300	< 0.1	< 0.097	< 1.0	7.6	41	< 1.0	6.3	< 0.097	< 1.1	< 0.097	< 0.099	< 1.1
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.0	< 1.7	< 1.7	< 2.2	< 1.7	< 1.7	< 2.2

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location:		Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	PCMW-18D			PCMW-19S			PCMW-19D			PCMW-20S		
Highest Groundwater Surface (ft bgs):					15.17			3.72			9.34			5.30		
Date Collected:	CAS Number				11/11/05	2/2/06	3/23/18	11/14/05	2/2/06	3/22/18	11/14/05	2/2/06	3/22/18	11/14/05	2/1/06	3/22/18
Volatile Organic Compounds																
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 5.6	< 5.6	< 10	< 4	< 5.6	< 10	< 4	< 5.6	< 10 [< 10]	< 4	< 5.6	< 10
Benzene	71-43-2	5	23	350	< 0.14	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50	< 0.43	< 0.14	< 0.50 [< 0.50]	< 0.43	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	< 0.37	< 0.37	< 1.0	< 0.2	< 0.37	< 1.0	< 0.2	< 0.37	< 1.0 [< 1.0]	< 0.2	< 0.17	< 1.0
Chloroform	67-66-3	80	80	180	2	1.8	12.3	< 0.38	< 0.36	< 1.0	< 0.38	< 0.36	< 1.0 [< 1.0]	< 0.38	< 0.4	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 0.49	< 0.49	< 2.0	< 0.87	< 0.49	< 2.0	< 0.87	< 0.49	< 2.0 [< 2.0]	< 0.87	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.34	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0	< 0.49	< 0.34	< 1.0 [< 1.0]	< 0.49	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.22	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0	< 0.29	< 0.22	< 1.0 [< 1.0]	< 0.29	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	2.5	< 0.28	1.5	< 0.31	< 0.28	< 1.0	< 0.31	< 0.28	< 1.0 [< 1.0]	< 0.31	< 0.46	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.22	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0	< 0.31	< 0.22	< 1.0 [< 1.0]	< 0.31	< 0.21	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.37	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0	< 0.36	< 0.37	< 1.0 [< 1.0]	< 0.36	< 0.76	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0 [< 1.0]	NA	NA	< 1.0
Semi-Volatile Organic Compounds																
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	< 1.1	NA	NA	< 0.95	NA	NA	< 0.98 [< 0.95]	NA	NA	< 1.0
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.8	< 1.1	< 1.7	< 1.7	< 0.95	< 1.7	< 1.9	< 0.98 [< 0.95]	2	< 1.7	< 1.0
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 0.1	< 1.1	< 0.097	< 0.097	< 0.95	< 0.097	< 0.11	< 0.98 [< 0.95]	< 0.097	< 0.097	< 1.0
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 2.2	< 1.7	< 1.7	< 1.9	< 1.7	< 1.8	< 2.0 [< 1.9]	< 1.7	< 1.7	< 2.0

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Location: Highest Groundwater Surface (ft bgs): Date Collected:	CAS Number	Used Aquifer TDS≤2,500 Res (Exceedances Shaded if GW <5 ft bgs)	Res VI Standard (Exceedances Bolded & Italicized if GW >5 ft bgs)	Non-Res VI Standard (Exceedances Shaded if GW >5 ft bgs)	PCMW-20D 10.88 11/14/05	PCMW-20D 10.88 2/1/06	PCMW-20D 10.88 3/22/18
Volatile Organic Compounds							
Acetone	67-64-1	38,000	37,000,000	470,000,000	< 4	< 5.6	< 10
Benzene	71-43-2	5	23	350	< 0.43	< 0.14	< 0.50
Chlorobenzene	108-90-7	100	760	9,600	< 0.2	< 0.17	< 1.0
Chloroform	67-66-3	80	80	180	< 0.38	< 0.4	< 1.0
1,2-Dichlorobenzene	95-50-1	600	5,400	69,000	NA	NA	< 1.0
Dichloromethane	75-09-2	5	7,600	95,000	< 0.87	< 1.2	< 2.0
Ethylbenzene	100-41-4	700	700	860	< 0.49	< 0.31	< 1.0
Isopropylbenzene	98-82-8	840	1,900	24,000	NA	NA	< 1.0
Methyl-tert-butylether	1634-04-4	20	6,300	96,000	NA	NA	< 1.0
Styrene (Monomer)	100-42-5	100	18,000	220,000	< 0.29	< 0.21	< 1.0
Tetrachloroethene	127-18-4	5	110	1,300	< 0.31	< 0.46	< 1.0
Toluene	108-88-3	1,000	34,000	430,000	< 0.31	< 0.21	< 1.0
Trichloroethene	79-01-6	5	9	110	< 0.36	< 0.76	< 1.0
Total Xylenes	1330-20-7	10,000	10,000	12,000	NA	NA	< 1.0
Semi-Volatile Organic Compounds							
1,1-Biphenyl	92-52-4	91	91	970	NA	NA	< 0.98
2-Methylnaphthalene	91-57-6	170	380	4,800	< 1.7	< 1.7	< 0.98
Naphthalene	91-20-3	100	100	1,300	< 0.097	< 0.097	< 0.98
Phenol	108-95-2	2,000	34,000,000	84,000,000	< 1.7	< 1.7	< 2.0

Table 21
Detected Groundwater Analytical Results Compared to VI Standards (ug/L)

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Notes:

1. Samples prior to 2018 were collected by Paulus, Sokolowski, and Sartor Engineering, PC on the dates indicated. Samples in 2018 and 2019 were collected by Arcadis on the dates indicated.
2. 2005 and 2006 samples were analyzed by Hampton-Clarke, Veritech Laboratories of Fairfield, New Jersey.
3. 2018 and 2019 samples were analyzed by SGS North America Incorporated Laboratories of Dayton, New Jersey.
4. Samples were submitted for laboratory analysis for one or more of the following constituent groups, as indicated above.
   - Target Compound List (TCL) volatile organic compounds (VOC) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260.
   - TCL semi-volatile organic compounds (SVOC) using USEPA SW-846 Method 8270.
5. Only compounds with a vapor intrusion standard are shown in this table.
6. Only compounds detected in one or more samples are shown in this table.
7. < = constituent not detected at a concentration above the reported detection limit. These results are also reported in gray.
8. NA = Not Analyzed.
9. Concentrations reported in micrograms per liter (ug/L) or parts per billion (ppb).
10. Highest groundwater surface is the highest groundwater surface observed during the 2018 and 2019 monitoring well gauging events, except for values in black which are for wells that couldn't be located or were destroyed prior to the 2018 monitoring well gauging events. In these cases, the highest groundwater surface observed from 2005 and 2006 is reported.
11. Highest groundwater surface observed is reported in feet below ground surface (bgs).
12. Groundwater vapor intrusion standards obtained from the Pennsylvania Department of Environmental Protection (PADEP) Technical Guidance Manual for Vapor Intrusion (VI) into Buildings from Groundwater and Soil Under Act 2 dated November 19, 2016. Groundwater vapor intrusion standards are only applicable if groundwater is greater than 5 feet bgs.
13. Shading indicates an exceedance of either: (1) PADEP's non-residential groundwater vapor intrusion standard when groundwater surface is more than 5 feet bgs; or (2) PADEP's residential Medium Specific Concentrations (MSCs) for Used Aquifers containing Total Dissolved Solids (TDS) ≤ 2,500 milligrams per liter (mg/L) when groundwater surface is equal to or less than 5 feet bgs.
14. Italics and bolding indicates an exceedance of PADEP's residential groundwater vapor intrusion standard when groundwater surface is more than 5 feet bgs.
15. * indicates that the groundwater monitoring well was installed to replace the missing historical well also listed in the monitoring well ID.
16. Brackets indicate the reported concentration of a duplicate sample.
17. Qualifier Definitions:
    B = The compound has been found in the sample as well as its associated blank.
    D = Concentration is based on a diluted sample analysis.
    J = Analyte is an estimated value.
18. Data from 2018 and 2019 have undergone a Tier II validation. Data prior to 2018 have not been validated.

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Pathway Eliminated?	Rationale for Exposure Pathway Elimination by Cleanup Plan
Current	Soil	Surface Soil	Site	Outdoor Worker	Adult	Ingestion	Y	Surface soil outside of impervious areas is heavily vegetated. The limited areas of exposed surface soil may be contacted during activities such as lawn maintenance, but such maintance is limited to a few times per year and the grass height is kept at 6-inches or higher.
						Dermal Contact	Y	
						Inhalation	Y	
		Surface Soil	Site	Trespasser	Adolescent	Ingestion	Y	Surface soil outside of impervious areas is heavily vegetated. Site access is restricted by perimeter chainlink fencing and locked gates.
						Dermal Contact	Y	
						Inhalation	Y	
		Surface & Subsurface Soil	Excavation/Trench	Utility Worker	Adult	Ingestion	Y	Subsurface utilities at the Site were disconnected when the above-ground facilities and structures were demolished. There are no active utilities at the Site, other than one manhole providing access to the Upper Delaware Collecting Sewer that extends across the Site along the alignment of Bath Street. Work on the Upper Delaware Collecting Sewer would be performed by the Philadelphia Water Department, and potentially limited to access via the manhole, minimizing worker contact with soil. No soil excavation for installation, maintenance, or repair of underground utilities is anticipated under current conditions. Such work (if needed) and any remedial work would be conducted under a Health and Safety Plan (HASP) with engineering controls in-place to limit exposure. Work on the railroad that extends through the eastern portion of the Site (e.g., railroad tie replacement, ballast stone placement) would be performed by the railroad owner working from the railroad right-of-way, minimizing worker contact with soil beyond the railroad tracks.
						Dermal Contact	Y	
						Inhalation	Y	
	Groundwater	Shallow Groundwater	Excavation/Trench	Utility Worker	Adult	Ingestion	Y	Subsurface utilities at the Site were disconnected when the above-ground facilities and structures were demolished. There are no active utilities at the Site, other than one manhole providing access to the Upper Delaware Collecting Sewer that conveys regional stormwater deep beneath the Site along the alignment of Bath Street. The sewer does not collect any storm water from the Site. Based on measurements from the one existing manhole onsite, this sewer is very deep with an invert elevation at least 29 feet bgs. Future maintenance or repair of this sewer, if needed, could involve non-intrusive means (no excavation but potential access through an existing onsite manhole). No installation, maintenance, or repair of underground utilities is anticipated under current conditions. If such work were needed and required excavation to the depth of the perched water or groundwater table, the work would be conducted under a HASP with engineering controls in-place to limit exposure.
						Dermal Contact	Y	
						Inhalation	Y	
		Outdoor Air	Site	Outdoor Worker	Adult	Inhalation	Y	The volatile organic compound (VOC) concentrations identified in vadose zone soil and groundwater at the Site are less than those that would cause a vapor intrusion concern for outdoor air due to dispersion and mixing across a massive air volume.
Future	Soil	Surface Soil	Site	Outdoor Worker	Adult	Ingestion	Y	Under a redevelopment scenario, future Site workers may be exposed to surface soil. The installation of a cap consisting of development components, including concrete floor slabs/foundations for new buildings; asphalt pavement and/or concrete for driveways, parking areas, and sidewalks; and 2-feet of clean soil (e.g., in landscape areas) will restrict worker exposure to constituents of concern (COCs) in soils.
						Dermal Contact	Y	
						Inhalation	Y	
		Surface Soil	Workplace	Indoor Worker	Adult	Ingestion	Y	Under a redevelopment scenario, wind may generate dust from exposed soil at the Site and the airborne outside soils may be incidentally ingested or inhaled as volatiles and particulates outdoors (and to a lesser extent indoors as dust). However, the installation of a cap will eliminate exposure to COCs in soils.
						Dermal Contact	Y	
						Inhalation	Y	
		Surface Soil	Hypothetical Residence	Resident	Adult/Child	Ingestion	Y	Under a hypothetical residential redevelopment scenario, residents will not be exposed to soil because a cap consisting of development components, including concrete floor slabs/foundations for new buildings; asphalt pavement and/or concrete for driveways, parking areas, and sidewalks; and 2-feet of clean soil (e.g., in landscape areas) will restrict exposure to COCs in soils. Additionally, a deed restriction will limit the property to commercial or industrial use.
						Dermal Contact	Y	
						Inhalation	Y	
		Surface & Subsurface Soil	Excavation/Trench	Utility Worker	Adult	Ingestion	Y	Soil may be contacted during utility excavations for installation, maintenance, or repair of underground utilities. The installation of a cap, use of other engineering controls, and compliance with HASPs and Post-Remedial Care Plan restrict worker exposure to COCs in soils.
						Dermal Contact	Y	
						Inhalation	Y	
	Groundwater	Shallow Groundwater	Excavation/Trench	Utility Worker	Adult	Ingestion	Y	Construction/utility workers may encounter shallow groundwater during utility excavations for installation, maintenance, or repair of underground utilities. Volatile constituents in groundwater may volatilize into the utility trench. Potential exposures will be addressed by using personal protective equipment (PPE) in accordance with the HASP.
						Dermal Contact	Y	
						Inhalation	Y	
		Tapwater	Workplace	Indoor Worker	Adult/Child	Ingestion	Y	In the future, an environmental covenant will restrict groundwater use; therefore, no potable water wells may be installed at the Site once the covenant is in-place.
						Dermal Contact	Y	
						Inhalation	Y	
			Residence	Resident	Adult	Ingestion	Y	
						Dermal Contact	Y	
						Inhalation	Y	
		Indoor Air	Workplace	Indoor Worker	Adult	Inhalation	TBD	The VOC concentrations identified in vadose zone soil and groundwater at the Site could cause a vapor intrusion (VI) concern if mitigation systems were not installed. However, redevelopment plans will be required to include (1) a VI mitigation system(s) within areas of potential VI concern identified by initial VI screening ; or (2) building-specific VI risk assessment(s) that demonstrates that a mitigation system is not needed.
			Hypothetical Residence	Resident	Adult/Child	Inhalation	Y	

<u>Notes</u>:
1. Only potentially complete pathways from the conceptual site model are included in this table.

Abbreviations
COCs - constituents of concern
HASP - Health and Safety Plan
personal protective equipment - PPE
TBD - to be determined
VOC - volatile organic compound

Table 23
Observed Vegetative Species

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Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Common Name	Scientific Name
Mugwort	Artemisia vulgaris
Japanese Honey Suckle	Lonicera japonica
Common Reed	Phragmite australis
Stickywilly	Galium apartine
Staghorn Sumac	Rhus typhina
Canada Goldenrod	Solidago canadensis
Asiatic Bittersweet	Celastrus orbiculatus
Japanese Knotweed	Reynoutria japonica
White Mullberry	Morus alba
Black Locust	Robinia psuedoacacia
Poison Ivy	Toxicodendron radicans
Fowl Bluegrass	Poa palustris
Common Plantain	Plantago major
Yellow Foxtail	Setaria pumila
Purple Loosetrife	Lythrum salicaria
Big Bluestem	Andropogon gerardii
American Sycamore	Platanus occidentalis
Pin Oak	Quercus palustris
Black Cherry	Prunus serotina
Birds Foot Trefoil	Lotus norniculatus
Queen Anne's Lace	Daucus carota
Princess Tree	Paulowna tomentosa
Eastern Cottonwood	Populus deltoides
White Birch	Betula papyrifera
Garlic Mustard	Alliaria petiolata
Chinese catalpa	Catalpa ovata
Vetch	Vicia sp.
Bradford Pear	Pyrus calleryana
White Spruce	Picea glauca
American Elm	Ulmus americana

Notes:
1. Listing of species detailed during site observations conducted on May 1, 2019 and November 12, 2019.

Table 24
Observed Wildlife Species

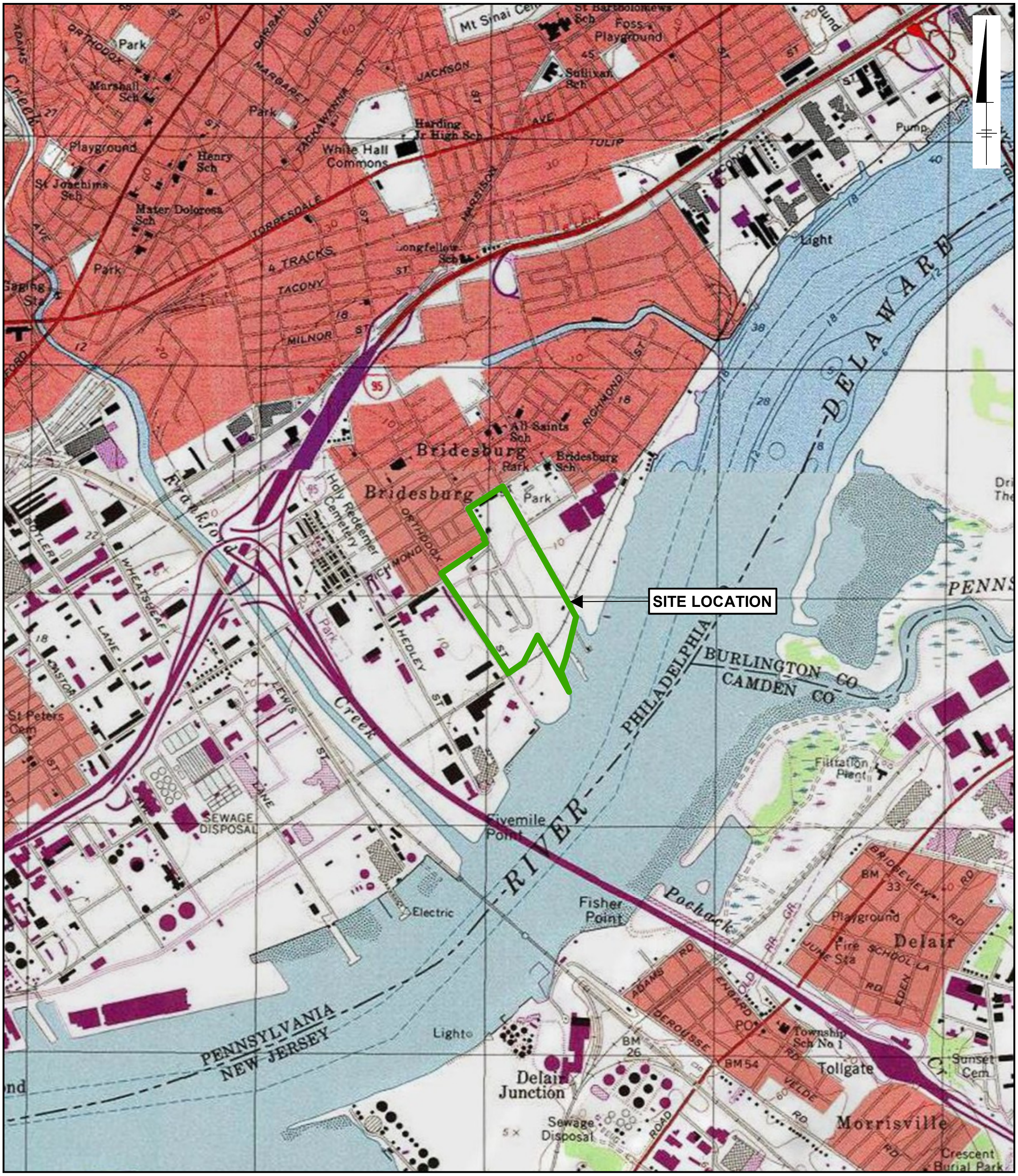
DRAFT

Remedial Investigation Report
National Grid Former Philadelphia Coke Plant
Philadelphia, Pennsylvania

Common Name	Scientific Name
American Crow	Corvus brachyrhynchos
American Robin	Turdus migratorius
Grey Squirrel	Sciurus carolinensis
Groundhog	Marmota monax
Raccoon	Procyon lotor
Red Fox	Vulpes vulpes
Ring-billed Gull	Larus delawarensis
White-tailed Deer	Odocoileus virginianus

Notes:
1. Listing of species detailed during site observations conducted on November 12, 2019.

FIGURES



NOTE:

1. USGS TOPOGRAPHIC MAP PROVIDED BY ESRI.

0 2,000 4,000 Feet

GRAPHIC SCALE

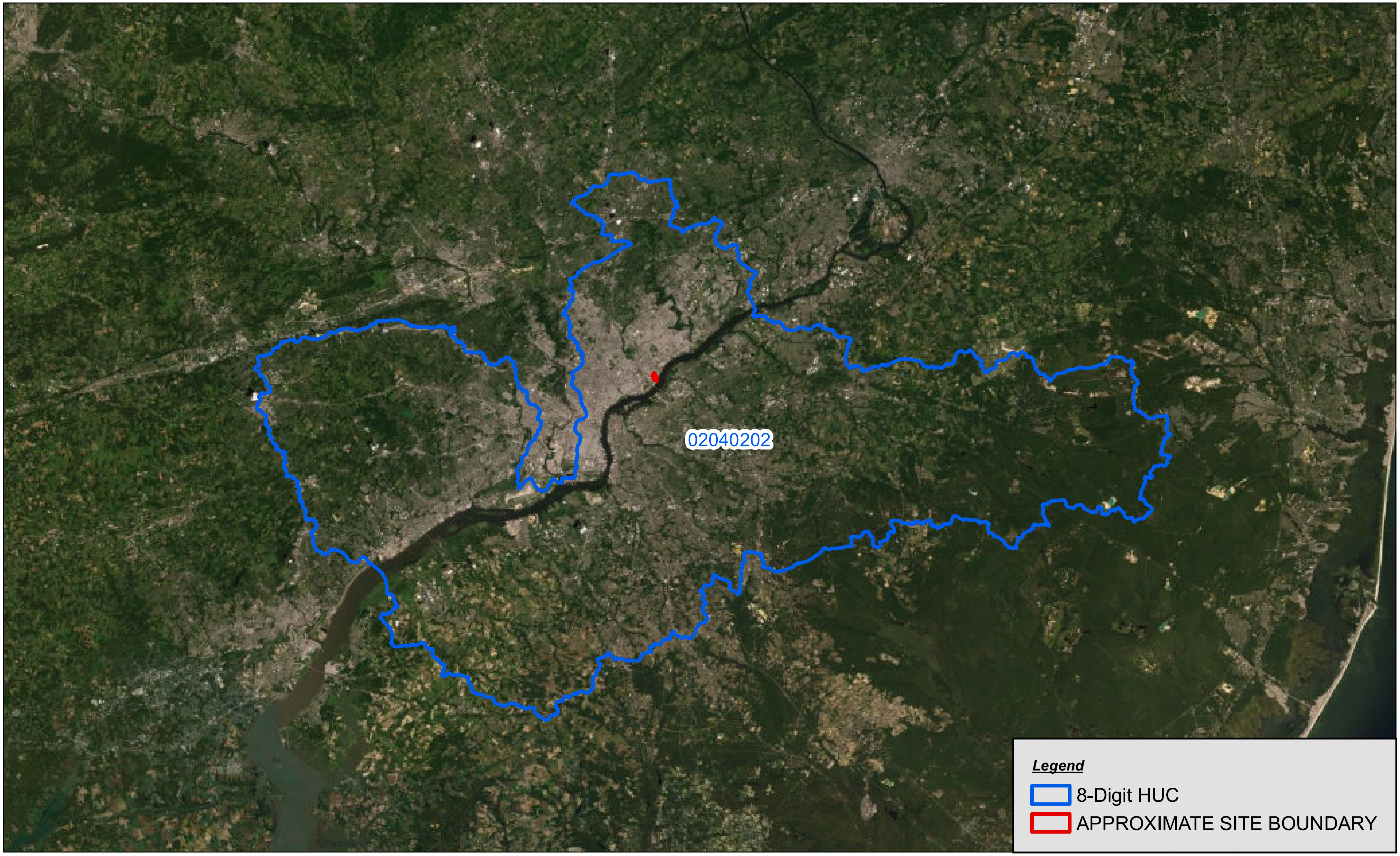
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig1_SiteLocationMap.mxd 6/24/2021 4:09:00 PM



0 50,000 100,000 Feet

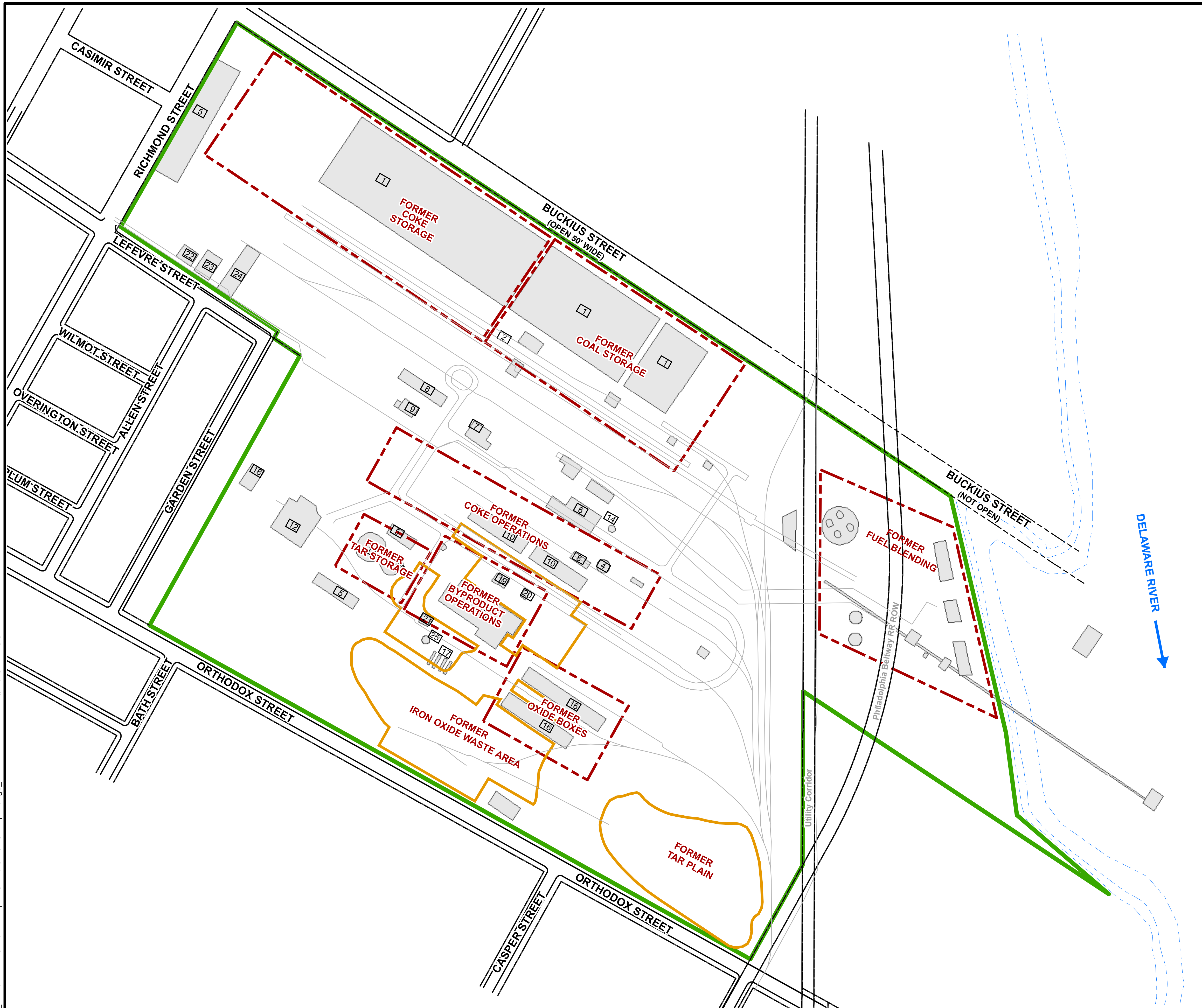
NOTE:
1. 2016 AERIAL IMAGE ACCESSED VIA ARC GIS ONLINE
2. HUC IS DEFINED AS HYDROLOGIC UNIT CODE

N

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

FIGURE 2. LOWER DELAWARE RIVER WATERSHED

ARCADIS Design & Consultancy for natural and built assets



LEGEND:

- FORMER SITE OPERATION AREA
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

FORMER STRUCTURES:

1 - COKE AND COAL STORAGE (NO STRUCTURES)
2 - CONVEYOR
3 - FUEL BLENDING AREA
4 - STACKS
5 - CONCRETE FOUNDATION
6 - BOILER HOUSE / PRODUCER BUILDING
7 - SHEET METAL BUILDING
8 - DUST COLLECTOR
9 - ELECTRIC SUBSTATION
10 - COKE OVENS
11 - QUENCHING STATION
12 - MACHINE SHOP
13 - TAR STORAGE TANK / HOLDER FOUNDATION
14 - TAR STORAGE TANK / HOLDER FOUNDATION
15 - BY-PRODUCTS BUILDING
16 - OXIDE BOXES
17 - TANKS
18 - FIELD OFFICES
19 - TAR DECANTERS
20 - DECANTER SLUDGE LAGOON
21 - WASTE LIQUOR PIT
22 - LAB
24 - CHANGE HOUSE
25 - ABSORBER TANK

NOTE:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

0 250 500 Feet

GRAPHIC SCALE

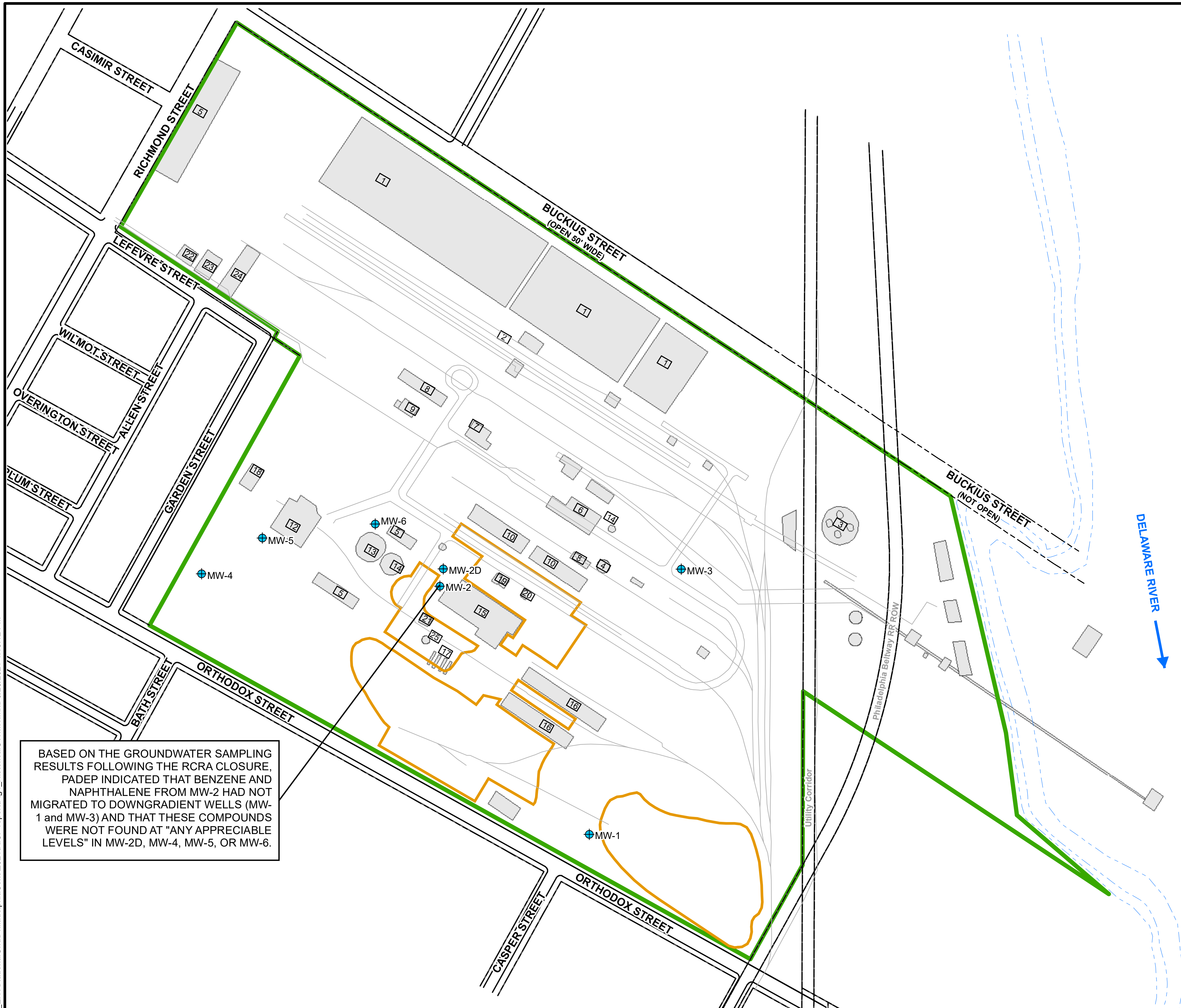
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

FORMER STRUCTURES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig3_FormerStructures.mxd 6/24/2021 4:15:57 PM



LEGEND:

- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

FORMER STRUCTURES:

1 - COKE AND COAL STORAGE (NO STRUCTURES)
2 - CONVEYOR
3 - FUEL BLENDING AREA
4 - STACKS
5 - CONCRETE FOUNDATION
6 - BOILER HOUSE / PRODUCER BUILDING
7 - SHEET METAL BUILDING
8 - DUST COLLECTOR
9 - ELECTRIC SUBSTATION
10 - COKE OVENS
11 - QUENCHING STATION
12 - MACHINE SHOP
13 - TAR STORAGE TANK / HOLDER FOUNDATION
14 - TAR STORAGE TANK / HOLDER FOUNDATION
15 - BY-PRODUCTS BUILDING
16 - OXIDE BOXES
17 - TANKS
18 - FIELD OFFICES
19 - TAR DECANTERS
20 - DECANTER SLUDGE LAGOON
21 - WASTE LIQUOR PIT
22 - LAB
24 - CHANGE HOUSE
25 - ABSORBER TANK

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1”=250’.
2. IN A JULY 26, 1999 LETTER, PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) CONCLUDED THAT VOLATILE ORGANIC COMPOUND AND SEMI-VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER SIGNIFICANTLY DECREASED FROM 1985 TO 1998 AND HAVE BEEN LOCALIZED SINCE 1994. THE CONCLUSION WAS BASED ON 14 YEARS OF GROUNDWATER SAMPLING FROM APRIL 1985 TO NOVEMBER 1998 AT MONITORING WELLS MW-1 THROUGH MW-6. DURING THIS TIME PERIOD, GROUNDWATER SAMPLES WERE GENERALLY COLLECTED ON A QUARTERLY BASIS (FOUR TIMES A YEAR).

0 250 500 Feet
GRAPHIC SCALE

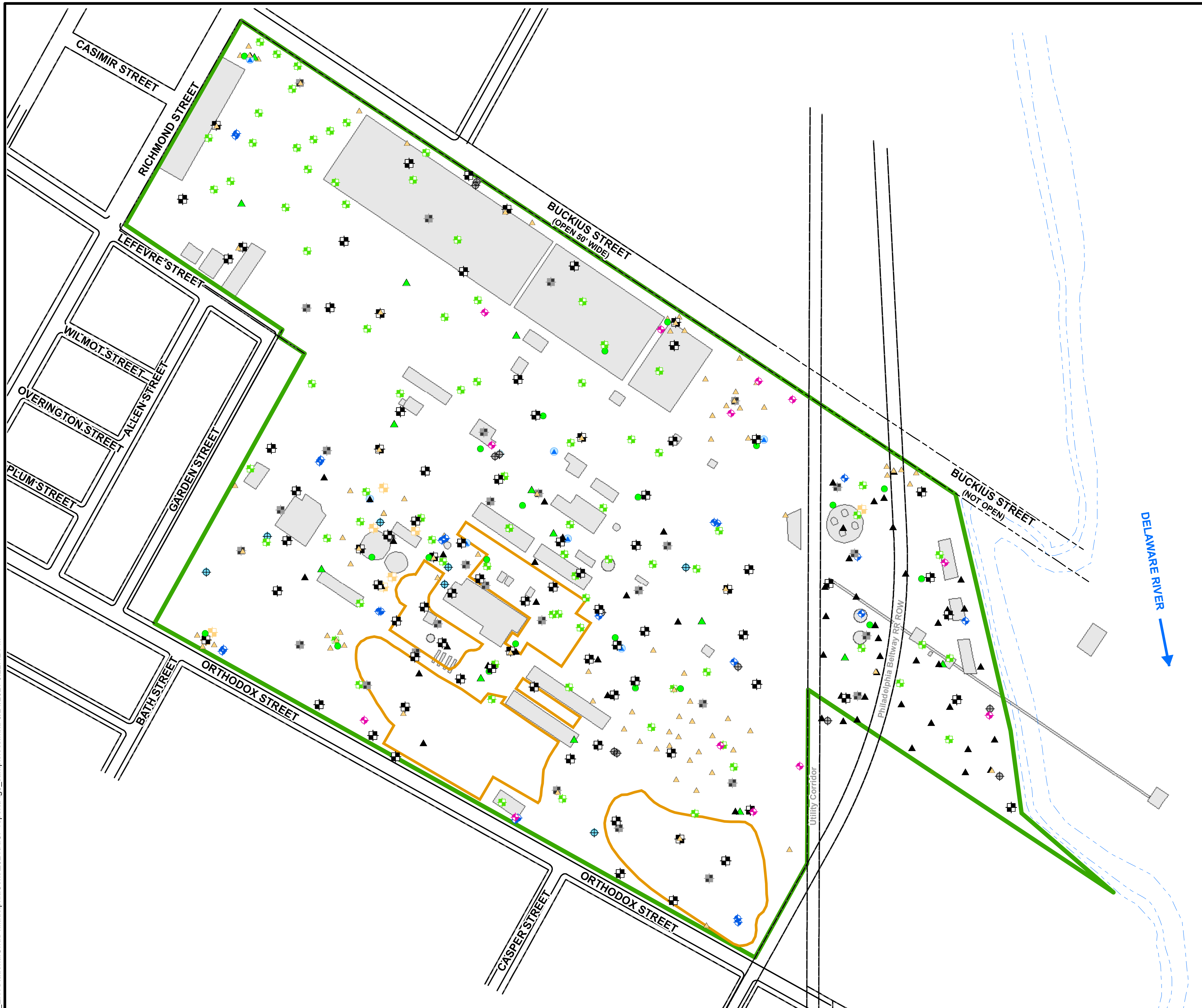
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

HISTORICAL GROUNDWATER MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig4_HistoricalGWMW.mxd 6/25/2021 4:15:12 PM



LEGEND:

- ARCADIS SOIL BORING LOCATION (2019)
- ARCADIS TEST PIT LOCATION (2019)
- PSS ENVIRONMENTAL SOIL BORINGS (2005)
- PSS ENVIRONMENTAL HYDROPUNCHES (2005)
- PSS ENVIRONMENTAL TEST PITS (2005)
- PSS ENVIRONMENTAL TEST PITS (2003)
- EEI GEOTECHNICAL TEST PITS (2005)
- ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- PSS ENVIRONMENTAL GROUNDWATER MONITORING WELLS (2005)
- MISSING/DESTROYED PSS ENVIRONMENTAL GROUNDWATER MONITORING WELLS
- RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- EEI GEOTECHNICAL SOIL BORINGS (2005)
- PSS SOIL VAPOR SAMPLING LOCATIONS (2006)
- FORMER RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTE:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

0 250 500 Feet

GRAPHIC SCALE

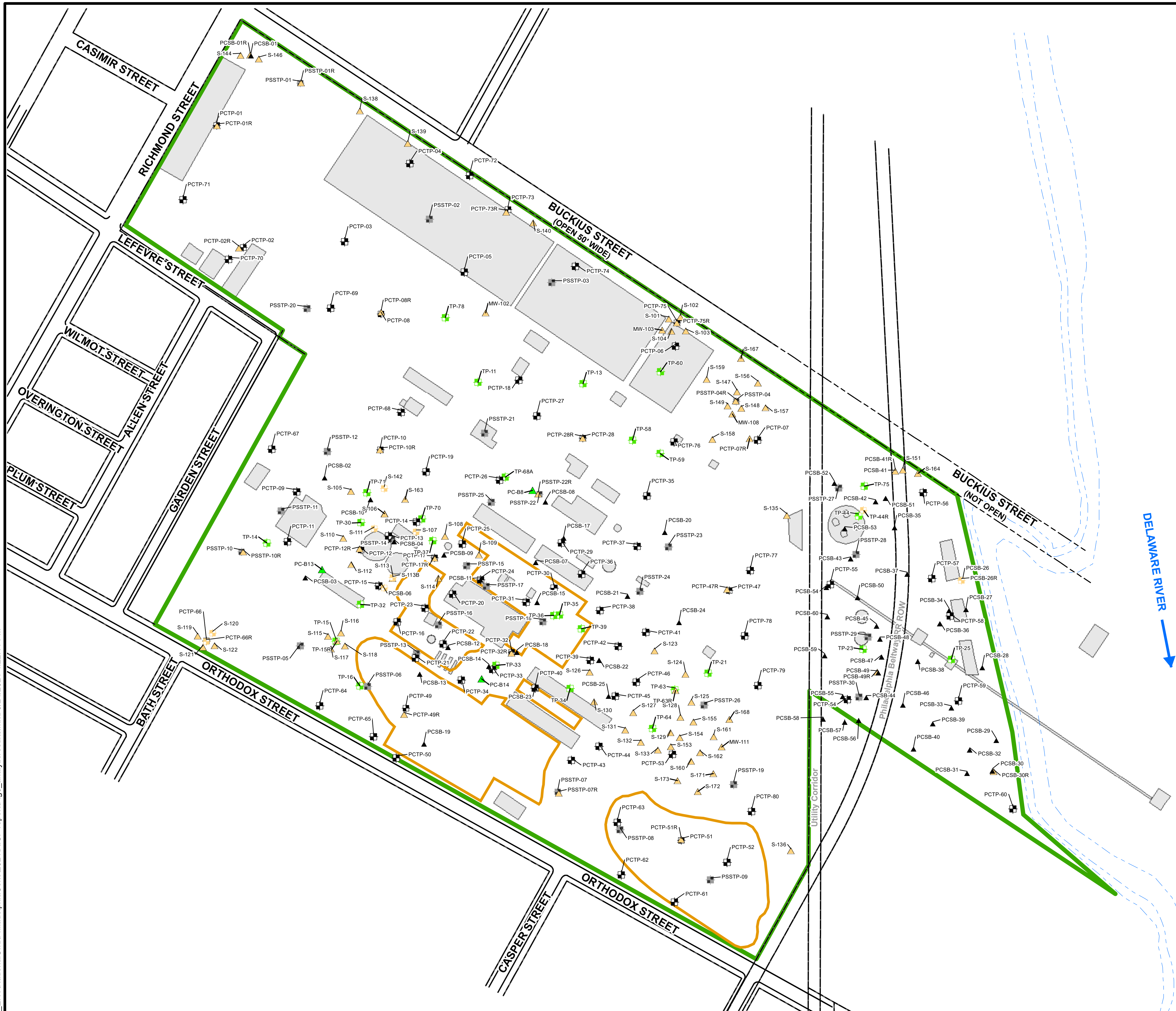
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig5_samplelocs.mxd 6/24/2021 3:22:42 PM



LEGEND:

- (S-101) 2019 SOIL BORING LOCATION (2019)
- (S-120) 2019 TEST PIT LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (PC-B6) EEI GEOTECHNICAL SOIL BORINGS (2005)
- FORMER RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. FIGURE ONLY SHOWS SAMPLE LOCATIONS WHERE SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS.

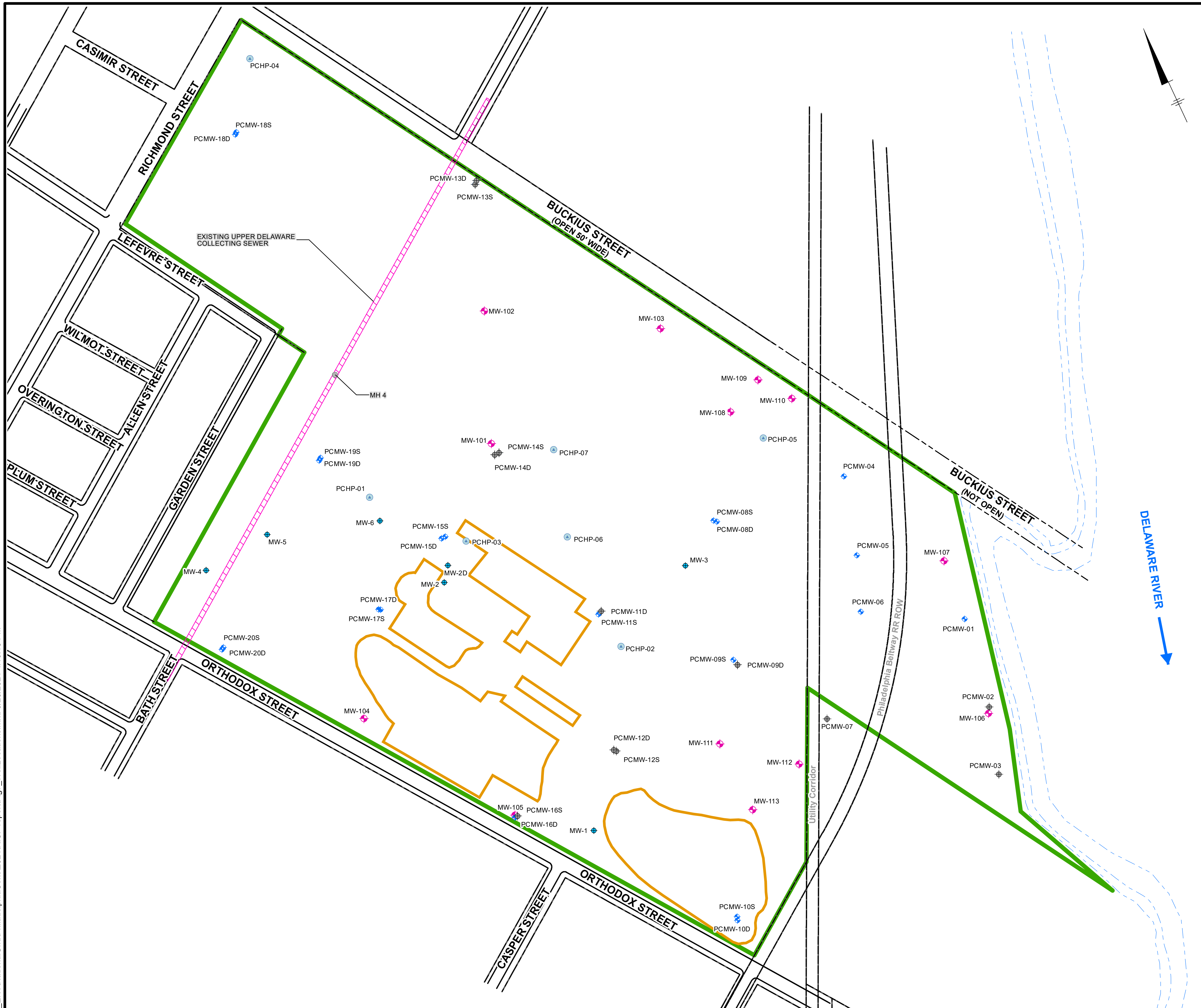
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL SAMPLING LOCATIONS WITH CHEMICAL ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE **6**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig6_analyticresults.mxd 6/24/2021 4:22:41 PM



LEGEND:

(MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)

(PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)

(PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL

(PCHP-03) PSS GROUNDWATER HYDROPUNCH (2005)

(MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)

FORMER RCRA EXCAVATION

APPROXIMATE SITE BOUNDARY

SHORELINE

NOTE:
1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

0 250 500 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

REMEDIAL INVESTIGATION GROUNDWATER MONITORING WELLS

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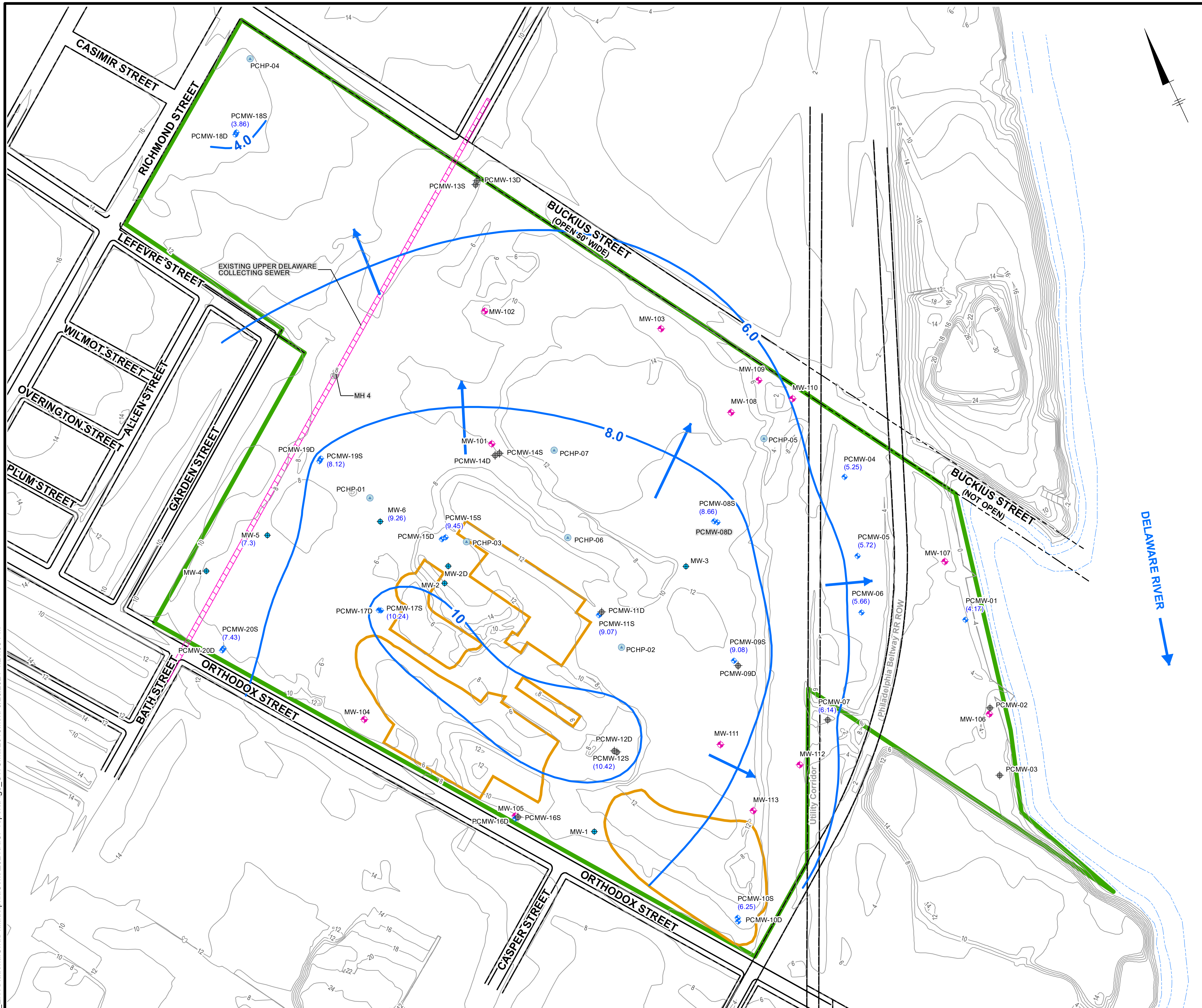
FIGURE **7**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig7_WellLocations.mxd 6/25/2021 4:16:18 PM



LEGEND:

- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- (9.07) GROUNDWATER ELEVATION - SHALLOW ZONE (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- (MW-101) GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (PCHP-03) PSS GROUNDWATER HYDROPUNCH (2005)
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT. (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. WATER LEVEL ELEVATIONS ARE FROM MARCH 19, 2018 APPROXIMATELY AN HOUR BEFORE LOW TIDE THROUGH THE DURATION OF LOW TIDE.
3. PCMW-07 AND PCMW-12S ARE OBSTRUCTED BY OVERGROWN ROOTS IMMEDIATELY BELOW THE WATER TABLE. HOWEVER, WATER ELEVATIONS WERE STILL OBTAINED FROM BOTH WELLS.
4. MONITORING WELLS MW-101 THROUGH MW-113 WERE NOT YET INSTALLED DURING THE MARCH 2018 WATER LEVEL GAUGING EVENT.

0 250 500 Feet

GRAPHIC SCALE

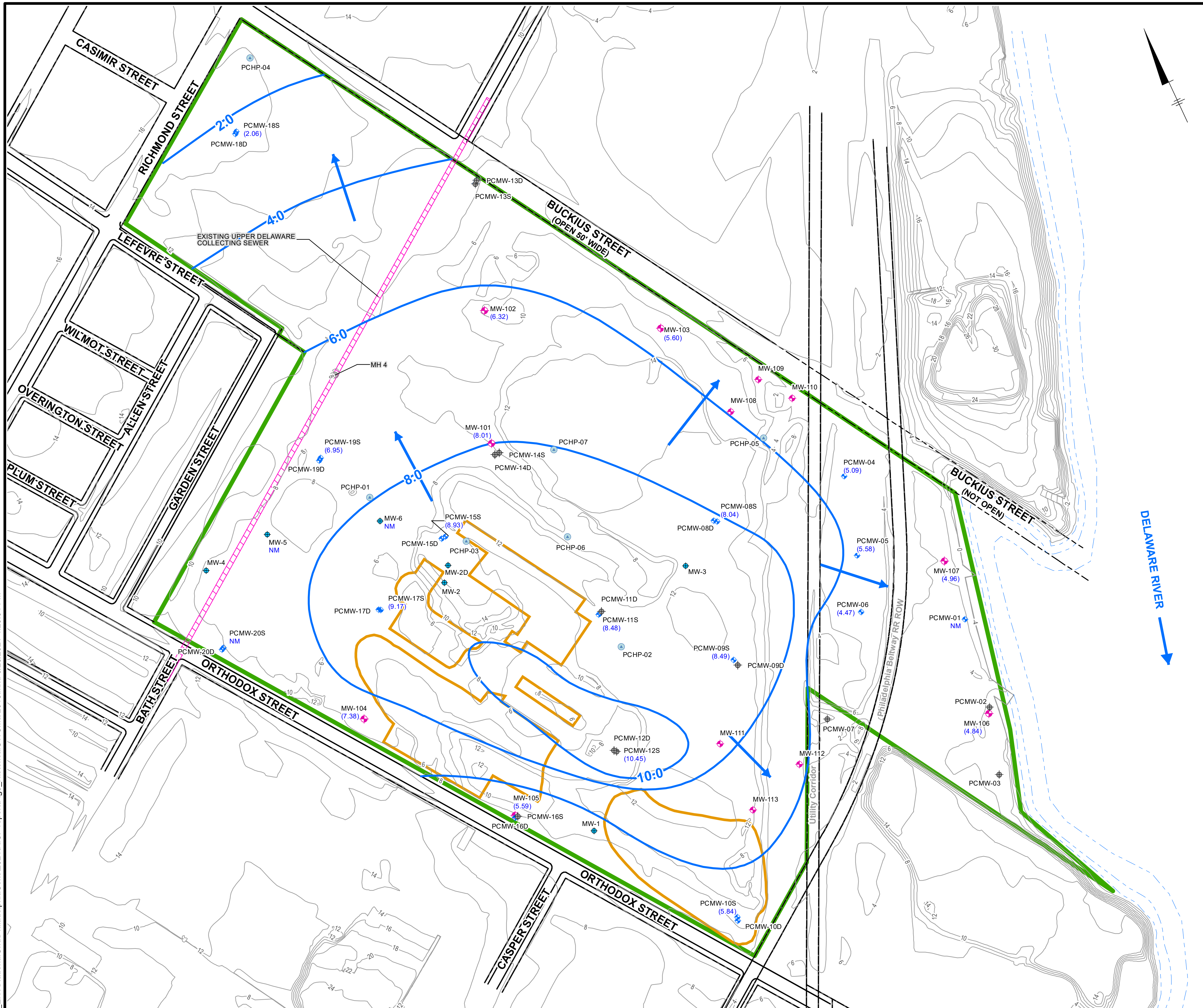
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER POTENTIOMETRIC SURFACE MAP - SHALLOW ZONE MARCH 19, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE **8**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig8_GWCMar2018.mxd 6/25/2021 4:21:35 PM



LEGEND:

- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- (9.07) GROUNDWATER ELEVATION - SHALLOW ZONE (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (PCHP-03) PSS GROUNDWATER HYDROPUNCH (2005)
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT. (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. WATER LEVEL ELEVATIONS ARE FROM MAY 29, 2018 APPROXIMATELY AT LOW TIDE TO AN HOUR AFTER LOW TIDE.
3. NM = NOT MEASURED
4. PCMW-12S IS OBSTRUCTED BY OVERGROWN ROOTS IMMEDIATELY BELOW THE WATER TABLE. HOWEVER, WATER ELEVATION WAS STILL OBTAINED FROM THE WELL.
5. MONITORING WELLS MW-108 THROUGH MW-113 WERE NOT YET INSTALLED DURING THE 2018 WATER LEVEL GAUGING EVENTS.

0 250 500 Feet

GRAPHIC SCALE

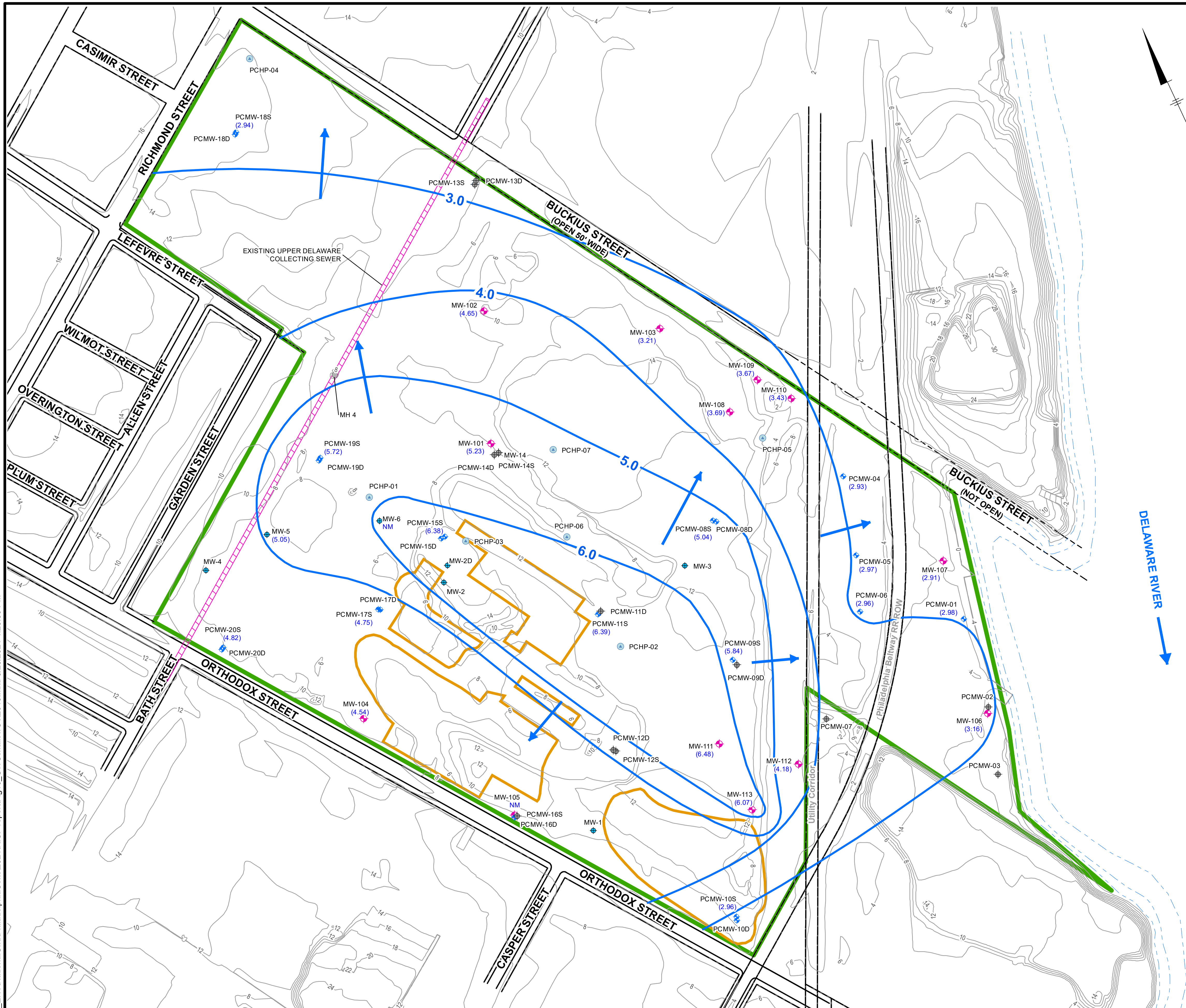
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER POTENTIOMETRIC SURFACE MAP - SHALLOW ZONE MAY 29, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE
9

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig9_HistoricalGWCMar2018.mxd 6/25/2021 4:23:04 PM



LEGEND:

- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- (2.98) GROUNDWATER ELEVATION - SHALLOW ZONE (FEET ABOVE MEAN SEA LEVEL NAVD 88)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (PCHP-03) PSS GROUNDWATER HYDROPUNCH (2005)
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT. (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTE:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. WATER LEVEL ELEVATIONS ARE FROM OCTOBER 3, 2019 APPROXIMATELY 2 HOURS BEFORE LOW TIDE THROUGH THE DURATION OF LOW TIDE.
3. NM = NOT MEASURED.

0 250 500 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER POTENTIOMETRIC SURFACE MAP - SHALLOW ZONE OCTOBER 3, 2019

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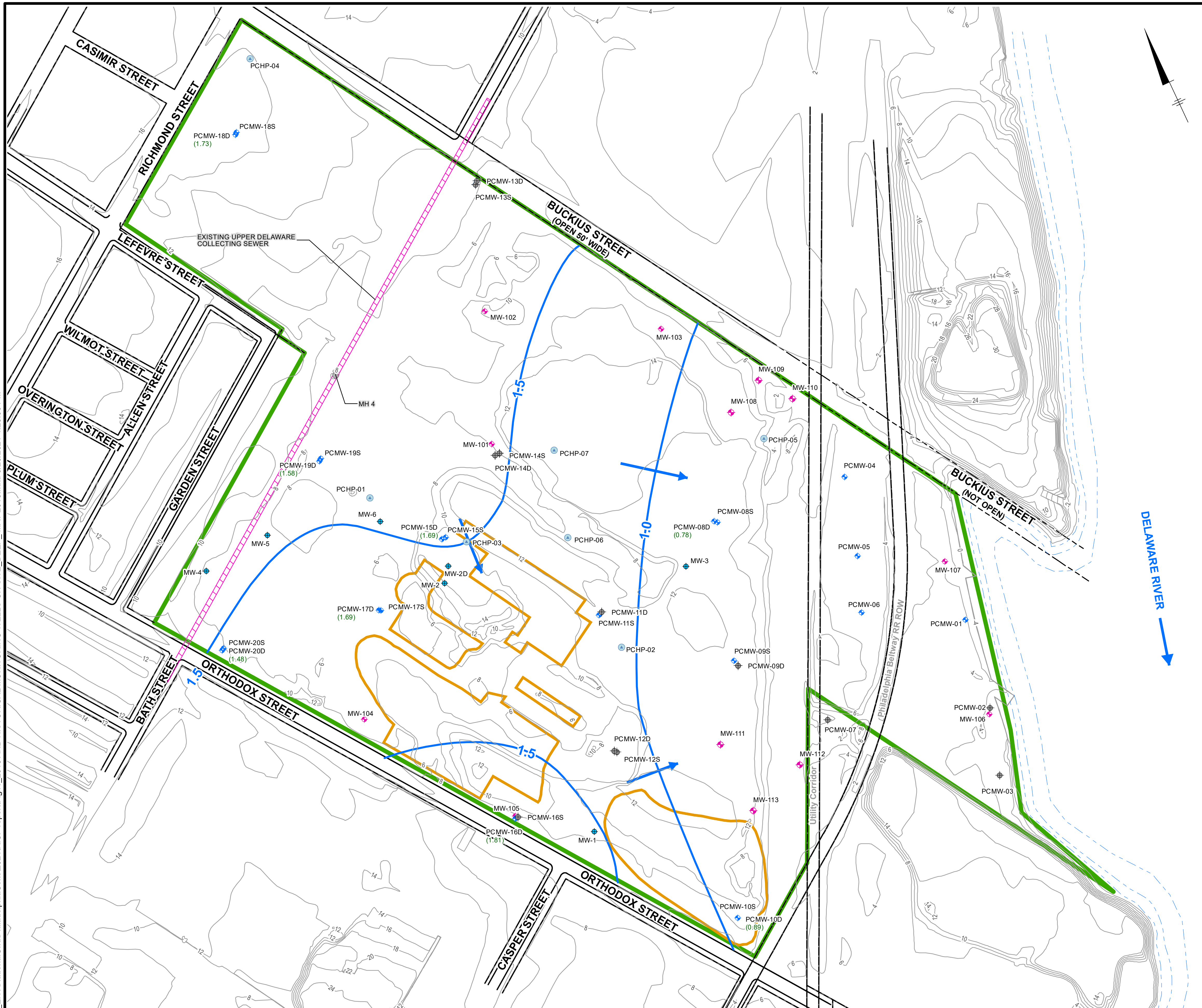
FIGURE **10**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig10_GWCshallowOct2019.mxd 6/25/2021 4:23:56 PM



LEGEND:

- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- (9.07) GROUNDWATER ELEVATION - DEEP ZONE (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (PCHP-03) PSS GROUNDWATER HYDROPUNCH (2005)
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT. (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. WATER LEVEL ELEVATIONS ARE FROM MAY 29, 2018 APPROXIMATELY AT LOW TIDE TO AN HOUR AFTER LOW TIDE.

0 250 500 Feet

GRAPHIC SCALE

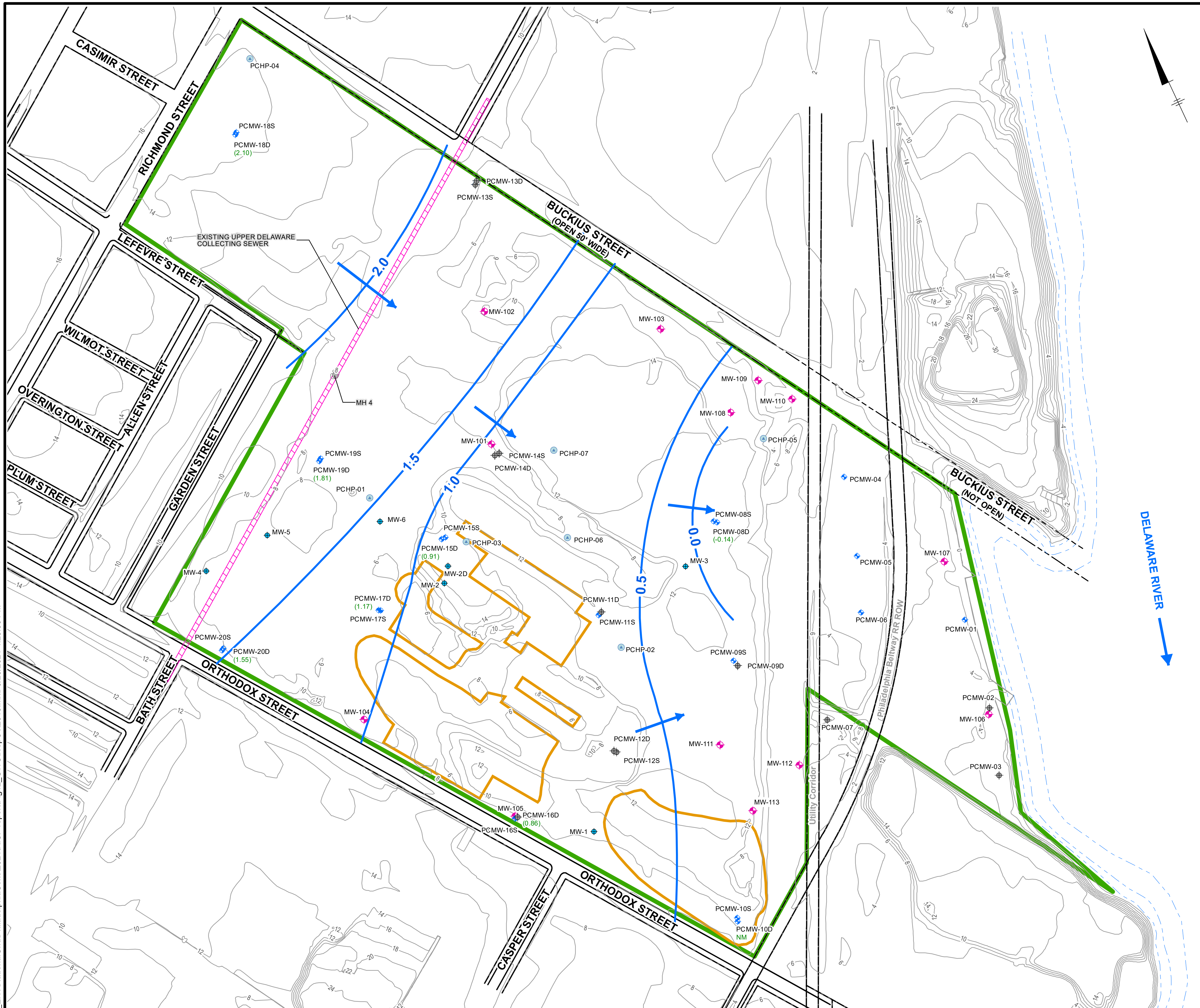
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER POTENTIOMETRIC SURFACE MAP - DEEP ZONE MAY 29, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE **11**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig11_2018 AND HISTORICAL MONITORING WELLS ON SITE_DEEP_ MAY 2018.mxd 6/25/2021 4:25:06 PM



LEGEND:

- INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)
- APPROXIMATE GROUNDWATER FLOW
- (0.91) GROUNDWATER ELEVATION - DEEP ZONE (FEET ABOVE MEAN SEA LEVEL NAVD 88)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (PCHP-03) PSS GROUNDWATER HYDROPUNCH
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- GROUND SURFACE ELEVATION CONTOURS FROM DATA Clearinghouse Philadelphia Contours 2ft. (Philadelphia Vertical Datum, 2004 - City of Philadelphia)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. WATER LEVEL ELEVATIONS ARE FROM OCTOBER 3, 2019 APPROXIMATELY 2 HOURS BEFORE LOW TIDE THROUGH THE DURATION OF LOW TIDE.
3. NM = NOT MEASURED.

0 250 500 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER POTENTIOMETRIC SURFACE MAP - DEEP ZONE OCTOBER 3, 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE **12**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig12_GWCdeepOct2019.mxd 6/25/2021 4:25:55 PM

LEGEND:

PUMPING WELL SEARCH RESULTS

- OTHER WITHDRAWAL WELL LOCATION
- MONITORING WELL LOCATION
- DOMESTIC WITHDRAWAL WELL LOCATION
- UNKNOWN WITHDRAWAL WELL LOCATION
- UNUSED/ABANDONED/DESTROYED WELL LOCATION
- SITE BOUNDARY
- 1/2-MILE RADIUS OF SITE

GEOLOGIC UNIT

- QT - FILL DEPOSITS, HOLOCENE MARSH/ALLUVIAL DEPOSITS, AND TRENTON GRAVEL (PLEISTOCENE) FORMATION
- XW - WISSAHICKON FORMATION

NOTES:

1. GEOLOGIC DATA - THE U.S. DEPARTMENT OF AGRICULTURE (USDA), 2005, (ACCESSED VIA WEB ON MARCH 28, 2012).
2. WELL DATA - PA TOPOGRAPHIC & GEOLOGIC SURVEY DATABASE (ACCESSED VIA WEB ON OCTOBER 13, 2020).
3. PER THE PHILADELPHIA WATER DEPARTMENT RECORDS, RESIDENTS AROUND THE SITE CONSUME CITY WATER. ACCORDING TO THE PENNSYLVANIA GROUNDWATER INFORMATION SYSTEM WEBSITE, THE ONE DOMESTIC WELL LOCATED NEAR THE SITE IS ALSO LISTED FOR MONITORING. THE ONE DOMESTIC WELL IS LOCATED ON A PROPERTY WHERE THERE IS A HISTORICAL DIESEL RELEASE. THEREFORE, IT IS LIKELY THAT THIS WELL WAS USED FOR AND/OR CONTINUES TO BE USED FOR MONITORING PURPOSES ONLY. MORE INFORMATION IS AVAILABLE IN SUBSECTION 3.2.2.1 OF THE REMEDIAL INVESTIGATION REPORT.
4. WELLS OUTSIDE THE 1/2-MILE RADIUS OF THE SITE ARE NOT SHOWN.

0 900 1,800
Feet

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SITE GEOLOGY MAP WITH LOCAL WELLS WITHIN HALF MILE RADIUS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
13

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig13_HalfMileRadius_DSCP_GeologicMapand_WaterSupply_B-size.mxd 6/24/2021 4:29:46 PM

LEGEND:

- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (S-120) ARCADIS TEST PIT LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (B-06) EEI GEOTECHNICAL SOIL BORINGS (2005)
- FORMER RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

CROSS SECTION TRANSECTS

- A-A'
- B-B'

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. FIGURE ONLY SHOWS SAMPLE LOCATIONS WHERE SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS.

0 250 500 Feet

GRAPHIC SCALE

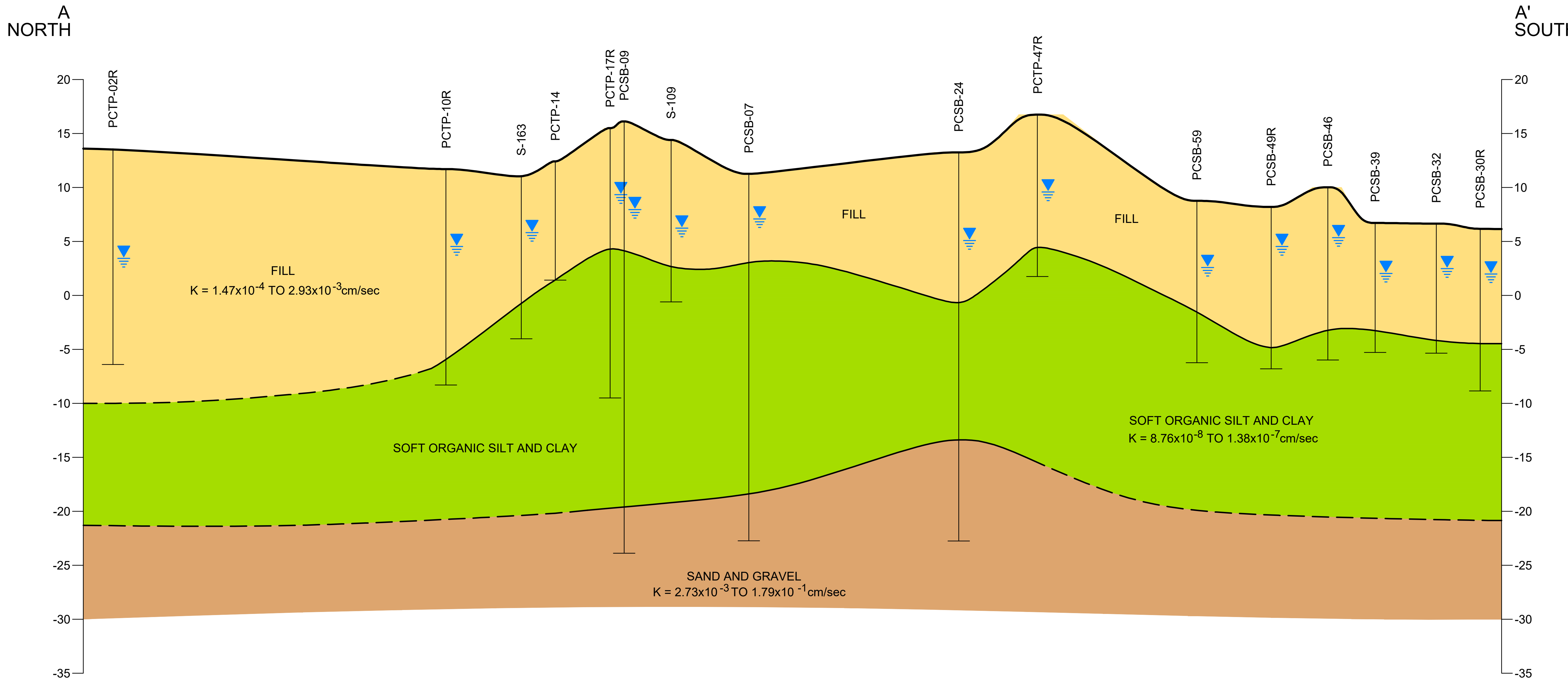
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

CROSS SECTION LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
14

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig14_CXLocationMap.mxd 6/24/2021 4:30:45 PM



DRAFT
CONFIDENTIAL

LEGEND

S-163	ARCADIS SOIL BORING LOCATION (2019)
PCSB-09	PSS ENVIRONMENTAL SOIL BORING (2005)
PCTP-14	PSS ENVIRONMENTAL TEST PIT (2005)
K	HYDRAULIC CONDUCTIVITY
cm/sec	CENTIMETER PER SECOND
	WELL/BORING LOCATION

APPROXIMATE GROUNDWATER ELEVATION BASED ON ELEVATION OF GROUNDWATER ENCOUNTERED IN THE BORING OR TEST PIT

FILL

CLAY

SAND AND GRAVEL

ASSUMED GEOLOGIC CONTACTS BASED ON AVAILABLE BORINGS

10

0 100 200

CROSS-SECTION SCALE IN FEET
VERTICAL EXAGGERATION: 20x

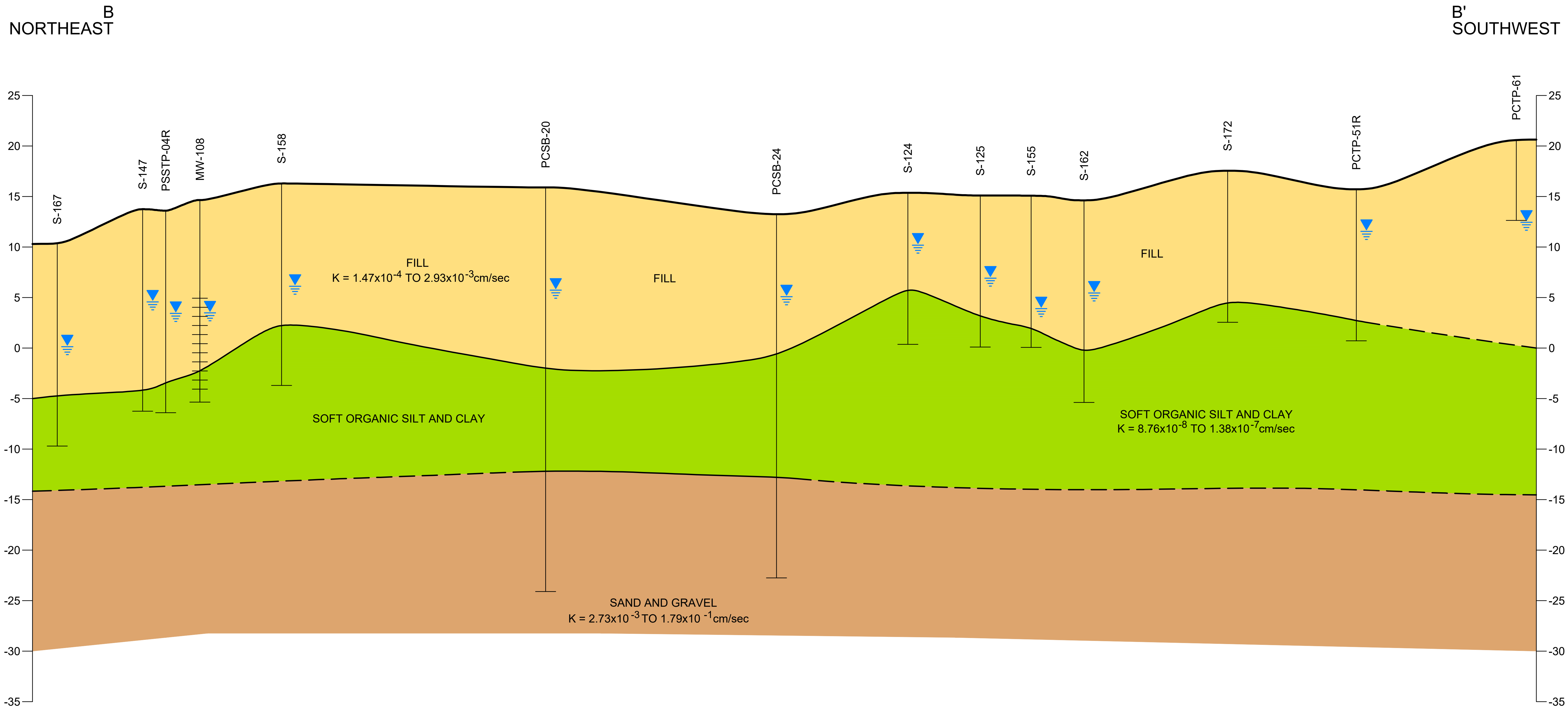
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GEOLOGIC CROSS-SECTION A - A'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
15

DIV/GROUP: ENV DB: C. McKeough PIC:(Opt) PM:(Reqd) TM: E. Green LYR:(Opt)ON=*;OFF=*REF*
C:\Users\akens\OneDrive - ARCADIS\BIM 360 Docs\National Grid\Project Files\Philadelphia Coke\2020\30004026\01-DWG\Xsec-WellPts.dwg LAYOUT: 15 SAVED: 6/24/2021 2:10 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: PDF-LB PLOTSTYLETABLE: BLACKGRAY.CTB PLOTTED: 6/24/2021 4:06 PM
BY: AKENS, DAVID
XREFS: PROJECTNAME: ----



LEGEND

S-163 ARCADIS SOIL BORING LOCATION (2019)

MW-108 ARCADIS GROUNDWATER MONITORING WELL LOCATION (2019)

PCSB-09 PSS ENVIRONMENTAL SOIL BORING (2005)

PCTP-14 PSS ENVIRONMENTAL TEST PIT (2005)

K HYDRAULIC CONDUCTIVITY

cm/sec CENTIMETER PER SECOND

WELL/BORING LOCATION

SCREENED INTERVAL

APPROXIMATE GROUNDWATER ELEVATION BASED ON ELEVATION OF GROUNDWATER ENCOUNTERED IN THE BORING OR TEST PIT

FILL

CLAY

SAND AND GRAVEL

ASSUMED GEOLOGIC CONTACTS BASED ON AVAILABLE BORINGS

10

0 50 100

CROSS-SECTION SCALE IN FEET
VERTICAL EXAGGERATION: 10x

DRAFT
CONFIDENTIAL

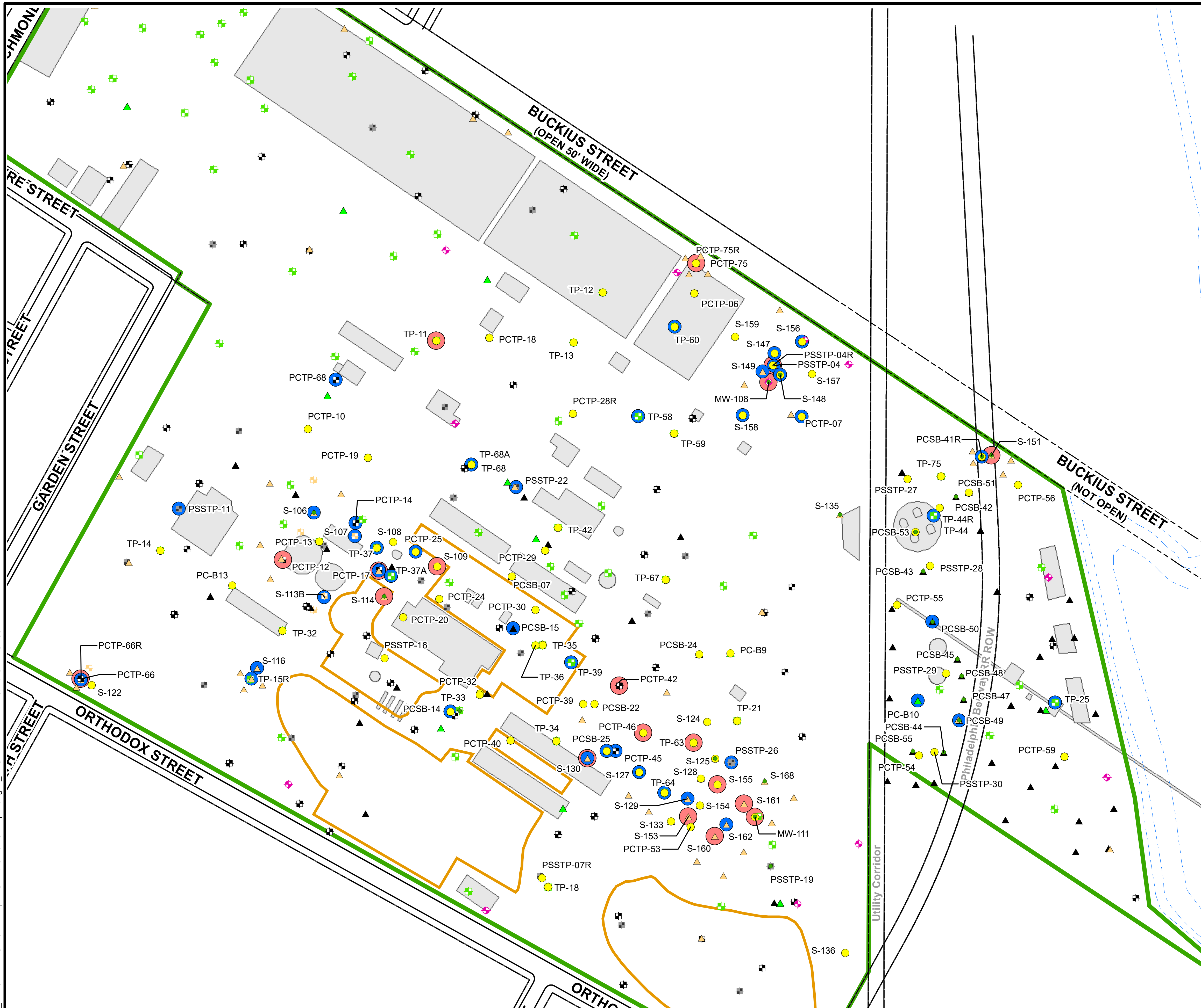
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GEOLOGIC CROSS-SECTION B - B'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
16

DIV/GROUP: ENV DB: C. McKeough PIC:(Opt) PM:(Reqd) TM: E. Green LYR:(Opt)ON=*;OFF=*REF*
C:\Users\akens\OneDrive - ARCADIS\BIM 360 Docs\National Grid\Project Files\Philadelphia Coke\2020\30004026\01-DWG\Xsec-WellPts.dwg LAYOUT: 16 SAVED: 6/24/2021 2:10 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: PDF-LB PLOTSTYLETABLE: BLACKGRAY.CTB PLOTTED: 6/24/2021 4:06 PM
BY: AKENS, DAVID
PROJECTNAME: ----
XREFS:



LEGEND:

- HEADSPACE PID READING >= 100 PPM
- SHEEN
- SOLIDIFIED TAR OR TAR-LIKE MATERIAL
- VISCOUS TAR OR OIL-LIKE MATERIAL
- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (S-120) 2019 ARCADIS TEST PIT LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PC-B6) EEI GEOTECHNICAL SOIL BORINGS (2005)
- FORMER RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1”=250’.
2. SAMPLE IDs ARE SHOWN FOR LOCATIONS WHERE PHOTOIONIZATION DETECTORS (PID) READINGS EQUAL TO OR GREATER THAN 100 PARTS PER MILLION (PPM), SHEEN, SOLIDIFIED TAR, AND/OR VISCOUS TAR/OIL-LIKE MATERIAL WERE OBSERVED.

0 200 400 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL BORING OBSERVATIONS

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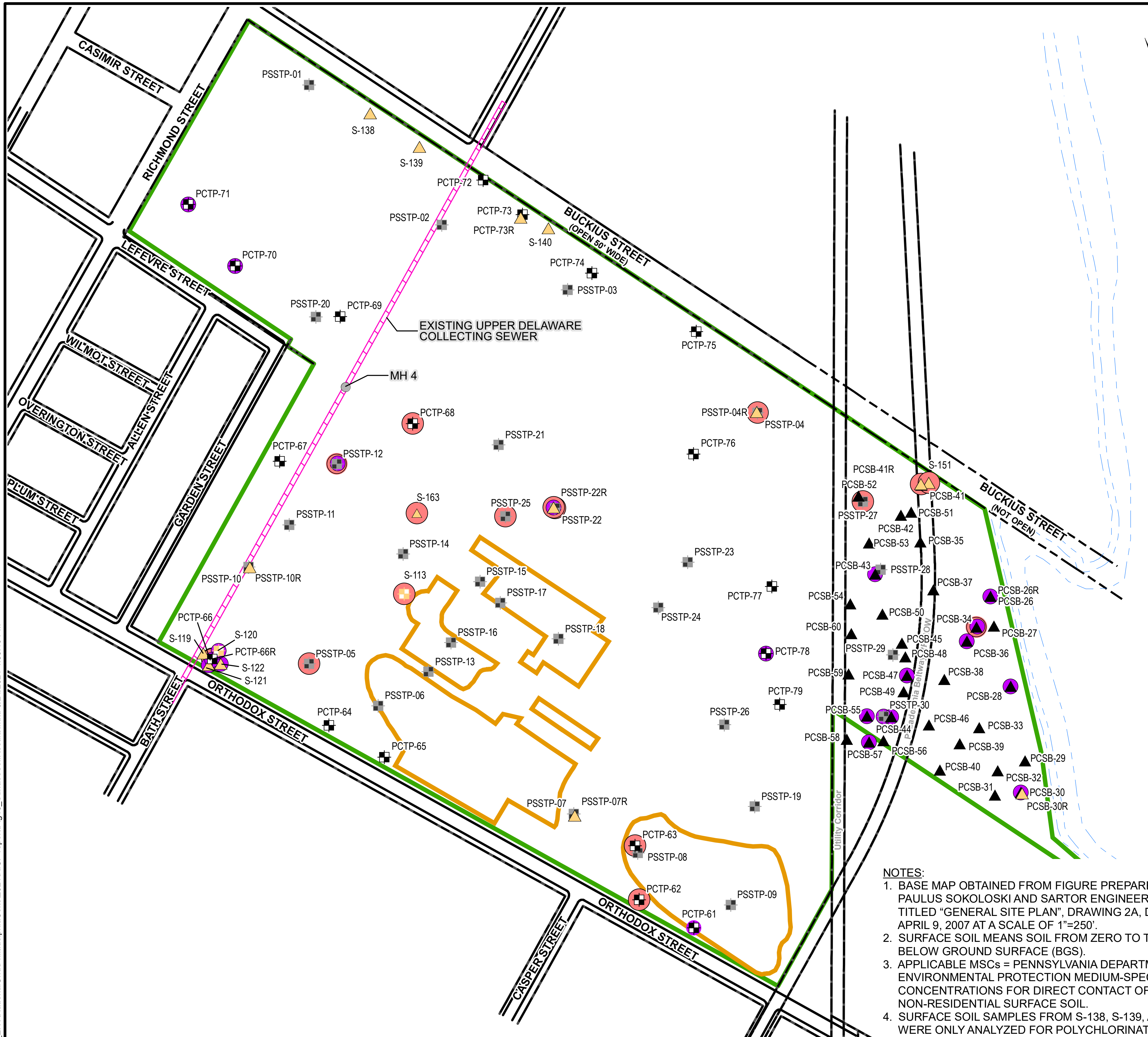
FIGURE
17

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig17_SBObservations.mxd 6/24/2021 4:32:39 PM



LEGEND:

- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS
- (S-163) ARCADIS SOIL BORING LOCATION
- (S-113) ARCADIS TEST PIT LOCATION
- LOCATION WHERE ONE OR MORE INORGANIC CONSTITUENTS EXCEED APPLICABLE MSCs
- LOCATION WHERE ONE OR MORE SVOC CONSTITUENTS EXCEED APPLICABLE MSCs
- SHORELINE
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE

0 250 500 Feet

GRAPHIC SCALE

NOTES:
1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. SURFACE SOIL MEANS SOIL FROM ZERO TO TWO FEET BELOW GROUND SURFACE (BGS).
3. APPLICABLE MSCs = PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION MEDIUM-SPECIFIC CONCENTRATIONS FOR DIRECT CONTACT OF NON-RESIDENTIAL SURFACE SOIL.
4. SURFACE SOIL SAMPLES FROM S-138, S-139, AND S-140 WERE ONLY ANALYZED FOR POLYCHLORINATED BIPHENYLS.

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PHILADELPHIA, PENNSYLVANIA
RI REPORT

SURFACE SOIL ANALYTICAL RESULTS

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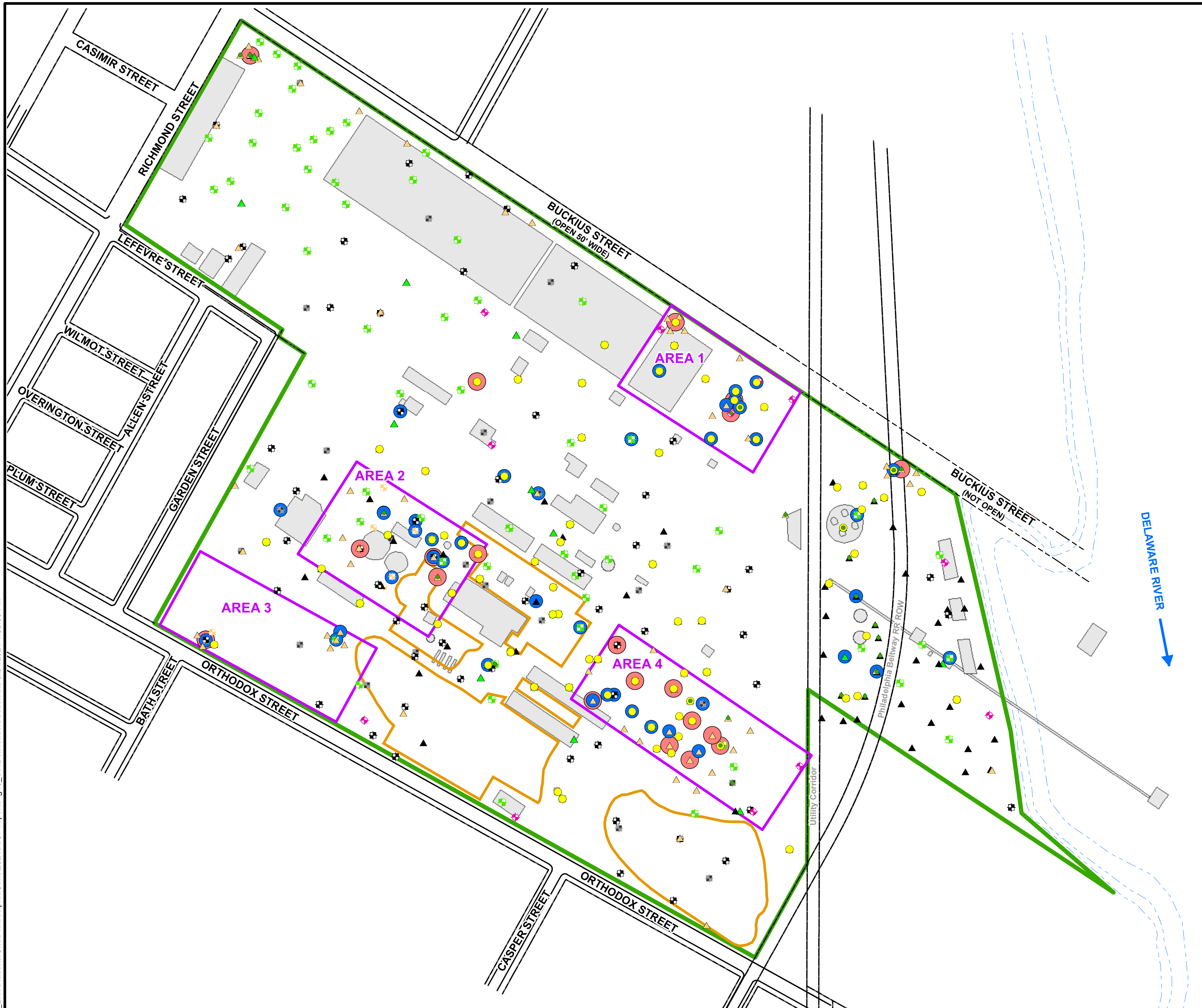
FIGURE
18

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig18_SurfaceSoilResults.mxd 6/24/2021 4:58:19 PM



LEGEND:

- HEADSPACE PID READING >= 100 PPM
- SHEEN
- SOLIDIFIED TAR OR TAR-LIKE MATERIAL
- VISCOUS TAR OR OIL-LIKE MATERIAL
- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (S-120) 2019 ARCADIS TEST PIT LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PC-B6) EEI GEOTECHNICAL SOIL BORINGS (2005)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. PID = PHOTOIONIZATION DETECTOR.
3. PPM = PARTS PER MILLION.

0 250 500 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL DELINEATION AREAS

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FIGURE **19**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig19_SoilDelineationAreas.mxd 6/24/2021 4:35:06 PM

LEGEND:

- HEADSPACE PID READING >= 100 PPM
- SHEEN
- SOLIDIFIED TAR OR TAR-LIKE MATERIAL
- VISCOUS TAR OR OIL-LIKE MATERIAL
- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1”=250’.
2. PID = PHOTOIONIZATION DETECTOR.
3. PPM = PARTS PER MILLION.

0 50 100 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL DELINEATION AREA 1

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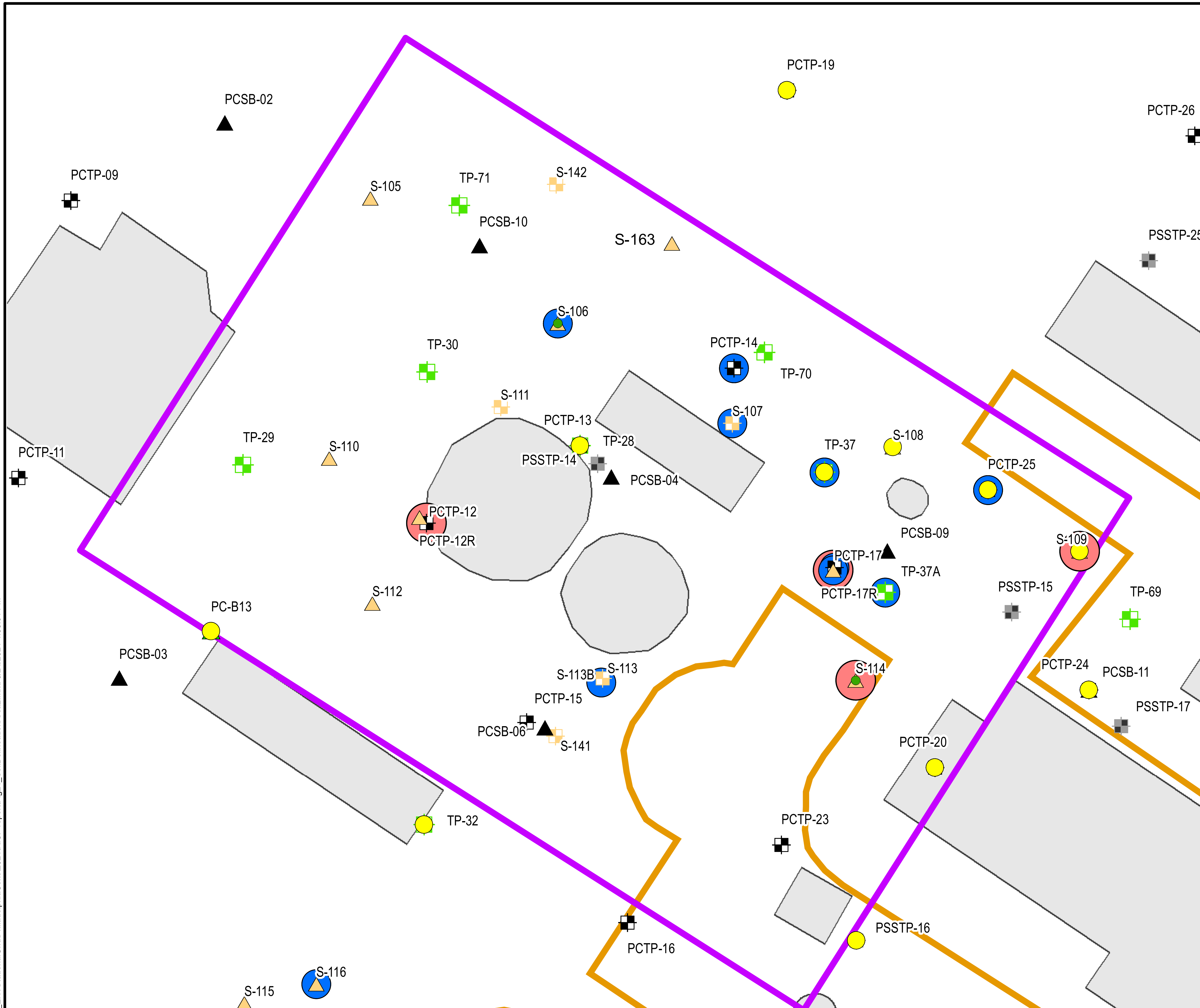
FIGURE 20

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig20_SoilDelineationArea1.mxd 6/24/2021 4:36:59 PM



LEGEND:

- HEADSPACE PID READING >= 100 PPM
- SHEEN
- SOLIDIFIED TAR OR TAR-LIKE MATERIAL
- VISCOUS TAR OR OIL-LIKE MATERIAL
- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (S-120) 2019 ARCADIS TEST PIT LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (PC-B6) EEI GEOTECHNICAL SOIL BORINGS (2005)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. PID = PHOTOIONIZATION DETECTOR.
3. PPM = PARTS PER MILLION.

0 50 100 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL DELINEATION AREA 2

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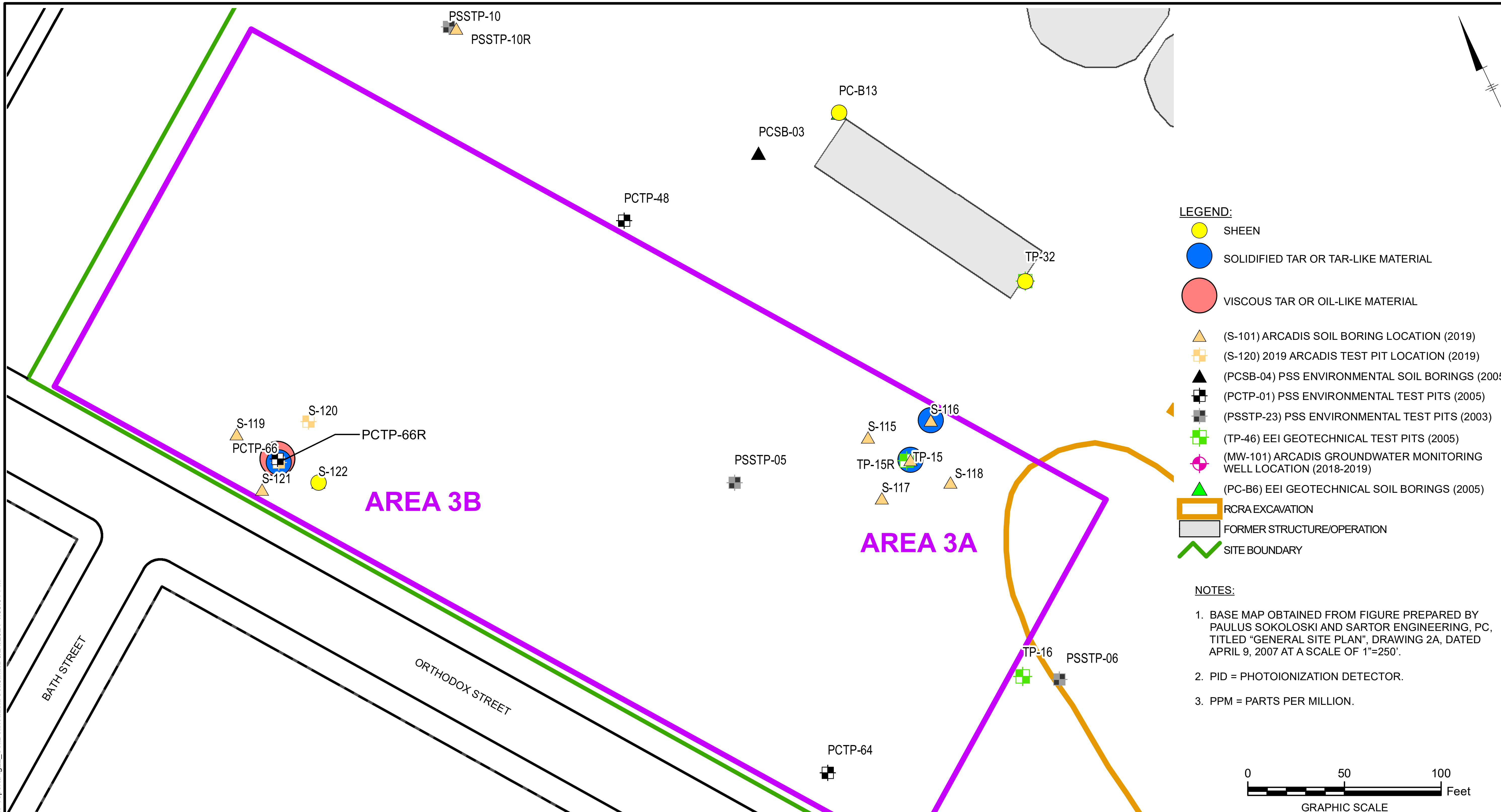
FIGURE
21

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig21_SoilDelineationArea2.mxd 6/24/2021 4:38:01 PM



NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL DELINEATION AREA 3

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FIGURE
22

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig22_SoilDelineationArea3.mxd 6/24/2021 4:39:01 PM

LEGEND:

- HEADSPACE PID READING >= 100 PPM
- SHEEN
- SOLIDIFIED TAR OR TAR-LIKE MATERIAL
- VISCOUS TAR OR OIL-LIKE MATERIAL
- (S-101) ARCADIS SOIL BORING LOCATION (2019)
- (PCSB-04) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (TP-46) EEI GEOTECHNICAL TEST PITS (2005)
- (PC-B6) EEI GEOTECHNICAL SOIL BORINGS (2005)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. PID = PHOTOIONIZATION DETECTOR.
3. PPM = PARTS PER MILLION.

0 50 100 Feet

GRAPHIC SCALE

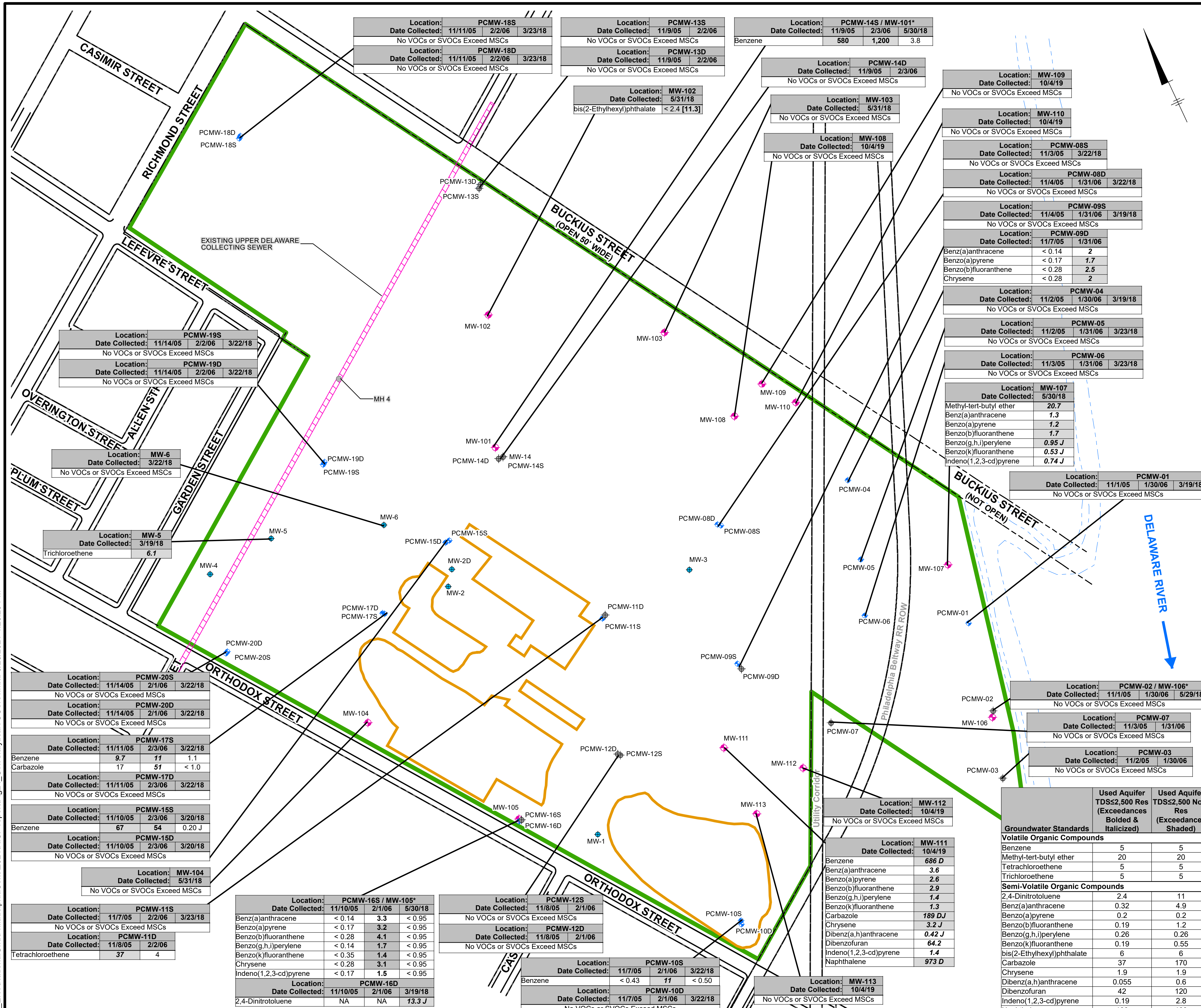
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL DELINEATION AREA 4

ARCADIS Design & Consultancy for natural and built assets

FIGURE
23

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig23_SoilDelineationArea4.mxd 6/24/2021 4:40:29 PM



Location:	PCMW-18S		
Date Collected:	11/11/05	2/2/06	3/23/18
No VOCs or SVOCs Exceed MSCs			
Location:	PCMW-18D		
Date Collected:	11/11/05	2/2/06	3/23/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-13S	
Date Collected:	11/9/05	2/2/06
No VOCs or SVOCs Exceed MSCs		
Location:	PCMW-13D	
Date Collected:	11/9/05	2/2/06
No VOCs or SVOCs Exceed MSCs		

Location:	PCMW-14S / MW-101*		
Date Collected:	11/9/05	2/3/06	5/30/18
Benzene	580	1,200	3.8

Location:	PCMW-14D	
Date Collected:	11/9/05	2/3/06
No VOCs or SVOCs Exceed MSCs		

Location:	MW-102
Date Collected:	5/31/18
bis(2-Ethylhexyl)phthalate	< 2.4 **[11.3]**

Location:	MW-103
Date Collected:	5/31/18
No VOCs or SVOCs Exceed MSCs	

Location:	MW-108
Date Collected:	10/4/19
No VOCs or SVOCs Exceed MSCs	

Location:	MW-109
Date Collected:	10/4/19
No VOCs or SVOCs Exceed MSCs	

Location:	MW-110
Date Collected:	10/4/19
No VOCs or SVOCs Exceed MSCs	

Location:	PCMW-08S	
Date Collected:	11/3/05	3/22/18
No VOCs or SVOCs Exceed MSCs		

Location:	PCMW-08D		
Date Collected:	11/4/05	1/31/06	3/22/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-09S		
Date Collected:	11/4/05	1/31/06	3/19/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-09D	
Date Collected:	11/7/05	1/31/06
Benz(a)anthracene	< 0.14	***2***
Benzo(a)pyrene	< 0.17	***1.7***
Benzo(b)fluoranthene	< 0.28	***2.5***
Chrysene	< 0.28	***2***

Location:	PCMW-04		
Date Collected:	11/2/05	1/30/06	3/19/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-05		
Date Collected:	11/2/05	1/31/06	3/23/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-06		
Date Collected:	11/3/05	1/31/06	3/23/18
No VOCs or SVOCs Exceed MSCs			

Location:	MW-107
Date Collected:	5/30/18
Methyl-tert-butyl ether	***20.7***
Benz(a)anthracene	***1.3***
Benzo(a)pyrene	***1.2***
Benzo(b)fluoranthene	***1.7***
Benzo(g,h,i)perylene	***0.95 J***
Benzo(k)fluoranthene	***0.53 J***
Indeno(1,2,3-cd)pyrene	***0.74 J***

Location:	PCMW-01		
Date Collected:	11/1/05	1/30/06	3/19/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-19S		
Date Collected:	11/14/05	2/2/06	3/22/18
No VOCs or SVOCs Exceed MSCs			
Location:	PCMW-19D		
Date Collected:	11/14/05	2/2/06	3/22/18
No VOCs or SVOCs Exceed MSCs			

Location:	MW-6
Date Collected:	3/22/18
No VOCs or SVOCs Exceed MSCs	

Location:	MW-5
Date Collected:	3/19/18
Trichloroethene	***6.1***

Location:	PCMW-20S		
Date Collected:	11/14/05	2/1/06	3/22/18
No VOCs or SVOCs Exceed MSCs			
Location:	PCMW-20D		
Date Collected:	11/14/05	2/1/06	3/22/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-17S		
Date Collected:	11/11/05	2/3/06	3/22/18
Benzene	***9.7***	***11***	1.1
Carbazole	17	***51***	< 1.0
Location:	PCMW-17D		
Date Collected:	11/11/05	2/3/06	3/22/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-15S		
Date Collected:	11/10/05	2/3/06	3/20/18
Benzene	67	54	0.20 J
Location:	PCMW-15D		
Date Collected:	11/10/05	2/3/06	3/20/18
No VOCs or SVOCs Exceed MSCs			

Location:	MW-104
Date Collected:	5/31/18
No VOCs or SVOCs Exceed MSCs	

Location:	PCMW-11S		
Date Collected:	11/7/05	2/2/06	3/23/18
No VOCs or SVOCs Exceed MSCs			
Location:	PCMW-11D		
Date Collected:	11/8/05	2/2/06	
Tetrachloroethene	***37***	4	

Location:	PCMW-16S / MW-105*		
Date Collected:	11/10/05	2/1/06	5/30/18
Benz(a)anthracene	< 0.14	**3.3**	< 0.95
Benzo(a)pyrene	< 0.17	**3.2**	< 0.95
Benzo(b)fluoranthene	< 0.28	**4.1**	< 0.95
Benzo(g,h,i)perylene	< 0.14	**1.7**	< 0.95
Benzo(k)fluoranthene	< 0.35	**1.4**	< 0.95
Chrysene	< 0.28	**3.1**	< 0.95
Indeno(1,2,3-cd)pyrene	< 0.17	**1.5**	< 0.95
Location:	PCMW-16D		
Date Collected:	11/10/05	2/1/06	3/19/18
2,4-Dinitrotoluene	NA	NA	***13.3 J***

Location:	PCMW-12S	
Date Collected:	11/8/05	2/1/06
No VOCs or SVOCs Exceed MSCs		
Location:	PCMW-12D	
Date Collected:	11/8/05	2/1/06
No VOCs or SVOCs Exceed MSCs		

Location:	PCMW-10S		
Date Collected:	11/7/05	2/1/06	3/22/18
Benzene	< 0.43	***11***	< 0.50
Location:	PCMW-10D		
Date Collected:	11/7/05	2/1/06	3/22/18
No VOCs or SVOCs Exceed MSCs			

Location:	MW-113
Date Collected:	10/4/19
No VOCs or SVOCs Exceed MSCs	

Location:	MW-112
Date Collected:	10/4/19
No VOCs or SVOCs Exceed MSCs	

Location:	MW-111
Date Collected:	10/4/19
Benzene	***686 D***
Benz(a)anthracene	***3.6***
Benzo(a)pyrene	***2.6***
Benzo(b)fluoranthene	***2.9***
Benzo(g,h,i)perylene	***1.4***
Benzo(k)fluoranthene	***1.3***
Carbazole	***189 DJ***
Chrysene	***3.2 J***
Dibenz(a,h)anthracene	***0.42 J***
Dibenzofuran	***64.2***
Indeno(1,2,3-cd)pyrene	***1.4***
Naphthalene	***973 D***

Location:	PCMW-02 / MW-106*		
Date Collected:	11/1/05	1/30/06	5/29/18
No VOCs or SVOCs Exceed MSCs			

Location:	PCMW-07	
Date Collected:	11/3/05	1/31/06
No VOCs or SVOCs Exceed MSCs		

Location:	PCMW-03	
Date Collected:	11/2/05	1/30/06
No VOCs or SVOCs Exceed MSCs		

Groundwater Standards	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)
Volatile Organic Compounds		
Benzene	5	5
Methyl-tert-butyl ether	20	20
Tetrachloroethene	5	5
Trichloroethene	5	5
Semi-Volatile Organic Compounds		
2,4-Dinitrotoluene	2.4	11
Benz(a)anthracene	0.32	4.9
Benzo(a)pyrene	0.2	0.2
Benzo(b)fluoranthene	0.19	1.2
Benzo(g,h,i)perylene	0.26	0.26
Benzo(k)fluoranthene	0.19	0.55
bis(2-Ethylhexyl)phthalate	6	6
Carbazole	37	170
Chrysene	1.9	1.9
Dibenz(a,h)anthracene	0.055	0.6
Dibenzofuran	42	120
Indeno(1,2,3-cd)pyrene	0.19	2.8
Naphthalene	100	100

LEGEND:

- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. SAMPLES PRIOR TO 2018 WERE COLLECTED BY PAULUS, SOKOLOWSKI, AND SARTOR ENGINEERING, PC. SAMPLES IN 2018 AND 2019 WERE COLLECTED BY ARCADIS.

3. ONLY COMPOUNDS EXCEEDING MEDIUM SPECIFIC CONCENTRATIONS (MSCS) ARE SHOWN IN THIS FIGURE.

4. < = CONSTITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.

5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L) OR PARTS PER BILLION (ppb).

6. SHADING INDICATES AN EXCEEDANCE OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S (PADEP'S) NONRESIDENTIAL MSCS FOR USED AQUIFERS CONTAINING TOTAL DISSOLVED SOLIDS (TDS) ≤ 2,500 MILLIGRAMS PER LITER (mg/L).

7. ITALICS AND BOLDING INDICATES AN EXCEEDANCE OF PADEP'S RESIDENTIAL MSCS FOR USED AQUIFERS CONTAINING TDS ≤ 2,500 mg/L.

8. BRACKETS INDICATE THE REPORTED CONCENTRATION OF A DUPLICATE SAMPLE.

9. D = CONCENTRATION IS BASED ON DILUTED SAMPLE ANALYSIS.

10. J = ANALYTE IS AN ESTIMATED VALUE.

11. * = INDICATES THAT THE GROUNDWATER MONITORING WELL WAS INSTALLED TO REPLACE THE MISSING HISTORICAL WELL ALSO LISTED IN THE WELL ID.

0 250 500 Feet

GRAPHIC SCALE

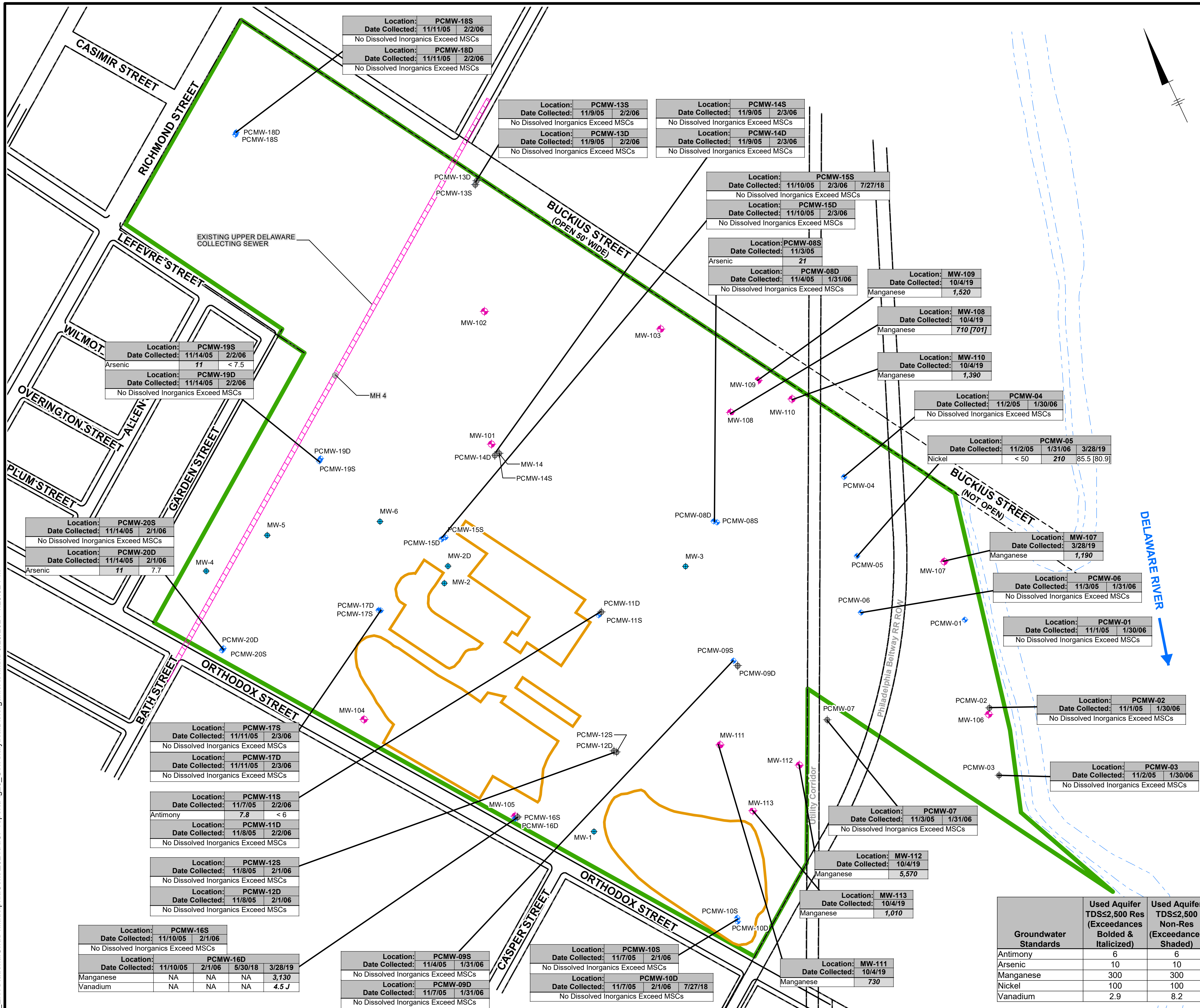
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER ANALYTICAL RESULTS VOCs AND SVOCs EXCEEDING MSCs

ARCADIS Design & Consultancy for natural and built assets

FIGURE **24**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig24_GWAnalyticalVOCSrev.mxd 6/25/2021 4:26:29 PM



LEGEND:

- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. SAMPLES PRIOR TO 2018 WERE COLLECTED BY PAULUS, SOKOLOWSKI, AND SARTOR ENGINEERING, PC. SAMPLES IN 2018 AND 2019 WERE COLLECTED BY ARCADIS.
3. ONLY COMPOUNDS EXCEEDING MEDIUM SPECIFIC CONCENTRATIONS (MSCS) ARE SHOWN IN THIS FIGURE.
4. < = CONSTITUENT NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED DETECTION LIMIT.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L) OR PARTS PER BILLION (ppb).
6. SHADING INDICATES AN EXCEEDANCE OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S (PADEP'S) NONRESIDENTIAL MSCS FOR USED AQUIFERS CONTAINING TOTAL DISSOLVED SOLIDS (TDS) ≤ 2,500 MILLIGRAMS PER LITER (mg/L).
7. ITALICS AND BOLDING INDICATES AN EXCEEDANCE OF PADEP'S RESIDENTIAL MSCS FOR USED AQUIFERS CONTAINING TDS ≤ 2,500 mg/L.
8. * = INDICATES THAT THE GROUNDWATER MONITORING WELL WAS INSTALLED TO REPLACE THE MISSING HISTORICAL WELL ALSO LISTED IN THE WELL ID.
9. J = ANALYTE IS AN ESTIMATED VALUE.

Groundwater Standards	Used Aquifer TDS≤2,500 Res (Exceedances Bolded & Italicized)	Used Aquifer TDS≤2,500 Non-Res (Exceedances Shaded)
Antimony	6	6
Arsenic	10	10
Manganese	300	300
Nickel	100	100
Vanadium	2.9	8.2

0 250 500 Feet

GRAPHIC SCALE

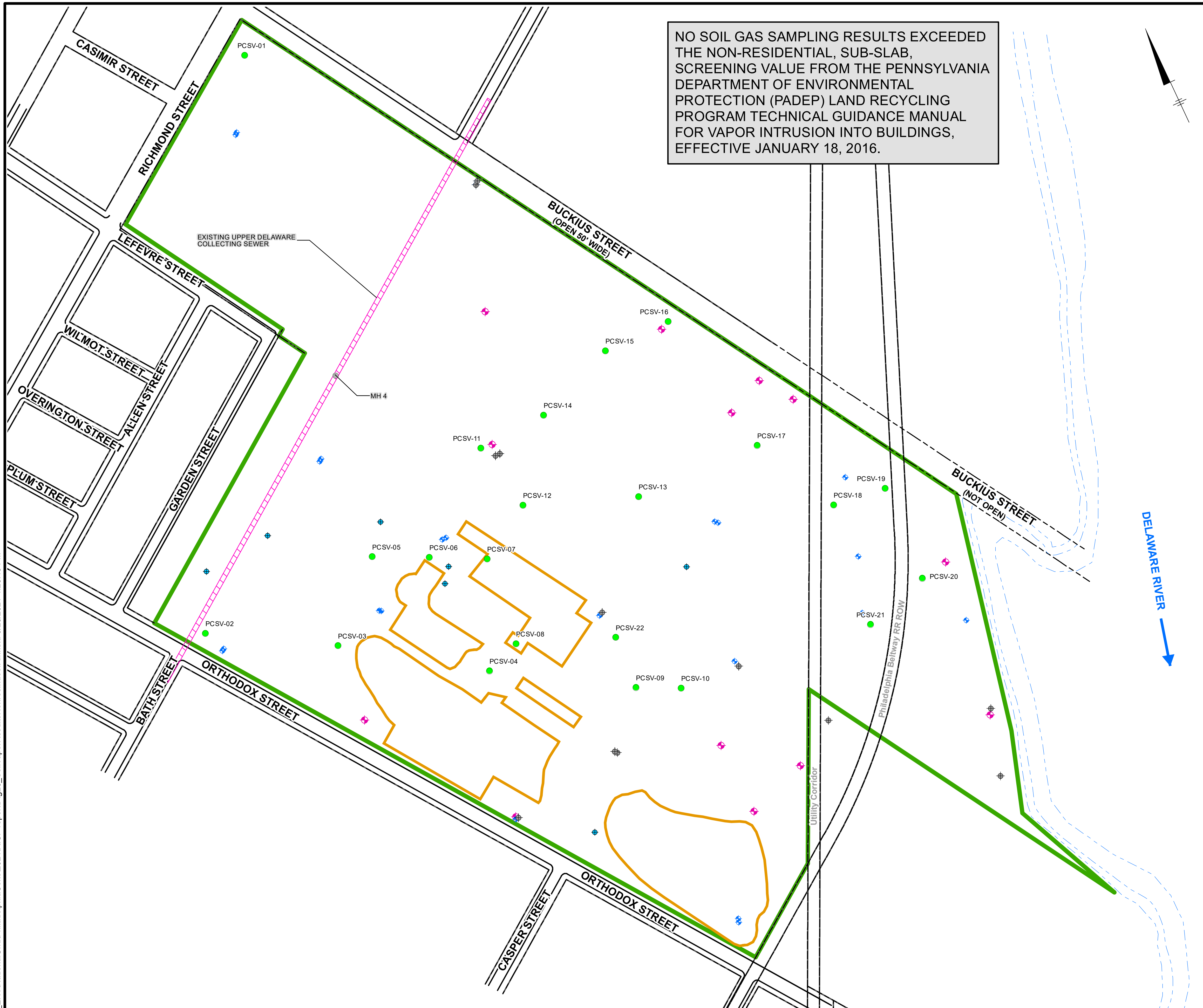
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER ANALYTICAL RESULTS DISSOLVED INORGANICS EXCEEDING MSCs

ARCADIS Design & Consultancy for natural and built assets

FIGURE **25**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig25_GWAnalyticalDisInorganicRev.mxd 6/25/2021 4:28:02 PM



LEGEND:

- (PCSV-20) PSS SOIL VAPOR SAMPLING LOCATIONS (2006)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. SAMPLES WERE COLLECTED BY PAULUS, SOKOLOWSKI, AND SARTOR ENGINEERING, PC ON THE DATES INDICATED.

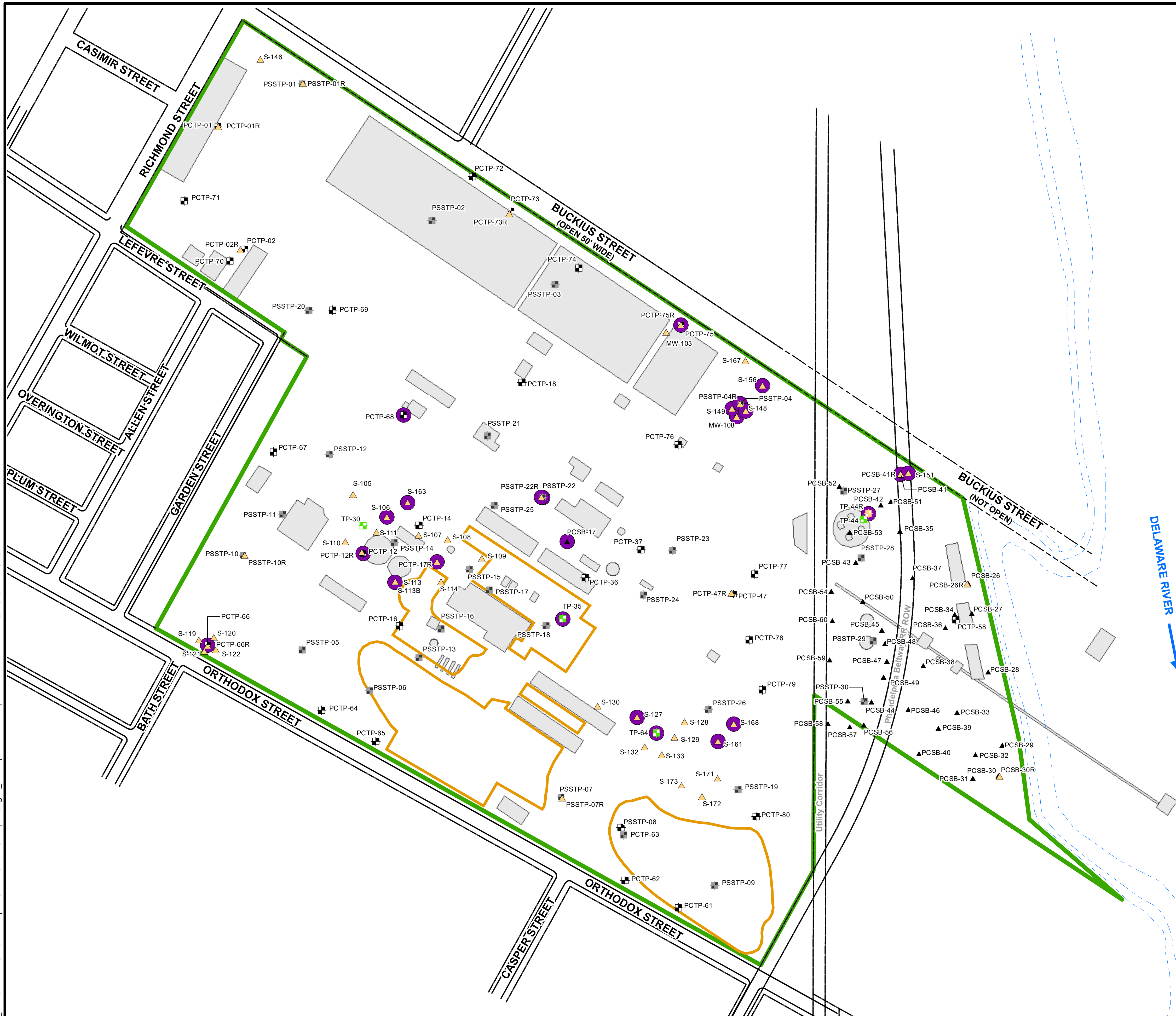
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL GAS SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 26

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig26_SoilVaporResultsNonresIndoorAir.mxd 6/25/2021 4:28:43 PM



LEGEND:

- LOCATION WHERE ONE OR MORE CONSTITUENTS EXCEED APPLICABLE VAPOR INTRUSION SCREENING STANDARDS
- (S-105) 2019 SOIL BORING LOCATION (2019)
- (S-120) 2019 TEST PIT LOCATION (2019)
- (PCSB-17) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (TP-44) EEI GEOTECHNICAL TEST PITS (2005)
- RCRA EXCAVATION
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. FIGURE ONLY SHOWS SAMPLE LOCATIONS WHERE UNSATURATED SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS.

3. VAPOR INTRUSION SCREENING VALUES OBTAINED FROM THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) TECHNICAL GUIDANCE MANUAL FOR VAPOR INTRUSION INTO BUILDINGS FROM GROUNDWATER AND SOIL UNDER ACT 2, DATED NOVEMBER 19, 2016.

4. APPLICABLE VAPOR INTRUSION SCREENING STANDARD IS THE PADEP STATEWIDE HEALTH STANDARD VAPOR INTRUSION SCREENING VALUE FOR NONRESIDENTIAL SOIL.

0 250 500 Feet

GRAPHIC SCALE

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SOIL SAMPLING LOCATIONS EXHIBITING POTENTIAL VAPOR INTRUSION CONCERNS IN VADOSE ZONE

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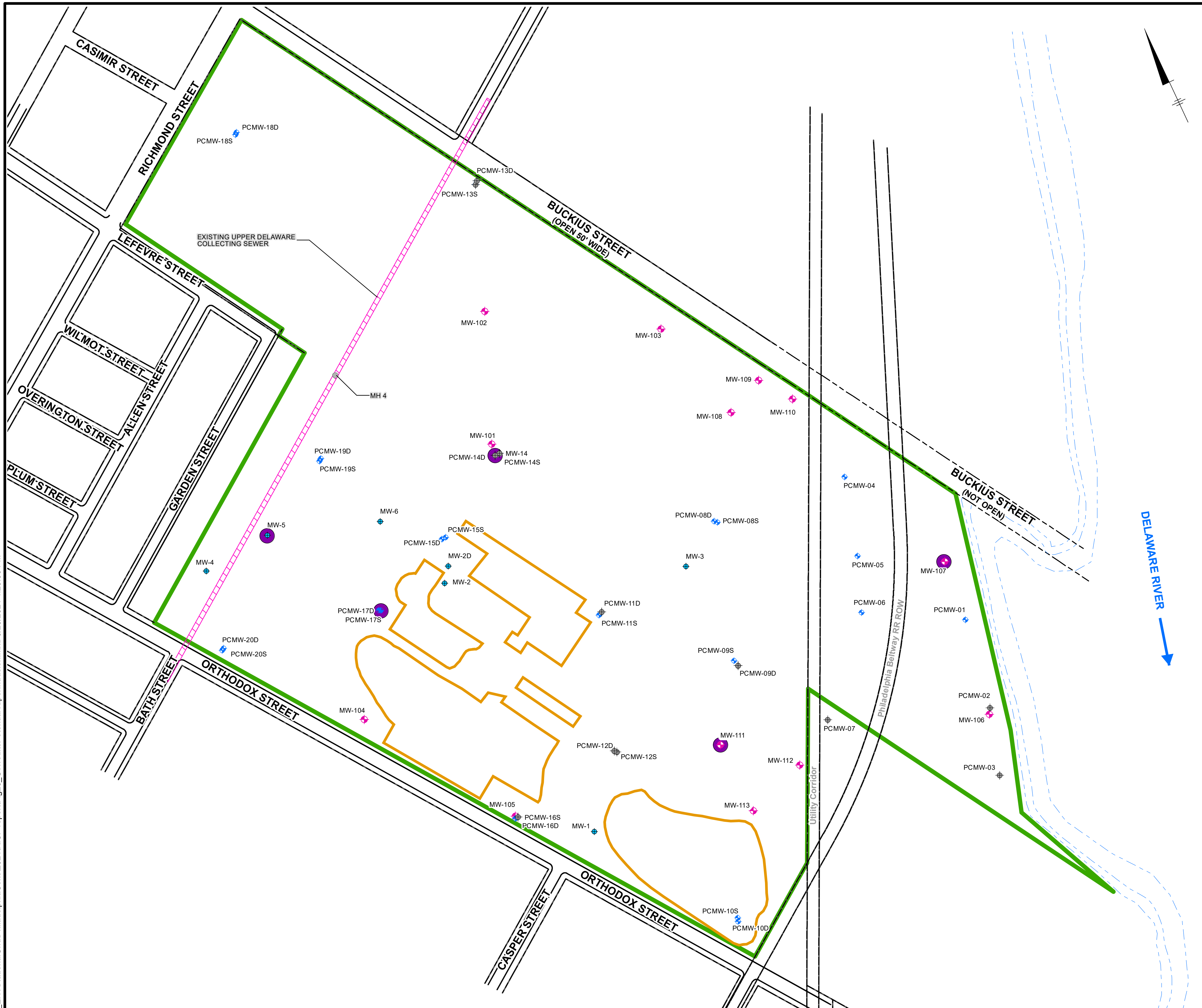
FIGURE
27

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig27_SoilVaporPotentialVaporIntrusionRev1.mxd 6/24/2021 4:45:25 PM



LEGEND:

- LOCATION WHERE ONE OR MORE CONSTITUENTS EXCEED APPLICABLE VAPOR INTRUSION SCREENING STANDARD
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (MW-5) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- FORMER RCRA EXCAVATION
- APPROXIMATE SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. VAPOR INTRUSION SCREENING VALUES OBTAINED FROM THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) TECHNICAL GUIDANCE MANUAL FOR VAPOR INTRUSION INTO BUILDINGS FROM GROUNDWATER AND SOIL UNDER ACT 2, DATED NOVEMBER 19, 2016.

3. APPLICABLE VAPOR INTRUSION SCREENING STANDARD IS THE PADEP STATEWIDE HEALTH STANDARD VAPOR INTRUSION SCREENING VALUE FOR NONRESIDENTIAL GROUNDWATER.

0 250 500 Feet

GRAPHIC SCALE

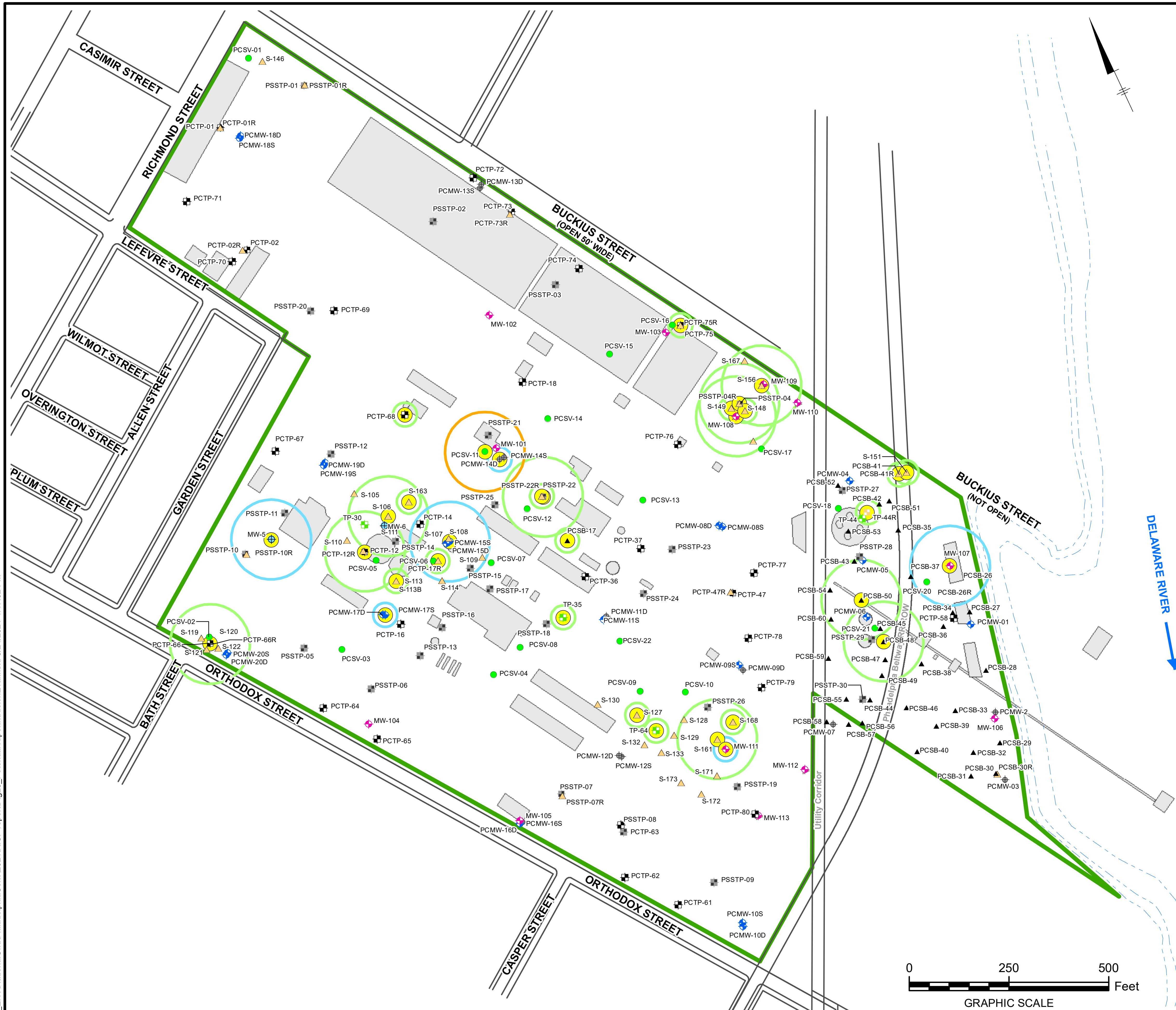
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

GROUNDWATER MONITORING WELLS EXHIBITING POTENTIAL VAPOR INTRUSION CONCERNS

ARCADIS Design & Consultancy for natural and built assets

FIGURE **28**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig28_GWresultsPotentialVaporIntrusion.mxd 6/25/2021 4:29:36 PM



LEGEND:

- PROXIMITY DISTANCE AROUND POTENTIAL VAPOR INTRUSION CONCERN FROM SOIL-GAS SAMPLING
- PROXIMITY DISTANCE AROUND POTENTIAL VAPOR INTRUSION CONCERN FROM SOIL
- PROXIMITY DISTANCE AROUND POTENTIAL VAPOR INTRUSION CONCERN FROM GROUNDWATER
- LOCATION WHERE ONE OR MORE CONSTITUENTS EXCEED APPLICABLE VAPOR INTRUSION SCREENING STANDARDS
- (S-105) 2019 SOIL BORING LOCATION (2019)
- (S-120) 2019 TEST PIT LOCATION (2019)
- (PCSB-17) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (TP-44) EEI GEOTECHNICAL TEST PITS (2005)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELLS
- (MW-05) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- (PCSV-20) PSS SOIL VAPOR SAMPLING LOCATIONS (2006)
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.
2. FIGURE ONLY SHOWS SOIL SAMPLING LOCATIONS WHERE UNSATURATED SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS. ALL GROUNDWATER MONITORING WELLS AND SOIL GAS SAMPLING LOCATIONS ARE SHOWN.
3. VAPOR INTRUSION SCREENING VALUES OBTAINED FROM THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) TECHNICAL GUIDANCE MANUAL FOR VAPOR INTRUSION INTO BUILDINGS FROM GROUNDWATER AND SOIL UNDER ACT 2, DATED NOVEMBER 19, 2016 (THE "VI GUIDANCE").
4. APPLICABLE VAPOR INTRUSION SCREENING STANDARD IS THE PADEP STATEWIDE HEALTH STANDARD VAPOR INTRUSION SCREENING VALUE FOR RESIDENTIAL GROUNDWATER AND SOIL.
5. PROXIMITY DISTANCE RADII ARE 30 FEET FOR PETROLEUM CONSTITUENTS (e.g., BENZENE, TOLUENE, NAPHTHALENE) AND 100 FEET FOR NON-PETROLEUM CONSTITUENTS PER SECTION E OF THE VI GUIDANCE.
6. FIGURE ONLY SHOWS SAMPLING LOCATIONS WHERE UNSATURATED SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS.

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

POTENTIAL VAPOR INTRUSION EVALUATION

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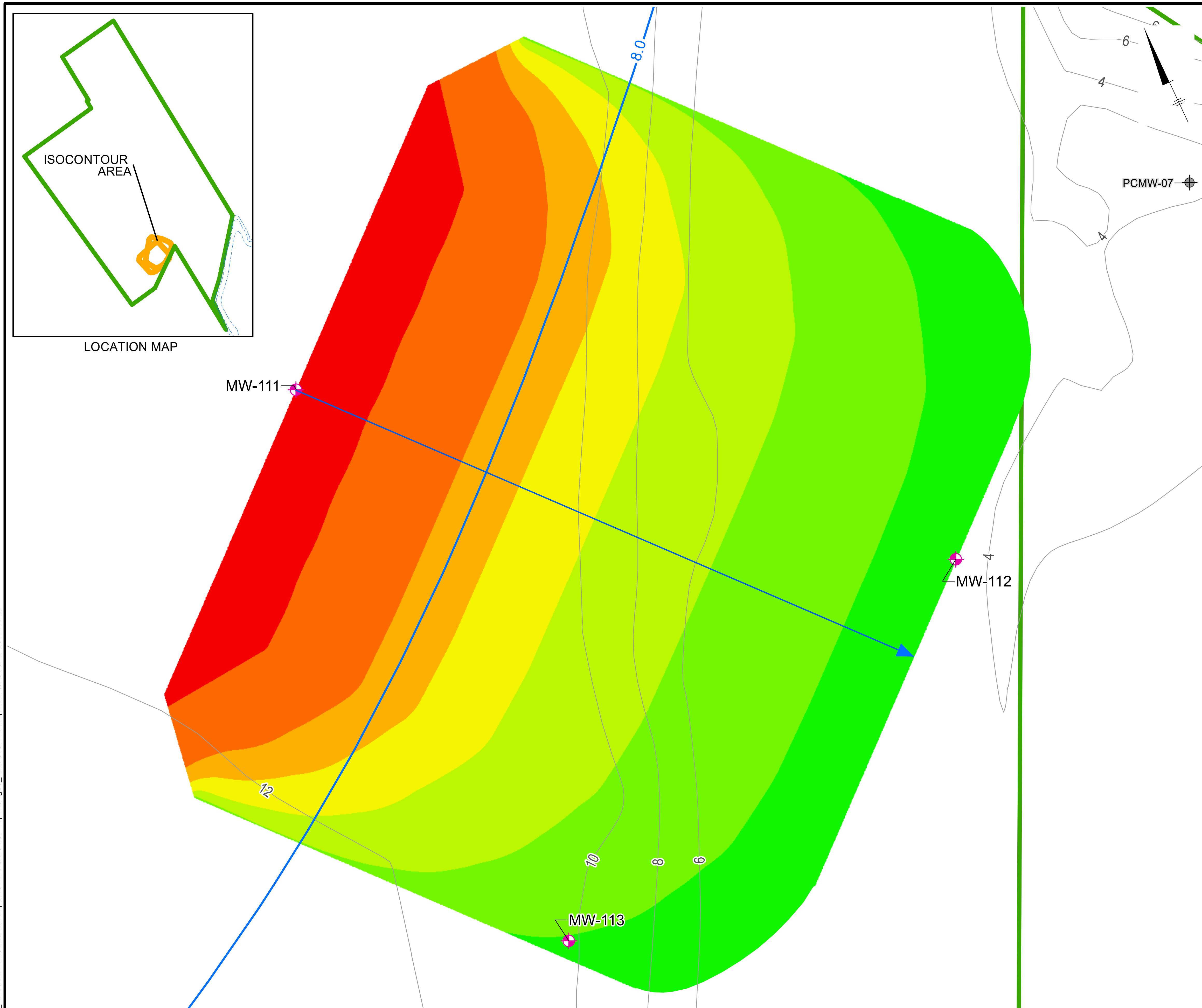
FIGURE
29

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig29_PotentialVaporIntrusionEval.mxd 6/24/2021 4:47:32 PM



LEGEND:

BENZENE CONCENTRATIONS (µg/L)

- 0.25 - 1
- 1.0-5.0
- 5.0-20
- 20-50
- 50-100
- 100-300
- >300

INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)

GROUNDWATER FLOW DIRECTION FROM MW-111

ARCADIS GROUNDWATER MONITORING WELL LOCATION (2019)

MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL

GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT. (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)

APPROXIMATE SITE BOUNDARY

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. WATER LEVEL ELEVATIONS ARE FROM MARCH 19, 2018 APPROXIMATELY AN HOUR BEFORE LOW TIDE THROUGH THE DURATION OF LOW TIDE.

3. PCMW-07 OBSTRUCTED BY OVERGROWN ROOTS IMMEDIATELY BELOW THE WATER TABLE. HOWEVER, WATER ELEVATIONS WERE STILL OBTAINED FROM BOTH WELLS.

4. MONITORING WELLS MW-101 THROUGH MW-113 WERE NOT YET INSTALLED DURING THE MARCH 2018 WATER LEVEL GAUGING EVENT.

0 30 60 Feet

GRAPHIC SCALE

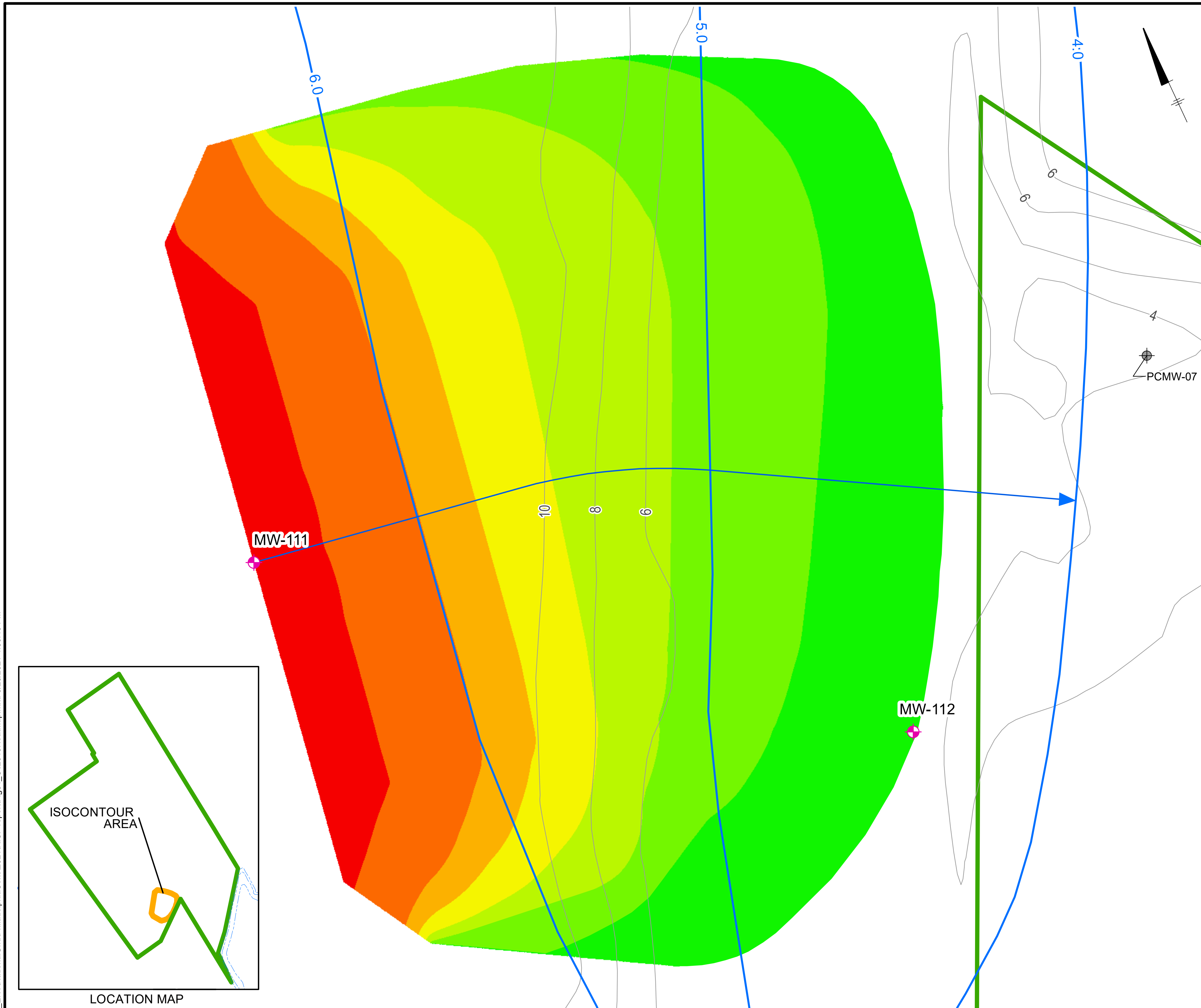
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

CALIBRATION ISOCONCENTRATION MAP
MARCH 19, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE **30**

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig30_Mar2018HeatMap.mxd 6/25/2021 4:37:24 PM



LEGEND:

BENZENE CONCENTRATIONS (µg/L)

- 0.25-1.0
- 1.0-5.0
- 5.0-20
- 20-50
- 50-100
- 100-300
- >300

INFERRED GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL, NAVD 88)

GROUNDWATER FLOW DIRECTION FROM MW-111

ARCADIS GROUNDWATER MONITORING WELL LOCATION (2019)

MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL

GROUND SURFACE ELEVATION CONTOURS FROM DATA CLEARINGHOUSE PHILADELPHIA CONTOURS 2-FT (PHILADELPHIA VERTICAL DATUM, 2004 - CITY OF PHILADELPHIA)

APPROXIMATE SITE BOUNDARY

NOTE:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED “GENERAL SITE PLAN”, DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1”=250’.
2. WATER LEVEL ELEVATIONS ARE FROM OCTOBER 3, 2019 APPROXIMATELY 2 HOURS BEFORE LOW TIDE THROUGH THE DURATION OF LOW TIDE.

0 30 60 Feet

GRAPHIC SCALE

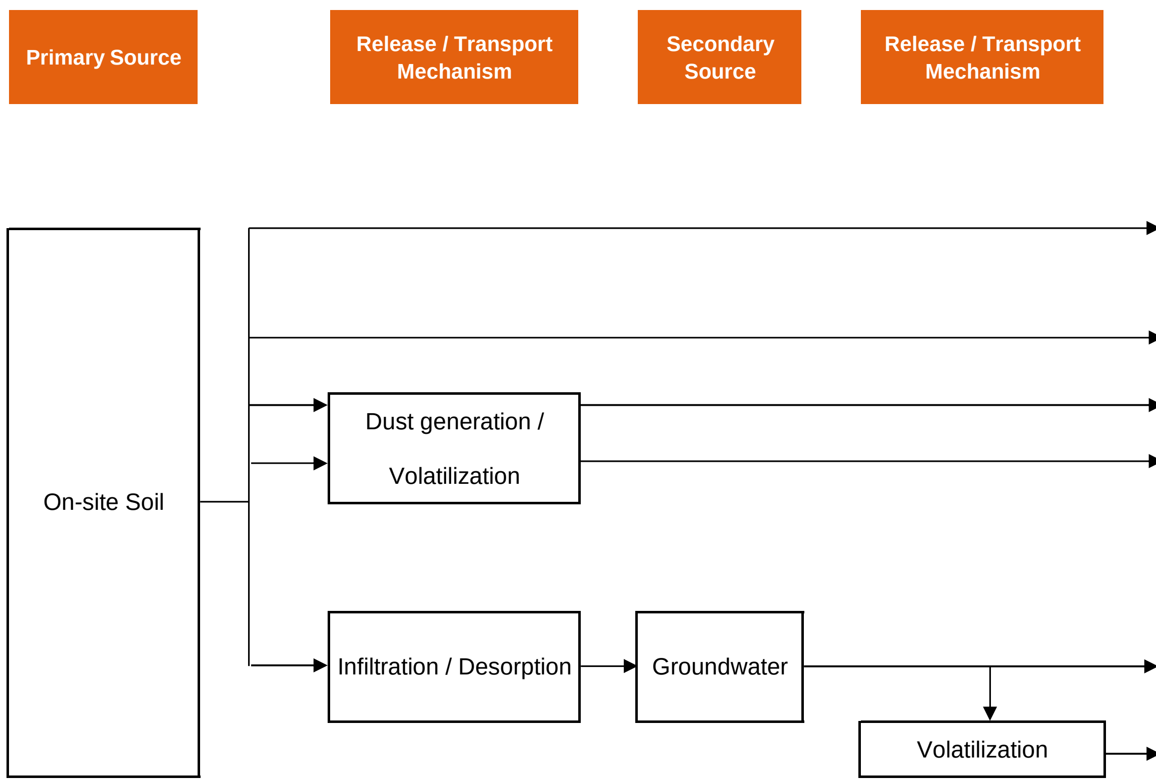
NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

CALIBRATION ISOCONCENTRATION MAP
OCTOBER 3, 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 31

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig31_Oc2019HeatMap.mxd 6/25/2021 4:30:40 PM



Exposure Medium	Exposure Route	Current Exposure Scenario: Utility Worker	Current Exposure Scenario: Outdoor Worker	Current Exposure Scenario: Trespasser	Future Exposure Scenario: Resident	Future Exposure Scenario: Utility Worker	Future Exposure Scenario: Indoor Worker	Future Exposure Scenario: Outdoor Worker	Future Exposure Scenario: Recreational User
Surface Soil	Ingestion	○ [a]	○ [a]	○ [b]	○ [c]	○ [d]	○ [d]	○ [d]	○ [d]
	Dermal Contact	○ [a]	○ [a]	○ [b]	○ [c]	○ [d]	--	○ [d]	○ [d]
Subsurface Soil	Ingestion	○ [a]	--	--	--	○ [d]	--	--	--
	Dermal Contact	○ [a]	--	--	--	○ [d]	--	--	--
Outdoor Air	Inhalation	○ [a]	○ [a]	○ [b]	○ [c]	○ [d]	--	○ [d]	○ [d]
Indoor Air	Inhalation	--	--	--	○ [c,d]	--	◐ [f]	--	--
Groundwater	Ingestion	○ [a]	--	--	○ [c,e]	○	○ [e]	--	--
	Dermal Contact	○ [a]	--	--	○ [c,e]	○	○ [e]	--	--
	Inhalation	○ [a]	--	--	○ [c,e]	○	○ [e]	--	--
Indoor Air	Inhalation	--	--	--	○ [c,d]	○ [d]	◐ [f]	--	--

Legend:
- ● = Complete Exposure Pathway.
- ◐ = Potentially Complete Exposure Pathway.
- ○ = Incomplete Exposure Pathway.
- -- = Not applicable.

NOTES:

Exposure pathway completeness is evaluated based on current and anticipated future use and

[a] Exposure route is currently incomplete due to vegetative cover and/or existing health and safety plan (HASP) requiring use of personal protective equipment (PPE) for ground intrusive / excavation work.

[b] Exposure route is currently incomplete for trespassers due to Site security fencing.

[c] Exposure route will be incomplete after a soil cover system and deed restriction are in place, limiting-the property to commercial/industrial use (no fence will be required).

[d] Exposure route is incomplete due to the exising vegetative cover (or soil cover system to be installed during redevelopment) and/or exisiting HASP requiring use of PPE for ground-instrusive / excavation work. No passive recreational use will be allowed at the Site until after the soil cover system is installed, mitigating potential exposure.

[e] Exposure route will be incomplete due to a groundwater use ordinance to be established for the Site.

[f] Vapor intrusion (VI) exposure pathway will be fully assessed by a VI evaluation once the redevelopment plans are complete. Altenatively, a VI mitigation system can be installed in lieu of a VI evaluation that eliminates potential exposure pathways.

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

HUMAN HEALTH CONCEPTUAL SITE MODEL

ARCADIS Design & Consultancy for natural and built assets

FIGURE
32

NOTE:
1. 2016 AERIAL IMAGE ACCESSED VIA ARC GIS ONLINE
2. HABITAT ASSESSED BY ARCADIS NOVEMBER, 2019

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

FIGURE 33. ECOLOGICAL COVER TYPE

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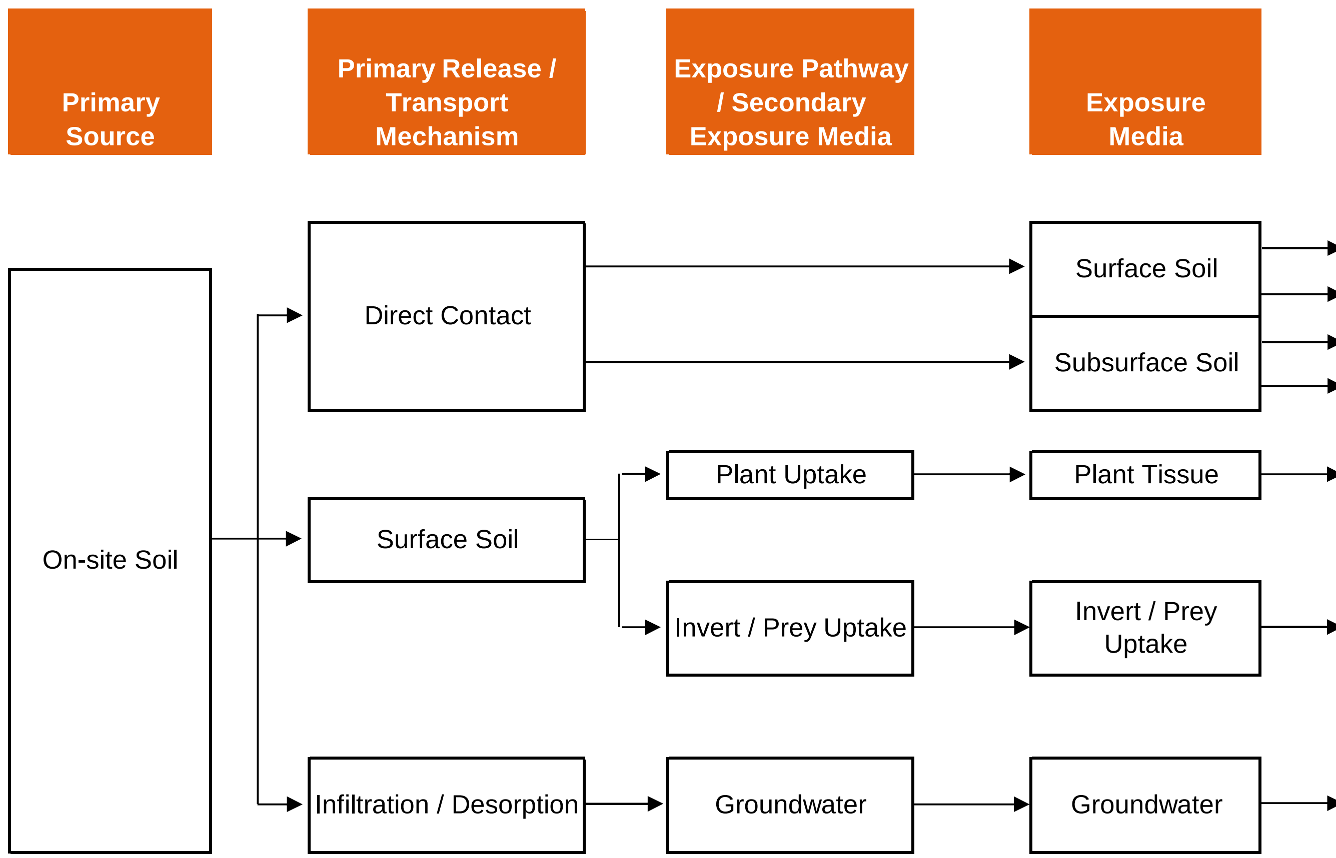


Exposure Route	Current Exposure Scenario: Terrestrial Plants	Current Exposure Scenario: Soil Invertebrates	Current Exposure Scenario: Wildlife	Future Exposure Scenario: Terrestrial Plants	Future Exposure Scenario: Soil Invertebrates	Future Exposure Scenario: Wildlife
Incidental Ingestion	○	◐	●	○	○	○
Direct Contact	●	●	◐	○	○	○
Incidental Ingestion	○	○	○	○	○	○
Direct Contact	○	○	○	○	○	○
Ingestion	○	◐	◐	○	○	○
Ingestion	○	○	◐	○	○	○
Ingestion	○	○	○	○	○	○
Dermal Contact	○	○	○	○	○	○

Legend:

● = Complete Exposure Pathway. Evaluated quantitatively through applicable ecological screening benchmarks.

◐ = Potentially Complete Exposure Pathway. Pathway expected to be insignificant. Pathway may be evaluated qualitatively.

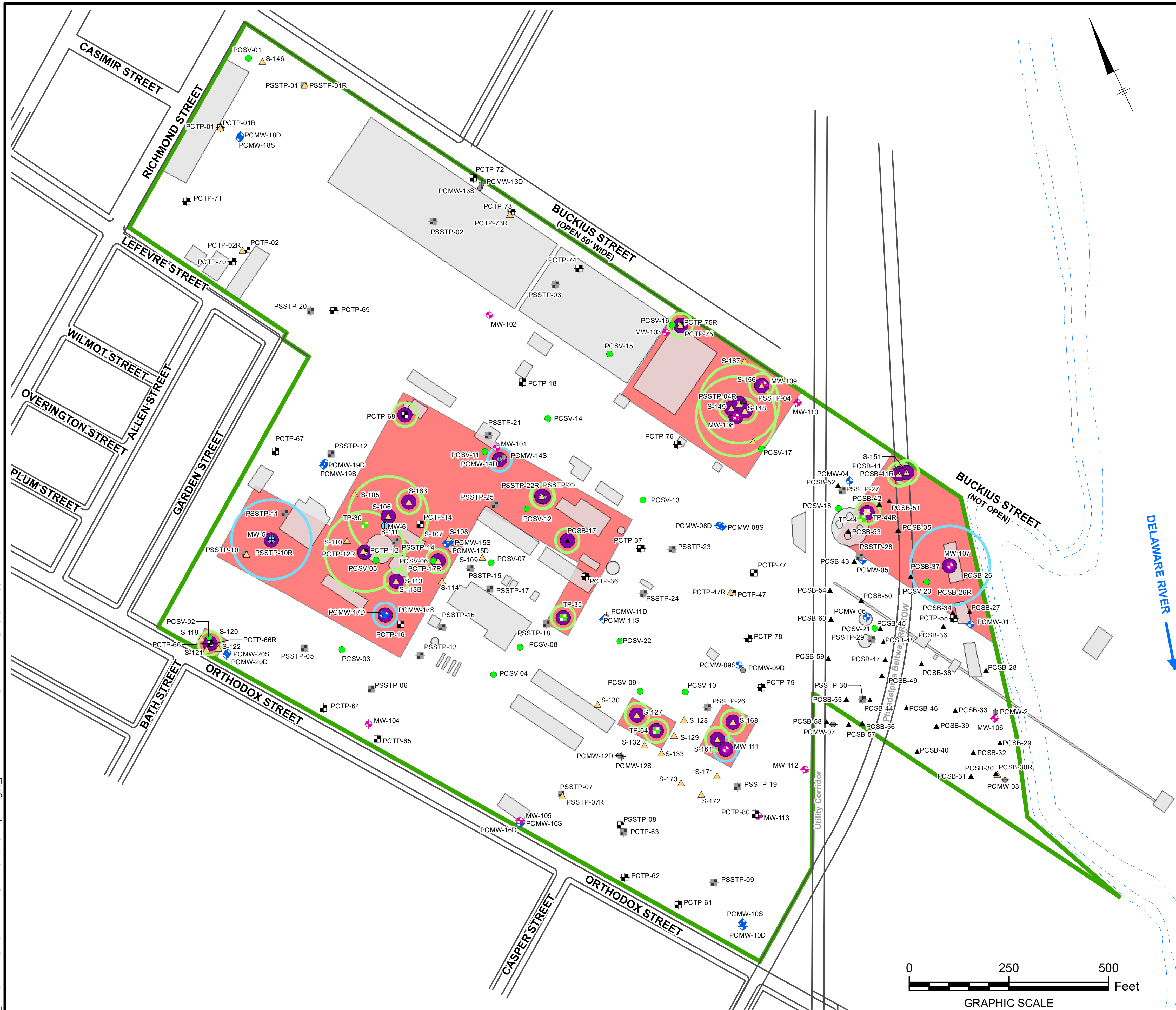
○ = Incomplete Exposure Pathway. Not evaluated.

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

ECOLOGICAL CONCEPTUAL SITE MODEL

ARCADIS Design & Consultancy for natural and built assets

FIGURE
34



LEGEND:

- APPROXIMATE AREAS WHERE POTENTIAL BUILDINGS WILL NEED VAPOR INTRUSION MITIGATION MEASURES OR ADDITIONAL VAPOR INTRUSION EVALUATION IS NEEDED
- PROXIMITY DISTANCE AROUND POTENTIAL VAPOR INTRUSION CONCERN FROM SOIL
- PROXIMITY DISTANCE AROUND POTENTIAL VAPOR INTRUSION CONCERN FROM GROUNDWATER
- LOCATION WHERE ONE OR MORE CONSTITUENTS EXCEED APPLICABLE VAPOR INTRUSION SCREENING STANDARDS
- (S-105) 2019 SOIL BORING LOCATION (2019)
- (S-120) 2019 TEST PIT LOCATION (2019)
- (PCSB-17) PSS ENVIRONMENTAL SOIL BORINGS (2005)
- (PSSTP-23) PSS ENVIRONMENTAL TEST PITS (2003)
- (PCTP-01) PSS ENVIRONMENTAL TEST PITS (2005)
- (TP-44) EEI GEOTECHNICAL TEST PITS (2005)
- (MW-101) ARCADIS GROUNDWATER MONITORING WELL LOCATION (2018-2019)
- (PCMW-12S) PSS GROUNDWATER MONITORING WELL (2005)
- (PCMW-12D) MISSING/DESTROYED PSS GROUNDWATER MONITORING WELL
- (MW-05) RCRA CLOSURE GROUNDWATER MONITORING WELL (1992 AND EARLIER)
- (PCSV-20) PSS SOIL VAPOR SAMPLING LOCATIONS (2006)
- FORMER STRUCTURE/OPERATION
- SITE BOUNDARY
- SHORELINE

NOTES:

1. BASE MAP OBTAINED FROM FIGURE PREPARED BY PAULUS SOKOLOSKI AND SARTOR ENGINEERING, PC, TITLED "GENERAL SITE PLAN", DRAWING 2A, DATED APRIL 9, 2007 AT A SCALE OF 1"=250'.

2. FIGURE ONLY SHOWS SOIL SAMPLING LOCATIONS WHERE UNSATURATED SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS. ALL GROUNDWATER MONITORING WELLS AND SOIL GAS SAMPLING LOCATIONS ARE SHOWN.

3. VAPOR INTRUSION SCREENING VALUES OBTAINED FROM THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) TECHNICAL GUIDANCE MANUAL FOR VAPOR INTRUSION INTO BUILDINGS FROM GROUNDWATER AND SOIL UNDER ACT 2, DATED NOVEMBER 19, 2016 (THE "VI GUIDANCE").

4. APPLICABLE VAPOR INTRUSION SCREENING STANDARD IS THE PADEP STATEWIDE HEALTH STANDARD VAPOR INTRUSION SCREENING VALUE FOR NONRESIDENTIAL GROUNDWATER AND SOIL.

5. PROXIMITY DISTANCE RADII ARE 30 FEET FOR PETROLEUM CONSTITUENTS (e.g., BENZENE, TOLUENE, NAPHTHALENE) AND 100 FEET FOR NON-PETROLEUM CONSTITUENTS PER SECTION E OF THE VI GUIDANCE.

6. FIGURE ONLY SHOWS SAMPLING LOCATIONS WHERE UNSATURATED SOIL SAMPLES WERE COLLECTED FOR LABORATORY ANALYSIS.

NATIONAL GRID
FORMER PHILADELPHIA COKE PLANT
PHILADELPHIA, PENNSYLVANIA
RI REPORT

SITE LOCATIONS WITH POTENTIAL VAPOR INTRUSION CONCERNS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
35

City: Syr Div/Group: IM/DV Created By: K. Sinsabaugh Last Saved By: AKENS
National Grid Philly Coke (B0036790.0000.00001)
T:_ENV\NationalGrid\PhiladelphiaCoke\2021\RICP report\Fig35_potentialVaporIntrusionConcerns.mxd 6/24/2021 4:50:17 PM