FINAL REPORT
AOI 11

PHILADELPHIA ENERGY SOLUTIONS
REFINING AND MARKETING LLC FACILITY
PHILADELPHIA, PENNSYLVANIA



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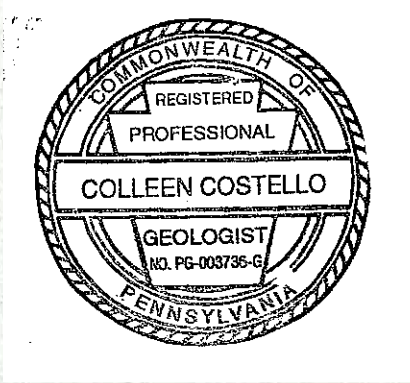
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June 21, 2013

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TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1
2.0 SELECTION OF CONSTITUENTS OF CONCERN AND APPLICABLE STANDARDS 3
3.0 SITE DESCRIPTION 4
3.1 Site History and Background 4
3.2 Physiography and Topography 4
3.3 Regional and Site-Specific Geology 5
3.4 Regional and Site-Specific Hydrogeology 7
3.4.1 Regional Hydrogeology 7
3.4.2 Site Specific Hydrogeology 8
3.5 Groundwater Usage and Use Restrictions 10
3.6 Surface Water 10
4.0 SUMMARY OF PREVIOUS INVESTIGATIONS 10
4.1 Installation of Groundwater Monitoring Wells 11
4.2 Surveying Activities 13
5.0 GROUNDWATER ATTAINMENT ACTIVITIES 14
5.1 Groundwater Gauging 14
5.2 Groundwater Attainment Sampling 14
6.0 QUALITY ASSURANCE/QUALITY CONTROL 19
6.1 Equipment Decontamination 19
6.2 Equipment Calibration 19
6.3 Sample Preservation 19
6.4 Laboratory Quality Assurance/Quality Control 20
6.5 Documentation 21
7.0 FATE AND TRANSPORT ANALYSIS 21
7.1 Fate and Transport Evaluation 21
7.2 Vapor Intrusion into Indoor Air 23
8.0 SITE CONCEPTUAL MODEL 24
8.1 Description and Use 24
8.2 Geology and Hydrogeology 24
8.3 Constituents of Concern 25
8.4 Groundwater Quality Conditions 25
8.5 Potential Migration Pathways and Site Receptors 26
9.0 HUMAN HEALTH EXPOSURE ASSESSMENT/RISK ASSESSMENT 27
9.1 Groundwater 27
9.2 LNAPL 29
9.3 Vapor 29
10.0 ECOLOGICAL ASSESSMENT 29
11.0 COMMUNITY RELATION ACTIVITIES 29
12.0 CONCLUSIONS AND RECOMMENDATIONS 30
13.0 ATTAINMENT 31
13.1 Site Specific Standard 31
13.1.1 Groundwater Sampling 31
13.1.2 Attainment Summary 31

14.0 SIGNATURES.....33
15.0 REFERENCES.....34

LIST OF TABLES

Table 1 Constituents of Concern for Groundwater
Table 2 Existing Deep Well Summary
Table 3 Summary of Deep Groundwater Elevations - 2011 to 2013
Table 4 Summary of Deep Groundwater Analytical Results - 2005 to 2011
Table 5 Summary of Attainment Sampling Deep Groundwater Analytical Results 2012-2013
Table 6 Regional Wide Groundwater Chemistry

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Area of Interest Site Plan
Figure 3 Deep Monitoring Well Location Plan
Figure 4 Deep Groundwater Elevation Contour Plan
Figure 5 Summary of Volatile and Semi-Volatile Exceedances in Deep Groundwater – 2008 to 2013
Figure 6 Summary Metal Exceedances in Deep Groundwater – 2008 to 2013

LIST OF APPENDICES

Appendix A Notice of Intent to Remediate and Report Notifications
Appendix B Regional Geologic Reference Figures
Appendix C Deep Soil Boring Logs and Monitoring Well Construction Summaries
Appendix D Site Wide Geologic Cross Sections (on CD)
Appendix E Historic Deep Groundwater Elevation Contour Plans (2001 to 2012)
Appendix F 2013 One Mile Radius Well Search
Appendix G Field Procedures
Appendix H Groundwater Sampling Summary Sheets
Appendix I Groundwater Analytical Reports (on CD) and Data Useability Assessment
Appendix J Fate and Transport Analysis

1.0 INTRODUCTION

This final report is for AOI 11 in the Philadelphia Energy Solutions Refining and Marketing LLC (PES) facility, herein referred to as facility. Sunoco Inc. (R&M) (Sunoco) sold the site, with the exception of Belmont Terminal, to PES under a Buyer Seller agreement signed by Sunoco, PES and the Pennsylvania Department of Environmental Protection (PADEP) in September 2012. Sunoco Logistics is the current owner of Belmont Terminal.

Sunoco and PADEP entered into a Consent Order & Agreement (CO&A) in December 2003 with respect to Sunoco's Philadelphia Refinery. Sunoco's Phase I Remedial Plan (Phase I Plan), dated November 2003, was included as an attachment to the CO&A. In accordance with the CO&A and Phase I Plan, a Current Conditions Report and Comprehensive Remedial Plan (CCR) was prepared by Sunoco in June 2004. The Phase I Plan and the CCR divided the facility into 11 Areas of Interest (AOIs) and presented a prioritization of the AOIs based on specific risk factors. The AOIs are shown in Figures 1 and 2 of this report. The CCR also presented the Phase II remedial approach and schedule to characterize each of the 11 AOIs and to conduct Phase I and II corrective action activities in accordance with the 2003 CO&A and the Phase I Plan.

The current remediation program for the facility is performed under the 2003 CO&A between PADEP and Sunoco. In April 2004, the PADEP and EPA signed an agreement entitled "One Cleanup Program Memorandum of Agreement (MOA or PA One-Cleanup Program)," which clarifies how sites remediated under Pennsylvania's Act 2 program may satisfy RCRA corrective action requirements through characterization and attainment of Act 2 remediation standards pursuant to Pennsylvania's Act 2. On November 22, 2005, Sunoco and its representatives met with officials of the PADEP and EPA to discuss the applicability of the Sunoco Philadelphia Refinery to the PA One Cleanup Program. During the November 22, 2005 meeting, all parties agreed that the One Cleanup Program would benefit the project by merging the remediation obligations under the various programs into one streamlined approach which would be conducted under the existing 2003 CO&A.

As a follow up to the November 22, 2005 meeting, Sunoco submitted a letter dated December 2, 2005 to EPA and PADEP documenting the discussions at the meeting. Sunoco submitted a notice of intent to remediate (NIR) for the refinery, excluding the Belmont Terminal, to the PADEP on October 12, 2006 and held a public involvement meeting in South

Philadelphia on September 19, 2007. A copy of this NIR and the Act 2 report notifications for this SCR/RIR are included in Appendix A.

On March 5, 2009, Sunoco and its representatives met again with EPA to discuss Sunoco Philadelphia Refinery's remediation progress and path forward under the One Clean-Up Program. Sunoco also developed a report entitled, *Work Plan for Sitewide Approach Under the One Cleanup Program* (Work Plan for Sitewide Approach), to document the Sitewide remedial approach extending beyond the requirements of the 2003 CO&A. DEP and EPA have reviewed and provided input to this report and the final report was submitted to DEP and EPA in September 2011.

Since 2003, Sunoco has completed site characterization activities at all eleven AOIs (AOIs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11). For each AOI that has been characterized, Sunoco prepared and submitted a corresponding Site Characterization Report (SCR) or in combination with a Remedial Investigation Report in accordance with the Revised Phase II Corrective Action Activities schedule that was included in the CCR and the Site Wide Approach Workplan. A Site Characterization Report/Remedial Investigation Report was submitted for AOI 11 on September 12, 2011. The PADEP provided comments to this report on December 9, 2011, which are included in Appendix A. One of these comments, evaluating volatile organic compounds (VOC) impacts in the Lower Sand aquifer has been further discussed with the PADEP. In the May 3, 2013 meeting with the PADEP it was agreed that the AOI 11 Final Report did not need to address VOC impacts in the Lower Sand aquifer in relation to the adjacent DSCP property since it was more appropriate to include that discussion in the Remedial Investigation Report for AOI 1 to be submitted in 2014. All of the other PADEP 2011 comments are addressed in this Final Report.

This Final Report has been prepared for AOI 11 in accordance with the 2003 CO&A and the Pennsylvania Land Recycling and Environmental Remediation Standards Act of 1995 (Act 2). AOI 11 consists of the deep groundwater (groundwater in the Lower or Farrington Sand) which is a geologic unit that underlies the majority of the facility. This Final Report documents the activities completed to demonstrate attainment of the site specific standard in the Lower Sand groundwater beneath the facility. Deep groundwater in each AOI was characterized during the individual AOI investigations between 2005 and 2011. In addition to the individual AOI investigations, additional deep groundwater characterization activities were completed in April, June and July 2011 as were documented in the 2011 RIR. To demonstrate attainment of the

PA Act 2 standard, deep groundwater wells were sampled on a quarterly basis over four events from 2012 to 2013.

An NIR was prepared for this site and it is included in Appendix A. In accordance with the provisions of Act 2, Langan, on behalf of Sunoco, prepared the required public and municipal notices as part of this Final Report submittal. The notices and their proof of receipt/publication are included in Appendix A of this Final Report.

This Act 2 Final Report is organized into the following major sections: Section 1, Introduction; Section 2, Selection of Constituents of Concern and Applicable Standards ; Section 3, Site Description; Section 4, Summary of Previous Investigations ; Section 5, Groundwater Attainment Activities; Section 6, Quality Assurance/Quality Control ; Section 7, Fate and Transport Analysis; Section 8, Site Conceptual Model; Section 9 Human Health Exposure /Risk Assessment, Section 10 Ecological Assessment, Section 11 Community Relation Activities, Section 12 Conclusion and Recommendations, Section 13 Attainment Section 14, Signatures; and, Section 15, References.

2.0 SELECTION OF CONSTITUENTS OF CONCERN AND APPLICABLE STANDARDS

The groundwater constituents of concern (COCs) for AOI 11 are listed in Table 1 of this report. The COCs for the completed activities include all current constituents from the Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E of PADEP's Closure Requirements for Underground Storage Tank Systems, with the exception of the waste oil parameters since waste oil is only stored in small tanks within the facility maintenance garages. In May 2009, two additional COCs, 1,2,4-trimethylbenze and 1,3,5-trimethylbenzene, were added to the list of COCs by Sunoco based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP. For AOI 11, four additional metals (arsenic, cobalt, iron and manganese) and wet chemistry parameters including ammonia, chloride, fluoride, nitrate, nitrite, sulfate, alkalinity, total organic carbon (TOC), total dissolved solids (TDS) and additional field parameters were added to the COC list to further characterize deep groundwater at the site. Although the wet chemistry parameters and field parameters were carried through the attainment sampling they are not included in the request for a Release of Liability. Sunoco is only requesting a Release of Liability for the VOC, semi-volatile organic compounds (SVOC) and metals indicated on Table 1.

The media of concern for AOI 11 is groundwater. The potential indoor air quality and off-site vapor migration exposure pathways from deep groundwater beneath the facility are not applicable since there is shallow groundwater throughout the facility that is currently being evaluated for potential vapor intrusion issues. As presented in the RIR, the potential receptors in AOI 11 are the Delaware River and Schuylkill River from groundwater discharge and the Potomac, Raritan and Magothy (PRM) aquifer system through groundwater recharge. This Final Report will only include a request for a Release of Liability for deep groundwater in AOI 11 under the site specific standard for the COCs listed on Table 1.

3.0 SITE DESCRIPTION

3.1 Site History and Background

The facility is located in southwest Philadelphia and has a long history of petroleum transportation, storage, and processing. The oldest portion of the facility started petroleum-related activities in the 1860s when the Atlantic Refining Company established an oil distribution center. In the 1900s, crude oil processing began and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals such as acids and ammonia were also produced at the facility. The current and future intended use of the facility is non-residential.

Groundwater quality and quantity in the Philadelphia area has been documented in detail in a number of USGS reports, as summarized in the reference section. As indicated in these reports, widespread industrial land use and urbanization in the region of the facility has had an effect on both groundwater quality and flow.

3.2 Physiography and Topography

The facility lies within the Atlantic Coastal Plain Physiographic Province which is generally low-lying and relatively flat. Land surface topography at the facility is relatively flat, with the land surface elevation being generally below 30 feet above mean sea level (ft. amsl). The flatness of the topography is representative of the Coastal Plain where alluvial sediments have been deposited by meandering streams and rivers with deposition ultimately controlled by the proximity to sea level. There are no significant

areas of topographic relief within the facility. Northwest of the facility, bedrock outcrops along the Fall Line (the line between the area where bedrock outcrops to the west and the Coastal Plain sediments lay to the east). The facility is underlain by a portion of the PRM aquifer system. The PRM system is a wedge-shaped mass of sediments of Cretaceous age composed of alternating layers of clay, silt, sand, and gravel that are thinnest near the Fall Line and gradually thicken in a southeast direction to the coast, where these deposits are several thousand feet thick. These deposits range in thickness from a featheredge along the Fall Line to more than 4,100 feet beneath Cape May County, New Jersey. The aquifer system is confined except in outcrop areas by the underlying crystalline rocks and the overlying Merchantville-Woodbury confining unit. In the northern part of the Coastal Plain, the PRM aquifer system is divided into two aquifers. They are the Farrington aquifer (mainly Raritan age) and the Old Bridge aquifer (Magothy age). The deep groundwater at the facility occurs in the Farrington Sand unit of the Farrington aquifer.

3.3 Regional and Site-Specific Geology

Regional Geology – PRM

The PRM system begins at the Fall Line east of the Delaware River and thickens as it moves eastward into New Jersey and towards the Atlantic Ocean. Not all units of the PRM system are present near the Fall Line but develop as the formation moves eastward. This system consists of unconsolidated sediments that are comprised of highly permeable sands and gravels separated by less-permeable layers of silts and clays (USGS, 2001). The Middle Clay and Farrington Sand units are part of the PRM system and exist in some areas beneath the facility.

The Middle Clay member of the Raritan Formation is the most extensive clay layer in the Philadelphia area. The Middle Clay is fairly uniform, being less variable in lithology than the other clay members of the Raritan Formation, and is a tough, red and white massive clay with a characteristic basal layer of lignite. The Middle Clay has been eroded away beneath parts of the facility, particularly under the West Yard. Regionally, the thickness of the Middle Clay ranges from 0 to 60 feet, with thicknesses commonly greater than 20 feet. The Middle Clay is characterized by a very low permeability and forms an effective barrier to vertical groundwater flow.

The Farrington Sand is the basal member of the lowermost part of the PRM consisting of pre-Cretaceous channels carved into underlying crystalline rocks (USGS, 1961). The Farrington Sand generally consists of coarse sand and fine gravel which grade upward into medium to fine-grained sand with a few beds/layers of clay. The color of the sand often varies from yellowish-brown to yellowish-gray. The coarse sand and fine gravels are fairly well sorted. Thickness of the Farrington Sand various throughout southeastern Pennsylvania and is summarized in USGS Plates 9 and 10 in Appendix B. Typical thickness is approximately 60 feet throughout the region, but ranges upwards to 90 feet. Throughout most of the region, the Farrington Sand is overlain by the Middle/Lower Clay (USGS, 1961). In locations of troughs (as observed in western portion of AOI 8, portions of AOI 9, and in AOI 10) the clay has been removed by erosion.

Site-Specific Geology

The geology of the facility is composed of several different geologic units which generally include the following units from deep to shallow: Wissahickon Formation (bedrock), Farrington Sand unit of PRM, Middle/Lower Clay, Trenton Gravel, and recent fill/alluvium. Detailed descriptions for Farrington Sand and the Middle/Lower Clay are presented below.

The groundwater monitoring wells screened within the Farrington Sand are referred to as deep monitoring wells. A total of 43 deep monitoring wells currently exist throughout AOI 11. The locations of the deep monitoring wells are shown in Figure 3. Site-specific boring logs and monitoring well summaries that describe the occurrence and thickness of the Middle Clay and Farrington Sand units are presented in Appendix C and site wide geologic cross sections are presented in Appendix D. Detailed site-specific and regional geologic cross sections that depict the occurrence and thickness of the Middle Clay and Farrington Sand units are presented in Appendices B and D, respectively. A complete list of deep monitoring wells located throughout the facility by AOI is provided in Table 2. Below is a general geologic description of the Farrington Sand and the Middle Clay beneath the facility.

- Farrington Sand beneath the facility generally consists of green, brown, orange and/or red, fine gravel and course sand that grades upward into medium-to-fine sands and contains thin layers of silts and clays.

- The Farrington Sand is present beneath the limits of the facility, with the exception of AOI 10 and the northwestern and western portions of AOI 8 where the sand has been eroded and replaced with alluvium.
- The extent of the Farrington Sand beneath the facility is generally consistent with the extent illustrated by USGS, 1961 Plate 7 (Appendix B).
- The Middle/Lower Clay ranges in thickness from 5 to 65 feet thick and the Farrington Sand ranges in thickness from 10 to 70 feet across the facility.
- The Lower/Middle Clay overlies the Farrington Sand in the majority of the facility. In the north-central and western portions of AOI 9, the Lower/Middle Clay appears to have been removed possibly due to erosion. The USGS (USGS, 1961) interpreted that a depositional trough is located near AOI 9 and notes that, near the heads of these troughs of deposition, the clay members have been removed. The Lower/Middle Clay is also absent due to erosion in a small part of AOI 3 and AOI 8.
- Based on geologic data collected in AOI 10, the Farrington Sand does not exist beneath AOI 10. This geologic interpretation is consistent with the extent of the Farrington Sand illustrated by USGS Plates 7, 9, 15, and 18 as presented in Appendix B. Alluvium is present beneath AOI 10 and thickens in a wedge shape towards the Schuylkill River.

3.4 Regional and Site-Specific Hydrogeology

3.4.1 Regional Hydrogeology

The Cape May Formation (commonly referred to as the Trenton Gravel) consists of sand, gravel and minor amounts of clay (Owens and Minard, 1979). In some of the western portions of the PRM, the Trenton Gravel overlies bedrock and can serve as an important shallow aquifer in the portions where the Trenton Gravel is thick. Where present between the Trenton Gravel and Farrington Sand, the Middle/Lower Clay acts to confine deep groundwater beneath the clay.

Regional development and industrial uses of the deep groundwater has manipulated groundwater flow and quality in Farrington Sand in the PRM. Excessive concentrations of iron and manganese have been reported in regional deep groundwater (USGS, 2001). Included in Appendix B are several figures

from the USGS illustrating the change in groundwater flow, direction, and quality in the Farrington Sand over the past century.

When examining the groundwater quality and chemistry of the Farrington Sand in the PRM, it is evident that historically there has been a high presence of dissolved metals (USGS, 2001 and Sloto, 2003). Releases of contaminants from industrial brines, sewage, and inorganic and organic wastes from industrial and residential sources have led to regionally degraded groundwater conditions. The PRM aquifer system no longer is used as a source of water supply in Philadelphia because of highly elevated concentrations of iron (as high as 429,000 micrograms per liter [ug/L]), manganese (as high as 4,000 ug/L), and sulfate (as high as 1,720,000 ug/L) that have contaminated the aquifer in South Philadelphia and have made the ground water unusable for most purposes (Sloto, 2003).

3.4.2 Site Specific Hydrogeology

The facility is located in the portion of the PRM system that originates at the fall line to the west of the Schuylkill River and extends eastward to the Delaware River. Deep groundwater elevation contours generated from March 2013 data collected by Aquaterra Technologies, Inc. (Aquaterra) are shown on Figure 4. Site Characterization (2005 to 2011), 2012 and 2013 deep groundwater contours are consistent with the March 2013 contours, shown on Figure 4, and are included in Appendix E. In addition, a synoptic groundwater gauging event was conducted in May of 2012 with the Sunoco, PGW and DSCP shallow and deep wells. These groundwater elevations from the deep wells are summarized in Appendix E and are consistent with the groundwater contours generated for AOI 11.

Below is a summary of the hydrologic conditions of the Farrington Sand beneath the facility based on lithologic data from deep boring logs and historic and current (2012-2013) groundwater elevation data.

- Depth to deep groundwater throughout the facility occurs at depths ranging between 8 and 33 feet below the ground surface to the piezometric surface.

- Downward vertical gradients exist between the shallow/intermediate and deep monitoring wells throughout the facility, with the exception of AOI 9 where deep groundwater flows vertically upward at the edges of the semi-confining clay.

  - Based on the 2012 through 2013 deep groundwater elevation data, the deep groundwater gradients are relatively flat with an average gradient of 0.001 ft/ft.

  - All deep groundwater flow generally is towards the Schuylkill River or the Delaware River (Figure 4). The current and historic deep groundwater flow patterns are generally consistent. Based on the deep groundwater elevation contours illustrated in Figure 4 and Appendix E, the following points can be made:

    - In AOI 8, a groundwater flow divide, trending northwest to southeast, exists. This divide generally corresponds with the eastern extent of the alluvium materials deposited following the erosion and removal of the Pleistocene age deposits. Groundwater on the east side of the divide flows to the east-southeast and groundwater on the west side of the divide flows to the southwest.

    - South of AOI 8, the deep groundwater flow direction is towards the south under a very low hydraulic gradient. This flow pattern and gradient is generally consistent across AOIs 1, 2, 3 and 4.

    - At AOIs 5, 6, and 7, deep groundwater flow is generally towards the southwest and the hydraulic gradient steepens along the facility boundary with the Schuylkill River.

    - The deep groundwater flow direction in AOI 9, on the west side of the Schuylkill River, is towards the southwest and occurs at an elevation that is consistent with the deep groundwater elevations in AOIs 5, 6, and 7. The groundwater flow direction in AOI 9 also matches the groundwater flow direction in AOIs 5, 6, and 7.

    - Since the Farrington Sand does not exist in AOI 10, no deep groundwater exists in AOI 10.

3.5 Groundwater Usage and Use Restrictions

Langan, as part of the AOI 11 characterization documented in the SCR/RIR, completed a well search for water wells within a 1.0 mile radius of the facility using the Pennsylvania Groundwater Information System (PaGWIS) software and database. The results of the search indicated there are no residential or agricultural water supply wells within the search radius. This finding is consistent with a well search completed by URS for the facility in 2002. This search was updated in 2013 in support of this Final Report. A list of potable wells obtained from the PADEP on May 28, 2013 were compared to the well search radius map and confirmed that there are no potable wells within a 1.0 mile radius of the facility. A copy of the well search radius figure is provided as Appendix F.

3.6 Surface Water

The Delaware River is the major surface water body within the vicinity of the facility. A tributary of the Delaware River, the Schuylkill River bisects the facility in a generally north to south direction (Figures 1 and 2). Both rivers are tidally-influenced in the vicinity of the facility. The Schuylkill River defines the western borders of AOIs 2, 3, 5, 6, 7, and 8 and the eastern borders of AOIs 9 and 10. Lands Creek, a small tidal tributary to the Schuylkill River, traverses the southern portion of AOI 10. The confluence of Lands Creek and the Schuylkill River is in the southeast corner of AOI 10. The Mingo Creek Flood Control Basin is located adjacent to and south of AOI 9. As reported by Dames & Moore (Dames & Moore, 1991), water levels in the Mingo Creek Flood Control Basin are maintained below the surface level of the Schuylkill River at all times by large-capacity pumps used for flood control.

4.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Previous studies of the deeper aquifer at the facility have been conducted by ENSR (*Investigation of Shallow and Deep Groundwater Quality, Philadelphia Refinery, Philadelphia, PA, May 1994.*). This study indicated that groundwater, both surficial and deeper, is in a reduced state and has inorganic compounds at concentrations consistent with a low oxygen, high electron potential (high eH) environment. However, the concentrations of these compounds are generally consistent with regional groundwater quality data collected by the USGS (Paulachok, 1991).

When examining the chemistry of deep groundwater beneath the facility as evidenced by both the site characterization and attainment groundwater wet chemistry results, the groundwater conditions are very similar to the surrounding regional deep groundwater conditions as is summarized in the table in Section 5.2. The deep groundwater within the facility has been strongly influenced by historic pumping and other industrial uses of the deep groundwater in the region (USGS, 2001 and Sloto, 2003). The 1994 ENSR investigation of the shallow and deep groundwater quality of the facility noted that there were elevated levels of iron and manganese in the Farrington Sand Aquifer and that the results were consistent with those found by the USGS's regional report released in 1991. Groundwater quality in the deep aquifer beneath the facility is discussed in further detail in the results sections of this report.

The following sections summarize the groundwater characterization and attainment activities that were completed in AOI 11. Site characterization activities were performed from 2005 through 2011 and attainment groundwater sampling was completed in 2012 and 2013 by Aquaterra, Stantec, and Langan in coordination with Sunoco. Field procedures followed during the site characterization activities are included in Appendix G of this report.

4.1 Installation of Groundwater Monitoring Wells

Deep groundwater monitoring wells existed at the facility prior to 2005, however, additional deep groundwater monitoring wells were installed between 2005 and 2011 as part of the individual AOI investigations. Deep monitoring well installation activities were performed by several drilling companies between 2005 and 2011 under direct supervision of Aquaterra, Langan, and Stantec in coordination with Sunoco. The locations of all deep monitoring wells at the facility are shown on Figure 3. Monitoring well construction details are provided in Table 2 and soil boring/monitoring well construction logs are provided in Appendix C. Geologic information obtained from the deep soil borings were used to prepare geologic cross sections provided in Appendix D. A summary of the deep monitoring wells installed in each AOI is described below.

<u>AOI 1</u>

- Three deep monitoring wells (S-264, S-46D, and S-80D) were installed between 2005 and 2007. The deep monitoring wells were installed using a combination

of hollow stem augers and mud rotary drilling techniques with split spoon samplers to record lithology.

AOI 2

- One deep monitoring well (S-72D) existed in AOI 2 prior to the AOI 2 site characterization activities. As part of the 2010 site characterization, a total of three (S-294D, S-302D and S-305D) deep monitoring wells were installed in AOI. The deep monitoring wells were installed using hollow stem augers, mud rotary, and split spoon samplers to record lithology.

AOI 3

- Six deep monitoring wells existed in AOI 3 prior to AOI 3 site characterization activities. Two deep monitoring wells (S-280D and S-284D) were installed in AOI 3 during the 2010 site characterization activities. The deep monitoring wells were installed using hollow stem augers, mud rotary, and split spoon samplers to record lithology. In 2010, S-6 was destroyed and in 2012, S-22 was damaged and both wells are no longer sampled.

AOI 4

- Two deep monitoring wells (S-38D and S-38D2) existed prior to AOI 4 site characterization activities. Two deep monitoring wells (S-58D and S-119D) were installed in 2005 as part of the site characterization activities. The deep monitoring wells were installed using hollow stem augers, mud rotary, and split spoon samplers to record lithology.

AOI 5

- Three deep monitoring wells (A-13D, A-19D, and A-21D) existed in AOI 5 prior to the AOI 5 site characterization activities. No additional deep groundwater monitoring wells were installed since adequate characterization data existed from the three existing deep monitoring wells.

AOI 6

- Four deep monitoring wells (B-48D, B-132D, B-133D, and B-134D) existed in AOI 6 prior to the AOI 6 site characterization activities. No additional deep

monitoring wells were installed in AOI 6 as adequate characterization data existed from the four existing deep monitoring wells.

AOI 7

- Two deep monitoring wells (C-50D and C-65D) existed in AOI 7 prior to the AOI 7 site characterization activities. Three deep monitoring wells (C-129D, C-134D and C-144D) were installed in 2010 as part of the AOI 7 site characterization activities. In late 2011 C-65D was destroyed and is no longer sampled. The deep monitoring wells were installed using hollow stem augers, mud rotary, and split spoon samplers to record lithology.

AOI 8

- Eleven deep monitoring wells (N-4, N-9, N-13, N-19, N-21, N-27, N-30, N-38D, N-44D, N-46D, and 50D) existed in AOI 8 prior to the AOI 8 site characterization activities. In early 2013 N-30 was destroyed and in late 2008 N-46D was destroyed and both wells are no longer sampled. The deep monitoring wells were advanced using hollow stem augers and split spoon samplers to record lithology.

AOI 9

- Three deep monitoring wells (S-74D1SRTF, S-76DSRTF, and S-106DSRTF) existed in AOI 9 prior to the AOI 9 site characterization activities. Two deep monitoring wells (S-74D2SRTF and S-120DSRTF) were installed in AOI 9 as part of the 2009 site characterization activities. Deep monitoring wells were advanced using hollow stem augers and split spoon samplers to record lithology.

AOI 10

- The Farrington Sand does not exist beneath AOI 10 so no deep wells are installed in AOI 10.

4.2 Surveying Activities

All deep monitoring wells at the facility were surveyed by Langan to establish the location and elevation of the inner and outer casing and ground surface at each point. All monitoring well elevations were determined to the nearest 0.01 foot relative to mean

sea level. All survey activities were performed by a Pennsylvania-licensed surveyor and tied to the NAVD 88 datum. The survey data for the monitoring wells is presented in Table 2.

5.0 GROUNDWATER ATTAINMENT ACTIVITIES

This section presents the details of the groundwater attainment gauging and sampling for AOI 11 completed in 2012 and 2013.

5.1 Groundwater Gauging

On an annual basis, all accessible groundwater monitoring wells, including deep groundwater monitoring wells, are gauged for depth-to-water and depth-to-product as part of the facility's routine monitoring program. In addition, the deep monitoring well gauging readings from the quarterly gauging events from 2012 to 2013 are summarized in Table 3. The groundwater monitoring data from Table 3 was used to generate deep groundwater elevation contours provided as Figure 4 and gauging data from historic events are displayed in Appendix E. Historic deep groundwater elevation contours from 2001 to 2011 are presented in Appendix E. Historic deep groundwater contours were compared to patterns from the recent gauging events performed in 2012 and 2013 which demonstrates that the groundwater contours in AOI 11 during the attainment sampling are consistent with historical conditions as well as offsite groundwater flow conditions.

5.2 Groundwater Attainment Sampling

Groundwater characterization sampling activities were completed in AOI 11 between 2005 and 2011 as documented in the 2011 RIR. A summary of the analytical data collected for the AOI 11 monitoring wells during the site characterization activities are summarized on Table 4. Aquaterra and Langan completed four rounds of attainment groundwater sampling in AOI 11 between 2012 and 2013 which is summarized on Table 5. The groundwater samples were collected via Low Flow sampling methods. A summary of the field procedures can be found in Appendix G and the Low Flow sampling sheets can be found in Appendix H.

During the attainment sampling from May 2012-April 2013, 178 groundwater samples were collected from the deep monitoring well network in AOI 11. The samples were analyzed by Lancaster and Accutest Laboratories Inc. For groundwater samples analyzed for metals, the samples were analyzed for both total and dissolved concentrations. The groundwater analytical results were screened against the PADEP non-residential groundwater medium specific concentrations (MSCs), and the secondary maximum contamination level (SMCL) for iron, and the results are presented in Tables 5 and Figure 5. Figure 5 also includes data from 2008 to 2011 to illustrate groundwater trends within AOI 11 in relation to the attainment sampling. The laboratory analytical reports and laboratory quality assurance/quality control data are included as Appendix I.

COCs detected at concentrations above their respective non-residential groundwater MSCs during the AOI 11 groundwater attainment sampling included: benzene, benzo(a)pyrene, benzo(G,H,I)perylene, methyl tertiary butyl ether (MTBE), 1,2,4 – trimethylbenzene, chrysene, naphthalene, lead, arsenic, cobalt, and manganese. Iron was detected over the SMCL. Asummary of these COC concentrations observed in the deep monitoring wells along with an evaluation of these COCs in relation to trends, spatial distribution, and groundwater flow are presented below:

- There were no volatile or semi-volatile COCs that were detected above their respective non-residential groundwater MSCs in AOIs 6 and 7.
- MTBE was detected at low concentrations above the non-residential MSCs in 2 wells in AOI 9, 1 well in AOI 5, 4 wells in AOI 3, and 1 well in AOI 1. MTBE concentrations ranged from ND to 110 ug/L during attainment sampling. All of the MTBE detections generally showed stable MTBE trends and were consistent with the MTBE concentrations collected during the site characterization activities. The MTBE concentrations were further evaluated through the fate and transport analysis summarized in Section 7.0.
- Benzene was detected in low concentrations above the non-residential MSCs in 43 wells in AOI 8, 1 well in AOI 1, 1 well in AOI 2, 2 wells in AOI 3 and 1 well in AOI 4. Benzene concentrations ranged from ND to 124 ug/L during attainment sampling. The benzene detections were within the range of benzene data collected during the site characterization activities. Benzene concentrations above the MSCs were further evaluated through the fate and transport analysis summarized in Section 7.0.

- Benzo(A)pyrene was detected in low concentrations above the non-residential MSCs in 1 well in AOI 8 and 1 well in AOI 2. Benzo(A)pyrene concentrations ranged from ND to 0.54 ug/L during attainment sampling. The Benzo(A)pyrene concentrations were further evaluated through the fate and transport analysis summarized in Section 7.0.
- Chrysene was detected in low concentrations in 1 well in AOI 8 at similar detections as observed during the site characterization activities. Chrysene concentrations ranged from ND to 2 ug/L during attainment sampling. The chrysene concentrations were further evaluated through the fate and transport analysis summarized in Section 7.0.
- Benzo(G,H,I)perylene was detected in low concentrations in 1 well in AOI 8. benzo(G,H,I)perylene concentrations ranged from ND to 0.41 ug/L. The benzo(G,H,I)perylene concentrations were further evaluated through the fate and transport analysis summarized in Section 7.0.
- 1,2,4-Trimethylbenzene was detected one time in one well in exceedance of the non-residential MSCs in AOI2 at 96 ug/L. The 1,2,4-Trimethylbenzene concentrations were delineated in the downgradient direction.
- Naphthalene was detected in 1 well in exceedance of the non-residential MSCs in AOI 2 at 521 ug/L The naphthalene concentrations were delineated in the downgradient direction.
- Manganese was detected above the non-residential MSC in 3 wells in AOI 5, 3 wells in AOI 6, 3 wells in AOI 7, 7 wells in AOI 3, 3 wells in AOI 4, 3 wells in AOI 1, 4 wells in AOI 2, 9 wells in AOI 8 and 3 wells in AOI 9. Total manganese concentrations ranged from 19.7 to 29,100 ug/L and dissolved manganese concentrations ranged from 5 to 14,200 ug/L. These detections were in the same range as the site characterization data as well as the background conditions summarized in Section 5.0. These detections were further evaluated through mass balance calculations summarized in Section 7.0.
- Lead was detected above the non-residential MSC in 3 wells in AOI 5, 4 wells in AOI 6, 2 wells in AOI 3, 1 well in AOI 4, and 3 wells in AOI 2. Total lead concentrations ranged from ND to 1,610 ug/L and dissolved lead concentrations ranged from ND to 12.9 ug/L. These detections were in the same range as the site characterization data as well as the background conditions summarized in

Section 5.0. These detections were further evaluated through mass balance calculations summarized in Section 7.0.

- Cobalt was detected above the non-residential MSC in 1 well in AOI 3, 1 well in AOI 8, and 1 well in AOI 1. Total cobalt concentrations ranged from ND to 821 ug/L and dissolved cobalt concentrations ranged from ND to 211 ug/L. These detections were in the same range as the site characterization data. These detections were further evaluated through mass balance calculations summarized in Section 7.0.
- Arsenic was detected above the non-residential MSC in 1 well in AOI 5, 1 well in AOI 1, 2 wells in AOI 8, 1 well in AOI 2 1 well in AOI 4, and 1 well in AOI 7. Total arsenic concentrations ranged from ND to 477 ug/L and dissolved arsenic concentrations ranged from ND to 293 ug/L. These detections were in the same range as the site characterization data as well as the background conditions summarized in Section 5.0. These detections were further evaluated through mass balance calculations summarized in Section 7.0.
- Iron does not have PADEP MSC, but in response to the PADEP 2011 comment letter both the total and dissolved iron concentrations were compared to the SMCL for iron. All of the wells that were sampled had exceedances of the SMCL for total iron and several of the wells had exceedances for dissolved iron. Total iron concentrations ranged from 136 to 1,690,000 ug/L and dissolved iron had concentrations that ranged from 100 to 453,000 ug/L. These detections were in the same range as the site characterization data as well as the background conditions summarized in Section 5.0. These detections were further evaluated through mass balance calculations summarized in Section 7.0. The fate and transport evaluation for lead also evaluated the results in relation to the lowest water quality in stream criteria (LWQSC) for iron
- All other COCs analyzed during the groundwater attainment sampling were below their respective non-residential groundwater MSCs.
- LNAPL was not observed in any of the deep monitoring wells monitored.

A brief comparison summary of the regional and site specific groundwater quality results for iron, manganese, sulfate, TDS, ammonia, nitrate/nitrite, alkalinity, chloride, fluoride, sulfide, and TOC are displayed in the Table 6.

A brief summary of the occurrence of wet chemistry results for the 2012 -2013 data presented below.

- Values for TDS ranged from 41,300 to 6,400,000 ug/L with an average detection of 610,013 ug/L. Slightly higher TDS values observed in AOIs 1, 2 and 8 correlating with the high levels of sulfates and manganese detections in these areas.
- Total alkalinity values ranged from ND to 1,210,000 ug/L, with an average detection of 310,362 ug/L. No significant trends observed for alkalinity. In general the total alkalinity values in AOI 3 and 8 were slightly higher.
- Ammonia values ranged from ND to 95,700 ug/L, with an average detection of 9,022 ug/L. In general ammonia values located along the Schuylkill River in AOIs 5, 6, 7 and 9 were slightly higher.
- Chloride values ranged from 2,500 to 1,000,000 ug/L, with an average detection of 73,001 ug/L. No significant trend is observed for chloride.
- Fluoride values ranged from ND to 1,600 ug/L, with an average detection of 193 ug/L. No distinct trend for fluoride was observed. There is a slight increase in fluoride observed in AOI 3 and AOI 8.
- Nitrate/nitrite values ranged from ND to 1,500 ug/L, with an average detection of 96 ug/L. No significant trends were observed.
- Sulfate values ranged from ND to 4,500,000 ug/L, with an average detection of 163,986 ug/L. In general, sulfate values are higher in AOIs 1, 2, and 8 indicative of reducing groundwater conditions in these areas.
- Sulfide values ranged from ND to 1,900 ug/L, with an average detection of 162 ug/L. No distinct trends for sulfide, however there is a slight increase in values in AOI 7 and in the southern portion of AOI 8.
- TOC values ranged from ND to 56,300 ug/L, with an average detection of 10,096 ug/L. There were no overall distinct trends for TOC throughout the facility. However there were slightly higher values detected in AOI 3 and 8.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

The following sections outline the field and laboratory quality assurance/quality control measures that were incorporated into the site characterization activities. All groundwater gauging and sampling activities were completed in accordance with the field sampling procedures included as Appendix G of this report. The complete laboratory analytical data packages for the site wide deep groundwater sampling events are included in Appendix I.

6.1 Equipment Decontamination

All sampling equipment was decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent and potable water and distilled deionized water. The decontamination process is documented below and a full summary of all field procedures are included in Appendix G.

- Initial rinse with clean tap water to remove excess residuals;
- Scrub equipment with sponge or clean, soft cloth in a distilled water/Liquinox@ (or equivalent) solution; and
- Double rinse with deionized/distilled water.

Rinse water generated during decontamination procedures will be treated on-site by passing the water through a bucket filled with activated carbon prior to disposal.

6.2 Equipment Calibration

Prior to each use, the water quality meter was calibrated by measuring the parameters using manufacturer-provided buffer solutions, deionized water and zero oxygen solution.

6.3 Sample Preservation

Samples were preserved, where necessary, with the addition of chemical preservatives, and by cooling the samples at 4°C before and during shipment to the laboratory. Chemical additives necessary for sample preservation were added to the sample containers by the analytical laboratory prior to releasing them to sampling personnel.

6.4 Laboratory Quality Assurance/Quality Control

The laboratory performed quality assurance and quality control (QA/QC) analyses, including laboratory control spikes and laboratory control spike duplicates, matrix spikes and matrix spike duplicates, surrogate spikes, method blanks and QA/QC checks such as GC/MS instrument tuning and mass calibration, as appropriate. Laboratory QA/QC summaries were completed by the laboratory and provided in each data package, attached. The analytical data, data qualifiers, and QC results provided in these reports were evaluated to determine the confidence with which this groundwater data could be used in the decision-making process. For the purposes of this investigation, sample results were summarized in 24 sample delivery groups, provided by Lancaster Laboratories and Accutest and were evaluated for usability. Copies of the usability assessment and laboratory reports are provided in Appendix I.

Data quality indicators (DQIs) are qualitative and quantitative measures of data quality "attributes," which are descriptors used to express various properties of analytical data. Thus, DQIs are the various measures of the individual data characteristics that collectively comprise the general, all-encompassing term "data quality." Quality attributes used to assess the data usability include:

- Method selectivity/specificity
- Accuracy (bias)
- Precision
- Representativeness
- Comparability
- Completeness

Based on the evaluation of these indicators in Appendix I, the majority of the groundwater data collected during this investigation is considered usable. As further detailed in Appendix I, few concentrations should be considered as biased because MS/MSD and surrogate recoveries were beyond acceptable control limits. The analytes most affected were the wet chemistry analytes, these analytes were used in a weight of evidence approach to characterize the site and are not included in the request for a Release of Liability. The limited VOC, SVOC or metals data that was identified as not to be used to demonstrate attainment due to elevated reporting limits was not included in the data evaluation and the fate and transport evaluation.

6.5 Documentation

Chain-of-custody forms were maintained throughout the sampling program to document sample acquisition, possession and analysis. Chain-of-custody documentation accompanied all samples from the field to the laboratory. Each sample was assigned a unique number that was recorded on permanent field sheet.

7.0 FATE AND TRANSPORT ANALYSIS

7.1 Fate and Transport Evaluation

The approach to fate-and-transport modeling for the organic COCs in the deep groundwater is summarized below:

1. Wells with organic COC concentrations above the MSC were evaluated to determine whether the concentrations were delineated to below the MSC by evaluating the data from downgradient wells based on the most recent sampling event as described above. Only wells with data verified as useable were used to delineate the downgradient wells. The following wells with organic COC concentrations exceeding groundwater MSCs were determined to not have the potential to impact off site receptors, due to downgradient well(s) below the MSC; BF-108, S-13, S-294D and S-46D.
2. QD simulations were then run for the remaining wells with organic COC exceedances (N-21, N-44D, N-50D, S-106DSRTF, S-120DSRTF, S-38D2, A-19D, S-8 and S-22) to predict the migration distance to which the concentration falls below the MSC. The predicted distances were then compared to the actual distance between the well and its downgradient property boundary (boundary with the Schuylkill River or off-site boundary).
3. The edge criterion (concentration) was then input into the PADEP SWLOAD model to calculate the mass loading of the COC and to determine if surface water mixing calculations were required.
4. Surface water wasteload allocations (using PENTOXSD), which calculate the allowable groundwater concentration in a plume discharging to surface water, were not required for any of the organic COCs, as the QD/SWLOAD simulations predicted no potential impact to the Schuylkill or Delaware River.

QD and SWLOAD models are primarily intended for use with dissolved organic compounds which undergo biodegradation and sorb to aquifer materials. For this reason, fate and transport analysis of the metal exceedences in AOI 11 was performed using the mass balance equation provided in Section IV of the PADEP Technical Guidance Manual (TGM). This equation predicts the maximum concentration of a COC in surface water downstream of a diffuse groundwater discharge. Wasteload allocation calculations were also performed in order to assess potential impacts of metals to the Schuylkill and Delaware Rivers. The wasteload allocation calculations predict the necessary concentration of a COC in discharging groundwater in order to raise surface water concentrations greater than the respective surface water quality criteria (SWQC). The approach to fate-and-transport modeling for the metals in the deep groundwater is summarized below:

1. There is no PADEP groundwater MSC for iron. Several wells in AOI 11 have iron concentrations exceeding the lowest water quality in stream criteria (LWQSC) for iron. The LWQSC values were obtained from the PA Code Chapter 93.7 Table 3 (specific water quality criteria). In order to assess the potential for iron to migrate off site and impact surface water, total and dissolved iron concentrations were screened against their respective LWQSC as wells as the SMCL. The following metals were included in the fate and transport analysis; arsenic, cobalt, iron, lead and manganese.
2. Fate and transport analysis was performed for all wells along the Schuylkill River that do not have a downgradient well along the flow path to the Schuylkill River, and have metal concentrations exceeding their respective PADEP non-residential used aquifer groundwater MSCs (or LWQSC for iron). Only wells with data verified as useable were used to delineate the downgradient wells. These wells bordering the Schuylkill River will be referred to as Metals Group 1 and include; N-38D, N-44D, N-50D, S-72D, S-302D, S-280D, C-129D, C-144D, C-134D, B-134D, B-132D, A-21D, A-13D, S-76D, S-120D, and S-106D.
3. Fate and transport analysis was performed for all wells along the eastern boundary of the PES Facility that do not have a downgradient well along their flow path off site to the east, and have metal concentrations exceeding their respective PADEP non-residential used aquifer groundwater MSCs (or LWQSC

for iron). Deep groundwater contours indicate that the flow direction for these wells is to the southeast in the direction of the Delaware River. These wells will be referred to as Metals Group 2 and include; N-4, N-9, N-19, N-21, N-27, A-19D, S-8, S-22, S-80D, S-264, S-38D, and S-38D2.

4. Both a mass balance equation and wasteload allocation calculations were performed for all wells included in Metals Groups 1 and 2. Wasteload allocation calculations were performed using the human health and aquatic life surface water screening criteria for each respective metal (PA Code Chapter 93.8 Table 5). For manganese and iron the surface water screening criteria are their PA Code Chapter 93.7 LWQSC. For arsenic, cobalt, and lead their surface water quality screening criteria for acute fish, chronic fish, and human health levels were used where applicable.
5. For Metals Group 2 mass balance equations and wasteload allocation calculations were calculated using the Schuylkill River, when in fact metal impacts from these wells would have a potential to impact the Delaware River. This was done as a conservative measure, as the Schuylkill River has a much smaller surface water flux than the Delaware River.

The fate and transport evaluation identified only benzene in S-38D2 with the potential to migrate off site. The QD predicted distance only exceeds the property boundary distance by 475 feet to reach the surface water quality standard and 297 feet to reach the non-residential MSC. Due to the conservative assumptions applied in the QD and SWLOAD calculations, the benzene in S-38D2 will most likely attenuate below the PADEP non-residential used aquifer MSC at a much shorter distance. These distances indicate that benzene will not migrate to the river in excedance of the surface water quality standards from S-38D2. Wasteload allocations and mass balance calculations indicate the metal concentrations observed in the deep groundwater and benzene in S-38D2 do not pose an ecological or human health threat to the Schuylkill or Delaware Rivers.

7.2 Vapor Intrusion into Indoor Air

The potential vapor intrusion into indoor air pathway is considered incomplete for AOI 11 because a water table aquifer exists throughout the facility within recent alluvium deposits and the Trenton Gravels, and the Middle/Lower clay exists beneath

the water table aquifer in most places of the facility. Where present, the Middle/Lower Clay serves as an aquitard that would prevent the upward migration of vapor from deep groundwater. Vapor intrusion assessments are being completed for the shallow groundwater in the ongoing remedial investigation activities in the various AOIs.

8.0 SITE CONCEPTUAL MODEL

A site conceptual model (SCM) was developed for AOI 11 based on earlier USGS studies, the 1994 deep groundwater study performed by ENSR, and the data collected between 2005 and 2013. The SCM for AOI 11 is described in the following sections:

8.1 Description and Use

The Farrington Sand is present beneath the entire facility property with the exception of AOI 10 and the northwestern and western portions of AOI 8 where it has been eroded and replaced with alluvium. The extent of the Farrington Sand beneath the facility is generally consistent with the extent illustrated by USGS. There are no active remediation systems currently operating in AOI 11 and no deep groundwater supply wells exist at the facility.

8.2 Geology and Hydrogeology

The following summarizes relevant information concerning geology and hydrogeology in AOI 11:

<u>Geology</u>

- The PRM system begins at the fall line just north of AOI 8 and thickens to the east into New Jersey and towards the Atlantic Ocean. The Middle Clay and Farrington Sand units of the PRM system exist in most areas beneath the facility.
- In most areas of the facility, the lithology is comprised of several the following units from deep to shallow: Wissahickon Formation (bedrock), Farrington Sand Unit of PRM, Middle/Lower Clay, Trenton Gravel, and recent fill/alluvium.

- Farrington Sand beneath the facility generally consists of green, brown, orange and/or red, fine gravel and course sand that grades upward into medium-to-fine sands and contains thin layers of silts and clays.
- The Farrington Sand is not present beneath AOI 10 and along the western portion of AOI 8.
- The Middle Clay is present in most places beneath the facility with the exception of AOI 10, the western portion of AOI 8, the western portion of AOI 9 and a small section of AOI 3.
- The extent of the Farrington Sand and Middle/Lower clay beneath the facility is generally consistent with the extent illustrated by USGS, 1961 Plate 7 (Appendix B).

Hydrogeology

- Downward vertical gradients exist between the shallow/intermediate and deep monitoring wells throughout the facility with the exception of AOI 9 where deep groundwater flows vertically upward at the edges of the semi-confining clay.
- Deep groundwater flow beneath the facility is generally towards the south and southwest (Figure 4) towards the Schuylkill River and ultimate towards the Delaware River.

8.3 Constituents of Concern

COCs in deep groundwater at concentrations above their respective non-residential groundwater MSCs include: benzene, benzo(a)pyrene, benzo(G,H,I)perylene, chrysene, methyl tertiary butyl ether (MTBE), naphthalene, 1,2,4- trimethylbenzene, lead, arsenic, cobalt, and manganese. Iron was detected over the SMCL. All other COCs analyzed during the attainment sampling were below their respective non-residential groundwater MSCs.

8.4 Groundwater Quality Conditions

As discussed previously in the report, deep groundwater quality throughout the region has been degraded by historic industrial operations and groundwater pumping. The groundwater quality data collected as part of the AOI 11 site characterization activities

are generally consistent with the degraded groundwater quality in the Farrington Sand throughout the Philadelphia region. Recent and historic data has also concluded that water quality has been regionally degraded over time due to urbanization. Average values of dissolved iron and manganese detected beneath the facility is generally consistent with regional conditions. These findings are also consistent with those found by the USGS in their regional report released in 1991 and the report released in 2003 and 2012. Included in Appendix B are several figures from the USGS and other supporting regional publications illustrating the drastic change in groundwater flow, direction, and quality in the Farrington Sand over the past century.

8.5 Potential Migration Pathways and Site Receptors

The following summarizes potential migration pathways and site receptors for AOI 11.

- Based on the results of fate and transport modeling completed, concentrations of COCs in the deep groundwater beneath the facility are not predicted to trigger violations of in-stream criteria in the Schuylkill River or the Delaware River.
- Deep groundwater beneath the facility is not pumped or otherwise brought to the surface. Based on the depth to deep groundwater beneath the facility and the absence of pumping, there are no migration pathways for deep groundwater to human health receptors at the facility. The potential direct contact pathway to groundwater is deemed incomplete based on the facility's existing permitting procedures which prevent exposure to groundwater that may be encountered in excavations. In addition, 2001 and 2013 investigations and well searches verified that no water supply wells for residential or agricultural use exist within a 1.0 mile radius of the facility.
- Groundwater withdrawal in the city of Philadelphia is not allowed without the prior approval from the Philadelphia Health Department.
- The potential vapor intrusion into indoor air pathway is considered incomplete for AOI 11 due to the presence of the Middle Clay and the upper aquifers.

9.0 HUMAN HEALTH EXPOSURE ASSESSMENT/RISK ASSESSMENT

Based on the current and future intended non-residential site use for AOI 11, an exposure assessment was conducted for all constituents that were above the non-residential statewide health standards in AOI 11. Potential human health exposures for the facility are for an industrial worker scenario. The media evaluated included groundwater. Further evaluation of the vapor intrusion pathway into indoor air pathway is considered incomplete for AOI 11 because a water table aquifer exists throughout the facility which is currently being evaluated for vapor intrusion.

The following table serves as a summary of potential human health exposure pathways that can be reasonably expected under the current and intended future non-residential use for AOI 11. The table lists potentially contaminated media, potential receptors for these media, and a summary of whether any potentially-complete exposure pathways exist at AOI 11 from the media to these receptors.

Exposure Pathway Evaluation Summary

Contaminated Media	Residents	Workers	Day Care	Construction	Trespassers	Recreation	Food
Groundwater	NA	No(1)	NA	No(1)	No	NA	NA
Air (indoor)	NA	No(2)	NA	No(2)	No	NA	NA
Surface Water	NA	No(3)	NA	No(3)	NA	NA	NA
Sediment	No	No(3)	NA	No(3)	NA	NA	NA

Notes:

(1) No complete groundwater pathways exist for workers.
(2) No complete pathway to indoor air exists based on the AOI 11 vapor evaluation.
(3) No complete pathway exists for surface water or sediment based on the Fate and Transport Modeling.
Na - Not applicable
No - No potential complete exposure pathway
Yes – Potential complete exposure pathway

A more detailed evaluation of each of these potential human health exposure pathways is presented in the following section by media.

9.1 Groundwater

Results of the groundwater sampling indicated COCs at concentrations above their respective non-residential groundwater MSCs or SMCL (iron), including benzene,

chrysene, MTBE, naphthalene, Benzo(A)pyrene Benzo(G,H,I)perylene, 1,2,4-Trimethylbenzene arsenic, lead, cobalt, manganese and iron.

Organics

None of the organic compounds are predicted to migrate beyond the site boundary with the exception of benzene in S-38D2. A QD simulation was performed using the maximum detected concentration of benzene at S-38D2 to predict the migration distance to which the concentration falls below both the Statewide Health Standard (5 ug/l) and the PADEP's Chapter 93 Water Quality Criteria for Toxic Substances Human Health Criteria (1.2 μg/L). The predicted distance was then compared to the actual distance between the well, the site boundary and the Delaware River (considered downgradient of potential groundwater flow from the source area).

The QD model determined that groundwater concentrations would attenuate to meet the non-residential SHS in 297 feet and the surface water quality criteria in 475 feet. A receptor evaluation was completed to determine if potentially complete pathways to deep groundwater exist within these distances. Due to the conservative assumptions applied in the QD and SWLOAD calculations, the benzene in S-38D2 will most likely attenuate below the PADEP non-residential used aquifer MSC at a distance much shorter than the predicted distances. Several commercial properties and the playing surface of the Franklin D. Roosevelt Golf Club are situated between the boundary of the facility and predicted point of attainment of the SHS. There are no withdrawals of groundwater for potable or non-potable purposes within 1 mile of the facility. Further, the vicinity surrounding the facility is zoned for non-residential use and is expected to remain so in perpetuity consistent with the City of Philadelphia's long term planning. The shallow groundwater table is also present eliminating the vapor pathway from deep groundwater.

Based on this analysis, no receptors with potentially complete direct contact groundwater pathways (i.e., ingestion, dermal contact and inhalation) were identified southeast of S-38D2; therefore benzene concentrations in deep groundwater do not pose a risk to human health. The distance from S-38D2 to the Delaware River is several thousand feet indicating that there is no exposure point at which receptors in the Delaware River would come in contact with benzene-impacted surface water from S-38D2, and the pathway is incomplete. Based on these analyses the pathway to

potential receptors in AOI 11 is incomplete for organics in groundwater detected over the non-residential SHS.

Metals

The fate and transport analysis do not predict that the metals concentrations beneath the site will have an unacceptable impact on surface water quality in either the Schuylkill or Delaware Rivers. In addition the iron and manganese concentrations are present within the range of regional metals conditions. Finally there are no groundwater receptors identified within 1 mile of the facility. Therefore the pathway to potential receptors for metals detections above the non-residential MSC is incomplete.

9.2 LNAPL

There is no LNAPL present in any of the 43 deep monitoring wells.

9.3 Vapor

The potential vapor intrusion into indoor air pathway is considered incomplete for AOI 11 because a water table aquifer exists throughout the facility which is being evaluated for vapor intrusion.

10.0 ECOLOGICAL ASSESSMENT

Because the potential deep groundwater to surface water pathway was evaluated using modeling, and the results indicated that no violations of the in-stream criteria would be triggered, no further ecological evaluation for surface water was performed. Deep groundwater beneath the facility does not discharge anywhere on the facility.

11.0 COMMUNITY RELATION ACTIVITIES

A Community Relation Plan (CRP) that includes public involvement with local residents to inform them of the anticipated investigations and remediation activities was completed as part of the NIR submittal in 2006. The purpose of this CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens to be informed of

on-site activities related to the investigation activities at the facility. This plan incorporates aspects of public involvement under both PADEP's Act 2 program and EPA's RCRA Corrective Action program. This report and future Act 2 reports will include the appropriate municipal and public notices in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in local newspapers. As part of the CRP, Sunoco has offered to hold annual public meetings in the city of Philadelphia to give status updates of the project.

EPA will complete its own public involvement through notices under the Corrective Action Program and by updating its online Fact Sheet for the facility. A copy of the NIR and the Act 2 report notifications for this SCR/RIR are included in Appendix A.

12.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the completed activities, the following conclusions and recommendations have been developed for AOI 11.

Groundwater

- The inorganic groundwater quality data collected as part of the AOI 11 site characterization activities are consistent with the degraded groundwater quality in the Farrington Sand throughout the Philadelphia region.
- LNAPL was not observed in any of the deep monitoring wells monitored.
- COCs at concentrations above their respective non-residential groundwater MSCs included: benzene, chrysene, MTBE, naphthalene, Benzo(A)pyrene Benzo(G,H,I)perylene, 1,2,4-Trimethylbenzene arsenic, lead, cobalt, manganese and iron..
- Based on the results of fate and transport modeling completed, concentrations of COCs in the deep groundwater beneath the facility are not predicted to trigger violations of in-stream criteria in the Schuylkill River or Delaware River.
- Dissolved benzene concentrations in S-38D2 are predicted to extend offsite, but these concentrations are stable and there are no complete pathways for benzene from S-38D2.

- Deep groundwater beneath the facility is not pumped or otherwise brought to the surface. Based on the depth to deep groundwater beneath the facility, and the absence of pumping, there are no migration pathways for deep groundwater to human health receptors at the facility.
- 2001 and 2013 investigations and well searches verified that no water supply wells for residential or agricultural use exist within a 1.0 mile radius of the facility.
- Groundwater withdrawal in the city of Philadelphia is not allowed without the prior approval from the Philadelphia Health Department.
- The potential vapor intrusion into indoor air pathway is considered incomplete for AOI 11 due to the presence of the Middle Clay and the upper aquifers.

Recommendations

- Sunoco will continue with annual sampling as part of post remedial care plan to ensure that the conditions remain consistent with those outlined in this Final Report.

13.0 ATTAINMENT

13.1 Site Specific Standard

13.1.1 Groundwater Sampling

Sunoco collected 4 rounds of groundwater sampling totaling 178 attainment samples in AOI 11 between 2012 and 2013. All COCs met the non-residential Statewide Health Standards with the exception of benzene, chrysene, MTBE, naphthalene, Benzo(A)pyrene Benzo(G,H,I)perylene, 1,2,4-Trimethylbenzene arsenic, cobalt, manganese, lead and iron in a limited number of monitoring wells. A fate and transport analysis for all of the compounds and calculation of a SSS for benzene supported the use of a site specific standard for these compounds.

13.1.2 Attainment Summary

The site is part of an active facility and only non-residential uses of the property are permitted for the future. There are no withdrawals of groundwater for

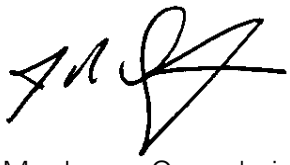
potable or non-potable purposes within 1 mile of the facility. An Environmental Covenant will be submitted summarizing the groundwater use restrictions, non-residential site use and the ongoing commitment to groundwater monitoring on an annual basis in AOI 11.

As documented for all constituents listed in Table 1, and as supported by the analytical laboratory results provided in Appendix G, the facility has demonstrated attainment of the Pennsylvania nonresidential Site Specific Standards and a Release of Liability is requested for these compounds under the pathway elimination option of the Site Specific Standard.

14.0 SIGNATURES

According to the site characterization findings, Langan has prepared this Final Report on behalf of Sunoco to justify a request for an Act 2 Release of Liability under the site specific standard for groundwater within AOI 11.

An Act 2 Release of Liability is hereby requested on behalf of Sunoco by the following representative:



Mr. James Oppenheim
Remediator

15.0 REFERENCES

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Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia Pennsylvania, U.S. Geological Survey, Water-Resources Investigations Report 01-4218, Sloto, R. A., 2003.

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TABLES

Table 1
Constituents of Concern for Groundwater
AOI 11 Final Report
PES Facility
Philadelphia, Pennsylvania

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

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

Metals	CAS No.
Arsenic (Total & Dissolved)	7440-38-2
Cobalt (Total & Dissolved)	7440-48-4
Iron (Total & Dissolved)	7439-89-6
Lead (Total & Dissolved)	7439-92-1
Manganese (Total & Dissolved)	7439-96-5
Mercury (Total & Dissolved)	7439-92-1

Misc Parameters (Not to be included in the ROL)	CAS No.
Ammonia	7664-41-7
Chloride	16887-00-6
Fluoride	7782-41-4
Sulfate	18785-72-3
Nitrate	84145-82-4
Nitrite	1594-56-5
Sulfide	-
Total Alkalinity	-
Bicarbonate	71-52-3
Total Organic Carbon	7440-44-0
Total Dissolved Solids	-

Field Parameters - Not to be included in the ROL (to be collected with downhole water quality meter)
pH
Specific Conductance
Dissolved Oxygen
Oxidation-Reduction Potential
Temperature

Notes:

1. Constituents are from Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E (pgs. 29-30) of PADEP Document, Closure Requirements for Underground Storage Tank Systems, effective April 1, 1998 and the March 18, 2008 revised PADEP Petroleum Short List.
2. The Miscelaneous and Field Parameters were included to assist in site characteristication but are not included in the request for a Release of Liability for the Site.
3. As per field equipment manufacturer's instructions.
4. As indicated by the "LD", all samples are to be analyzed using the lowest dilution possible.

Table 2
Existing Deep Well Summary
AOI 11
PES Facility
Philadelphia, Pennsylvania

Well ID	Northing	Easting	Well Type	Well Classification[2]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction Details[3]							
								Well Completion Depth (ft. bgs)	Well Diameter (in)	Top of Inner Casing Elevation[4] (ft. msl) (NAVD88)	Ground Surface Elevation (ft.) (NAVD88)	Top of Screen Elevation (ft) (NAVD88)	Bottom of Screen Elevation (ft) (NAVD88)	Depth to Screen (ft. bgs)	Screen Length (ft.)
AOI 1															
S-264	221289.016	2685761.821	Monitoring Well	Deep	Y	Y	12/20/07	81	4	26.63	25.19	-45.81	-55.81	71	10
S-46D	222025.700	2685274.000	Monitoring Well	Deep	Y	Y	3/18/05	69	2	15.71	13.63	-40.37	-55.37	54	15
S-80D	223710.420	2685511.730	Monitoring Well	Deep	Y	Y	3/31/05	80	2	31.74	--	--	--	64	15
AOI 2															
S-72D	223838.100	2683833.766	Monitoring Well	Deep	N	N	3/7/94	100	2	34.51	32.08	-56.93	-66.93	89	10
S-294D	224164.508	2684682.460	Monitoring Well	Deep	Y	Y	6/10/10	99	4	34.68	35.07	-48.93	-63.93	84	15
S-302D	222606.828	2683247.675	Monitoring Well	Deep	Y	Y	5/10/10	92	4	24.60	22.05	-54.95	-69.95	77	15
S-305D	221989.608	2684881.879	Monitoring Well	Deep	Y	Y	6/1/10	82	4	20.48	17.90	-49.10	-64.10	67	15
AOI 3															
BF-108	219700.730	2683185.260	Monitoring Well	Deep	--	--	--	--	--	10.98	9.46	--	--	--	--
S-13	218891.500	2683521.790	Monitoring Well	Deep	Y	Y	2/26/92	85	2	6.48	6.27	-58.73	-68.73	65	10
S-22	218842.350	2684080.790	Monitoring Well	Deep	Y	Y	3/19/92	85	2	18.66	17.41	-52.59	-62.59	70	10
S-69D	219970.516	2682398.764	Monitoring Well	Deep	N	N	3/2/94	64	2	13.64	11.70	-42.30	-52.30	54	10
S-8	218427.640	2683688.160	Monitoring Well	Deep	Y	Y	2/19/92	91	2	6.05	6.33	-53.67	-63.17	60	9.5
S-280D	220955.220	2682595.586	Monitoring Well	Deep	Y	Y	5/17/10	61	4	25.88	23.42	-27.58	-37.58	51	10
S-284D	220356.118	2683136.483	Monitoring Well	Deep	Y	Y	5/25/10	78	4	12.12	9.71	-53.29	-68.29	63	15
S-6	--	--	Monitoring Well	Deep	Y	Y	3/2/92	72	4	--	8.37	-53.63	-63.63	62	10
BF-90D	218957.152	2683040.367	Monitoring Well	Intermediate/Deep	--	--	--	--	--	9.77	7.35	--	--	--	--
AOI 4															
S-119D	220820.250	2685497.800	Monitoring Well	Deep	Y	Y	4/4/05	72	2	25.10	23.36	--	--	57	15
S-38D	219173.760	2685231.040	Monitoring Well	Deep	N	N	3/14/94	130	2	17.70	15.88	-104.12	-114.12	120	10
S-38D2	219162.590	2685229.490	Monitoring Well	Deep	N	N	3/17/94	80	2	18.19	15.84	-54.16	-64.16	70	10
S-59D	221368.050	2683842.990	Monitoring Well	Deep	Y	Y	4/13/05	56	2	--	--	--	--	41	15
AOI 5															
A-13D	215608.118	2682677.259	Monitoring Well	Deep	Y	Y	11/13/86	69	4	9.39	7.07	-51.93	-61.93	59	10
A-19D	217562.844	2683562.754	Monitoring Well	Deep	Y	Y	10/30/86	60	4	10.64	--	--	--	50	10
A-21D	215629.744	2681388.358	Monitoring Well	Deep	Y	Y	10/28/86	85	4	11.25	7.94	-67.06	-77.06	75	10
AOI 6															
B-132D	216098.267	2680856.844	Monitoring Well	Deep	Y	Y	3/7/01	85	2	10.31	--	--	--	75	10
B-133D	216723.250	2681722.458	Monitoring Well	Deep	Y	Y	3/5/01	65	2	8.60	6.10	-48.90	-58.90	55	10
B-134D	216764.146	2681037.349	Monitoring Well	Deep	Y	Y	3/5/01	79	2	8.12	5.45	5.45	-4.55	69	10
B-48D	217521.709	2682250.701	Monitoring Well	Deep	Y	Y	11/6/86	55	4	9.42	8.77	-36.23	-46.23	45	10
AOI 7															
C-50D	219609.420	2682342.490	Monitoring Well	Deep	Y	Y	11/4/86	26	4	11.49	9.11	-6.89	-16.89	16	10
C-129D	220492.006	2681929.233	Monitoring Well	Deep	Y	Y	6/25/10	66	4	9.19	6.85	-44.15	-59.15	51	15
C-144D	220107.413	2680336.744	Monitoring Well	Deep	Y	Y	7/9/10	78	4	8.67	6.14	-56.86	-71.86	63	15
C-65D	220116.050	2680259.790	Monitoring Well	Deep	Y	Y	11/11/86	75	4	9.62	7.60	-57.40	-67.40	65	10
AOI 8															
N-13	227095.475	2683398.971	Monitoring Well	Deep	Y	N	12/13/84	50	--	26.77	24.35	--	--	--	--
N-19	226736.819	2684650.605	Monitoring Well	Deep	Y	N	12/14/84	60	--	32.78	30.46	--	--	--	--
N-21	226627.765	2683879.135	Monitoring Well	Deep	Y	N	11/30/84	51.5	--	28.01	25.04	--	--	--	--
N-27	226112.946	2684408.569	Monitoring Well	Deep	Y	N	11/29/84	60.5	--	23.26	20.73	--	--	--	--
N-30	225824.605	2685036.828	Monitoring Well	Deep	Y	N	12/6/84	60	--	40.15	37.39	--	--	--	--
N-38D	226897.427	2680792.262	Monitoring Well	Deep	Y	Y	2/25/94	85	2	10.43	8.77	-66.23	-76.23	75	10
N-4	227944.638	2683123.405	Monitoring Well	Deep	Y	N	12/12/84	44.5	--	26.36	23.91	--	--	--	--
N-44D	225587.984	2682498.213	Monitoring Well	Deep	N	N	--	58	--	30.70	27.17	--	--	--	--
N-50D	225249.929	2682949.287	Monitoring Well	Deep	N	N	12/7/84	60	--	32.31	30.53	--	--	--	--
N-9	227374.619	2684097.082	Monitoring Well	Deep	Y	N	11/28/84	78	--	38.21	36.00	--	--	--	--
N-46D6	225495.445	2683945.399	Monitoring Well	Deep	N	N	12/5/84	55	--	32.80	29.70	--	--	--	--
AOI 9															
S-74D2 SRTF	216095.384	2679122.082	Monitoring Well	Deep	Y	Y	7/14/09	42	4	13.28	10.67	-21.33	-31.33	32	10
S-74D1 SRTF	216087.004	2679175.318	Monitoring Well	Deep	--	--	--	--	4	12.58	10.85	--	--	--	--
S-76D SRTF	216806.470	2678240.930	Monitoring Well	Deep	--	--	--	--	2	8.63	6.51	--	--	--	--
S-106D SRTF	214778.370	2677609.520	Monitoring Well	Deep	--	--	--	--	--	9.46	7.37				
S-120D SRTF	215267.387	2677542.246	Monitoring Well	Deep	Y	Y	6/12/09	35	4	12.37	9.35	-15.65	-25.65	25	10

NOTES:

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

Abandoned/damaged/destroyed wells

AOI - Area of Interest
ft. - feet
bgs - below ground surface
in. - inches
msl - elevation relative to mean sea level
g/cc - grams per cubic centimeter
NA - Data not available

1. Former well IDs were derived from handwritten notes on the logs themselves or the referenced report.
2. Well classification based on the formation in which the well was screened in. Wells screened within the Middle Clay or the Farrington Sand were classified as deep wells.
   Well classification for wells screened above the Lower/Middle Clay were based on the following: screened in Fill/Alluvium - Shallow, screened in Trenton Gravel - Intermediate, screened in Fill/Alluvium & Trenton Gravel - Shallow/Intermediate
3. Well construction details were taken directly from well boring logs provided by Handex, Stantec, Aquaterra or collected from available historic reports.

Table 3 - Summary of Deep Groundwater Elevations 2012 to 2013 Groundwater Elevations
AOI 11
PES Facility
Philadelphia, Pennsylvania

Monitoring Point ID	Northing	Easting	Well Type	Date	Well Classification	Static or Pumping	Well Completion Depth (ft bgs)	Depth to GW (ft btic) May 2012	Depth to GW (ft btic) August 2012	Depth to GW (ft btic) October/November 2012	Depth to GW (ft btic) March 2013	GW Elevation (ft amsl) May 2012	GW Elevation (ft amsl) August 2012	GW Elevation (ft amsl) October/November 2012	GW Elevation (ft amsl) March 2013	TIC Elevation (ft am sl)	Notes
AOI 1																	
S-46D	222025.7	2685274	Monitoring Well	7/26/2010	Deep	Static	69	14.99*	15.34	NG	22.24	0.72		---	-6.53	15.71	
S-80D	223710.42	2685511.73	Monitoring Well	7/23/2010	Deep	Static	80	33.30	30.57	30.28	30.41	-1.56		1.46	1.33	31.74	
S-264	221289.016	2685761.821	Monitoring Well		Deep	Static	81	26.45	26.77	26.79	26.72	0.18		-0.16	-0.09	26.63	
AOI 2																	
S-72D	223838.1	2683833.766	Monitoring Well	7/2/2010	Deep	Static	100	32.85	33.18	NG	32.89	1.66		---	1.62	34.51	
S-294D	224164.508	2684682.46	Monitoring Well	7/2/2010	Deep	Static	99	33.39	32.86	NG	30.41	1.29		---	4.27	34.68	
S-302D	222606.828	2683247.675	Monitoring Well	7/2/2010	Deep	Static	92	23.69	24.50	NG	23.61	0.91		---	1.00	24.60	
S-305D	221989.608	2684881.879	Monitoring Well	7/2/2010	Deep	Static	82	20.15*	20.54	NG	20.43	0.33		---	0.05	20.48	
AOI 3																	
BF-90D	218957.152	2683040.367	Monitoring Well	7/13/2010	Intermediate/Deep	Static	--	10.05	10.56	10.66	10.54	-0.73		-0.89	-0.77	9.32	Well damaged in 2010
BF-108	219700.73	2683185.26	Monitoring Well	7/13/2010	Deep	Static	--	11.40	11.73	11.75	11.71	-0.42		-0.77	-0.73	10.98	
S-6	---	---	Monitoring Well		Deep	Static	72	NG	---	NG	NG	---		---	---	---	Well destroyed
S-8	218427.64	2683688.16	Monitoring Well	7/13/2010	Deep	Static	91	7.47	7.43	NG	9.16	-1.42		---	22.58	6.05	Well damaged in 2010 and April 2011, not
S-13	218891.5	2683521.79	Monitoring Well	7/13/2010	Deep	Static	85	9.13	7.98	NG	8.05	---		---	-1.69	6.48	Well damaged
S-22	218842.35	2684080.79	Monitoring Well	7/13/2010	Deep	Static	85	19.90	20.22	NG	20.19	-1.24		---	-1.53	18.66	Well damaged in 2012
S-69D	219970.516	2682398.764	Monitoring Well	7/13/2010	Deep	Static	64	14.38	14.53	14.67	14.53	-0.74		-1.03	-0.89	13.64	
S-280D	220955.22	2682595.586	Monitoring Well	7/13/2010	Deep	Static	61	26.53	25.94	26.27	26.08	-0.65		-0.39	-0.20	25.88	
S-284D	220356.118	2683136.483	Monitoring Well	7/13/2010	Deep	Static	78	12.19	12.43	12.48	12.32	-0.07		-0.36	-0.21	12.12	
AOI 4																	
S-38D	219173.76	2685231.04	Monitoring Well	7/15/2010	Deep	Static	130	18.40	18.88	18.89	18.84	-0.70	1.18	-1.19	-1.14	17.70	Not used in 2010 GW contouring due to GW elevation anomaly
S-38D2	219162.59	2685229.49	Monitoring Well	7/15/2010	Deep	Static	80	19.03	19.51	19.43	19.36	-0.84	1.32	-1.24	-1.17	18.19	former S-38I
S-59D	221368.050	2683842.990	Monitoring Well		Intermediate/Deep	Static	56	16.83	16.94	16.82	16.79	---	-0.19	0.31	0.34	---	
S-119D	220820.25	2685497.8	Monitoring Well	7/15/2010	Deep	Static	72	25.04	25.44	NG	25.33	0.06	0.34	---	-0.23	25.10	
AOI 5																	
A-13D	215608.118	2682677.259	Monitoring Well	7/30/2010	Deep	Static	69	11.69	11.94	11.98	12.76	-2.30	2.55	-2.59	-3.37	9.39	
A-19D	217562.844	2683562.754	Monitoring Well	8/2/2010	Deep	Static	60	12.68	---	13.09	14.51	-2.04	---	-2.45	-3.87	10.64	
A-21D	215629.744	2681388.358	Monitoring Well	8/2/2010	Deep	Static	85	16.86	16.73	16.57	17.98	-5.61	5.48	-5.32	-6.73	11.25	
AOI 6																	
B-48D	217521.709	2682250.701	Monitoring Well	7/29/2010	Deep	Static	55	11.01	11.47	11.66	11.93	-1.59	2.05	-2.24	-2.51	9.42	
B-132D	216098.267	2680856.844	Monitoring Well	7/30/2010	Deep	Static	85	15.59	15.49	15.55	16.76	-5.28	5.18	-5.24	-6.45	10.31	
B-133D	216723.25	2681722.458	Monitoring Well	7/29/2010	Deep	Static	65	10.19	10.66	10.86	11.18	-1.59	2.06	-2.26	-2.58	8.60	
C-134D	218306.504	2681164.764	Monitoring Well	7/8/2010	Deep	Static	70	10.91	11.47	11.56	11.81	-1.51	2.07	-2.16	-2.41	9.40	
B-134D	216764.146	2681037.349	Monitoring Well	7/29/2010	Deep	Static	79	11.26	11.47	11.88	12.21	-3.14	3.35	-3.76	-4.09	8.12	
AOI 7																	
C-50D	219609.42	2682342.49	Monitoring Well	7/8/2010	Deep	Static	26	11.72	12.20	12.35	12.32	-0.23	0.71	-0.86	-0.83	11.49	
C-65D	220116.05	2680259.79	Monitoring Well	7/8/2010	Deep	Static	75	Destroyed	---	NG	NG	---	---	---	---	9.62	
C-129D	220492.006	2681929.233	Monitoring Well	7/8/2010	Deep	Static	66	9.19	9.81	9.84	10.42	0.00	0.62	-0.65	-1.23	9.19	Not used in 2010 GW contouring due to GW elevation anomaly
C-144D	220107.413	2680336.744	Monitoring Well	8/17/2010	Deep	Static	78	12.19	12.72	13.34	13.76	-3.52	4.05	-4.38	-4.80	8.67	Well damaged in 2010
AOI 8																	
N-4	227944.638	2683123.405	Monitoring Well	8/6/2010	Deep	Static	45	19.42	19.59	NG	20.18	6.94	-6.77	---	6.18	26.36	
N-9	227374.619	2684097.082	Monitoring Well	8/5/2010	Deep	Static	78	32.62	33.13	NG	33.81	5.59	-5.08	---	4.40	38.21	
N-13	227095.475	2683398.971	Monitoring Well	8/6/2010	Deep	Static	50	22.14	22.67	NG	20.37	4.63	-4.10	---	6.40	26.77	
N-19	226736.819	2684650.605	Monitoring Well	8/5/2010	Deep	Static	60	29.74	30.29	NG	30.51	3.04	-2.49	---	2.27	32.78	
N-21	226627.765	2683879.135	Monitoring Well	8/6/2010	Deep	Static	52	23.80	21.24	NG	24.58	4.21	-6.77	---	3.43	28.01	
N-27	226112.946	2684408.569	Monitoring Well	8/5/2010	Deep	Static	61	20.79	NG	NG	21.35	2.47	---	---	1.91	23.26	Well destroyed in 2013
N-30	225824.605	2685036.828	Monitoring Well	8/5/2010	Deep	Static	60	36.45	NG	NG	NG	3.70	---	---	---	40.15	
N-38D	226897.427	2680792.262	Monitoring Well	8/5/2010	Deep	Static	85	10.32	NG	9.78	9.94	0.11	---	0.65	0.49	10.43	
N-44D	225587.984	2682498.213	Monitoring Well	8/5/2010	Deep	Static	58	26.36	NG	26.89	26.94	4.34	---	3.81	3.76	30.70	
N-46D	225495.445	2683945.399	Monitoring Well	8/5/2010	Deep	Static	55	Destroyed	NG	NG	NG	---	---	---	---	32.80	
N-50D	225249.929	2682949.287	Monitoring Well	8/5/2010	Deep	Static	60	27.48	NG	28.04	27.65	4.83	---	4.27	4.66	32.31	Not used in 2010 GW contouring due to GW elevation anomaly
AOI 9																	
S-74D1 SRTF	216087.004	2679175.318	Monitoring Well	8/3/2010	Deep	Static	--	19.67	10.65	21.60	21.14	-7.09	-1.93	-9.02	-8.56	12.58	Not used in 2010 or 2011 GW contouring due to GW elevation anomaly
S-74D2 SRTF	216095.384	2679122.082	Monitoring Well	8/3/2010	Deep	Static	42	18.61	19.22	20.18	19.22	-5.33	5.94	-6.89	-5.94	13.28	
S-76D SRTF	216806.47	2678240.93	Monitoring Well	8/3/2010	Deep	Static	--	15.68	16.22	NG	NG	-7.05	7.59	---	---	8.63	
S-106D SRTF	214778.37	2677609.52	Monitoring Well	8/3/2010	Deep	Static	--	17.15	17.81	19.11	NG	-7.69	8.35	-9.65	---	9.46	
S-120D SRTF	215267.387	2677542.246	Monitoring Well	8/3/2010	Deep	Static	35	19.96	20.59	21.89	21.17	-7.59	8.22	-9.52	-8.80	12.37	

Notes:
1. Depth to water provided by Stantek August 2010 and Aquaterra in April and June/July 2011.
g/cc = grams per cubic centimeter
ft amsl = Feet Above Mean Sea Level
GW = Groundwater
NA = Not Applicable
NM = Not Measured
NP = No Product
ft btic = Feet Below Top of Inner Casing
*= Data taken from sampling DTW rather than Gauging

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	A-13D				A-13D				A-13D				A-13D				A-19D				A-19D				A-21D				A-21D				A-21D				A-21D			
			Sample Date	12/5/2006				5/3/2007				4/11/2011				7/1/2011				4/11/2011				7/1/2011				12/5/2006				5/7/2007				4/11/2011				7/1/2011			
			Sample ID	A-13D_1252006				A-13D_050307				A-13D_04112011				A-13D_07012011				A-19D_04112011				A-19D_07012011				A-21D_1252006				A-21D_050707				A-21D_04112011				A-21D_07012011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	NA				NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	NA				ND	U	0.05	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.0095	1	ND	U	0.0097	1	NA				ND	U	0.05	1	ND	U	0.0096	1	ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	NA				NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	3	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	3	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	5	1	4		0.5	1	4		0.5	1	***43***		0.5	1	***40***		0.5	1	ND	U	1	1	0.57	J	5	1	2		0.5	1	2		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				NA				ND	U	2	1	ND	U	2	1	***11.4***		2	1	5.2		2	1	NA				NA				2.1		2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				NA				ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	NA				NA				***32500***		200	1	***20400***		200	1	***35300***		200	1	***24300***		200	1	NA				NA				***34200***		200	1	***27000***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				NA				***709***		5	1	***621***		5	1	***3480***		5	1	***3130***		5	1	NA				NA				***708***		5	1	***611***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	NA				NA				7.2		0.95	1	4.4		0.95	1	***29.1***		0.95	1	***27***		0.95	1	NA				NA				4.6		0.95	1	4.6		0.95	1
Cobalt	7440-48-4	31	ug/l	NA				NA				3	J	2.3	1	3.1	J	0.62	1	5		2.3	1	4.8	J	0.62	1	NA				NA				ND	U	2.3	1	ND	U	0.62	1
Iron	7439-89-6	300	ug/l	NA				NA				***54900***		52.2	1	***44400***		14.1	1	***48800***		52.2	1	***44100***		14.1	1	NA				NA				***50500***		52.2	1	***45400***		14.1	1
Lead	7439-92-1	5	ug/l	NA				NA				2.6		0.052	1	0.33	J	0.08	1	0.059	J	0.052	1	ND	U	0.08	1	NA				NA				ND	U	0.052	1	0.16	J	0.08	1
Manganese	7439-96-5	300	ug/l	NA				NA				***746***		0.84	1	***647***		0.44	1	***3520***		0.84	1	***3320***		0.44	1	NA				NA				***724***		0.84	1	***638***		0.44	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				307000		460	1	316000		460	1	171000		460	1	174000		460	1	NA				NA				289000		460	1	289000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				NA				307000		460	1	316000		460	1	171000		460	1	174000		460	1	NA				NA				289000		460	1	289000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				NA				454000		9700	1	456000		9700	1	340000		9700	1	313000		9700	1	NA				NA				376000		9700	1	352000		9700	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				6900		500	1	9300		500	1	8100		500	1	9600		500	1	NA				NA				8400		500	1	9600		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				NA				11800		200	1	14400		200	1	1700		200	1	1600		200	1	NA				NA				25200		200	1	25500		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				NA				ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				NA				90800		4000	20	90200		4000	20	52200		4000	20	58400		4000	20	NA				NA				54700		4000	20	62300		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				NA				2100	J	1500	5	2500	J	1500	5	16100		1500	5	14800		1500	5	NA				NA				ND	U	1500	5	2100	J	1500	5
Sulfide	18496-25-8	5	ug/l	NA				NA				ND	U	**54**	1	ND	U	**54**	1	***97***	J	**54**	1	ND	U	**54**	1	NA				NA				ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	NA				NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	B-132D				B-132D				B-133D				B-133D				B-133D				B-134D				B-134D				B-134D				B-134D				B-48D			
			Sample Date	4/11/2011				7/1/2011				6/6/2006				4/8/2011				7/1/2011				5/24/2005				6/6/2006				4/8/2011				7/1/2011				5/24/2005			
			Sample ID	B-132D_04112011				B-132D_07012011				B133D-060606				B-133D_04082011				B-133D_07012011				B134D-052405				B134D-060606				B-134D_04082011				B-134D_07012011				B48D-052405			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	2	1	ND	U	0.5	1	NA				NA				ND	U	2	1	ND	U	0.5	1	NA			
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.028	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.028	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.029	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	2	1	ND	U	0.5	1	NA				NA				ND	U	2	1	ND	U	0.5	1				
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	2	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	2	1	ND	U	0.5	1	ND	U	5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	1		0.5	1	1		0.5	1	ND	U	5	1	2		1	1	2		0.5	1	ND	U	5	1	ND	U	5	1	2		1	1	1		0.5	1	ND	U	5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	**10**	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	**10**	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	10	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	NA				ND	U	2	1	2.7		2	1	NA				NA				ND	U	2	1	ND	U	2	1	NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA			
Iron (Dissolved)	7439-89-6	300	ug/l	***27000***		200	1	***18100***		200	1	NA				***11100***		200	1	***14300***		200	1	NA				NA				***7170***		200	1	***15300***		200	1	NA			
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	NA				ND	U	1	1	ND	U	1	1	NA				NA				ND	U	1	1	ND	U	1	1	NA			
Manganese (Dissolved)	7439-96-5	300	ug/l	268		5	1	246		5	1	NA				197		5	1	199		5	1	NA				NA				229		5	1	235		5	1	NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	3.6		0.95	1	4.3		0.95	1	NA				9.5		2	1	***10.9***		0.95	1	NA				NA				3.9		2	1	4.3		0.95	1	NA			
Cobalt	7440-48-4	31	ug/l	ND	U	2.3	1	ND	U	0.62	1	NA				ND	U	5	1	2.4	J	0.62	1	NA				NA				ND	U	5	1	0.73	J	0.62	1	NA			
Iron	7439-89-6	300	ug/l	***37200***		52.2	1	***37100***		14.1	1	NA				***35300***		200	1	***33200***		14.1	1	NA				NA				***36600***		200	1	***35200***		14.1	1	NA			
Lead	7439-92-1	5	ug/l	ND	U	0.052	1	ND	U	0.08	1	ND	U	1	1	ND	U	1	1	0.12	J	0.08	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.08	1	ND	U	1	1
Manganese	7439-96-5	300	ug/l	261		0.84	1	247		0.44	1	NA				220		5	1	210		0.44	1	NA				NA				245		5	1	247		0.44	1	NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	316000		460	1	307000		460	1	NA				296000		2000	1	293000		460	1	NA				NA				301000		2000	1	308000		460	1	NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	ND	U	460	1	NA				ND	U	2000	1	ND	U	460	1	NA				NA				ND	U	2000	1	ND	U	460	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	316000		460	1	307000		460	1	NA				296000		2000	1	293000		460	1	NA				NA				301000		2000	1	308000		460	1	NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	340000		9700	1	343000		9700	1	NA				328000		30000	1	344000		9700	1	NA				NA				297000		30000	1	320000		9700	1	NA			
Total Organic Carbon	TOC	NS	ug/l	6600		500	1	8000		500	1	NA				7200		1000	1	8700		500	1	NA				NA				7700		1000	1	9500		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	25400		200	1	26400		200	1	NA				28000		600	1	25200		200	1	NA				NA				***30500***		600	1	28900		200	1	NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	NA				ND	U	500	5	ND	U	250	5	NA				NA				ND	U	500	5	ND	U	250	5	NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	500	5	ND	U	400	5	NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	65700		4000	20	68800		4000	20	NA				67300		8000	20	66200		4000	20	NA				NA				52600		4000	10	51200		2000	10	NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	1500	5	2300	J	1500	5	NA				ND	U	5000	5	2300	J	1500	5	NA				NA				ND	U	5000	5	ND	U	1500	5	NA			
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	NA				ND	U	**160**	1	ND	U	**54**	1	NA				NA				ND	U	**160**	1	ND	U	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	500	5	ND	U	400	5	NA			

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	B-48D				B-48D				B-48D				BF-108				BF-108				BF-108				BF-108				BF-90D				BF-90D				BF-90D			
			Sample Date	6/8/2006				4/8/2011				7/1/2011				12/2/2009				7/22/2010				4/7/2011				7/5/2011				7/21/2010				4/7/2011				7/5/2011			
			Sample ID	B48D-060806				B-48D_04082011				B-48D_07012011				BF-108_120209				BF-108_072210				BF-108_04072011				BF-108_07052011				BF-90D_072110				BF-90D_04072011				BF-90D_07052011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	NA				ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.029	1	ND	U	0.028	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l					ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	1		1	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	5	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	5	1	4		1	1	4		0.5	1	***100***		1	1	***120***		1	1	***55***		0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	**5**	1	ND	U	**5**	1	ND	U	0.9	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	1	J	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	5	1	ND	U	5	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	5	1	ND	U	5	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	5	1	ND	U	5	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	5	1	ND	U	5	1	1	J	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	2	J	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				ND	U	2	1	ND	U	2	1	NA				NA				ND	U	2	1	ND	U	2	1	NA				ND	U	2	1	2.1		2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	NA				***9310***		200	1	***12500***		200	1	NA				NA				ND	U	200	1	ND	U	200	1	NA				ND	U	200	1	ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	NA				ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				***2050***		5	1	***1890***		5	1	NA				NA				***1070***		5	1	262		5	1	NA				167		5	1	***351***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	NA				ND	U	2	1	2.2		0.95	1	NA				NA				ND	U	0.95	1	***85.6***		0.95	1	NA				1.6	J	0.95	1	***33.1***		0.95	1
Cobalt	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	0.62	1	NA				NA				2.5	J	2.3	1	***94.8***		0.62	1	NA				3.2	J	2.3	1	***32.6***		0.62	1
Iron	7439-89-6	300	ug/l	NA				***35100***		200	1	***39200***		14.1	1	NA				NA				90.5	J	52.2	1	***294000***		70.5	5	NA				***1460***		52.2	1	***92900***		14.1	1
Lead	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	0.96	J	0.08	1	NA				NA				ND	U	0.052	1	***1110***		0.4	5	NA				2.5		0.052	1	***356***		0.08	1
Manganese	7439-96-5	300	ug/l	NA				***2110***		5	1	***2030***		0.44	1	NA				NA				***1060***		0.84	1	***2840***		0.44	1	NA				190		0.84	1	***1090***		0.44	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				272000		2000	1	274000		460	1	NA				NA				265000		460	1	342000		460	1	NA				242000		460	1	472000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				ND	U	2000	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				272000		2000	1	274000		460	1	NA				NA				265000		460	1	342000		460	1	NA				242000		460	1	472000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				429000		30000	1	313000		9700	1	NA				NA				335000		9700	1	408000		9700	1	NA				339000		9700	1	388000		9700	1
Total Organic Carbon	TOC	NS	ug/l	NA				5500		1000	1	7100		500	1	NA				NA				3800		500	1	12300		500	1	NA				13500		500	1	12700		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				6700		600	1	8400		200	1	NA				NA				750		200	1	ND	U	200	1	NA				840		200	1	ND	U	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				ND	U	500	5	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				72300		8000	20	74100		4000	20	NA				NA				37500		2000	10	10200		1000	5	NA				25800		1000	5	11800		1000	5
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				ND	U	5000	5	3700	J	1500	5	NA				NA				16300		1500	5	23100		1500	5	NA				14300		1500	5	33200		1500	5
Sulfide	18496-25-8	5	ug/l	NA				ND	U	**160**	1	ND	U	**54**	1	NA				NA				ND	U	**54**	1	ND	U	54	1	NA				ND	U	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	400	5	580		400	5	NA				ND	U	400	5	620		400	5

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	C-129D				C-129D				C-129D				C-134D				C-134D				C-134D				C-144D				C-144D				C-50D			
			Sample Date	7/12/2010				4/8/2011				6/29/2011				7/20/2010				4/8/2011				7/1/2011				7/19/2010				7/5/2011				1/13/2010			
			Sample ID	C-129D_071210				C-129D_04082011				C-129D_06292011				C-134D_072010				C-134D_04082011				C-134D_07012011				C-144D_071910				C-144D_07052011				C-50D_011310			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																							
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	0.5	J	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.028	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.0099	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	0.7	J	0.5	1	2		1	1	2		1	1	1		0.5	1	1		1	1	0.7	J	0.5	1	0.9	J	0.5	1	0.9	J	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																							
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	2	J	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1
Naphthalene	91-20-3	100	ug/l	1	J	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	1	J	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1
Phenanthrene	85-01-8	1100	ug/l	2	J	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	2	J	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																							
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				ND	U	2	1	ND	U	2	1	NA				6.4		2	1	2.3		2	1	NA				ND	U	2	1	NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	NA			
Iron (Dissolved)	7439-89-6	300	ug/l	NA				ND	U	200	1	ND	U	200	1	NA				ND	U	200	1	ND	U	200	1	NA				***55700***		200	1	NA			
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	0.05	1	ND	U	1	1	ND	U	1	1	ND	U	0.05	1	ND	U	1	1	ND	U	1	1	ND	U	0.05	1	ND	U	1	1	ND	U	0.05	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				115		5	1	104		5	1	NA				ND	U	5	1	ND	U	5	1	NA				***1490***		5	1	NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																							
Arsenic	7440-38-2	10	ug/l	NA				***11***		2	1	9.6		2	1	NA				***10.7***		2	1	5.8		0.95	1	NA				2.5		0.95	1	NA			
Cobalt	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	0.76	J	0.62	1	NA				1.1	J	0.62	1	NA			
Iron	7439-89-6	300	ug/l	NA				***19900***		200	1	***20800***		200	1	NA				***8100***		200	1	***649***		14.1	1	NA				***74900***		14.1	1	NA			
Lead	7439-92-1	5	ug/l	NA				ND	U	1	1	ND	U	1	1	NA				1.1		1	1	0.16	J	0.08	1	NA				0.84	J	0.08	1	NA			
Manganese	7439-96-5	300	ug/l	NA				140		5	1	114		5	1	NA				***374***		5	1	43		0.44	1	NA				***1540***		0.44	1	NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																							
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				398000		2000	1	386000		2000	1	NA				239000		2000	1	222000		460	1	NA				412000		460	1	NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				ND	U	2000	1	ND	U	2000	1	NA				45200		2000	1	157000		460	1	NA				ND	U	460	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				398000		2000	1	386000		2000	1	NA				149000		2000	1	ND	U	460	1	NA				412000		460	1	NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				350000		30000	1	343000		30000	1	NA				312000		30000	1	402000		9700	1	NA				461000		9700	1	NA			
Total Organic Carbon	TOC	NS	ug/l	NA				8300		1000	1	8000		1000	1	NA				23400		1000	1	37000		500	1	NA				11000		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	***44900***		600	1	***36900***		600	1	NA				26400		600	1	18600		200	1	NA				22300		200	1	NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	500	5	ND	U	500	5	NA				ND	U	500	5	ND	U	250	5	NA				ND	U	250	5	NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	500	5	ND	U	500	5	NA				ND	U	500	5	ND	U	400	5	NA				ND	U	400	5	NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	47800		4000	10	47100		4000	10	NA				79200		8000	20	82900		4000	20	NA				36300		2000	10	NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	6000		5000	5	ND	U	5000	5	NA				7200		5000	5	18600		1500	5	NA				4300	J	1500	5	NA			
Sulfide	18496-25-8	5	ug/l	ND	U	**160**	1	ND	U	**160**	1	NA				***560***		**160**	1	***1100***		**54**	1	NA				***120***	J	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	NA				ND	U	500	5	ND	U	500	5	NA				ND	U	500	5	ND	U	400	5	NA				ND	U	400	5	NA			

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	C-50D				C-50D				C-50D				N-13				N-13				N-13				N-13				N-19				N-19				N-19			
			Sample Date	7/13/2010				4/8/2011				7/5/2011				2/7/2008				7/23/2008				4/6/2011				6/27/2011				2/6/2008				7/16/2008				4/5/2011			
			Sample ID	C-50D_071310				C-50D_04082011				C-50D_07052011				N-13_2/7/2008				N-13_7/23/2008				N-13_04062011				N-13_06272011				N-19_2/6/2008				N-19_07/16/08				N-19_4-5-11			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	0.5	J	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	3		0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	2		1	1	2		1	1	1		0.5	1	0.9	J	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	1	J	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				2.8		2	1	5.4		2	1	NA				NA				2.4		2	1	3.9		2	1	NA				NA				ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	NA				***8210***		200	1	***25500***		200	1	NA				NA				***8880***		200	1	***10100***		200	1	NA				NA				***29600***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	0.05	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				***2890***		5	1	***2970***		5	1	NA				NA				***1370***		5	1	***1370***		5	1	NA				NA				***484***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	NA				***44.5***		2	1	***45***		0.95	1	NA				NA				***12.3***		0.95	1	9.8		0.95	1	NA				NA				1	J	0.95	1
Cobalt	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	0.62	1	NA				NA				7.6		2.3	1	5.1		0.62	1	NA				NA				4.3	J	2.3	1
Iron	7439-89-6	300	ug/l	NA				***52700***		200	1	***56000***		14.1	1	NA				NA				***26100***		52.2	1	***22800***		14.1	1	NA				NA				***30100***		52.2	1
Lead	7439-92-1	5	ug/l	NA				ND	U	1	1	ND	U	0.08	1	NA				NA				***11.8***		0.052	1	***6.3***		0.08	1	NA				NA				2.3		0.052	1
Manganese	7439-96-5	300	ug/l	NA				***3050***		5	1	***3140***		0.44	1	NA				NA				***1450***		0.84	1	***1440***		0.44	1	NA				NA				***489***		0.84	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				397000		2000	1	379000		460	1	NA				NA				265000		460	1	271000		460	1	NA				NA				164000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				ND	U	2000	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				397000		2000	1	379000		460	1	NA				NA				265000		460	1	271000		460	1	NA				NA				164000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				666000		60000	1	693000		19400	1	NA				NA				390000		9700	1	414000		9700	1	NA				NA				369000		9700	1
Total Organic Carbon	TOC	NS	ug/l	NA				17500		1000	1	17500		500	1	NA				NA				10400		500	1	11900		500	1	NA				NA				3400		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				16400		600	1	12400		200	1	NA				NA				3100		200	1	760		200	1	NA				NA				250	J	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				ND	U	500	5	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	250	5	NA				NA				ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				199000		20000	50	212000		10000	50	NA				NA				68000		4000	20	67700		4000	20	NA				NA				87200		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				ND	U	5000	5	2100	J	1500	5	NA				NA				6900		1500	5	8200		1500	5	NA				NA				36300		1500	5
Sulfide	18496-25-8	5	ug/l	NA				ND	U	**160**	1	ND	U	**54**	1	NA				NA				ND	U	**54**	1	ND	U	**54**	1	NA				NA				ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	NA				ND	U	500	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-19				N-21				N-21				N-21				N-21				N-27				N-27				N-27				N-27				N-30			
			Sample Date	6/27/2011				2/7/2008				7/23/2008				4/6/2011				6/29/2011				2/6/2008				7/17/2008				4/5/2011				6/28/2011				7/22/2008			
			Sample ID	N-19_06272011				N-21_2/07/2008				N-21_7/23/2008				N-21_04062011				N-21_06292011				N-27_2/6/2008				N-27_7/17/08				N-27_4-5-11				N-27_06282011				N-30_7/22/2008			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	2	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA			
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.03	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.03	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	2	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA			
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	2		1	1	***16***		1	1	***20***		0.5	1	***110***		1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	3		1	1	3		1	1	2		0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	10		2	1	190		2	1	120		0.5	1	64		2	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	1	1	1		1	1	0.6	J	0.5	1	ND	U	1	1	ND	U	1	1	4		1	1	3		0.5	1	2		0.5	1	ND	U	1	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	1	1	1		1	1	0.7	J	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	1	J	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	NA				NA				4.3		2	1	***54***		2	1	NA				NA				ND	U	2	1	ND	U	2	1	NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	NA				NA				***36.1***		5	1	***228***		5	1	NA				NA				10.4		5	1	9.8		5	1	NA			
Iron (Dissolved)	7439-89-6	300	ug/l	***23500***		200	1	NA				NA				***54300***		200	1	***535000***		**1000**	5	NA				NA				***867***		200	1	ND	U	200	1	NA			
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	251		5	1	NA				NA				***606***		5	1	***4830***		5	1	NA				NA				***5930***		5	1	***5850***		5	1	NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	1	J	0.95	1	NA				NA				5.7		0.95	1	***55.7***		2	1	NA				NA				ND	U	0.95	1	ND	U	0.95	1	NA			
Cobalt	7440-48-4	31	ug/l	3.5	J	0.62	1	NA				NA				***39.1***		2.3	1	***228***		5	1	NA				NA				10.6		2.3	1	9.5		0.62	1	NA			
Iron	7439-89-6	300	ug/l	***27600***		14.1	1	NA				NA				***62400***		52.2	1	***526000***		1000	5	NA				NA				***1530***		52.2	1	***1650***		14.1	1	NA			
Lead	7439-92-1	5	ug/l	2.8		0.08	1	NA				NA				1.7		0.052	1	1.2		1	1	NA				NA				0.23	J	0.052	1	0.32	J	0.08	1	NA			
Manganese	7439-96-5	300	ug/l	276		0.44	1	NA				NA				***650***		0.84	1	***4810***		5	1	NA				NA				***6070***		0.84	1	***5850***		0.44	1	NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	172000		460	1	NA				NA				ND	U	460	1	ND	U	2000	1	NA				NA				198000		460	1	197000		460	1	NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	2000	1	NA				NA				ND	U	460	1	ND	U	460	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	172000		460	1	NA				NA				ND	U	460	1	ND	U	2000	1	NA				NA				198000		460	1	197000		460	1	NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	386000		9700	1	NA				NA				1040000		19400	1	7000000		240000	1	NA				NA				629000		19400	1	635000		9700	1	NA			
Total Organic Carbon	TOC	NS	ug/l	4100		500	1	NA				NA				13200		500	1	31700		1000	1	NA				NA				2600		500	1	3300		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	ND	U	200	1	NA				NA				1700		200	1	12900		600	1	NA				NA				710		200	1	740		200	1	NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	500	5	NA				NA				ND	U	250	5	ND	U	250	5	NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	500	5	NA				NA				ND	U	400	5	ND	U	400	5	NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	87800		4000	20	NA				NA				47600		2000	10	83600		8000	20	NA				NA				108000		4000	20	108000		4000	20	NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	23800		1500	5	NA				NA				703000		30000	100	5400000		500000	500	NA				NA				176000		6000	20	192000		6000	20	NA			
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	NA				NA				ND	U	**54**	1	ND	U	160	1	NA				NA				ND	U	**54**	1	ND	U	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	NA				NA				ND	U	400	5	1200		500	5	NA				NA				ND	U	400	5	ND	U	400	5	NA			

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-30				N-30				N-38D				N-38D				N-38D				N-38D				N-4				N-4				N-4			
			Sample Date	4/5/2011				6/28/2011				2/7/2008				7/24/2008				4/6/2011				6/28/2011				2/7/2008				7/15/2008				4/6/2011			
			Sample ID	N-30_4-5-11				N-30_06282011				N-38D_2/7/2008				N-38D_7/24/2008				N-38D_04062011				N-38D_06282011				N-4_2/7/2008				N-4_7/15/2008				N-4_04062011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																							
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.0098	1	ND	U	0.028	1	ND	U	0.029	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	***71***		1	1	5		1	1	2		0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	7		1	1	2		1	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	1		1	1	ND	U	1	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	29		2	1	3		2	1	3		0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	2		1	1	2		0.5	1
Toluene	108-88-3	1000	ug/l	2		0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	4		0.5	1	ND	U	0.5	1	4		1	1	ND	U	1	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																							
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	0.9	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	0.9	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	0.9	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	0.9	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	0.9	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																							
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	NA				NA				2.3		2	1	ND	U	2	1	NA				NA				ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***22900***		200	1	***21900***		200	1	NA				NA				ND	U	200	1	ND	U	200	1	NA				NA				ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	243		5	1	237		5	1	NA				NA				***356***		5	1	***340***		5	1	NA				NA				***2850***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																							
Arsenic	7440-38-2	10	ug/l	3		0.95	1	5.3		0.95	1	NA				NA				***13.5***		0.95	1	***12.5***		0.95	1	NA				NA				ND	U	0.95	1
Cobalt	7440-48-4	31	ug/l	7		2.3	1	22.3		0.62	1	NA				NA				3.7	J	2.3	1	3	J	0.62	1	NA				NA				2.4	J	2.3	1
Iron	7439-89-6	300	ug/l	***36500***		52.2	1	***56400***		14.1	1	NA				NA				***37000***		52.2	1	***28200***		14.1	1	NA				NA				***11700***		52.2	1
Lead	7439-92-1	5	ug/l	***23.9***		0.052	1	***42.4***		0.08	1	NA				NA				***32.7***		0.052	1	***5.4***		0.08	1	NA				NA				1.9		0.052	1
Manganese	7439-96-5	300	ug/l	288		0.84	1	***380***		0.44	1	NA				NA				***861***		0.84	1	***445***		0.44	1	NA				NA				***3080***		0.84	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																							
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	68100		460	1	65800		460	1	NA				NA				1090000		460	1	1080000		460	1	NA				NA				627000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	68100		460	1	65800		460	1	NA				NA				1090000		460	1	1080000		460	1	NA				NA				627000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	503000		9700	1	468000		9700	1	NA				NA				818000		38800	1	860000		38800	1	NA				NA				756000		19400	1
Total Organic Carbon	TOC	NS	ug/l	3900		500	1	6000		500	1	NA				NA				40600		500	1	40900		500	1	NA				NA				6600		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	ND	U	200	1	420	J	200	1	NA				NA				***85100***		200	1	***88200***		200	1	NA				NA				1100		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	NA				NA				630		250	5	920		250	5	NA				NA				ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	136000		10000	50	136000		10000	50	NA				NA				8700		1000	5	15600		1000	5	NA				NA				56000		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	132000		15000	50	148000		15000	50	NA				NA				ND	U	1500	5	7100		1500	5	NA				NA				53800		3000	10
Sulfide	18496-25-8	5	ug/l	ND	U	**220**	4	ND	U	**54**	1	NA				NA				ND	U	**54**	1	ND	U	**54**	1	NA				NA				ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-4				N-44D				N-44D				N-44D				N-50D				N-50D				N-50D				N-50D				N-9				N-9			
			Sample Date	6/27/2011				7/25/2008				4/5/2011				6/28/2011				2/8/2008				7/23/2008				4/5/2011				6/29/2011				2/7/2008				7/16/2008			
			Sample ID	N-4_06272011				N-44D_7/25/2008				N-44D_4-5-11				N-44D_06282011				N-50D_2/8/2008				N-50D_7/23/2008				N-50D_4-5-11				N-50D_06292011				N-9_2/7/2008				N-9_07/16/08			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	NA				0.9	J	0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	2	1	NA				NA			
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.028	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.029	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	NA				5		0.5	1	ND	U	0.5	1	NA				NA				ND	U	0.5	1	ND	U	2	1	NA				NA			
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	***6***		1	1	***10***		0.5	1	***7***		0.5	1	4		1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	***8***		1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	4		1	1	6		0.5	1	3		0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	2		1	1	ND	U	1	1	6		1	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	1	1	2		0.5	1	1		0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	2		1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	5		2	1	14		0.5	1	9		0.5	1	ND	U	2	1	ND	U	2	1	5		0.5	1	14		2	1	ND	U	2	1	ND	U	2	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2		0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	1	1	1		0.5	1	0.6	J	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	1		1	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	***9***		**5**	1	ND	U	**5**	1	***2***	J	1	1	***5***		**5**	1	ND	U	**5**	1	ND	U	**5**	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	5	1	1	J	1	1	2	J	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	5	1	2	J	1	1	2	J	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	5	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	13		5	1	ND	U	5	1	3	J	1	1	8		5	1	ND	U	5	1	ND	U	5	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	NA				***55.1***		2	1	***62.2***		2	1	NA				NA				ND	U	2	1	ND	U	2	1	NA				NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA				NA			
Iron (Dissolved)	7439-89-6	300	ug/l	***361***		200	1	NA				***17200***		200	1	***31100***		200	1	NA				NA				***9620***		200	1	ND	U	200	1	NA				NA			
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***2750***		5	1	NA				***486***		5	1	***605***		5	1	NA				NA				***1000***		5	1	***588***		5	1	NA				NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	ND	U	0.95	1	NA				***114***		0.95	1	***132***		0.95	1	NA				NA				4.1		0.95	1	***29.6***		2	1	NA				NA			
Cobalt	7440-48-4	31	ug/l	4.3	J	0.62	1	NA				ND	U	2.3	1	ND	U	0.62	1	NA				NA				ND	U	2.3	1	13		5	1	NA				NA			
Iron	7439-89-6	300	ug/l	***9310***		14.1	1	NA				***27400***		52.2	1	***36600***		14.1	1	NA				NA				***25100***		52.2	1	***71500***		200	1	NA				NA			
Lead	7439-92-1	5	ug/l	1.3		0.08	1	NA				1.7		0.052	1	0.75	J	0.08	1	NA				NA				***37.7***		0.052	1	***576***		5	5	NA				NA			
Manganese	7439-96-5	300	ug/l	***2890***		0.44	1	NA				***560***		0.84	1	***598***		0.44	1	NA				NA				***1070***		0.84	1	***1230***		5	1	NA				NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	573000		460	1	NA				134000		460	1	160000		460	1	NA				NA				409000		460	1	304000		2000	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	2000	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	573000		460	1	NA				134000		460	1	160000		460	1	NA				NA				409000		460	1	304000		2000	1	NA				NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	801000		19400	1	NA				275000		9700	1	342000		9700	1	NA				NA				653000		9700	1	430000		30000	1	NA				NA			
Total Organic Carbon	TOC	NS	ug/l	7800		500	1	NA				49400		500	1	53500		500	1	NA				NA				20500		500	1	18400		1000	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	ND	U	200	1	NA				980		200	1	1100		200	1	NA				NA				2500		200	1	2400		600	1	NA				NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	500	5	NA				NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	500	5	NA				NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	62600		4000	20	NA				28400		1000	5	30000		2000	10	NA				NA				18700		1000	5	17200		2000	5	NA				NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	85300		1500	5	NA				15700		1500	5	17200		1500	5	NA				NA				ND	U	1500	5	8800		5000	5	NA				NA			
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	NA				***2000***		**110**	2	***1600***		**54**	1	NA				NA				ND	U	**54**	1	ND	U	**160**	1	NA				NA			
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	500	5	NA				NA			

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-9				N-9				S-106DSRTF				S-106DSRTF				S-106DSRTF				S-119D				S-119D				S-119D				S-120DSRTF				S-120DSRTF			
			Sample Date	4/5/2011				6/27/2011				1/22/2009				4/8/2011				6/30/2011				5/3/2005				4/6/2011				6/28/2011				4/8/2011				6/30/2011			
			Sample ID	N-9_4-5-11				N-9_06272011				S-106DSRTF_012209				S-106DSRTF_04082011				S-106DSRTF_06302011				S119D-050305				S-119D_04062011				S-119D_06282011				S-120DSRTF_04082011				S-120DSRTF_06302011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.03	1	ND	U	0.0096	1	ND	U	0.0095	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.0095	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	2		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	0.7	J	0.5	1	0.6	J	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	14		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	1		0.5	1	0.6	J	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	2		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	6		0.5	1	4		0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	***27***		1	1	***300***		0.5	1	***260***		0.5	1	ND	U	5	1	0.5	J	0.5	1	0.6	J	0.5	1	***37***		0.5	1	***30***		0.5	1
Toluene	108-88-3	1000	ug/l	0.5	J	0.5	1	ND	U	0.5	1	1		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	2		0.5	1	0.7	J	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**10**	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	NA				ND	U	2	1	ND	U	2	1	NA				4.6		2	1	4.6		2	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	NA				11.2		5	1	10.2		5	1	NA				7.4		5	1	6.6		5	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	ND	U	200	1	***4170***		200	1	NA				***787***		200	1	***1710***		200	1	NA				***29400***		200	1	***29300***		200	1	ND	U	200	1	ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	NA				ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	155		5	1	***1810***		5	1	NA				***1030***		5	1	***913***		5	1	NA				282		5	1	277		5	1	***1720***		5	1	***1710***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	1.9	J	0.95	1	2.2		0.95	1	NA				5.1		0.95	1	5.1		0.95	1	NA				5.1		0.95	1	5		0.95	1	***11.3***		0.95	1	9.2		0.95	1
Cobalt	7440-48-4	31	ug/l	8.3		2.3	1	8.3		0.62	1	NA				11.5		2.3	1	9.4		0.62	1	NA				7.9		2.3	1	7.5		0.62	1	3.2	J	2.3	1	4.8	J	0.62	1
Iron	7439-89-6	300	ug/l	***3960***		52.2	1	***11900***		14.1	1	NA				***31800***		52.2	1	***29900***		14.1	1	NA				***31100***		52.2	1	***31300***		14.1	1	***39100***		52.2	1	***37800***		14.1	1
Lead	7439-92-1	5	ug/l	2.6		0.052	1	***7.7***		0.08	1	NA				0.2	J	0.052	1	ND	U	0.08	1	ND	U	1	1	1.2		0.052	1	1		0.08	1	4.5		0.052	1	***14***		0.08	1
Manganese	7439-96-5	300	ug/l	***1430***		0.84	1	***1900***		0.44	1	NA				***1060***		0.84	1	***969***		0.44	1	NA				287		0.84	1	286		0.44	1	***1880***		0.84	1	***1890***		0.44	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	479000		460	1	451000		460	1	NA				416000		460	1	409000		460	1	NA				66700		460	1	62700		460	1	364000		460	1	354000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	479000		460	1	451000		460	1	NA				416000		460	1	409000		460	1	NA				66700		460	1	62700		460	1	364000		460	1	354000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	431000		9700	1	639000		9700	1	NA				494000		9700	1	511000		9700	1	NA				458000		9700	1	487000		9700	1	400000		9700	1	394000		9700	1
Total Organic Carbon	TOC	NS	ug/l	2500		500	1	3000		500	1	NA				9700		500	1	11200		500	1	NA				1400		500	1	2300		500	1	11000		500	1	12900		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	590	J	200	1	1500		200	1	NA				14700		200	1	16200		200	1	NA				ND	U	200	1	530	J	200	1	9200		200	1	20300		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	54900		4000	20	67800		4000	20	NA				48900		2000	10	48800		2000	10	NA				140000		10000	50	136000		20000	100	25500		1000	5	24300		2000	10
Sulfate (As So4)	14808-79-8	NS	ug/l	89000		6000	20	99400		6000	20	NA				36800		1500	5	33000		1500	5	NA				145000		15000	50	85300		3000	10	ND	U	1500	5	1800	J	1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-13				S-22				S-22				S-22				S-22				S-264				S-264				S-280D				S-280D				S-280D			
			Sample Date	11/30/2009				11/30/2009				7/16/2010				4/7/2011				6/29/2011				4/6/2011				6/28/2011				7/23/2010				4/7/2011				6/28/2011			
			Sample ID	S-13_113009				S-22_113009				S-22_071610				S-22_04072011				S-22_06292011				S-264_04062011				S-264_06282011				S-280D_072310				S-280D_04072011				S-280D_06282011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	2	1	4		2	1	ND	U	2	1	2	J	0.5	1	ND	U	3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.029	1	ND	U	0.03	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.0098	1	ND	U	0.0098	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.0098	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	3	5	1		0.5	1	2		0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	2	1	12		2	1	2		2	1	9		0.5	1	10	J	3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	1	1	***33***		1	1	***6***		1	1	***20***		0.5	1	***28***		3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	140		1	1	110		1	1	17		1	1	110		0.5	1	140		3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	35		1	1	4		1	1	ND	U	1	1	5		0.5	1	7		3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	2	1	9		2	1	ND	U	2	1	10		0.5	1	10	J	3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	1		1	1	***66***		1	1	***48***		1	1	***75***		0.5	1	***49***		3	5	5		0.5	1	6		0.5	1	2		1	1	1		0.5	1	1		0.5	1
Toluene	108-88-3	1000	ug/l	3		1	1	44		1	1	7		1	1	43		0.5	1	53		3	5	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	**5**	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.9	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	5	1	ND	U	5	1	ND	U	5	1	3	J	1	1	1	J	0.9	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	5	1	ND	U	5	1	ND	U	5	1	1	J	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	1	1	ND	U	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				NA				NA				ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	NA				2.5		2	1	2.4		2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				NA				NA				ND	U	5	1	ND	U	5	1	29		5	1	***35.7***		5	1	NA				ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	NA				NA				NA				***2940***		200	1	***1750***		200	1	***6940***		200	1	***9920***		200	1	NA				***9420***		200	1	***9270***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	2.3		1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				NA				NA				293		5	1	239		5	1	***7420***		5	1	***8580***		5	1	NA				***694***		5	1	***661***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	NA				NA				NA				2.9		0.95	1	2.6		0.95	1	8.6		0.95	1	2.7		0.95	1	NA				***15.3***		0.95	1	***14.5***		0.95	1
Cobalt	7440-48-4	31	ug/l	NA				NA				NA				6.9		2.3	1	7.1		0.62	1	***44.4***		2.3	1	***35.5***		0.62	1	NA				3	J	2.3	1	2.8	J	0.62	1
Iron	7439-89-6	300	ug/l	NA				NA				NA				***36300***		52.2	1	***28500***		14.1	1	***46700***		52.2	1	***14000***		14.1	1	NA				***23500***		52.2	1	***23300***		14.1	1
Lead	7439-92-1	5	ug/l	NA				NA				NA				3.9		0.052	1	0.46	J	0.08	1	***6.2***		0.052	1	0.25	J	0.08	1	NA				0.16	J	0.052	1	0.28	J	0.08	1
Manganese	7439-96-5	300	ug/l	NA				NA				NA				***371***		0.84	1	272		0.44	1	***7840***		0.84	1	***8570***		0.44	1	NA				***709***		0.84	1	***672***		0.44	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				210000		460	1	199000		460	1	308000		460	1	316000		460	1	NA				228000		460	1	210000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				NA				ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				NA				NA				210000		460	1	199000		460	1	308000		460	1	316000		460	1	NA				228000		460	1	210000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				NA				NA				300000		9700	1	320000		9700	1	645000		19400	1	695000		19400	1	NA				249000		9700	1	258000		9700	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				NA				13400		500	1	12700		500	1	12000		500	1	13800		500	1	NA				4500		500	1	5900		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				NA				NA				1800		200	1	1600		200	1	2200		200	1	2000		200	1	NA				14700		200	1	17200		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				NA				NA				ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				NA				NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				NA				NA				41300		2000	10	35700		2000	10	89300		4000	20	91100		4000	20	NA				45400		2000	10	43400		2000	10
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				NA				NA				1500	J	1500	5	ND	U	1500	5	105000		6000	20	130000		6000	20	NA				4200	J	1500	5	6500		1500	5
Sulfide	18496-25-8	5	ug/l	NA				NA				NA				ND	U	54	1	ND	U	54	1	ND	U	**54**	1	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	54	1
Fluoride	16984-48-8	4000	ug/l	NA				NA				NA				500		400	5	910		400	5	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	580		400	5

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-284D				S-284D				S-284D				S-294D				S-294D				S-294D				S-302D				S-302D				S-302D				S-305D			
			Sample Date	7/23/2010				4/7/2011				6/29/2011				7/23/2010				4/6/2011				6/28/2011				7/26/2010				4/7/2011				6/28/2011				7/26/2010			
			Sample ID	S-284D_072310				S-284D_04072011				S-284D_06292011				S-294D_072310				S-294D_04062011				S-294D_06282011				S-302D_072610				S-302D_04072011				S-302D_06282011				S-305D_072610			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	15		2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.029	1	ND	U	0.0099	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.029	1	ND	U	0.01	1	ND	U	0.0098	1	ND	U	0.029	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	6		2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1
Benzene	71-43-2	5	ug/l	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	0.5	J	0.5	1	ND	U	1	1	19		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	0.6	J	0.5	1	ND	U	0.5	1	ND	U	1	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	17		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	3		2	1	0.8	J	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	5		2	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	0.8	J	0.5	1	0.8	J	0.5	1	ND	U	1	1	0.6	J	0.5	1	0.5	J	0.5	1	ND	U	1	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	1		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	**5**	1	ND	U	1	1	ND	U	**5**	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	**5**	1
Fluorene	86-73-7	1900	ug/l	ND	U	5	1	ND	U	1	1	ND	U	5	1	6		5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Naphthalene	91-20-3	100	ug/l	ND	U	5	1	ND	U	1	1	ND	U	5	1	***140***		24	5	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	5	1	ND	U	1	1	ND	U	5	1	8		5	1	1	J	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1
Pyrene	129-00-0	130	ug/l	ND	U	5	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	1	J	1	1	ND	U	5	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				ND	U	2	1	ND	U	2	1	NA				ND	U	2	1	3.2		2	1	NA				ND	U	2	1	ND	U	2	1	NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1	NA			
Iron (Dissolved)	7439-89-6	300	ug/l	NA				***1220***		200	1	***821***		200	1	NA				***60500***		200	1	***65000***		200	1	NA				***67200***		200	1	***66900***		200	1	NA			
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				***979***		5	1	***922***		5	1	NA				***8210***		5	1	***8390***		5	1	NA				***4140***		5	1	***3930***		5	1	NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	NA				ND	U	0.95	1	ND	U	2	1	NA				4.3		0.95	1	4.5		0.95	1	NA				ND	U	0.95	1	ND	U	0.95	1	NA			
Cobalt	7440-48-4	31	ug/l	NA				ND	U	2.3	1	ND	U	5	1	NA				4.3	J	2.3	1	4.3	J	0.62	1	NA				ND	U	2.3	1	1.8	J	0.62	1	NA			
Iron	7439-89-6	300	ug/l	NA				***2580***		52.2	1	***2710***		200	1	NA				***68100***		52.2	1	***69100***		14.1	1	NA				***77400***		52.2	1	***76300***		14.1	1	NA			
Lead	7439-92-1	5	ug/l	NA				0.14	J	0.052	1	ND	U	1	1	NA				0.3	J	0.052	1	0.14	J	0.08	1	NA				ND	U	0.052	1	ND	U	0.08	1	NA			
Manganese	7439-96-5	300	ug/l	NA				***972***		0.84	1	***905***		5	1	NA				***8120***		0.84	1	***8400***		0.44	1	NA				***4040***		0.84	1	***4000***		0.44	1	NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				327000		460	1	315000		2000	1	NA				235000		460	1	236000		460	1	NA				270000		460	1	266000		460	1	NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				ND	U	460	1	ND	U	2000	1	NA				ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				327000		460	1	315000		2000	1	NA				235000		460	1	236000		460	1	NA				270000		460	1	266000		460	1	NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				531000		19400	1	550000		30000	1	NA				862000		19400	1	883000		19400	1	NA				944000		19400	1	950000		19400	1	NA			
Total Organic Carbon	TOC	NS	ug/l	NA				4900		500	1	5000		1000	1	NA				3500		500	1	4600		500	1	NA				8500		500	1	10000		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				22300		200	1	23500		600	1	NA				ND	U	200	1	1500		200	1	NA				11600		200	1	13200		200	1	NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				ND	U	250	5	ND	U	500	5	NA				ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				ND	U	400	5	ND	U	500	5	NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				59300		4000	20	66300		8000	20	NA				88100		10000	50	93600		10000	50	NA				82900		10000	50	75000		10000	50	NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				157000		6000	20	166000		20000	20	NA				331000		15000	50	350000		15000	50	NA				410000		15000	50	400000		15000	50	NA			
Sulfide	18496-25-8	5	ug/l	NA				ND	U	**54**	1	ND	U	**160**	1	NA				***220***		**54**	1	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	NA				ND	U	400	5	ND	U	500	5	NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA			

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-305D				S-305D				S-38D				S-38D				S-38D				S-38D2				S-38D2				S-46D				S-46D				S-46D			
			Sample Date	4/6/2011				6/29/2011				5/3/2005				4/6/2011				6/29/2011				4/7/2011				6/29/2011				4/18/2005				6/13/2008				4/6/2011			
			Sample ID	S-305D_04062011				S-305D_06292011				S38D-050305				S-38D_04062011				S-38D_06292011				S-38D2_04072011				S-38D2_06292011				S46D-041805				S-46D_061308				S-46D_04062011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	2	NA				NA				ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0098	1	ND	U	0.0095	1	ND	U	0.029	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.0099	1	ND	U	0.0095	1	ND	U	0.029	1	NA				ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	2		0.5	1	1	J	1	2	ND	U	5	1	NA				ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	2	NA				NA				ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	0.5	J	0.5	1	ND	U	0.5	1	***110***		1	2	ND	U	5	1	***46***		1	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	1		0.5	1	ND	U	0.5	1	20		1	2	ND	U	5	1	4		1	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	12		1	2	ND	U	5	1	2		1	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	0.8	J	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	3		0.5	1	ND	U	0.5	1	2	J	1	2	ND	U	5	1	NA				0.7	J	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	2	ND	U	5	1	ND	U	1	1	1		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	4		0.5	1	0.7	J	0.5	1	0.8	J	0.5	1	14		1	2	ND	U	5	1	3		1	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	**10**	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	0.9	1	ND	U	**10**	1	NA				ND	U	1	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	0.9	1	ND	U	10	1	NA				ND	U	1	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	0.9	1	ND	U	10	1	NA				ND	U	1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	0.9	1	ND	U	10	1	NA				ND	U	1	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	1	1	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	0.9	1	ND	U	10	1	NA				ND	U	1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	***39.6***		2	1	***51.9***		2	1	NA				ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	NA				NA				***34.6***		2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	16.6		5	1	24		5	1	NA				ND	U	5	1	ND	U	5	1	ND	U	5	1	ND	U	5	1	NA				NA				19.7		5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***67500***		200	1	***78700***		200	1	NA				ND	U	200	1	ND	U	200	1	***1650***		200	1	***1120***		200	1	NA				NA				***33300***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	NA				ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	NA				NA				ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***1840***		5	1	***2160***		5	1	NA				ND	U	5	1	***430***		5	1	***6730***		5	1	***6410***		5	1	NA				NA				***16400***		25	5
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	***322***		0.95	1	***367***		0.95	1	NA				ND	U	0.95	1	ND	U	0.95	1	ND	U	0.95	1	1.7	J	0.95	1	NA				NA				***128***		0.95	1
Cobalt	7440-48-4	31	ug/l	17		2.3	1	23.6		0.62	1	NA				ND	U	2.3	1	ND	U	0.62	1	ND	U	2.3	1	5		0.62	1	NA				NA				26.7		2.3	1
Iron	7439-89-6	300	ug/l	***103000***		52.2	1	***114000***		14.1	1	NA				***2790***		52.2	1	***5710***		14.1	1	***3060***		52.2	1	***8740***		14.1	1	NA				NA				***57500***		52.2	1
Lead	7439-92-1	5	ug/l	ND	U	0.052	1	ND	U	0.08	1	ND	U	1	1	2.4		0.052	1	1.7		0.08	1	0.072	J	0.052	1	4.2		0.08	1	ND	U	1	1	NA				***9.8***		0.052	1
Manganese	7439-96-5	300	ug/l	***1870***		0.84	1	***2170***		0.44	1	NA				291		0.84	1	***309***		0.44	1	***6670***		0.84	1	***7270***		0.44	1	NA				NA				***17600***		4.2	5
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	294000		460	1	283000		460	1	NA				127000		460	1	123000		460	1	258000		460	1	251000		460	1	NA				NA				290000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	294000		460	1	283000		460	1	NA				127000		460	1	123000		460	1	258000		460	1	251000		460	1	NA				NA				290000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	1140000		38800	1	1160000		19400	1	NA				150000		9700	1	174000		9700	1	337000		9700	1	384000		9700	1	NA				NA				751000		19400	1
Total Organic Carbon	TOC	NS	ug/l	14800		500	1	14800		500	1	NA				ND	U	500	1	1200		500	1	2600		500	1	2700		500	1	NA				NA				10300		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	2300		200	1	10200		200	1	NA				ND	U	200	1	ND	U	200	1	ND	U	200	1	ND	U	200	1	NA				NA				5400		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	NA				NA				ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	70100		10000	50	76600		10000	50	NA				4100		1000	5	3200		1000	5	38200		2000	10	44900		2000	10	NA				NA				78600		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	484000		15000	50	508000		15000	50	NA				ND	U	1500	5	ND	U	1500	5	12800		1500	5	11400		1500	5	NA				NA				231000		6000	20
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	54	1	ND	U	**54**	1	ND	U	**54**	1	NA				NA				ND	U	**270**	5
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	630		400	5	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-46D				S-59D				S-59D				S-59D				S-69D				S-69D				S-69D				S-69D				S-69D				S-69D			
			Sample Date	6/28/2011				5/6/2005				4/7/2011				6/29/2011				11/8/2005				11/7/2008				12/1/2009				7/22/2010				4/7/2011				6/29/2011			
			Sample ID	S-46D_06282011				S59D-050605				S-59D_04072011				S-59D_06292011				S-69D_11_8_2005				S-69D_110708				S-69D_120109				S-69D_072210				S-69D_04072011				S-69D_06292011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0098	1	ND	U	0.028	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.029	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1					ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	5	1	2		0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2		0.5	1	ND	U	5	1	2		0.5	1	2		0.5	1	5		1	1	ND	U	0.5	1	ND	U	1	1	2		1	1	5		0.5	1	4		1	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	5	1	0.5	J	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				ND	U	0.2	1	NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				ND	U	0.2	1	NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				ND	U	0.2	1	NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				ND	U	0.2	1	NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	**10**	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.2	1	ND	U	1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	**5**	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	10	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.2	1					ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	10	1	ND	U	0.9	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	10	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.2	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	10	1	ND	U	0.9	1	ND	U	1	1	ND	U	0.2	1	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	5	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				ND	U	1	1	NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				ND	U	0.2	1	NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	***11.1***		2	1	NA				***13.3***		2	1	***13.2***		2	1	NA				NA				NA				NA				ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	18.2		5	1	NA				11.9		5	1	10.8		5	1	NA				NA				NA				NA				ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***7400***		200	1	NA				***2430***		200	1	***1620***		200	1	NA				NA				NA				NA				ND	U	200	1	ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	NA				ND	U	1	1	ND	U	1	1	NA				0.064	J	0.05	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***20500***		25	5	NA				***2910***		5	1	***2440***		5	1	NA				NA				NA				NA				***2940***		5	1	***2730***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	***20.7***		0.95	1	NA				***55.1***		0.95	1	***49.3***		0.95	1	NA				NA				NA				NA				ND	U	0.95	1	ND	U	2	1
Cobalt	7440-48-4	31	ug/l	17.8		0.62	1	NA				12.7		2.3	1	11.2		0.62	1	NA				NA				NA				NA				4	J	2.3	1	ND	U	5	1
Iron	7439-89-6	300	ug/l	***10400***		14.1	1	NA				***15600***		52.2	1	***11500***		14.1	1	NA				NA				NA				NA				70.6	J	52.2	1	ND	U	200	1
Lead	7439-92-1	5	ug/l	2.1		0.08	1	ND	U	1	1	1.5		0.052	1	0.16	J	0.08	1	ND	U	10	1	NA				NA				NA				ND	U	0.052	1	ND	U	1	1
Manganese	7439-96-5	300	ug/l	***21200***		2.2	5	NA				***3010***		0.84	1	***2460***		0.44	1	NA				NA				NA				NA				***3000***		0.84	1	***2770***		5	1
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	302000		460	1	NA				438000		460	1	414000		460	1	NA				NA				NA				NA				326000		460	1	324000		2000	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1	NA				NA				NA				NA				ND	U	460	1	ND	U	2000	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	302000		460	1	NA				438000		460	1	414000		460	1	NA				NA				NA				NA				326000		460	1	324000		2000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	676000		19400	1	NA				676000		19400	1	688000		19400	1	NA				NA				NA				NA				493000		9700	1	492000		30000	1
Total Organic Carbon	TOC	NS	ug/l	12000		500	1	NA				7300		500	1	7600		500	1	NA				NA				NA				NA				4200		500	1	3900		1000	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	4300		200	1	NA				3200		200	1	2300		200	1	NA				NA				NA				NA				2600		200	1	3300		600	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5	NA				NA				NA				NA				ND	U	250	5	ND	U	500	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				NA				NA				NA				ND	U	400	5	ND	U	500	5
Chloride (As Cl)	16887-00-6	NS	ug/l	80500		4000	20	NA				179000		10000	50	171000		10000	50	NA				NA				NA				NA				94000		4000	20	91600		8000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	166000		6000	20	NA				8700		1500	5	9500		1500	5	NA				NA				NA				NA				21400		1500	5	19600		5000	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	NA				ND	U	**54**	1	ND	U	**54**	1	NA				NA				NA				NA				ND	U	**54**	1	ND	U	**160**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5	NA				NA				NA				NA				ND	U	400	5	ND	U	500	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-72D				S-72D				S-72D				S-72D				S-72D				S-74D1SRTF				S-74D1SRTF				S-74D2SRTF				S-74D2SRTF				S-76DSRTF			
			Sample Date	11/7/2005				12/9/2009				7/23/2010				4/7/2011				6/28/2011				4/8/2011				6/30/2011				4/8/2011				6/30/2011				1/22/2009			
			Sample ID	S-72D_11_7_2005				S-72D_120909				S-72D_072310				S-72D_04072011				S-72D_06282011				S-74D1SRTF_04082011				S-74D1SRTF_06302011				S-74D2SRTF_04082011				S-74D2SRTF_06302011				S-76DSRTF_012209			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																												
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	NA				ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	NA			
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.02	1	ND	U	0.029	1	ND	U	0.029	1	ND	U	0.0098	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.0095	1	ND	U	0.0099	1	ND	U	0.0095	1	ND	U	0.03	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l					ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	NA			
Benzene	71-43-2	5	ug/l	ND	U	1	1	***15***		1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	1		1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	1		1	1	1		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	17		1	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	3		1	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	NA				ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	1		1	1	ND	U	1	1	1		1	1	1		0.5	1	ND	U	0.5	1	2		0.5	1	2		0.5	1	0.6	J	0.5	1	0.6	J	0.5	1	1		1	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	1		1	1
Semi-Volatile Organic Compounds																																												
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	**5**	1	ND	U	**5**	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	**5**	1
Fluorene	86-73-7	1900	ug/l	0.3		0.1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	5	1	ND	U	5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.9	1	ND	U	5	1
2-Hexanone	591-78-6	44	ug/l	ND	U	1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	ND	U	0.1	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																												
Arsenic (Dissolved)	7440-38-2	10	ug/l	NA				NA				NA				ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	NA			
Cobalt (Dissolved)	7440-48-4	31	ug/l	NA				NA				NA				ND	U	5	1	ND	U	5	1	25.5		5	1	24.3		5	1	ND	U	5	1	ND	U	5	1	NA			
Iron (Dissolved)	7439-89-6	300	ug/l	NA				NA				***48600***		200	1	***58100***		200	1	***7180***		200	1	***6360***		200	1	***529***		200	1	239		200	1	NA			
Lead (Dissolved)	7439-92-1	5	ug/l	NA				ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	NA				NA				NA				***4020***		5	1	***3770***		5	1	200		5	1	177		5	1	257		5	1	253		5	1	NA			
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																												
Arsenic	7440-38-2	10	ug/l	NA				NA				NA				ND	U	0.95	1	ND	U	0.95	1	***18.9***		0.95	1	***18.8***		0.95	1	4		0.95	1	4.1		0.95	1	NA			
Cobalt	7440-48-4	31	ug/l	NA				NA				NA				ND	U	2.3	1	ND	U	0.62	1	27.9		2.3	1	24.4		0.62	1	ND	U	2.3	1	ND	U	0.62	1	NA			
Iron	7439-89-6	300	ug/l	NA				NA				***62200***		52.2	1	***62200***		14.1	1	***44000***		52.2	1	***39200***		14.1	1	***26400***		52.2	1	***25700***		14.1	1	NA			
Lead	7439-92-1	5	ug/l	ND	U	10	1	NA				NA				ND	U	0.052	1	ND	U	0.08	1	0.066	J	0.052	1	ND	U	0.08	1	1.3		0.052	1	0.82	J	0.08	1	NA			
Manganese	7439-96-5	300	ug/l	NA				NA				***3950***		0.84	1	***3690***		0.44	1	214		0.84	1	171		0.44	1	278		0.84	1	268		0.44	1	NA			
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																												
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				206000		460	1	221000		460	1	297000		460	1	298000		460	1	545000		460	1	534000		460	1	NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				NA				ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	ND	U	460	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	NA				NA				NA				206000		460	1	221000		460	1	297000		460	1	298000		460	1	545000		460	1	534000		460	1	NA			
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	NA				NA				NA				662000		19400	1	688000		19400	1	303000		9700	1	313000		9700	1	606000		19400	1	594000		19400	1	NA			
Total Organic Carbon	TOC	NS	ug/l	NA				NA				NA				3200		500	1	4300		500	1	6900		500	1	8200		500	1	6600		500	1	7400		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	NA				NA				NA				5800		200	1	4000		200	1	24100		200	1	26200		200	1	13100		200	1	16800		200	1	NA			
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	NA				NA				NA				ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	ND	U	250	5	NA			
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	NA				NA				NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA			
Chloride (As Cl)	16887-00-6	NS	ug/l	NA				NA				NA				87900		4000	20	77700		4000	20	44500		4000	20	45600		2000	10	35500		2000	10	36500		2000	10	NA			
Sulfate (As So4)	14808-79-8	NS	ug/l	NA				NA				NA				247000		6000	20	216000		6000	20	ND	U	1500	5	ND	U	1500	5	ND	U	1500	5	1800	J	1500	5	NA			
Sulfide	18496-25-8	5	ug/l	NA				NA				NA				ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**54**	1	NA			
Fluoride	16984-48-8	4000	ug/l	NA				NA				NA				ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	ND	U	400	5	NA			

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 4 - Summary of Deep Groundwater Analytical Results 2005 to 2011
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-76DSRTF				S-76DSRTF				S-8				S-8				S-8				S-8				S-80D				S-80D				S-80D			
			Sample Date	4/8/2011				6/30/2011				11/25/2009				7/21/2010				4/7/2011				6/29/2011				4/15/2005				4/6/2011				6/28/2011			
			Sample ID	S-76DSRTF_04082011				S-76DSRTF_06302011				S-8_112509				S-8_072110				S-8_04072011				S-8_06292011				S80D-041505				S-80D_04062011				S-80D_06282011			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																							
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.0094	1	ND	U	0.03	1	ND	U	0.029	1	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.028	1	ND	U	0.0096	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	NA				ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	***61***		1	1	ND	U	1	1	0.5	J	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	4		1	1	ND	U	1	1	ND	U	0.5	1	ND	U	5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	2		1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2		0.5	1	3		0.5	1	9		1	1	1		1	1	***30***		0.5	1	8		0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	2		1	1	ND	U	1	1	8		0.5	1	0.8	J	0.5	1	ND	U	5	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																							
Anthracene	120-12-7	66	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	**5**	1	ND	U	**47**	10	ND	U	**100**	10	ND	U	1	1	ND	U	**11**	1	ND	U	0.9	1	ND	U	0.9	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	47	10	ND	U	100	10	ND	U	1	1	ND	U	11	1	ND	U	1	1	ND	U	0.9	1
Naphthalene	91-20-3	100	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	47	10	ND	U	100	10	ND	U	1	1	ND	U	11	1	ND	U	1	1	ND	U	0.9	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	47	10	ND	U	100	10	ND	U	1	1	ND	U	11	1	ND	U	1	1	ND	U	0.9	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	0.9	1	ND	U	5	1	ND	U	47	10	ND	U	100	10	ND	U	1	1	ND	U	11	1	ND	U	1	1	ND	U	0.9	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																							
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	NA				NA				ND	U	2	1	ND	U	2	1	NA				ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	NA				NA				ND	U	5	1	ND	U	5	1	NA				ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***1620***		200	1	***949***		200	1	NA				NA				ND	U	200	1	ND	U	200	1	NA				***44000***		200	1	***42900***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	1.1		1	1	1		1	1	ND	U	1	1	NA				ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***3900***		5	1	***3540***		5	1	NA				NA				***1140***		5	1	***368***		5	1	NA				***11800***		25	5	***11900***		25	5
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Total																																							
Arsenic	7440-38-2	10	ug/l	ND	U	0.95	1	ND	U	0.95	1	NA				NA				***45.3***		0.95	1	***13.7***		0.95	1	NA				ND	U	0.95	1	ND	U	0.95	1
Cobalt	7440-48-4	31	ug/l	2.9	J	2.3	1	2.5	J	0.62	1	NA				NA				***71.9***		2.3	1	***46.8***		0.62	1	NA				ND	U	2.3	1	ND	U	0.62	1
Iron	7439-89-6	300	ug/l	***1910***		52.2	1	***1840***		14.1	1	NA				NA				***155000***		52.2	1	***54500***		14.1	1	NA				***44500***		52.2	1	***43700***		14.1	1
Lead	7439-92-1	5	ug/l	0.077	J	0.052	1	0.49	J	0.08	1	NA				NA				***2590***		0.52	10	***239***		0.08	1	ND	U	1	1	ND	U	0.052	1	ND	U	0.08	1
Manganese	7439-96-5	300	ug/l	***3830***		0.84	1	***3470***		0.44	1	NA				NA				***7410***		0.84	1	***1460***		0.44	1	NA				***11800***		4.2	5	***12000***		2.2	5
Mercury	7439-97-6	2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
General Chemistry																																							
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	214000		460	1	204000		460	1	NA				NA				136000		460	1	55800		460	1	NA				142000		460	1	141000		460	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	460	1	ND	U	460	1	NA				NA				ND	U	460	1	ND	U	460	1	NA				ND	U	460	1	ND	U	460	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	214000		460	1	204000		460	1	NA				NA				136000		460	1	55800		460	1	NA				142000		460	1	141000		460	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	267000		9700	1	268000		9700	1	NA				NA				333000		9700	1	154000		9700	1	NA				945000		19400	1	969000		19400	1
Total Organic Carbon	TOC	NS	ug/l	1700		500	1	2400		500	1	NA				NA				13000		500	1	5500		500	1	NA				5300		500	1	6400		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	2300		200	1	4800		200	1	NA				NA				20400		600	3	3000		200	1	NA				ND	U	200	1	420	J	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	NA				NA				ND	U	250	5	ND	U	250	5	NA				ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	32400		2000	10	33400		2000	10	NA				NA				98300		4000	20	27300		1000	5	NA				78000		10000	50	73600		10000	50
Sulfate (As So4)	14808-79-8	NS	ug/l	3000	J	1500	5	4600	J	1500	5	NA				NA				3900	J	1500	5	5800		1500	5	NA				461000		15000	50	462000		15000	50
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	NA				NA				NA				ND	U	**1100**	20	NA				ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	NA				NA				ND	U	400	5	ND	U	400	5	NA				ND	U	400	5	ND	U	400	5

Notes:

[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:

J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:

25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	A-13D				A-13D				A-13D				A-13D				A-19D				A-19D				A-19D				A-19D				A-21D				A-21D			
			Sample Date	5/30/2012				8/21/2012				11/1/2012				3/27/2013				5/31/2012				8/20/2012				10/26/2012				3/29/2013				5/30/2012				8/21/2012			
			Sample ID	A-13D_53012				A-13D_082112				A-13D_11112				A-13D_32713				A-19D_53112				A-19D_082012				A-19D_102612				A-19D_032913				A-21D_53012				A-21D_082112			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.014	1	NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.03	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	2	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2		0.5	1	2		0.5	1	ND	U	1	1	0.57	J	0.16	1	***64***		1	1	***53***		0.5	1	***49.8***		1	1	***56.7***		0.16	1	2		0.5	1	2		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				0.1	J	0.1	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.02	1	NA				0.1	J	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.012	1	NA				ND	U	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1	NA				ND	U	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.01	1	NA				ND	U	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.016	1	NA				ND	U	0.1	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.5	1	ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.5	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.017	1	ND	U	0.1	1	ND	U	0.1	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.5	1	ND	U	0.09	1	ND	U	5	1	ND	U	0.036	1	ND	U	0.1	1	ND	U	0.1	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.05	1	ND	U	0.021	1	ND	U	0.5	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.021	1	0.1	J	0.1	1	0.2	J	0.1	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.015	1	ND	U	0.5	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.015	1	ND	U	0.1	1	0.1	J	0.1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	3.9		0.97	1	7.6		2	1	5.5		2	1	***15.9***		3	1	***22.7***		0.97	1	2.1		2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	0.9	B	50	1	1.3	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	3.1	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***4650***		200	1	***738***		200	1	19.5	B	100	1	***3540***		24	1	***23800***		200	1	***20000***		200	1	***28200***		100	1	***30700***		24	1	***37300***		200	1	***19000***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	3	1	***7.2***		1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***402***		5	1	***355***		5	1	187		15	1	***362***		0.4	1	***2670***		5	1	***2860***		5	1	***2550***		15	1	***2680***		0.4	1	***787***		5	1	***608***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	9.6		0.95	1	2.8		0.4	1	ND	U	4	1	6.9		0.97	1	***24.3***		2	1	***25.5***		0.4	1	***22.4***		3	1	***38***		0.97	1	3.6		0.95	1	4.8		0.4	1
Cobalt	7440-48-4	31	ug/l	2.4	J	0.62	1	2.6	J	0.66	1	1.2	B	50	1	1	B	0.59	1	ND	U	5	1	3.8	J	0.66	1	ND	U	50	1	7.8	B	0.59	1	ND	U	0.62	1	0.78	J	0.66	1
Iron	7439-89-6	300	ug/l	***21400***		14.1	1	***13700***		33.3	1	***2670***		100	1	***16200***		24	1	***34900***		200	1	***36800***		33.3	1	***34100***		100	1	***34100***		24	1	***50200***		14.1	1	***49200***		33.3	1
Lead	7439-92-1	5	ug/l	1.9		0.08	1	0.32	J	0.034	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	0.036	J	0.034	1	ND	U	3	1	***7.2***		1.7	1	0.12	J	0.08	1	1.7		0.034	1
Manganese	7439-96-5	300	ug/l	***467***		0.44	1	***371***		0.83	1	255		15	1	***424***		0.4	1	***2680***		5	1	***2930***		0.83	1	***2660***		15	1	***2760***		0.4	1	***796***		0.44	1	***660***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.07	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				325000		700	1	NA				NA				NA				187000		700	1	NA				NA				NA				311000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	2000	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	316000		700	1	325000		700	1	295000		5000	1	328000		5000	1	160000		2000	1	187000		700	1	173000		5000	1	160000		5000	1	321000		700	1	311000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	316000		700	1	NA				295000		5000	1	328000		2800	1	160000		2000	1	NA				173000		5000	1	160000		2800	1	321000		700	1	NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				27300		1000	1	12600		240	1	NA				NA				NA				7700		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	446000		19400	1	542000		19400	1	393000		10000	1	187000		1800	1	310000		30000	1	320000		9700	1	230000		10000	1	282000		1800	1	348000		19400	1	380000		19400	1
Total Organic Carbon	TOC	NS	ug/l	19100		500	1	32300		500	1	NA				NA				9000		1000	1	8900		500	1	7800		1000	1	NA				10800		500	1	9200		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	7000		200	1	8500		200	1	570		100	1	3400		130	2	630		600	1	900		200	1	1500		200	1	1700		66	1	26300		200	1	25000		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	850		250	5	130		110	1	27	B	5.6	1	ND	U	500	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	460	J	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				130		100	1	27	B	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	500	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	44800		4000	20	56400		4000	20	4800		1000	1	11400		48	1	43500		8000	20	51300		4000	20	45300		2000	1	38600		48	1	51300		4000	20	59700		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	8100		1500	5	20900		1500	5	11400		5000	1	6900	B	380	1	8000		5000	5	5500		1500	5	ND	U	10000	1	5400	B	380	1	ND	U	1500	5	ND	U	1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	54	1	ND	U	54	1	ND	U	2000	1	***810***	B	280	1	***420***		**160**	1	***56***	J	**54**	1	ND	U	2000	1	***680***	B	280	1	ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	1400		400	5	700		400	5	1300		100	1	1100		5.1	1	ND	U	500	5	ND	U	400	5	220		200	1	160	B	5.1	1	ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
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MSC - Medium Specific Concentration
RSL - Regional Screening Level
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Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
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The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
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Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	A-21D				A-21D				B-132D				B-132D				B-132D				B-132D				B-133D				B-133D				B-133D				B-133D			
			Sample Date	11/1/2012				3/29/2013				5/31/2012				8/20/2012				11/1/2012				3/29/2013				5/31/2012				8/20/2012				11/2/2012				3/29/2013			
			Sample ID	A-21D_11112				A-21D_32913				B-132D_53112				B-132D_082012				B-132D_11112				B-132D_32913				B-133D_53112				B-133D_082012				B-133D_110212				B-133D_32913			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.014	1	NA				NA				NA				ND	U	0.015	1	NA				NA								ND	U	0.015	1	NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2.1		1	1	2.3		0.16	1	2		0.5	1	2		0.5	1	2		1	1	2.1		0.16	1	2		0.5	1	2		0.5	1	3.3		1	1	1.6		0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	0.042	J	0.1	1	ND	U	0.02	1	NA				0.2	J	0.1	1	0.055	J	0.1	1	ND	U	0.02	1	NA				0.2	J	0.09	1	0.1	B	0.1	1	0.133		0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.051	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.051	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	0.1	J	0.1	1	0.047	J	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	0.13		0.05	1	0.173		0.021	1	0.3	J	0.09	1	0.3	J	0.1	1	0.17		0.051	1	0.18		0.021	1	0.7		0.09	1	0.6		0.09	1	0.48		0.05	1	0.415		0.021	1
Pyrene	129-00-0	130	ug/l	0.041	J	0.1	1	ND	U	0.015	1	ND	U	0.09	1	0.1	J	0.1	1	ND	U	0.1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	4	1	2.5	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	2	B	0.97	1	3.2		2	1	2.1		2	1	4		4	1	5.6		0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	0.5	B	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	2.1	B	50	1	0.8	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***36600***		100	1	***36100***		24	1	***18700***		200	1	***11700***		200	1	***29100***		100	1	***28400***		24	1	***19200***		200	1	***11200***		200	1	***26900***		100	1	***24600***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	***7.6***		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	***6.4***		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	***6***		1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***669***		15	1	***634***		0.4	1	257		5	1	248		5	1	264		15	1	274		0.4	1	229		5	1	204		5	1	278		15	1	229		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	2.1	B	4	1	4.2		0.97	1	3.7		0.95	1	4		0.4	1	2.4	B	4	1	3.5		0.97	1	9.7		0.95	1	***11.2***		0.4	1	7.6		4	1	***10.2***		0.97	1
Cobalt	7440-48-4	31	ug/l	0.7	B	50	1	ND	U	0.59	1	ND	U	0.62	1	ND	U	0.66	1	ND	U	50	1	ND	U	0.59	1	2.5	J	0.62	1	2.7	J	0.66	1	2.3	B	50	1	1.1	B	0.59	1
Iron	7439-89-6	300	ug/l	***47500***		100	1	***45200***		24	1	***38900***		14.1	1	***35100***		33.3	1	***39600***		100	1	***37100***		24	1	***34800***		14.1	1	***33000***		33.3	1	***38500***		100	1	***35600***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	***9***		1.7	1	0.099	J	0.08	1	0.19	J	0.034	1	ND	U	5	1	***5.8***		1.7	1	ND	U	0.08	1	0.45	J	0.034	1	ND	U	5	1	***8.5***		1.7	1
Manganese	7439-96-5	300	ug/l	***696***		15	1	***654***		0.4	1	265		0.44	1	249		0.83	1	283		15	1	275		0.4	1	233		0.44	1	225		0.83	1	291		15	1	249		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				302000		700	1	NA				NA				NA				286000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA								ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	767000		5000	1	280000		5000	1	298000		700	1	302000		700	1	348000		5000	1	295000		5000	1	295000		700	1	286000		700	1	338000		5000	1	286000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	767000		5000	1	281000		2800	1	298000		700	1	NA				348000		5000	1	298000		2800	1	295000		700	1	NA				338000		5000	1	287000		2800	1
Total Carbon	7440-44-0	NS	ug/l	7400		1000	1	7200		240	1	NA				NA				5900		1000	1	6200		240	1	NA				NA				8100		1000	1	6300		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	363000		10000	1	332000		1800	1	375000		19400	1	395000		19400	1	353000		10000	1	302000		1800	1	369000		19400	1	376000		19400	1	318000		10000	1	367000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				6400		500	1	7000		500	1	NA				NA				7700		500	1	7600		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	470		100	1	24200		1500	22	24000		200	1	24000		200	1	260		100	1	24400		1500	22	26800		200	1	25900		200	1	28900		2000	20	26600		1500	22
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	200		110	1	10	B	5.6	1	ND	U	250	5	ND	U	250	5	220		110	1	ND	U	5.6	1	300	J	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	200		100	1	10	B	4.6	1	NA				NA				220		100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	60200		1000	1	64000		48	1	68500		4000	20	71500		4000	20	75200		1000	1	75500		48	1	70600		4000	20	82600		10000	50	76200		1000	1	89600		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	5000	1	ND	U	380	1	2000	J	1500	5	ND	U	1500	5	ND	U	5000	1	ND	U	380	1	3600	J	1500	5	ND	U	1500	5	ND	U	5000	1	ND	U	380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	ND	U	**280**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***410***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***680***	B	280	1
Fluoride	16984-48-8	4000	ug/l	150		100	1	ND	U	5.1	1	ND	U	400	5	ND	U	400	5	200		100	1	170	B	5.1	1	ND	U	400	5	ND	U	400	5	130		100	1	160	B	5.1	1

Notes:
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PADEP - Pennsylvania Department of Environmental Protection
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MSC - Medium Specific Concentration
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TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
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Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

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25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	B-134D				B-134D				B-134D				B-134D				B-48D				B-48D				B-48D				B-48D				BF-108				BF-108			
			Sample Date	5/31/2012				8/20/2012				11/2/2012				4/1/2013				6/1/2012				8/20/2012				11/2/2012				4/1/2013				5/30/2012				8/20/2012			
			Sample ID	B-134D_53112				B-134D_082012				B-134D_110212				B-134D_40113				B-48D_6112				B-48D_082012				B-48D_110212				B-48D_40113				BF-108_53012				BF-108_082012			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				ND	U	0.014	1	NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	2		0.5	1	2		0.5	1	3.4		1	1	1.8		0.16	1	6		0.5	1	7		0.5	1	6.2		1	1	6.2		0.16	1	***110***		0.5	1	***83***		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.02	1	NA				0.2	J	0.09	1	0.36	B	0.1	1	0.262		0.02	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.09	1	0.18		0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.09	1	0.068		0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	0.9		0.09	1	0.3	J	0.09	1	1.6		0.1	1	1.07		0.017	1	ND	U	0.09	1	ND	U	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	0.2	J	0.09	1	0.09	J	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1
Phenanthrene	85-01-8	1100	ug/l	0.3	J	0.09	1	0.2	J	0.09	1	0.19		0.05	1	0.162		0.021	1	0.3	J	0.09	1	0.6		0.09	1	2.1		0.05	1	0.92		0.021	1	ND	U	0.09	1	ND	U	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.09	1	0.044	J	0.1	1	ND	U	0.015	1	0.3	J	0.09	1	0.3	J	0.09	1	0.3	B	0.1	1	0.27		0.015	1	ND	U	0.09	1	ND	U	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	2	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1.8	B	0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	0.7	B	50	1	0.9	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***19200***		200	1	***17200***		200	1	***19100***		100	1	***9890***		24	1	***21000***		200	1	***6430***		200	1	***28900***		100	1	***24800***		24	1	ND	U	200	1	ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	***6.6***		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	***5.2***		1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	227		5	1	***371***		5	1	293		15	1	219		0.4	1	***1960***		5	1	***1830***		5	1	***2490***		15	1	***2110***		0.4	1	***792***		5	1	***881***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	4.1		0.95	1	5.4		0.4	1	2.6	B	4	1	5.5		0.97	1	1.3	J	0.95	1	1.3	J	0.4	1	ND	U	4	1	2.3	B	0.97	1	ND	U	0.95	1	ND	U	0.4	1
Cobalt	7440-48-4	31	ug/l	0.79	J	0.62	1	1.7	J	0.66	1	1.8	B	50	1	ND	U	0.59	1	ND	U	0.62	1	ND	U	0.66	1	ND	U	50	1	ND	U	0.59	1	2.7	J	0.62	1	2.6	J	0.66	1
Iron	7439-89-6	300	ug/l	***33800***		14.1	1	***50500***		33.3	1	***39400***		100	1	***33300***		24	1	***29300***		14.1	1	***26000***		33.3	1	***39700***		100	1	***40100***		24	1	***1680***		14.1	1	***412***		33.3	1
Lead	7439-92-1	5	ug/l	ND	U	0.08	1	1.9		0.034	1	ND	U	5	1	***7.3***		1.7	1	ND	U	0.08	1	ND	U	0.034	1	ND	U	5	1	***6.4***		1.7	1	0.94	J	0.08	1	0.19	J	0.034	1
Manganese	7439-96-5	300	ug/l	230		0.44	1	***460***		0.83	1	***369***		15	1	238		0.4	1	***1990***		0.44	1	***1880***		0.83	1	***2590***		15	1	***2210***		0.4	1	***822***		0.44	1	***888***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.07	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				314000		700	1	NA				NA								280000		700	1	NA				NA								276000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	296000		700	1	314000		700	1	349000		5000	1	416000		5000	1	274000		700	1	280000		700	1	340000		5000	1	350000		5000	1	289000		700	1	276000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	296000		700	1	NA				349000		5000	1	417000		3500	1	274000		700	1	NA				340000		5000	1	350000		3500	1	289000		700	1	NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				7700		1000	1	5900		240	1	NA				NA				6500		1000	1	4800		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	294000		19400	1	343000		19400	1	288000		10000	1	285000		1800	1	395000		19400	1	397000		19400	1	388000		10000	1	300000		1800	1	306000		19400	1	345000		9700	1
Total Organic Carbon	TOC	NS	ug/l	7800		500	1	11000		500	1	NA				NA				6100		500	1	5800		500	1	NA				NA				5400		500	1	4400		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	29700		200	1	***32000***		200	1	***33400***		2000	20	***31700***		1600	24	7000		200	1	8800		200	1	290		100	1	9500		330	5	1200		200	1	900		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	190		110	1	19	B	5.6	1	300	J	250	5	ND	U	250	5	210		110	1	20	B	5.6	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				190		100	1	19	B	4.6	1	NA				NA				210		100	1	20	B	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	54100		4000	20	54800		4000	20	57200		1000	1	56800		48	1	71200		4000	20	82300		10000	50	67700		1000	1	64500		48	1	28600		2000	10	32000		2000	10
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	1500	5	ND	U	1500	5	ND	U	5000	1	ND	U	380	1	3100	J	1500	5	ND	U	1500	5	ND	U	5000	1	380	B	380	1	12900		1500	5	12400		1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***540***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***680***	B	280	1	ND	U	54	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	120		100	1	160	B	5.1	1	ND	U	400	5	ND	U	400	5	160		100	1	150	B	5.1	1	440	J	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved results for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	BF-108				BF-108				BF-90D				BF-90D				BF-90D				BF-90D				C-129D				C-129D				C-129D				C-129D			
			Sample Date	11/1/2012				4/1/2013				5/30/2012				8/17/2012				10/26/2012				4/1/2013				5/31/2012				8/21/2012				11/1/2012				4/2/2013			
			Sample ID	BF-108_110112				BF-108_40113				BF-90D_53012				BF-90D_081712				BF-90D_102612				BF-90D_40113				C-129D_53112				C-129D_082112				C-129D_110112				C-129D_40213			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.015	1	NA				NA				NA				NA				NA				NA				NA				ND	U	0.015	1	NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	***86.4***		1	1	***73.7***		0.16	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1	2		0.5	1	2		0.5	1	2		1	1	0.82	J	0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.02	1	NA				0.1	J	0.1	1	0.043	J	0.1	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	ND	U	0.017	1	0.1	J	0.1	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.017	1	0.1	J	0.09	1	ND	U	0.1	1	ND	U	0.1	1	0.207		0.017	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.036	1	2		0.1	1	0.2	J	0.09	1	ND	U	5	1	0.648		0.036	1	0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.05	1	ND	U	0.021	1	0.2	J	0.1	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.021	1	2		0.09	1	1		0.1	1	0.22		0.05	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.015	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.015	1	0.3	J	0.09	1	0.3	J	0.1	1	0.11		0.1	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	4	1	ND	U	0.97	1	4.3		2	1	6.4		2	1	6.5		3	1	3.4		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	1.5	B	50	1	2	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	**50**	1	1	B	0.59	1	ND	U	5	1	ND	U	5	1	0.9	B	50	1	ND	U	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	18.8	B	100	1	ND	U	24	1	ND	U	200	1	ND	U	200	1	ND	U	100	1	255		24	1	ND	U	200	1	ND	U	200	1	***599***		100	1	***54300***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	3.4		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	3	1	***5.2***		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	2.5	B	1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***872***		15	1	***982***		0.4	1	ND	U	5	1	16.1		5	1	142		15	1	179		0.4	1	49		5	1	67.9		5	1	67.8		15	1	***1500***		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	0.091	B	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	ND	U	4	1	ND	U	0.97	1	4.6		0.95	1	7.7		0.4	1	9.9		3	1	7.5		0.97	1	***17.3***		0.95	1	9.2		0.4	1	7		4	1	2.6	B	0.97	1
Cobalt	7440-48-4	31	ug/l	2.3	B	50	1	2	B	0.59	1	0.87	J	0.62	1	1.1	J	0.66	1	ND	U	50	1	1.1	B	0.59	1	2.2	J	0.62	1	1.9	J	0.66	1	1	B	50	1	ND	U	0.59	1
Iron	7439-89-6	300	ug/l	166		100	1	136		24	1	***546***		14.1	1	***2950***		33.3	1	***3380***		100	1	***6260***		24	1	***21600***		14.1	1	***20600***		33.3	1	***17700***		100	1	***76100***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	4.1		1.7	1	1.5		0.08	1	***13.8***		0.034	1	***5.9***		3	1	4.7		1.7	1	ND	U	0.08	1	0.075	J	0.034	1	2.1	B	5	1	2.2	B	1.7	1
Manganese	7439-96-5	300	ug/l	***883***		15	1	***1010***		0.4	1	19.7		0.44	1	68.4		0.83	1	170		15	1	199		0.4	1	93.4		0.44	1	74.3		0.83	1	77.5		15	1	***1540***		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.089	1	NA				0.072	J	0.0081	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.089	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				125000		700	1	NA				NA				NA				372000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				48600		700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	290000		5000	1	315000		5000	1	ND	U	700	1	125000		700	1	260000		5000	1	208000		5000	1	384000		700	1	372000		700	1	379000		5000	1	447000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	291000		5000	1	315000		1400	1	94200		700	1	NA				260000		5000	1	210000		3500	1	384000		700	1	NA				379000		5000	1	447000		3500	1
Total Carbon	7440-44-0	NS	ug/l	4100		1000	1	3700		240	1	NA				NA				NA				8500		240	1	NA				NA				7500		1000	1	249000		2400	10
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	323000		10000	1	318000		1800	1	155000		9700	1	207000		9700	1	326000		10000	1	41300		1800	1	340000		19400	1	346000		19400	1	294000		10000	1	485000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				13700		500	1	13500		500	1	12200		1000	1	NA				9700		500	1	8800		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	1100		100	1	1100		66	1	16000		200	1	1400		200	1	1800		200	1	790		66	1	***41400***		200	1	***39300***		200	1	1100		100	1	***32400***		1600	24
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	110	1	17	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	970		5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	36	B	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	ND	U	100	1	17	B	4.6	1	NA				NA				ND	U	100	1	1100		4.6	1	NA				NA				ND	U	100	1	36	B	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	***1100***		400	5	20		10	1	130		1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	32700		1000	1	30800		48	1	16300		1000	5	16700		1000	5	16600		2000	1	17400		48	1	49000		4000	20	52200		4000	20	51700		1000	1	33200		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	13700		5000	1	12800		380	1	1700	J	1500	5	3600	J	1500	5	ND	U	10000	1	3000	B	380	1	4300	J	1500	5	3900	J	1500	5	ND	U	5000	1	600	B	380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***410***	B	280	1	ND	U	54	1	ND	U	54	1	ND	U	2000	1	ND	U	280	1	***120***	J	**54**	1	***72***	J	**54**	1	ND	U	2000	1	***1200***	B	280	1
Fluoride	16984-48-8	4000	ug/l	210		100	1	140	B	5.1	1	1000		400	5	940		400	5	600		200	1	480		5.1	1	ND	U	400	5	280		100	1	83	B	5.1	1				

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved results for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	C-134D				C-134D				C-134D				C-134D				C-144D				C-144D				C-144D				C-144D				C-50D				C-50D			
			Sample Date	5/31/2012				8/20/2012				11/2/2012				4/1/2013				5/31/2012				8/21/2012				11/1/2012				4/2/2013				5/31/2012				8/21/2012			
			Sample ID	C-134D_53112				C-134D_082012				C-134D_110212				C-134D_40113				C-144D_53112				C-144D_082112				C-144D_110112				C-144D_40213				C-50D_53112				C-50D_082112			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0098	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	2.3		1	1	0.92	J	0.16	1	1	J	0.5	1	1	J	0.5	1	0.88	J	1	1	2.4		0.16	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.02	1	NA				0.1	J	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				0.1	J	0.1	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	0.2	J	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	0.1	J	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	0.1	J	0.1	1
Fluorene	86-73-7	1900	ug/l	0.3	J	0.09	1	0.1	J	0.1	1	0.075	J	0.1	1	ND	U	0.017	1	0.4	J	0.09	1	0.3	J	0.1	1	0.19		0.1	1	ND	U	0.017	1	0.5	J	0.1	1	ND	U	0.1	1
Naphthalene	91-20-3	100	ug/l	0.5	J	0.09	1	0.2	J	0.1	1	0.099	J	0.1	1	ND	U	0.036	1	0.2	J	0.09	1	0.1	J	0.1	1	ND	U	0.1	1	ND	U	0.036	1	0.1	J	0.1	1	ND	U	0.1	1
Phenanthrene	85-01-8	1100	ug/l	0.2	J	0.09	1	0.3	J	0.1	1	0.062		0.05	1	ND	U	0.021	1	0.2	J	0.09	1	0.1	J	0.1	1	ND	U	0.05	1	0.203		0.021	1	0.4	J	0.1	1	0.2	J	0.1	1
Pyrene	129-00-0	130	ug/l	0.1	J	0.09	1	0.4	J	0.1	1	0.053	J	0.1	1	ND	U	0.015	1	0.2	J	0.09	1	0.2	J	0.1	1	ND	U	0.1	1	0.173		0.015	1	0.5	J	0.1	1	0.2	J	0.1	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	2.1	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1.9	B	0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	0.4	B	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	0.8	B	50	1	1.6	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	ND	U	200	1	***1660***		200	1	25.1	B	100	1	***1150***		24	1	***46200***		200	1	***32600***		200	1	***61200***		100	1	***4470***		24	1	***13000***		200	1	***11400***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	***6***		1.7	1	ND	U	1	1	ND	U	1	1	3.7	B	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***778***		5	1	***660***		5	1	***1360***		15	1	***711***		0.4	1	***1570***		5	1	***1170***		5	1	***1450***		15	1	84.9		0.4	1	***3320***		5	1	***2940***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	2.2		0.95	1	4.5		0.4	1	6.3		4	1	4.9		0.97	1	4		0.95	1	3.2		0.4	1	ND	U	4	1	***10.6***		0.97	1	***39.1***		0.95	1	***40.7***		0.4	1
Cobalt	7440-48-4	31	ug/l	ND	U	0.62	1	ND	U	0.66	1	0.5	B	50	1	ND	U	0.59	1	7.5		0.62	1	1.7	J	0.66	1	0.9	B	50	1	1.7	B	0.59	1	ND	U	0.62	1	0.9	J	0.66	1
Iron	7439-89-6	300	ug/l	***2880***		14.1	1	***13100***		33.3	1	***46800***		100	1	***17100***		24	1	***90300***		14.1	1	***69400***		33.3	1	***76800***		100	1	***23100***		24	1	***56900***		14.1	1	***50700***		33.3	1
Lead	7439-92-1	5	ug/l	ND	U	0.08	1	0.067	J	0.034	1	ND	U	5	1	***5.7***		1.7	1	***10***		0.08	1	1.6		0.034	1	4.6	B	5	1	ND	U	0.08	1	0.039	J	0.034	1	ND	U	0.08	1
Manganese	7439-96-5	300	ug/l	***823***		0.44	1	***717***		0.83	1	***1490***		15	1	***785***		0.4	1	***1790***		0.44	1	***1200***		0.83	1	***1470***		15	1	95.9		0.4	1	***3370***		0.44	1	***3000***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.07	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				354000		700	1	NA				NA				NA				359000		700	1	NA				NA				NA				367000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	346000		700	1	354000		700	1	430000		5000	1	382000		5000	1	450000		700	1	359000		700	1	497000		5000	1	448000		5000	1	340000		700	1	367000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	346000		700	1	NA				430000		5000	1	383000		3500	1	450000		700	1	NA				497000		5000	1	448000		3500	1	340000		700	1	NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				8500		1000	1	2900		240	1	NA				NA				9200		1000	1	267000		4800	20	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	465000		19400	1	530000		19400	1	506000		10000	1	544000		1800	1	460000		19400	1	467000		19400	1	390000		10000	1	312000		1800	1	844000		38800	1	952000		77600	1
Total Organic Carbon	TOC	NS	ug/l	4300		500	1	5500		500	1	NA				NA				15000		500	1	10000		500	1	NA				NA				15900		500	1	15100		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	7500		200	1	12800		200	1	16000		1000	10	16200		1200	18	25700		200	1	21300		200	1	28100		2000	20	***35000***		1800	28	9900		200	1	9700		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	270		110	1	30	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	22	B	5.6	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				270		100	1	30	B	4.6	1	NA				NA				ND	U	100	1	22	B	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	59800		4000	20	95500		10000	50	74700		1000	1	136000		48	1	43700		4000	20	54600		4000	20	40700		1000	1	45200		48	1	315000		20000	100	316000		40000	200
Sulfate (As So4)	14808-79-8	NS	ug/l	3700	J	1500	5	16800		1500	5	13900		5000	1	11200		380	1	5200		1500	5	10100		1500	5	ND	U	5000	1	2400	B	380	1	ND	U	1500	5	ND	U	1500	5
Sulfide	18496-25-8	5	ug/l	***620***		54	1	***1400***		54	1	ND	U	2000	1	***410***	B	280	1	ND	U	**54**	1	***220***		**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	1600		400	5	1200		400	5	1400		100	1	740		5.1	1	ND	U	400	5	ND	U	400	5	150		100	1	330		5.1	1	ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
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ug/l - micrograms per liter
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NS - No Standard
NA - Not Analyzed
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The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
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Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	C-50D				C-50D				N-13				N-13				N-13				N-13				N-19				N-19				N-19				N-19			
			Sample Date	11/2/2012				4/2/2013				5/24/2012				8/21/2012				10/31/2012				3/29/2013				5/24/2012				8/15/2012				10/31/2012				3/25/2013			
			Sample ID	C-50D_110212				C-50D_40213				N-13_52412				N-13_082112				N-13_103112				N-13_032913				N-19_52412				N-19_081512				N-19_103112				N-19_32513			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	2	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.015	1	NA				NA				NA				ND	U	0.014	1	NA				NA				NA				ND	U	0.015	1	NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.03	1	ND	U	0.0098	1	ND	U	0.015	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	2	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	0.3	J	0.24	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	2	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	0.16	1	0.8	J	0.5	1	0.9	J	0.5	1	0.83	J	1	1	1		0.16	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	0.24	J	0.23	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	0.34		0.1	1	ND	U	0.02	1	NA				ND	U	0.1	1	0.11		0.1	1	ND	U	0.02	1	NA				ND	U	0.1	1	0.097	J	0.1	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.5	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	0.54		0.1	1	ND	U	0.017	1	ND	U	0.1	1	ND	U	0.1	1	0.22		0.1	1	ND	U	0.017	1	ND	U	0.5	1	ND	U	0.1	1	0.25		0.1	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	0.076	J	0.1	1	ND	U	0.036	1	ND	U	0.1	1	ND	U	0.1	1	0.1		0.1	1	ND	U	0.036	1	ND	U	0.5	1	ND	U	0.1	1	0.13		0.1	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	0.69		0.05	1	ND	U	0.021	1	ND	U	0.1	1	ND	U	0.1	1	0.51		0.05	1	ND	U	0.021	1	ND	U	0.5	1	ND	U	0.1	1	0.54		0.05	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	0.45		0.1	1	ND	U	0.015	1	ND	U	0.1	1	ND	U	0.1	1	0.061	J	0.1	1	ND	U	0.015	1	ND	U	0.5	1	ND	U	0.1	1	0.066	J	0.1	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	2.5	B	4	1	***17.2***		0.97	1	ND	U	2	1	ND	U	2	1	2.3	B	4	1	1.7	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1	B	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	1.7	B	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	2.4	B	50	1	0.6	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***469***		100	1	***36300***		24	1	***6010***		200	1	***4200***		200	1	***11700***		100	1	***3280***		24	1	***19400***		200	1	***18500***		200	1	***27400***		100	1	***22000***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	4.1		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***1740***		15	1	***3310***		0.4	1	***1240***		5	1	***1080***		5	1	***1210***		15	1	***897***		0.4	1	212		5	1	254		5	1	***388***		15	1	282		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	***35.3***		4	1	***56.2***		0.97	1	6.7		0.95	1	9		0.4	1	8.6		4	1	7.6		0.97	1	ND	U	2	1	1.4	J	0.4	1	ND	U	4	1	1.3	B	0.97	1
Cobalt	7440-48-4	31	ug/l	2.7	B	50	1	ND	U	0.59	1	1.7	J	0.62	1	6.3		0.66	1	2.9	B	50	1	1.5	B	0.59	1	ND	U	5	1	9.6		0.66	1	2.8	B	50	1	3.3	B	0.59	1
Iron	7439-89-6	300	ug/l	***33000***		100	1	***58600***		24	1	***17700***		14.1	1	***23900***		33.3	1	***21300***		100	1	***12500***		24	1	***21200***		200	1	***28900***		33.3	1	***29000***		100	1	***24800***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	ND	U	1.7	1	3.1		0.08	1	***8.2***		0.034	1	***8.4***		5	1	***53.8***		1.7	1	ND	U	1	1	***8.5***		0.034	1	2.2	B	5	1	3.6		1.7	1
Manganese	7439-96-5	300	ug/l	***1910***		15	1	***3560***		0.4	1	***1260***		0.44	1	***1260***		0.83	1	***1280***		15	1	***962***		0.4	1	215		5	1	***340***		0.83	1	***395***		15	1	277		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.089	1	NA				0.076	J	0.07	1	ND	U	0.2	1	0.14	B	0.095	1	NA				0.056	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				260000		700	1	255000		700	1	NA				NA				191000		2000	1	169000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	2000	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	337000		5000	1	396000		5000	1	260000		700	1	255000		700	1	256000		5000	1	356000		5000	1	191000		2000	1	169000		700	1	178000		5000	1	188000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	337000		5000	1	396000		3500	1	NA				NA				256000		5000	1	357000		2800	1	NA				NA				178000		5000	1	189000		3500	1
Total Carbon	7440-44-0	NS	ug/l	13600		1000	1	242000		2400	10	NA				NA				10200		1000	1	12000		240	1	NA				NA				3200		1000	1	3200		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	354000		10000	1	836000		1800	1	404000		19400	1	405000		19400	1	382000		10000	1	807000		1800	1	347000		30000	1	349000		9700	1	359000		10000	1	354000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				11000		500	1	11300		500	1	NA				NA				3700		1000	1	3600		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	220		100	1	10800		400	6	2700		200	1	8000		200	1	ND	U	100	1	3300		130	2	ND	U	600	1	ND	U	200	1	ND	U	100	1	330		66	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	230		110	1	43	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	380		5.6	1	ND	U	500	5	ND	U	250	5	290		110	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	230		100	1	43	B	4.6	1	NA				NA				ND	U	100	1	560		4.6	1	NA				NA				290		100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	21		10	1	180		1	1	ND	U	500	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	21700		1000	1	272000		48	1	66300		4000	20	75200		4000	20	86700		1000	1	92400		48	1	66400		8000	20	85000		10000	50	91200		1000	1	74800		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	5000	1	390	B	380	1	8300		1500	5	7400		1500	5	5900		5000	1	292000		380	1	16500		5000	5	25200		1500	5	36200		5000	1	27200		380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***980***		28	1	ND	U	***54***	1	***59***	J	***54***	1	ND	U	2000	1	ND	U	280	1	NA				ND	U	***54***	1	ND	U	2000	1	ND	U	280	1
Fluoride	16984-48-8	4000	ug/l	530		100	1	270		5.1	1	ND	U	400	5	ND	U	400	5	180		100	1	200		5.1	1	ND	U	500	5	ND	U	400	5	150		100	1	49	B	5.1	1

Notes:
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PADEP - Pennsylvania Department of Environmental Protection
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MSC - Medium Specific Concentration
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TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
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NS - No Standard
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Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

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25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-21				N-21				N-21				N-21				N-27				N-27				N-27				N-27				N-27				N-30				N-30			
			Sample Date	5/25/2012				8/17/2012				10/26/2012				3/29/2013				5/25/2012				8/16/2012				10/31/2012				3/26/2013				5/23/2012				8/15/2012			
			Sample ID	N-21_52512				N-21_81712				N-21_102612				N-21_032913				N-27_52512				N-27_081612				N-27_103112				N-27_32613				N-30_52312				N-30_081512			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																												
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	10	5	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				ND	U	0.015	1	NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0098	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	5	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	10	5	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	***110***		0.5	1	***110***		0.5	1	***97.8***		5	5	***124***		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	0.5	J	0.5	1	0.7	J	0.5	1	ND	U	5	5	1.1		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	5	0.29	J	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	48		0.5	1	67		0.5	1	64.9		10	5	64.9		0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	0.6	J	0.5	1	0.7	J	0.5	1	ND	U	5	5	0.78	J	0.16	1	2		0.5	1	3		0.5	1	2.1		1	1	2.5		0.16	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	5	0.4	J	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																												
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.1	1	ND	U	2	1	ND	U	0.02	1	NA				ND	U	0.09	1	0.15		0.1	1	ND	U	0.023	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.1	1	ND	U	2	1	ND	U	0.012	1	NA				ND	U	0.09	1	0.16		0.05	1	ND	U	0.013	1	NA				0.1	J	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.014	1	NA				0.1	J	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.011	1	NA				0.1	J	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	**2**	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.013	1	ND	U	0.1	1	0.1	J	0.09	1
Fluorene	86-73-7	1900	ug/l	0.7		0.09	1	0.9		0.1	1	ND	U	2	1	0.357		0.017	1	ND	U	0.1	1	ND	U	0.09	1	0.34		0.1	1	ND	U	0.019	1	ND	U	0.1	1	ND	U	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	25	5	ND	U	0.036	1	ND	U	0.1	1	0.1	J	0.09	1	0.4		0.1	1	ND	U	0.039	1	ND	U	0.1	1	ND	U	0.09	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	2	1	ND	U	0.021	1	ND	U	0.1	1	ND	U	0.09	1	0.6		0.05	1	ND	U	0.023	1	ND	U	0.1	1	ND	U	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	2	1	ND	U	0.015	1	ND	U	0.1	1	ND	U	0.09	1	0.1		0.1	1	ND	U	0.017	1	ND	U	0.1	1	0.1	J	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	***34.9***		2	1	***34.2***		2	1	***14.4***		3	1	***19.2***		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1.2	B	0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	***211***		5	1	***211***		5	1	***151***		50	1	***191***		0.59	1	9.8		5	1	9.7		5	1	9.3	B	50	1	10.6	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***453000***		**1000**	5	***425000***		**1000**	5	***252000***		100	1	***297000***		24	1	ND	U	200	1	***444***		200	1	***850***		100	1	***1350***		24	1	***34100***		200	1	***26800***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	30	10	ND	U	17	10	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***4760***		5	1	***4240***		5	1	***3220***		15	1	***3940***		0.4	1	***5670***		5	1	***5450***		5	1	***5800***		15	1	***5890***		0.4	1	266		5	1	249		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	***31.7***		0.95	1	***32.6***		0.4	1	***13.4***		3	1	***42.7***	B	19	20	ND	U	0.95	1	ND	U	0.4	1	ND	U	4	1	1.5	B	0.97	1	ND	U	0.95	1	1.7	J	0.4	1
Cobalt	7440-48-4	31	ug/l	***208***		0.62	1	***212***		0.66	1	***157***		50	1	***181***		0.59	1	9.9		0.62	1	10.3		0.66	1	9.7	B	50	1	10.3	B	0.59	1	0.75	J	0.62	1	5.1		0.66	1
Iron	7439-89-6	300	ug/l	***453000***		70.5	5	***407000***		167	5	***253000***		100	1	***281000***		24	1	***1010***		14.1	1	***1010***		33.3	1	***1090***		100	1	***3050***		24	1	***37000***		14.1	1	***39800***		33.3	1
Lead	7439-92-1	5	ug/l	0.31	J	0.08	1	0.23	J	0.034	1	ND	U	30	10	***17.9***	B	17	10	0.17	J	0.08	1	0.16	J	0.034	1	ND	U	5	1	ND	U	1.7	1	1.2		0.08	1	***7.4***		0.034	1
Manganese	7439-96-5	300	ug/l	***4700***		0.44	1	***4290***		0.83	1	***3350***		15	1	***3750***		0.4	1	***5920***		0.44	1	***5690***		0.83	1	***5870***		15	1	***5400***		0.4	1	280		0.44	1	295		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.032	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.066	J	0.0081	1
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				210000		700	1	207000		700	1	NA				NA				73400		700	1	69100		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	ND	U	5000	1	ND	U	5000	1	210000		700	1	207000		700	1	223000		5000	1	226000		5000	1	73400		700	1	69100		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				ND	U	5000	1	ND	U	1400	1	NA				NA				223000		5000	1	226000		2800	1	NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				28400		240	1	NA				NA				2600		1000	1	2400		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	6400000		77600	1	6020000		77600	1	6090000		10000	1	5970000		1800	1	600000		19400	1	538000		19400	1	562000		10000	1	655000		1800	1	480000		19400	1	470000		19400	1
Total Organic Carbon	TOC	NS	ug/l	30600		500	1	27900		500	1	26100		1000	1	NA				2400		500	1	2400		500	1	NA				NA				3800		500	1	4300		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	2500		200	1	2400		200	1	2900		200	1	3300		130	2	420	J	200	1	780		200	1	ND	U	100	1	710		66	1	ND	U	200	1	ND	U	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	340	J	250	5	ND	U	250	5	ND	U	110	1	32	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				ND	U	100	1	32	B	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	62500		10000	50	80000		10000	50	79100		2000	1	82700		48	1	97200		10000	50	114000		10000	50	98200		1000	1	108000		48	1	131000		10000	50	134000		10000	50
Sulfate (As So4)	14808-79-8	NS	ug/l	4030000		150000	500	3990000		150000	500	4410000		200000	20	4500000		7500	20	148000		15000	50	174000		15000	50	199000		50000	10	151000		380	1	123000		15000	50	147000		15000	50
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	200	1	1400	B	51	10	ND	U	400	5	ND	U	400	5	140		100	1	85	B	5.1	1	ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-38D				N-38D				N-38D				N-38D				N-4				N-4				N-4				N-4				N-4				N-44D				N-44D			
			Sample Date	5/24/2012				8/16/2012				10/31/2012				3/27/2013				5/24/2012				8/17/2012				11/1/2012				3/26/2013				5/23/2012				8/16/2012			
			Sample ID	N-38D_52412				N-38D_081612				N-38D_103112				N-38D_32713				N-4_52412				N-4_81712				N-4_110112				N-4_32613				N-44D_52312				N-44D_081612			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																												
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	2	1	ND	U	5	1	ND	U	0.19	1	ND	U	2	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0098	1	ND	U	0.0096	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.029	1	ND	U	0.015	1	ND	U	0.011	1	0.044		0.029	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.26	1	ND	U	1	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	2	1	ND	U	5	1	ND	U	0.36	1	ND	U	2	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	1		1	1	ND	U	0.5	1	ND	U	0.24	1	***7***		1	1	***9***		0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.24	1	1		1	1	3		0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	1		0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	5		2	1	1.7	J	5	1	ND	U	0.45	1	9		2	1	12		0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1	ND	U	0.5	1	2		1	1	2.7		1	1	2.6		0.16	1	ND	U	1	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																												
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.5	1	0.12		0.1	1	ND	U	0.02	1	NA				0.4	J	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				0.1	J	0.09	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.5	1	0.23		0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	**0.5**	1	0.055	J	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				0.2	J	0.09	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.5	1	0.069		0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	**0.5**	1	0.063	J	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	0.1	J	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.5	1	0.084	J	0.1	1	ND	U	0.012	1	ND	U	0.5	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.09	1	ND	U	0.5	1	0.085	J	0.1	1	ND	U	0.017	1	2		0.5	1	2		0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.5	1	0.051	J	0.1	1	ND	U	0.036	1	ND	U	0.5	1	ND	U	0.09	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.05	1	ND	U	0.021	1	ND	U	0.09	1	ND	U	0.5	1	0.3		0.05	1	ND	U	0.021	1	2		0.5	1	2		0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.015	1	0.2	J	0.09	1	ND	U	0.5	1	0.19		0.1	1	ND	U	0.015	1	ND	U	0.5	1	0.2	J	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																											
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	7.1		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1	***41.5***		2	1	***45.4***		2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	0.7	B	50	1	1.9	B	0.59	1	ND	U	5	1	ND	U	5	1	5	B	50	1	5.5	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***1030***		200	1	***2170***		200	1	***744***		100	1	***19700***		24	1	ND	U	200	1	ND	U	200	1	183		100	1	49.7	B	24	1	***32800***		200	1	***31200***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	4.6	B	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***347***		5	1	***334***		5	1	***353***		15	1	***365***		0.4	1	***1230***		5	1	***1290***		5	1	***1950***		15	1	***1700***		0.4	1	***645***		5	1	***584***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	2.8		0.95	1	5.3		0.4	1	ND	U	4	1	9.9		0.97	1	ND	U	0.95	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1	***64.5***		2	1	***59.5***		0.4	1
Cobalt	7440-48-4	31	ug/l	0.91	J	0.62	1	3.2	J	0.66	1	2.3	B	50	1	5.4	B	0.59	1	4.3	J	0.62	1	ND	U	5	1	5.2	B	50	1	5.5	B	0.59	1	ND	U	5	1	ND	U	0.66	1
Iron	7439-89-6	300	ug/l	***27600***		14.1	1	***30400***		33.3	1	***30000***		100	1	***35500***		24	1	***1500***		14.1	1	***395***		200	1	***632***		100	1	191		24	1	***34700***		200	1	***34800***		33.3	1
Lead	7439-92-1	5	ug/l	0.53	J	0.08	1	***7.7***		0.034	1	4.7	B	5	1	***15.2***		1.7	1	1.6		0.08	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	0.49	J	0.034	1
Manganese	7439-96-5	300	ug/l	***383***		0.44	1	***474***		0.83	1	***428***		15	1	***665***		0.4	1	***1240***		0.44	1	***1270***		5	1	***2070***		15	1	***1770***		0.4	1	***650***		5	1	***607***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.048	J	0.0081	1	ND	U	0.2	1	0.14	B	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.044	J	0.0081	1
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	1150000		700	1	1130000		700	1	NA				NA				264000		700	1	263000		2000	1	NA				NA				175000		2000	1	169000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	2000	1	NA				NA				ND	U	2000	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	1150000		700	1	1130000		700	1	1170000		5000	1	1210000		5000	1	264000		700	1	263000		2000	1	543000		5000	1	552000		5000	1	175000		2000	1	169000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				1170000		5000	1	1210000		2800	1	NA				NA				543000		5000	1	554000		2800	1	NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				30600		1000	1	46400		730	3	NA				NA				4200		1000	1	3700		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	932000		77600	1	860000		77600	1	769000		10000	1	734000		1800	1	600000		19400	1	577000		60000	1	725000		10000	1	798000		1800	1	353000		30000	1	365000		9700	1
Total Organic Carbon	TOC	NS	ug/l	41200		500	1	40800		500	1	NA				NA				1500		500	1	1200		1000	1	NA				NA				53600		1000	1	52400		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	***95700***		200	1	***95700***		200	1	2700		200	2	***91600***		2600	40	ND	U	200	1	ND	U	600	1	190		100	1	110	B	66	1	960		600	1	ND	U	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	500	5	ND	U	110	1	ND	U	5.6	1	ND	U	500	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	500	5	ND	U	10	1	ND	U	1	1	ND	U	500	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	6500		1000	5	12100		1000	5	14800		1000	1	7100		48	1	106000		10000	50	107000		20000	50	76700		1000	1	92000		48	1	32000		4000	10	35400		2000	10
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	1500	5	ND	U	1500	5	ND	U	5000	1	480	B	380	1	119000		15000	50	98700		50000	50	122000		20000	4	101000		380	1	19000		5000	5	17600		1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***950***	B	**280**	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	***1300***		**160**	1	***1600***		**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	150		100	1	ND	U	5.1	1	ND	U	400	5	ND	U	500	5	230		100	1	190	B	5.1	1	ND	U	500	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	N-44D				N-44D				N-50D				N-50D				N-50D				N-50D				N-9				N-9				N-9				N-9			
			Sample Date	10/31/2012				3/27/2013				5/23/2012				8/16/2012				10/31/2012				3/27/2013				5/25/2012				8/17/2012				10/31/2012				3/26/2013			
			Sample ID	N-44D_103112				N-44D_32713				N-55D_52312				N-50D_081612				N-50D_103112				N-50D_32713				N-9_52512				N-9_81712				N-9_103112				N-9_32613			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	0.4	J	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	***9***		0.5	1	***6.7***		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	2.7		1	1	2.7		0.24	1	0.7	J	0.5	1	ND	U	0.5	1	ND	U	1	1	1.3		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	1.5		1	1	1.2		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	13.2		5	1	13.6		0.45	1	11		0.5	1	7		0.5	1	1.8	J	5	1	9.1		0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	0.16	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	0.43	J	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	0.17		0.1	1	0.157		0.02	1	NA				0.5		0.09	1	0.053	J	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	0.33		0.1	1	ND	U	0.031	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				0.4	J	0.09	1	0.78		0.05	1	0.451		0.012	1	NA				ND	U	0.09	1	0.17		0.05	1	ND	U	0.018	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				***0.4***	J	0.09	1	***0.54***		0.1	1	***0.508***		0.012	1	NA				0.1	J	0.09	1	ND	U	0.1	1	ND	U	0.019	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				0.4	J	0.09	1	0.8		0.05	1	0.545		0.01	1	NA				0.1	J	0.09	1	ND	U	0.05	1	ND	U	0.016	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				***0.3***	J	0.09	1	***0.41***		0.1	1	***0.398***		0.016	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.024	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	***2***		0.1	1	0.4	J	0.09	1	0.68		0.1	1	0.553		0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.018	1
Fluorene	86-73-7	1900	ug/l	1.3		0.1	1	1.01		0.017	1	1		0.1	1	ND	U	0.09	1	ND	U	0.1	1	0.195		0.017	1	ND	U	0.09	1	ND	U	0.09	1	0.61		0.1	1	ND	U	0.026	1
Naphthalene	91-20-3	100	ug/l	0.34		0.1	1	ND	U	0.036	1	0.4	J	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1	0.24		0.1	1	ND	U	0.055	1
Phenanthrene	85-01-8	1100	ug/l	1.7		0.05	1	1.35		0.021	1	4		0.1	1	ND	U	0.09	1	0.18		0.05	1	0.264		0.021	1	ND	U	0.09	1	ND	U	0.09	1	1.6		0.05	1	ND	U	0.032	1
Pyrene	129-00-0	130	ug/l	0.14		0.1	1	ND	U	0.015	1	4		0.1	1	0.7		0.09	1	0.83		0.1	1	0.809		0.015	1	ND	U	0.09	1	ND	U	0.09	1	0.25		0.1	1	ND	U	0.023	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	***51.8***		4	1	***56.7***		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	**50**	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	4.5	B	50	1	4.6	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***34200***		100	1	***34700***		24	1	***656***		200	1	***2000***		200	1	ND	U	100	1	***4070***		24	1	ND	U	200	1	***5750***		200	1	***1340***		100	1	***4350***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***639***		15	1	***691***		0.4	1	***869***		5	1	***436***		5	1	54.6		15	1	***634***		0.4	1	***1880***		5	1	***2390***		5	1	***2110***		15	1	***2100***		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	***77.5***		4	1	***91.2***		0.97	1	4.4		0.95	1	2.4		0.4	1	2	B	4	1	2.6	B	0.97	1	1	J	0.95	1	2.4		0.4	1	3.6	B	4	1	2.1	B	0.97	1
Cobalt	7440-48-4	31	ug/l	ND	U	50	1	ND	U	0.59	1	1.4	J	0.62	1	ND	U	0.66	1	0.6	B	50	1	1.5	B	0.59	1	5.5		0.62	1	6.6		0.66	1	24.4	B	50	1	4.4	B	0.59	1
Iron	7439-89-6	300	ug/l	***33500***		100	1	***35400***		24	1	***22400***		14.1	1	***7550***		33.3	1	***1630***		100	1	***20300***		24	1	***5550***		14.1	1	***12700***		33.3	1	***27300***		100	1	***9800***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	1.8	B	1.7	1	***6.6***		0.08	1	0.7	J	0.034	1	***6.5***		5	1	***26.7***		1.7	1	2.7		0.08	1	4.5		0.034	1	***34.2***		5	1	3.2		1.7	1
Manganese	7439-96-5	300	ug/l	***604***		15	1	***628***		0.4	1	***916***		0.44	1	***453***		0.83	1	99.7		15	1	***658***		0.4	1	***1890***		0.44	1	***2110***		0.83	1	***2300***		15	1	***1890***		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				0.051	J	0.0081	1	ND	U	0.2	1	0.11	B	0.095	1	NA				0.054	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				386000		700	1	247000		700	1	NA				NA				427000		700	1	499000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	173000		5000	1	187000		5000	1	386000		700	1	247000		700	1	134000		5000	1	327000		5000	1	427000		700	1	499000		700	1	524000		5000	1	509000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	173000		5000	1	187000		2800	1	NA				NA				134000		5000	1	327000		2800	1	NA				NA				524000		5000	1	510000		2800	1
Total Carbon	7440-44-0	NS	ug/l	51100		1800	1.8	24600		730	3	NA				NA				5300		1000	1	10400		240	1	NA				NA				2300		1000	1	2400		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	316000		10000	1	203000		1800	1	460000		19400	1	318000		9700	1	166000		10000	1	360000		1800	1	632000		19400	1	663000		19400	1	606000		10000	1	647000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				25100		500	1	13600		500	1	NA				NA				3300		500	1	5300		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	170		100	1	1400		66	1	5500		200	1	1100		200	1	390		100	1	3900		130	2	860		200	1	ND	U	200	1	2400		200	2	1500		66	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	220		110	1	ND	U	5.6	1	340	J	250	5	680		250	5	1500		110	1	130		5.6	1	ND	U	250	5	ND	U	250	5	110		110	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	220		100	1	ND	U	4.6	1	NA				NA				1500		100	1	130		4.6	1	NA				NA				110		100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	35200		1000	1	35200		48	1	22000		1000	5	11500		1000	5	4800		1000	1	18900		48	1	56800		4000	20	61700		10000	50	62700		1000	1	59200		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	20500		5000	1	23200		380	1	1600	J	1500	5	9900		1500	5	15500		5000	1	3600	B	380	1	84300		6000	20	85600		15000	50	111000		25000	5	90200		380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***980***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1
Fluoride	16984-48-8	4000	ug/l	150		100	1	25	B	5.1	1	ND	U	400	5	ND	U	400	5	320		100	1	490		5.1	1	ND	U	400	5	ND	U	400	5	200		100	1	180	B	5.1	1

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-106DSRTF				S-106DSRTF				S-106DSRTF				S-106DSRTF				S-119D				S-119D				S-119D				S-119D				S-120DSRTF				S-120DSRTF			
			Sample Date	5/29/2012				8/20/2012				10/31/2012				3/28/2013				5/23/2012				8/16/2012				10/25/2012				3/26/2013				5/29/2012				8/20/2012			
			Sample ID	S-106D_52912				S-106D_082012				S-106D_103112				S-106D_032813				S-119D_52312				S-119D_081612				S-119D_102512				S-119D_032613				S-120D_52912				S-120D_082012			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	0.7	J	0.5	1	1		0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	6		0.5	1	6		0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	***100***		0.5	1	***87***		0.5	1	***89.3***		1	1	***55.6***		0.16	1	ND	U	0.5	1	0.5	J	0.5	1	ND	U	1	1	0.43	J	0.16	1	***36***		0.5	1	***39***		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	0.5	J	0.5	1	0.7	J	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.02	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	**1**	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	**1**	1	ND	U	0.016	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.017	1	0.1	J	0.09	1	ND	U	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.09	1	0.1	J	0.09	1	ND	U	0.1	1	ND	U	0.036	1	0.2	J	0.1	1	0.1	J	0.1	1	ND	U	5	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.05	1	ND	U	0.021	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.021	1	0.3	J	0.09	1	0.3	J	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.09	1	0.049	J	0.1	1	ND	U	0.015	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	2.5	B	0.97	1	ND	U	2	1	2.9		2	1	3.6		3	1	2.1	B	0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	7.1		5	1	7.9		5	1	6.6	B	50	1	5	B	0.59	1	6.3		5	1	6.8		5	1	ND	U	50	1	5.7	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***4040***		200	1	***5240***		200	1	***5170***		100	1	***4390***		24	1	***21500***		200	1	***26200***		200	1	***28600***		100	1	***25800***		24	1	***3310***		200	1	***3260***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	3	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***873***		5	1	***778***		5	1	***719***		15	1	***607***		0.4	1	253		5	1	251		5	1	283		15	1	277		0.4	1	***1590***		5	1	***1510***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	4.9		0.95	1	4.4		0.4	1	3.2	B	4	1	4.6		0.97	1	4		0.95	1	4.2		0.4	1	3.3		3	1	3.4		0.97	1	***17.6***		0.95	1	***16.1***		0.4	1
Cobalt	7440-48-4	31	ug/l	7.2		0.62	1	8.2		0.66	1	7.6	B	50	1	4.9	B	0.59	1	6.8		0.62	1	7.2		0.66	1	ND	U	50	1	6	B	0.59	1	1.1	J	0.62	1	1.8	J	0.66	1
Iron	7439-89-6	300	ug/l	***24800***		14.1	1	***22600***		33.3	1	***22600***		100	1	***19300***		24	1	***25500***		14.1	1	***28600***		33.3	1	***26300***		100	1	***26100***		24	1	***30700***		14.1	1	***29800***		33.3	1
Lead	7439-92-1	5	ug/l	0.29	J	0.08	1	0.43	J	0.034	1	2.6	B	5	1	ND	U	1.7	1	0.28	J	0.08	1	0.63	J	0.034	1	4.8		3	1	ND	U	1.7	1	0.87	J	0.08	1	0.48	J	0.034	1
Manganese	7439-96-5	300	ug/l	***880***		0.44	1	***802***		0.83	1	***753***		15	1	***635***		0.4	1	259		0.44	1	255		0.83	1	256		15	1	268		0.4	1	***1690***		0.44	1	***1590***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.087	J	0.07	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.057	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.088	J	0.07	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				375000		700	1	NA				NA				51700		700	1	64500		700	1	NA				NA				NA				360000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	381000		700	1	375000		700	1	440000		5000	1	182000		5000	1	51700		700	1	64500		700	1	46600		5000	1	78600		5000	1	362000		700	1	360000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	381000		700	1	NA				440000		5000	1	183000		2800	1	NA				NA				46600		5000	1	78700		1400	1	362000		700	1	NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				6900		1000	1	6600		240	1	NA				NA				1200		1000	1	1400		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	410000		19400	1	439000		19400	1	379000		10000	1	333000		1800	1	460000		19400	1	453000		19400	1	424000		10000	1	419000		1800	1	384000		19400	1	410000		19400	1
Total Organic Carbon	TOC	NS	ug/l	7100		500	1	7700		500	1	NA				NA				810	J	500	1	ND	U	500	1	NA				NA				9300		500	1	10100		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	16600		200	1	14900		200	1	ND	U	100	1	19500		1100	16	ND	U	200	1	390	J	200	1	240		200	1	240		66	1	9600		200	1	8700		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	290		110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				290		100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	38100		2000	10	39800		2000	10	41700		1000	1	36700		48	1	117000		10000	50	119000		10000	50	116000		2000	1	115000		48	1	22500		1000	5	25200		1000	5
Sulfate (As So4)	14808-79-8	NS	ug/l	18000		1500	5	11900		1500	5	10100		5000	1	6800	B	380	1	132000		15000	50	136000		15000	50	133000		10000	1	136000		380	1	ND	U	1500	5	ND	U	1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***560***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	***410***	B	280	1	ND	U	54	1	ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	220		100	1	240		5.1	1	ND	U	400	5	ND	U	400	5	ND	U	200	1	6.2	B	5.1	1	420	J	400	5	ND	U	400	5

Notes:
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EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
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Q - Qualifier
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ug/l - micrograms per liter
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NS - No Standard
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The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
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Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

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Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-120DSRTF				S-120D				S-13				S-13				S-13				S-13				S-22				S-22				S-22D				S-22			
			Sample Date	11/1/2012				3/28/2013				5/24/2012				8/16/2012				11/1/2012				3/29/2013				8/21/2012				11/1/2012				6/1/2012				3/25/2013			
			Sample ID	S-120D_11112				S-120D_32813				S-13_52412				S-13_081612				S-13_110112				S-13_32913				S-22_082112				S-22_110112				S-22D_6112				S-22_32513			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	2	J	0.5	1	1.2	J	5	1	2		0.5	1	2.1		0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA				NA				ND	U	0.015	1	NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0098	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.015	1	ND	U	0.0097	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	12		0.5	1	7.5		5	1	14		0.5	1	10.7		0.36	1
Benzene	71-43-2	5	ug/l	0.57		0.5	1	0.87	J	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	***15***		0.5	1	***13.2***		0.5	1	***20***		0.5	1	***18.6***		0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	1.9		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	92		0.5	1	57.5		1	1	120		0.5	1	127		0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	0.36	J	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	3		0.5	1	2		1	1	4		0.5	1	4.4		0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	11.1		5	1	24.6		0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	10		0.5	1	10.1		5	1	12		0.5	1	12.4		0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	***42.9***		1	1	***47.1***		0.16	1	***33***		0.5	1	***42***		0.5	1	***47.4***		1	1	***47.6***		0.16	1	***60***		0.5	1	***72.3***		1	1	***56***		0.5	1	***67***		0.16	1
Toluene	108-88-3	1000	ug/l	0.73	J	1	1	1.1		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	38		0.5	1	33.3		1	1	50		0.5	1	41.9		0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	0.05	J	0.1	1	ND	U	0.02	1	0.3	J	0.1	1	0.24		0.1	1	NA				0.242		0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				0.2	J	0.09	1	ND	U	0.05	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.05	1	NA				ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				0.3	J	0.09	1	ND	U	0.05	1	ND	U	0.01	1	ND	U	0.1	1	ND	U	0.05	1	NA				ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.016	1	ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	0.314		0.017	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	0.9		0.1	1	0.48		0.1	1	1		0.09	1	0.455		0.017	1
Naphthalene	91-20-3	100	ug/l	0.11		0.1	1	ND	U	0.036	1	0.1	J	0.1	1	0.2	J	0.09	1	ND	U	0.1	1	ND	U	0.036	1	0.4	J	0.1	1	0.28		0.1	1	ND	U	0.09	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	0.15		0.05	1	0.28		0.021	1	ND	U	0.1	1	ND	U	0.09	1	0.22		0.05	1	ND	U	0.021	1	0.7		0.1	1	1		0.05	1	1		0.09	1	0.671		0.021	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.015	1	0.2	J	0.1	1	0.5	J	0.09	1	0.051	J	0.1	1	ND	U	0.015	1	ND	U	0.1	1	0.072	J	0.1	1	ND	U	0.09	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	2.6	B	4	1	4.2		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1	ND	U	2	1	ND	U	4	1	ND	U	2	1	ND	U	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	1.1	B	50	1	ND	U	0.59	1	18.1		5	1	20.6		5	1	24.6	B	50	1	18.9	B	0.59	1	ND	U	5	1	4.5	B	50	1	ND	U	5	1	3.4	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***14400***		100	1	***4200***		24	1	***1420***		200	1	***731***		200	1	***1310***		100	1	***1430***		24	1	***687***		200	1	***17100***		100	1	***7810***		200	1	***12700***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	1.8	B	1.7	1	ND	U	1	1	1.3		1	1	ND	U	5	1	***5.3***		1.7	1	ND	U	1	1	ND	U	5	1	ND	U	1	1	ND	U	1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***1650***		15	1	***1490***		0.4	1	***464***		5	1	***442***		5	1	***615***		15	1	***504***		0.4	1	220		5	1	213		15	1	191		5	1	187		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	ND	U	0.2	1	ND	U	0.2	1	NA				ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	***16.7***		4	1	***17***		0.97	1	1.1	J	0.95	1	3		0.4	1	ND	U	4	1	1.2	B	0.97	1	2.7		0.4	1	2.1	B	4	1	2.2		0.95	1	3		0.97	1
Cobalt	7440-48-4	31	ug/l	3.6	B	50	1	ND	U	0.59	1	19.8		0.62	1	24.8		0.66	1	24.8	B	50	1	18.5	B	0.59	1	3.1	J	0.66	1	4.7	B	50	1	3.8	J	0.62	1	3.6	B	0.59	1
Iron	7439-89-6	300	ug/l	***37200***		100	1	***26700***		24	1	***2980***		14.1	1	***7220***		33.3	1	***1380***		100	1	***2400***		24	1	***25600***		33.3	1	***31900***		100	1	***25700***		14.1	1	***28900***		24	1
Lead	7439-92-1	5	ug/l	4.4	B	5	1	***5.8***		1.7	1	***9.5***		0.08	1	***36.9***		0.034	1	ND	U	5	1	***8.3***		1.7	1	0.079	J	0.034	1	ND	U	5	1	0.11	J	0.08	1	ND	U	1.7	1
Manganese	7439-96-5	300	ug/l	***1740***		15	1	***1440***		0.4	1	***480***		0.44	1	***513***		0.83	1	***624***		15	1	***463***		0.4	1	236		0.83	1	227		15	1	197		0.44	1	209		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				0.067	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	ND	U	0.07	1	ND	U	0.2	1	NA				ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				75000		700	1	72400		700	1	NA				NA				200000		700	1	NA				NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	NA				ND	U	700	1	NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	418000		5000	1	363000		5000	1	75000		700	1	72400		700	1	75000		5000	1	75500		5000	1	200000		700	1	252000		5000	1	205000		700	1	241000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	418000		5000	1	367000		2800	1	NA				NA				74500		5000	1	75500		2800	1	NA				252000		5000	1	205000		700	1	241000		3500	1
Total Carbon	7440-44-0	NS	ug/l	8700		1000	1	8700		240	1	NA				NA				6500		1000	1	8700		240	1	NA				14000		1000	1	NA				13100		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	390000		10000	1	448000		1800	1	330000		9700	1	319000		9700	1	297000		10000	1	310000		1800	1	297000		9700	1	301000		10000	1	285000		9700	1	338000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				6300		500	1	6300		500	1	NA				NA				14800		500	1	NA				14500		500	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	12300		1000	10	9700		330	5	ND	U	200	1	ND	U	200	1	ND	U	100	1	200		66	1	3800		200	1	ND	U	100	1	540	J	200	1	1900		66	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	190		110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	150		110	1	ND	U	5.6	1	ND	U	250	5	200		110	1	ND	U	250	5	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	190		100	1	ND	U	4.6	1	NA				NA				150		100	1	ND	U	4.6	1	NA				200		100	1	NA				ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	1.7	B	1	1	ND	U	400	5	ND	U	10	1	ND	U	400	5	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	24700		1000	1	28300		48	1	71600		4000	20	73700		4000	20	74700		1000	1	72900		48	1	43400		2000	10	55200		1000	1	39300		4000	20	63800		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	5000	1	ND	U	380	1	50800		1500	5	40200		1500	5	58700		10000	2	54600		380	1	ND	U	1500	5	ND	U	5000	1	2300	J	1500	5	ND	U	380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***1300***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	54	1	ND	U	2000	1	ND	U	**54**	1	***290***	B	280	1
Fluoride	16984-48-8	4000	ug/l	350		100	1	300		5.1	1	ND	U	400	5	ND	U	400	5	150		100	1	34	B	5.1	1	740		400	5	670		100	1	ND	U	400	5	680		5.1	1

Notes:
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AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-264				S-264				S-264				S-264				S-280D				S-280D				S-280D				S-280D				S-284D				S-284D			
			Sample Date	5/23/2012				8/15/2012				10/26/2012				3/26/2013				5/29/2012				8/17/2012				10/31/2012				3/26/2013				5/25/2012				8/17/2012			
			Sample ID	S-264_52312				S-264_081512				S-264_102612				S-264D_032613				S-280D_52912				S-280D_081712				S-280D_103112				S-280D_32613				S-284D_52512				S-284D_081712			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	1	J	0.5	1	1	J	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				ND	U	0.014	1	NA				NA							
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0098	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	2		0.5	1	2		0.5	1	ND	U	1	1	2.4		0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	0.7	J	0.5	1	0.7	J	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	5		0.5	1	6		0.5	1	5.9		1	1	4.8		0.16	1	0.7	J	0.5	1	0.8	J	0.5	1	ND	U	1	1	0.97	J	0.16	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.1	1	ND	U	2	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.1	1	ND	U	2	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.1	1	ND	U	**2**	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	**2**	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	2	1	ND	U	0.017	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.017	1	0.4	J	0.09	1	0.2	J	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.09	1	0.2	J	0.1	1	ND	U	5	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.036	1	3		0.09	1	2		0.09	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	2	1	ND	U	0.021	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.05	1	ND	U	0.021	1	0.2	J	0.09	1	0.1	J	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.1	1	ND	U	2	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.015	1	0.1	J	0.09	1	ND	U	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	3	1	2.9	B	0.97	1	ND	U	2	1	4.4		2	1	ND	U	4	1	7.9		0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	***34.5***		5	1	24.6		5	1	ND	U	50	1	23.5	B	0.59	1	ND	U	5	1	ND	U	5	1	2.4	B	50	1	3	B	0.59	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***5960***		200	1	ND	U	200	1	***7190***		100	1	***10300***		24	1	***6730***		200	1	***11700***		200	1	***8110***		100	1	***19700***		24	1	ND	U	200	1	ND	U	200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	3	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	2.9	B	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***7200***		5	1	***7700***		5	1	***7220***		15	1	***6070***		0.4	1	***464***		5	1	***480***		5	1	231		15	1	***726***		0.4	1	***663***		5	1	***974***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	0.096	B	0.095	1	NA				ND	U	0.2	1
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	3.7		0.95	1	2.8		0.4	1	ND	U	3	1	2.1	B	0.97	1	6.5		0.95	1	7.2		0.4	1	ND	U	4	1	***14.8***		0.97	1	2.3		0.95	1	1.1	J	0.4	1
Cobalt	7440-48-4	31	ug/l	***39.7***		0.62	1	26.3		0.66	1	ND	U	50	1	24.9	B	0.59	1	2.3	J	0.62	1	2.8	J	0.66	1	2.9	B	50	1	2.8	B	0.59	1	1.4	J	0.62	1	1.2	J	0.66	1
Iron	7439-89-6	300	ug/l	***13300***		14.1	1	***8810***		33.3	1	***7210***		100	1	***11600***		24	1	***16500***		14.1	1	***16200***		33.3	1	***9260***		100	1	***27700***		24	1	***5120***		14.1	1	***3690***		33.3	1
Lead	7439-92-1	5	ug/l	0.77	J	0.08	1	0.26	J	0.034	1	ND	U	3	1	ND	U	1.7	1	0.11	J	0.08	1	ND	U	0.034	1	ND	U	5	1	ND	U	1.7	1	0.74	J	0.08	1	0.063	J	0.034	1
Manganese	7439-96-5	300	ug/l	***7270***		0.44	1	***8080***		0.83	1	***6960***		15	1	***6380***		0.4	1	***476***		0.44	1	***467***		0.83	1	242		15	1	***748***		0.4	1	***1470***		0.44	1	***1010***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.047	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.033	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.058	J	0.0081	1
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	308000		700	1	302000		700	1	NA				NA				NA				167000		700	1	NA				NA				371000		700	1	350000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	308000		700	1	302000		700	1	351000		5000	1	334000		5000	1	161000		700	1	167000		700	1	111000		5000	1	231000		5000	1	371000		700	1	350000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				351000		5000	1	334000		2800	1	161000		700	1	NA				112000		5000	1	231000		2800	1	NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				NA				12800		240	1	NA				NA				1600		1000	1	4800		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	718000		19400	1	740000		19400	1	613000		10000	1	734000		1800	1	254000		9700	1	269000		9700	1	226000		10000	1	300000		1800	1	670000		38800	1	676000		38800	1
Total Organic Carbon	TOC	NS	ug/l	13100		500	1	13300		500	1	11800		1000	1	NA				4100		500	1	2900		500	1	NA				NA				6100		500	1	4900		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	4600		200	1	1500		200	1	1500		200	1	6400		260	4	11100		200	1	6700		200	1	ND	U	100	1	16600		1200	18	22100		200	1	23600		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	220		110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA				220		100	1	ND	U	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	86000		4000	20	92300		10000	50	87800		2000	1	71300		48	1	40400		4000	20	45600		2000	10	44700		1000	1	46700		48	1	123000		10000	50	120000		10000	50
Sulfate (As So4)	14808-79-8	NS	ug/l	124000		6000	20	107000		15000	50	108000		10000	1	228000		380	1	6100		1500	5	12800		1500	5	19700		5000	1	34800		380	1	152000		15000	50	170000		15000	50
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	ND	U	280	1	ND	U	54	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	***350***		**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	300	1	170	B	5.1	1	500	J	400	5	ND	U	400	5	170		100	1	450		5.1	1	ND	U	400	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved results for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-284D				S-284D				S-294D				S-294D				S-294D				S-294D				S-302D				S-302D				S-302D				S-302D			
			Sample Date	10/31/2012				3/28/2013				5/30/2012				8/17/2012				10/26/2012				4/1/2013				5/29/2012				8/17/2012				10/25/2012				3/28/2013			
			Sample ID	S-284D_103112				S-284D_032813				S-294D_53012				S-294D_081712				S-294D_102612				S-294D_40113				S-302D_52912				S-302D_081712				S-302D_102512				S-302D_032813			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	2.4	J	5	1	2.9		0.19	1	3		0.5	1	ND	U	0.5	1	ND	U	2	1	***96***		0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.014	1	NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.014	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	0.65	J	5	1	0.96	J	0.36	1	0.9	J	0.5	1	ND	U	0.5	1	ND	U	2	1	30.4		0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	***88.6***		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	ND	U	0.24	1	5		0.5	1	ND	U	0.5	1	2.5		1	1	107		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.23	1	4		0.5	1	ND	U	0.5	1	2.1		1	1	107		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	1.4	J	5	1	1.3	J	0.45	1	0.6	J	0.5	1	ND	U	0.5	1	ND	U	2	1	117		0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	0.16	1	1		0.5	1	0.9	J	0.5	1	1.1		1	1	5.4		0.16	1	ND	U	0.5	1	0.6	J	0.5	1	ND	U	1	1	0.68	J	0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	4.5		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	2	1	11.3		0.041	2	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				0.1	J	0.09	1	ND	U	2	1	0.514		0.012	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				0.1	J	0.09	1	ND	U	**2**	1	***0.282***		0.012	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				0.1	J	0.09	1	ND	U	**2**	1	0.345		0.01	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**2**	1	0.168		0.016	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	0.6		0.1	1	0.1	J	0.09	1	ND	U	**2**	1	0.487		0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	0.23		0.1	1	0.184		0.017	1	2		0.1	1	0.2	J	0.09	1	ND	U	2	1	48.7		0.034	2	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	2.7		0.1	1	1.92		0.036	1	48		0.1	1	0.4	J	0.09	1	20.6		5	1	***521***		0.36	10	ND	U	0.09	1	ND	U	0.09	1	ND	U	5	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	0.12		0.05	1	0.154		0.021	1	4		0.1	1	0.2	J	0.09	1	ND	U	2	1	57.1		0.042	2	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.015	1	1		0.1	1	0.3	J	0.09	1	ND	U	2	1	2.97		0.015	1	0.7		0.09	1	0.8		0.09	1	ND	U	1	1	0.521		0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																									
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	4	1	ND	U	0.97	1	2.7		2	1	2.9		2	1	ND	U	3	1	5.1		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	6	2	2.2	B	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	**50**	1	ND	U	0.59	1	5.4		5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	ND	U	100	1	***534***		24	1	***62100***		200	1	***61500***		200	1	***65500***		100	1	***97500***		24	1	***44500***		200	1	***65400***		200	1	***70200***		100	1	***72800***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	3	1	3.2		1.7	1	ND	U	1	1	ND	U	1	1	***5.5***		3	1	5		1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***931***		15	1	***737***		0.4	1	***8730***		5	1	***8740***		5	1	***7930***		15	1	***485***		0.4	1	***4020***		5	1	***4030***		5	1	***3720***		15	1	***4070***		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.089	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																									
Arsenic	7440-38-2	10	ug/l	ND	U	4	1	1.5	B	0.97	1	5.2		0.95	1	4.4		0.4	1	ND	U	3	1	***36.5***		0.97	1	ND	U	0.95	1	ND	U	0.4	1	ND	U	6	2	2.5	B	0.97	1
Cobalt	7440-48-4	31	ug/l	1.2	B	50	1	ND	U	0.59	1	8.1		0.62	1	4.6	J	0.66	1	ND	U	50	1	ND	U	0.59	1	3.2	J	0.62	1	2.9	J	0.66	1	ND	U	50	1	ND	U	0.59	1
Iron	7439-89-6	300	ug/l	***2970***		100	1	***1760***		24	1	***72800***		14.1	1	***67500***		33.3	1	***67500***		100	1	***123000***		24	1	***97800***		14.1	1	***80400***		33.3	1	***75500***		100	1	***78300***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	ND	U	1.7	1	0.78	J	0.08	1	0.18	J	0.034	1	ND	U	3	1	4.8		1.7	1	0.71	J	0.08	1	ND	U	0.034	1	***5.6***		3	1	4.8		1.7	1
Manganese	7439-96-5	300	ug/l	***1040***		15	1	***793***		0.4	1	***8960***		0.44	1	***8620***		0.83	1	***8090***		15	1	***503***		0.4	1	***4100***		0.44	1	***4110***		0.83	1	***3960***		15	1	***4110***		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				0.052	J	0.0081	1	ND	U	0.2	1	ND	U	0.089	1	NA				0.047	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																									
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				244000		700	1	NA				NA				NA				263000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	368000		5000	1	378000		5000	1	222000		700	1	244000		700	1	250000		5000	1	149000		5000	1	215000		700	1	263000		700	1	250000		5000	1	294000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	368000		5000	1	380000		2800	1	222000		700	1	NA				251000		5000	1	149000		3500	1	215000		700	1	NA				251000		5000	1	294000		2800	1
Total Carbon	7440-44-0	NS	ug/l	5200		1000	1	5700		240	1	NA				NA				NA				8200		240	1	NA				NA				7800		1000	1	8100		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	657000		10000	1	599000		1800	1	930000		38800	1	902000		38800	1	807000		10000	1	1930000		1800	1	954000		38800	1	904000		38800	1	928000		10000	1	883000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				5200		500	1	3100		500	1	3400		1000	1	NA				8600		500	1	8700		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	270		100	1	24700		1200	18	720		200	1	1300		200	1	990		200	1	5100		200	3	12200		200	1	10000		200	1	12400		2000	10	12200		400	6
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	34	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	9.3	B	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	ND	U	100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	34	B	4.6	1	NA				NA				ND	U	100	1	9.3	B	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	1.4	B	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	123000		10000	10	71300		48	1	81400		10000	50	93100		10000	50	87500		2000	1	1000000		240	5	66200		10000	50	72400		10000	50	73700		2000	1	73900		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	142000		25000	5	168000		380	1	348000		15000	50	327000		15000	50	331000		10000	1	1300	B	380	1	368000		15000	50	372000		15000	50	386000		10000	1	370000		380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***910***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	***1900***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	***1300***	B	280	1
Fluoride	16984-48-8	4000	ug/l	200		100	1	170	B	5.1	1	ND	U	400	5	ND	U	400	5	ND	U	200	1	270		5.1	1	ND	U	400	5	ND	U	400	5	300		200	1	170	B	5.1	1

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-305D				S-305D				S-305D				S-305D				S-38D				S-38D				S-38D				S-38D				S-38D2				S-38D2			
			Sample Date	5/25/2012				8/17/2012				10/25/2012				3/27/2013				5/24/2012				8/16/2012				3/25/2013				10/25/2012				5/24/2012				8/16/2012			
			Sample ID	S-305D_52512				S-305D_081712				S-305D_102512				S-305D_32713				S-38D_52412				S-38D_081612				S-38D_32513				S-38D_102512				S-38D2_52412				S-58D2_081612			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.19	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.011	1	ND	U	0.02	1	ND	U	0.0098	1	ND	U	0.0096	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.26	1	ND	U	1	1	1		0.5	1	2		0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.36	1	ND	U	2	1	ND	U	0.5	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	0.39	J	0.24	1	ND	U	1	1	***43***		0.5	1	***60***		0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	0.97	J	0.24	1	ND	U	1	1	4		0.5	1	12		0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	0.44	J	0.23	1	ND	U	1	1	2		0.5	1	6		0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	0.8	J	0.5	1	ND	U	0.5	1	1.8	J	0.45	1	ND	U	2	1	0.7	J	0.5	1	1	J	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.16	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	0.46	J	0.23	1	ND	U	1	1	4		0.5	1	7		0.5	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	0.02	1	ND	U	1	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.012	1	ND	U	1	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.012	1	ND	U	**1**	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	0.01	1	ND	U	1	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	0.016	1	ND	U	**1**	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.012	1	ND	U	1	1	ND	U	0.09	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	0.3	J	0.1	1	0.2	J	0.09	1	ND	U	1	1	ND	U	0.017	1	ND	U	0.1	1	ND	U	0.09	1	ND	U	0.017	1	ND	U	1	1	ND	U	0.09	1	ND	U	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	5	1	ND	U	0.036	1	0.3	J	0.1	1	ND	U	0.09	1	0.146		0.036	1	ND	U	5	1	0.3	J	0.09	1	0.5	J	0.09	1
Phenanthrene	85-01-8	1100	ug/l	0.2	J	0.1	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.021	1	0.2	J	0.1	1	ND	U	0.09	1	ND	U	0.021	1	ND	U	1	1	ND	U	0.09	1	ND	U	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.1	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.015	1	0.2	J	0.1	1	ND	U	0.09	1	ND	U	0.015	1	ND	U	1	1	ND	U	0.09	1	ND	U	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	6.6		2	1	***66.2***		2	1	***293***		6	2	***103***		1.9	2	ND	U	2	1	ND	U	2	1	ND	U	0.97	1	ND	U	3	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	14.1		5	1	19.1		5	1	ND	U	50	1	20	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	0.59	1	ND	U	50	1	ND	U	5	1	ND	U	5	1
Iron (Dissolved)	7439-89-6	300	ug/l	***40700***		200	1	***81700***		200	1	***102000***		100	1	***74400***		24	1	ND	U	200	1	ND	U	200	1	***723***		24	1	***941***		100	1	212		200	1	***2420***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	***7.4***		3	1	ND	U	1.7	1	***12.9***		1	1	ND	U	1	1	ND	U	1.7	1	ND	U	3	1	2.6		1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***2030***		5	1	***1920***		5	1	***1850***		15	1	***1290***		0.4	1	273		5	1	272		5	1	237		0.4	1	242		15	1	***7270***		5	1	***7160***		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.095	1	ND	U	0.2	1	NA				ND	U	0.2	1
Metals - Total																																											
Arsenic	7440-38-2	10	ug/l	***477***		0.95	1	***395***		0.4	1	***406***		6	2	***333***		1.9	2	***20.8***		0.95	1	0.72	J	0.4	1	ND	U	0.97	1	ND	U	3	1	1.5	J	0.95	1	1.1	J	0.4	1
Cobalt	7440-48-4	31	ug/l	***39.2***		0.62	1	19.4		0.66	1	ND	U	50	1	30.5	B	0.59	1	***821***		3.1	5	ND	U	0.66	1	ND	U	0.59	1	ND	U	50	1	7.8		0.62	1	7.5		0.66	1
Iron	7439-89-6	300	ug/l	***151000***		14.1	1	***112000***		33.3	1	***113000***		100	1	***95600***		24	1	***1690000***		141	10	***4590***		33.3	1	***4130***		24	1	***4910***		100	1	***9810***		14.1	1	***9420***		33.3	1
Lead	7439-92-1	5	ug/l	0.27	J	0.08	1	ND	U	0.034	1	***7.3***		3	1	ND	U	1.7	1	***1610***		0.8	10	1.2		0.034	1	3		1.7	1	3.6		3	1	***8***		0.08	1	2.1		0.034	1
Manganese	7439-96-5	300	ug/l	***2360***		0.44	1	***1970***		0.83	1	***1940***		15	1	***1360***		0.4	1	***29100***		2.2	5	285		0.83	1	204		0.4	1	235		15	1	***7180***		0.44	1	***7160***		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.052	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.041	J	0.0081	1	ND	U	0.095	1	ND	U	0.2	1	NA				0.048	J	0.0081	1
General Chemistry																																											
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	333000		700	1	267000		700	1	NA				NA				138000		700	1	118000		700	1	NA				NA				261000		700	1	254000		700	1
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	333000		700	1	267000		700	1	252000		5000	1	235000		5000	1	138000		700	1	118000		700	1	129000		5000	1	134000		5000	1	261000		700	1	254000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				252000		5000	1	235000		2800	1	NA				NA				129000		3500	1	134000		5000	1	NA				NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				14100		1000	1	13800		240	1	NA				NA				700	B	240	1	ND	U	1000	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	571000		19400	1	1140000		38800	1	1060000		10000	1	590000		1800	1	168000		9700	1	148000		9700	1	208000		1800	1	155000		10000	1	345000		19400	1	361000		19400	1
Total Organic Carbon	TOC	NS	ug/l	16000		500	1	14700		500	1					NA				ND	U	500	1	ND	U	500	1	NA				NA				2100		500	1	1400		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	21300		200	1	8100		200	1	9700		2000	10	10900		400	6	340	J	200	1	ND	U	200	1	100	B	66	1	200		200	1	ND	U	200	1	ND	U	200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	5.6	1	ND	U	110	1	ND	U	250	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA				ND	U	4.6	1	ND	U	100	1								
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	1	1	ND	U	10	1	ND	U	400	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	73400		10000	50	73600		10000	50	71500		2000	1	71700		48	1	2500		1000	5	4400		1000	5	3000		48	1	3100		2000	1	43000		4000	20	46400		2000	10
Sulfate (As So4)	14808-79-8	NS	ug/l	476000		15000	50	494000		15000	50	504000		30000	3	500000		750	2	ND	U	1500	5	ND	U	1500	5	ND	U	380	1	ND	U	10000	1	12600		1500	5	10700		1500	5
Sulfide	18496-25-8	5	ug/l	***100***	J	**54**	1	ND	U	**54**	1	ND	U	2000	1	***1500***	B	280	1	ND	U	**2700**	50	ND	U	**54**	1	ND	U	280	1	ND	U	2000	1	ND	U	**54**	1	ND	U	54	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	280		200	1	120	B	5.1	1	ND	U	400	5	ND	U	400	5	300		5.1	1	300		200	1	ND	U	400	5	450	J	400	5

Notes:
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PADEP - Pennsylvania Department of Environmental Protection
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MSC - Medium Specific Concentration
RSL - Regional Screening Level
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The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
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Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

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Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-38D2				S-38D2				S-46D				S-46D				S-46D				S-46D				S-59D				S-59D				S-59D				S-59D			
			Sample Date	10/25/2012				3/25/2013				5/23/2012				8/15/2012				10/25/2012				3/26/2013				5/25/2012				8/16/2012				10/25/2012				3/29/2013			
			Sample ID	S-38D2_102512				S-38D2_32513				S-46D_52312				S-46D_081512				S-46D_102512				S-49D_032613				S-59D_52512				S-59D_081612				S-59D_102512				S-59D_32913			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	2	1	0.29	J	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.02	1	ND	U	0.01	1	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.02	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	1.4		0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	2	1	0.38	J	0.36	1	ND	U	0.5	1	ND	U	0.5	1	6.5		2	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	***12.7***		1	1	***106***		0.24	1	ND	U	0.5	1	ND	U	0.5	1	***24.3***		1	1	***17***		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	23.9		0.24	1	ND	U	0.5	1	ND	U	0.5	1	21		1	1	15.9		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	13.3		0.23	1	ND	U	0.5	1	ND	U	0.5	1	23.5		1	1	20.6		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	2	1	2.5		0.45	1	ND	U	0.5	1	ND	U	0.5	1	186		20	10	168		0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	ND	U	1	1	ND	U	0.16	1	1	J	0.5	1	1		0.5	1	***29.7***		1	1	***33.3***		0.16	1	4		0.5	1	5		0.5	1	4.4		1	1	2.7		0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	15.1		0.23	1	ND	U	0.5	1	ND	U	0.5	1	15.5		1	1	11.1		0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	ND	U	1	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	**1**	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	**1**	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	**1**	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	**1**	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	1	1	ND	U	0.01	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	1	1	ND	U	0.02	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	1	1	0.861		0.017	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	ND	U	5	1	0.434		0.04	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	5	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	5	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	1	1	ND	U	0.02	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	1	1	0.384		0.021	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	ND	U	1	1	ND	U	0.02	1	ND	U	0.09	1	0.1	J	0.1	1	ND	U	1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	3	1	ND	U	0.97	1	***22.9***		2	1	***16.5***		2	1	7.6		3	1	5.7		0.97	1	***12.5***		2	1	***16.6***		2	1	***34.6***		3	1	***33.1***		0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	50	1	2	B	0.59	1	23.4		5	1	27.2		5	1	ND	U	50	1	ND	U	0.59	1	10.8		5	1	11.2		5	1	ND	U	50	1	9.8	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***6640***		100	1	***3270***		24	1	***30000***		200	1	***25700***		100	1	***69600***		100	1	***74200***		24	1	***445***		200	1	***2110***		200	1	***7100***		100	1	***5630***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	3.7		3	1	1.7	B	1.7	1	ND	U	1	1	ND	U	1	1	3.6		3	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	4.7		3	1	3.6		1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***10300***		30	2	***7970***		0.4	1	***14200***		5	1	***14000***		10	2	***1350***		15	1	***1560***		0.4	1	***2430***		5	1	***2120***		5	1	***1980***		15	1	***1950***		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.1	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	ND	U	3	1	3		0.97	1	***110***		0.95	1	***127***		0.4	1	***12.8***		3	1	***12.9***		0.97	1	***55.3***		0.95	1	***51.5***		0.4	1	***54.3***		3	1	***51.8***		0.97	1
Cobalt	7440-48-4	31	ug/l	ND	U	50	1	3.1	B	0.59	1	23		0.62	1	28.6		0.66	1	ND	U	50	1	ND	U	0.59	1	11.7		0.62	1	11.2		0.66	1	ND	U	50	1	10.7	B	0.59	1
Iron	7439-89-6	300	ug/l	***7630***		100	1	***8040***		24	1	***48400***		14.1	1	***54300***		33.3	1	***81300***		100	1	***89500***		24	1	***11900***		14.1	1	***11900***		33.3	1	***9790***		100	1	***14200***		24	1
Lead	7439-92-1	5	ug/l	***5.4***		3	1	ND	U	1.7	1	0.32	J	0.08	1	1.9		0.034	1	ND	U	3	1	ND	U	1.7	1	0.5	J	0.08	1	0.099	J	0.034	1	4.1		3	1	***9.3***		1.7	1
Manganese	7439-96-5	300	ug/l	***8140***		15	1	***8150***		0.4	1	***14800***		0.44	1	***14700***		1.7	2	***1410***		15	1	***1560***		0.4	1	***2540***		0.44	1	***2200***		0.83	1	***1740***		15	1	***1820***		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.1	1	NA				0.051	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.056	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				298000		700	1	272000		700	1	NA				NA				424000		700	1	422000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	285000		5000	1	271000		5000	1	298000		700	1	272000		700	1	292000		5000	1	308000		5000	1	424000		700	1	422000		700	1	473000		5000	1	486000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	285000		5000	1	271000		3500	1	NA				NA				292000		5000	1	308000		1400	1	NA				NA				473000		5000	1	488000		2800	1
Total Carbon	7440-44-0	NS	ug/l	1900		1000	1	2600		240	1	NA				NA				11800		1000	1	11400		240	1	NA				NA				7600		1000	1	7600		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	335000		10000	1	229000		1800	1	782000		38800	1	796000		9700	1	583000		10000	1	640000		1800	1	708000		38800	1	724000		38800	1	658000		10000	1	756000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				11100		500	1	10800		500	1	NA				NA				8300		500	1	8400		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	ND	U	200	1	110	B	66	1	5500		200	1	12200		200	1	1100		200	1	1100		66	1	2000		200	1	2400		200	1	2000		200	1	1800		66	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	64	B	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	ND	U	100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	64	B	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	45800		2000	1	44800		48	1	75100		5000	25	75900		10000	50	209000		2000	1	243000		48	1	159000		10000	50	150000		10000	50	149000		2000	1	161000		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	13900		10000	1	10400		380	1	235000		7500	25	222000		15000	50	ND	U	10000	1	450	B	380	1	4500	J	1500	5	7100		1500	5	ND	U	10000	1	1700	B	380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	ND	U	280	1	***61***	J	**54**	1	ND	U	**54**	1	ND	U	2000	1	***1500***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1
Fluoride	16984-48-8	4000	ug/l	310		200	1	320		5.1	1	ND	U	400	5	ND	U	400	5	380		200	1	320		5.1	1	ND	U	400	5	ND	U	400	5	310		200	1	280		5.1	1

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25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

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AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-69D				S-69D				S-69D				S-69D				S-72D				S-72D				S-72D				S-72D				S-74D1				S-74D1			
			Sample Date	5/29/2012				8/17/2012				11/1/2012				3/28/2013				5/29/2012				8/17/2012				10/25/2012				3/27/2013				5/29/2012				8/20/2012			
			Sample ID	S-69D_52912				S-69D_081712				S-69D_110112				S-69D_032813				S-72D_52912				S-72D_081712				S-72D_102512				S-72D_32713				S-74D1_52912				S-74D1_082012			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																										
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1	ND	U	2	1	ND	U	0.5	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0096	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.011	1	ND	U	0.029	1	ND	U	0.0097	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	1	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1	ND	U	2	1	ND	U	0.5	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	1	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	1	1	ND	U	0.5	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1	ND	U	2	1	ND	U	0.5	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	5		0.5	1	6		0.5	1	5.9		1	1	8.1		0.16	1	1		0.5	1	2		0.5	1	1.5		1	1	1.5		0.16	1	1		1	1	2		0.5	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	1	1	ND	U	0.5	1
Semi-Volatile Organic Compounds																																										
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.02	1	NA				ND	U	0.09	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.012	1	NA				ND	U	0.09	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	1	1	ND	U	0.01	1	NA				ND	U	0.09	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**1**	1	ND	U	0.016	1	NA				ND	U	0.09	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.012	1	ND	U	0.5	1	ND	U	0.09	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.09	1	0.1	J	0.09	1	ND	U	1	1	ND	U	0.017	1	ND	U	0.5	1	ND	U	0.09	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.09	1	0.3	J	0.09	1	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	5	1	ND	U	0.036	1	ND	U	0.5	1	0.1	J	0.09	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.05	1	ND	U	0.021	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.021	1	ND	U	0.5	1	0.1	J	0.09	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	1	1	ND	U	0.015	1	ND	U	0.5	1	0.2	J	0.09	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	ND	U	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	3	1	ND	U	0.97	1	ND	U	2	1	ND	U	2	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	ND	U	5	1	ND	U	5	1	2.1	B	50	1	3	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	24.6		5	1	24.2		5	1
Iron (Dissolved)	7439-89-6	300	ug/l	ND	U	200	1	ND	U	200	1	27.2	B	100	1	55.3	B	24	1	***49800***		200	1	***57800***		200	1	***58200***		100	1	***56200***		24	1	***10000***		200	1	***12500***		200	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	***7.1***		3	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***3260***		5	1	***2380***		5	1	***1480***		15	1	***3360***		0.4	1	***3840***		5	1	***3890***		5	1	***3450***		15	1	***3690***		0.4	1	170		5	1	170		5	1
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	ND	U	0.95	1	5		0.4	1	ND	U	4	1	1	B	0.97	1	ND	U	0.95	1	ND	U	0.4	1	ND	U	3	1	ND	U	0.97	1	***19.1***		2	1	***18.2***		0.4	1
Cobalt	7440-48-4	31	ug/l	4.8	J	0.62	1	11.6		0.66	1	6.6	B	50	1	3.8	B	0.59	1	ND	U	0.62	1	ND	U	0.66	1	ND	U	50	1	ND	U	0.59	1	28.5		5	1	26.9		0.66	1
Iron	7439-89-6	300	ug/l	***547***		14.1	1	***24000***		33.3	1	***15100***		100	1	***2050***		24	1	***63600***		14.1	1	***63200***		33.3	1	***61700***		100	1	***66000***		24	1	***40900***		200	1	***40500***		33.3	1
Lead	7439-92-1	5	ug/l	0.15	J	0.08	1	***10.7***		0.034	1	4.9	B	5	1	ND	U	1.7	1	0.17	J	0.08	1	ND	U	0.034	1	***8.4***		3	1	ND	U	1.7	1	ND	U	1	1	0.043	J	0.034	1
Manganese	7439-96-5	300	ug/l	***3330***		0.44	1	***2870***		0.83	1	***1910***		15	1	***3580***		0.4	1	***3820***		0.44	1	***3800***		0.83	1	***3470***		15	1	***3790***		0.4	1	195		5	1	193		0.83	1
Mercury	7439-97-6	2	ug/l	NA				0.18	J	0.016	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.055	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.094	J	0.07	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				321000		700	1	NA				NA				NA				225000		700	1	NA				NA				311000		700	1				
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	2000	1	ND	U	700	1
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	334000		700	1	321000		700	1	354000		5000	1	338000		5000	1	196000		700	1	225000		700	1	212000		5000	1	212000		5000	1	306000		2000	1	311000		700	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	334000		700	1	NA				354000		5000	1	338000		2800	1	196000		700	1	NA				212000		5000	1	212000		2800	1	306000		2000	1	NA			
Total Carbon	7440-44-0	NS	ug/l	NA				NA				3700		1000	1	3100		240	1	NA				NA				2500		1000	1	2500		240	1	NA				NA			
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	512000		19400	1	495000		19400	1	465000		10000	1	483000		1800	1	716000		19400	1	385000		9700	1	597000		10000	1	628000		1800	1	328000		60000	1	358000		19400	1
Total Organic Carbon	TOC	NS	ug/l	4900		500	1	3400		500	1	NA				NA				4300		500	1	2500		500	1	NA				NA				6700		1000	1	7500		500	1
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	4900		200	1	1300		200	1	650		100	1	3600		130	2	5200		200	1	3100		200	1	3700		800	4	3900		130	2	23600		600	1	23100		200	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	ND	U	110	1	9.3	B	5.6	1	300	J	250	5	460	J	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	500	5	ND	U	250	5
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				ND	U	100	1	9.3	B	4.6	1	NA				NA				ND	U	100	1	5	B	4.6	1	NA				NA			
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	500	5	ND	U	400	5
Chloride (As Cl)	16887-00-6	NS	ug/l	97300		4000	20	89200		5000	25	96200		1000	1	108000		48	1	73000		10000	50	83200		10000	50	78600		2000	1	80800		48	1	45400		4000	10	54400		4000	20
Sulfate (As So4)	14808-79-8	NS	ug/l	18000		1500	5	19900		1500	5	19900		5000	1	18400		380	1	207000		15000	50	221000		15000	50	227000		10000	1	235000		380	1	ND	U	5000	5	ND	U	1500	5
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	***680***	B	280	1	NA				ND	U	**54**	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	ND	U	400	5	230		100	1	190	B	5.1	1	ND	U	400	5	ND	U	400	5	ND	U	200	1	140	B	5.1	1	ND	U	500	5	ND	U	400	5

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-74D1				S-74D1				S-74D2				S-74D2				S-74D2				S-74D2				S-76D				S-76D				S-76D				S-76D			
			Sample Date	10/31/2012				3/28/2013				5/29/2012				8/20/2012				10/31/2012				3/28/2013				5/30/2012				8/20/2012				10/31/2012				3/28/2013			
			Sample ID	S-74D1_103112				S-74D1_32813				S-74D2_52912				S-74D2_082012				S-74D2_103112				S-74D2_032813				S-76D_53012				S-76D_082012				S-76D_103112				S-76D_32813			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																											
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA				NA				NA				ND	U	0.015	1	NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0096	1	ND	U	0.0098	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0098	1	ND	U	0.015	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	1.6		1	1	1.7		0.16	1	ND	U	0.5	1	0.7	J	0.5	1	0.63	J	1	1	0.66	J	0.16	1	5		0.5	1	5		0.5	1	5.7		1	1	6.2		0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																											
Anthracene	120-12-7	66	ug/l	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.02	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	0.05	1	ND	U	0.01	1	NA				ND	U	0.1	1	ND	U	0.05	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.017	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	ND	U	0.1	1	ND	U	0.036	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.036	1	0.1	J	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	0.045	J	0.05	1	ND	U	0.021	1	0.1	J	0.09	1	ND	U	0.09	1	0.066		0.05	1	ND	U	0.021	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.05	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	0.082	J	0.1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.015	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																										
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	4	1	5.9		0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1.3	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	4	1	1.2	B	0.97	1
Cobalt (Dissolved)	7440-48-4	31	ug/l	26.2	B	50	1	24.5	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1	ND	U	5	1	ND	U	5	1	1.4	B	50	1	0.8	B	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***16200***		100	1	***21300***		24	1	***1010***		200	1	***4120***		200	1	***7240***		100	1	***2070***		24	1	***1470***		200	1	***1450***		200	1	***1050***		100	1	***1100***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	5	1	1.9	B	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	4.2		1.7	1	ND	U	1	1	ND	U	1	1	ND	U	5	1	3.3		1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	176		15	1	154		0.4	1	246		5	1	239		5	1	236		15	1	250		0.4	1	***3550***		5	1	***3630***		5	1	***3310***		15	1	***3420***		0.4	1
Mercury (Dissolved)	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																										
Arsenic	7440-38-2	10	ug/l	***16.9***		4	1	***18.7***		0.97	1	4.2		0.95	1	4.6		0.4	1	3.8	B	4	1	5.8		0.97	1	ND	U	0.95	1	0.42	J	0.4	1	ND	U	4	1	2.2	B	0.97	1
Cobalt	7440-48-4	31	ug/l	27.5	B	50	1	25.9	B	0.59	1	ND	U	0.62	1	ND	U	0.66	1	ND	U	50	1	ND	U	0.59	1	2.4	J	0.62	1	2.6	J	0.66	1	1.7	B	50	1	0.8	B	0.59	1
Iron	7439-89-6	300	ug/l	***42100***		100	1	***40300***		24	1	***26200***		14.1	1	***24300***		33.3	1	***25500***		100	1	***26100***		24	1	***1850***		14.1	1	***1740***		33.3	1	***1620***		100	1	***1800***		24	1
Lead	7439-92-1	5	ug/l	ND	U	5	1	2.4	B	1.7	1	0.22	J	0.08	1	0.12	J	0.034	1	ND	U	5	1	4		1.7	1	0.27	J	0.08	1	0.056	J	0.034	1	ND	U	5	1	3.1		1.7	1
Manganese	7439-96-5	300	ug/l	181		15	1	175		0.4	1	272		0.44	1	249		0.83	1	253		15	1	261		0.4	1	***3640***		0.44	1	***3590***		0.83	1	***3440***		15	1	***3600***		0.4	1
Mercury	7439-97-6	2	ug/l	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.07	1	ND	U	0.2	1	ND	U	0.095	1	NA				0.087	J	0.07	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																										
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	NA				NA				NA				516000		700	1	NA				NA								214000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	418000		5000	1	337000		5000	1	520000		700	1	516000		700	1	591000		5000	1	570000		5000	1	223000		700	1	214000		700	1	268000		5000	1	239000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	418000		5000	1	337000		2800	1	520000		700	1	NA				591000		5000	1	575000		2800	1	223000		700	1	NA				268000		5000	1	239000		2800	1
Total Carbon	7440-44-0	NS	ug/l	6700		1000	1	6400		240	1	NA				NA				6000		1000	1	6000		240	1	NA				NA				1900		1000	1	1900		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	283000		10000	1	267000		1800	1	560000		38800	1	628000		19400	1	545000		10000	1	582000		1800	1	263000		9700	1	283000		9700	1	271000		10000	1	278000		1800	1
Total Organic Carbon	TOC	NS	ug/l	NA				NA				6900		500	1	6800		500	1	NA				NA				2700		500	1	2100		500	1	NA				NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	670		100	1	27200		1200	18	10300		200	1	13700		200	1	170		100	1	12400		790	12	7500		200	1	3400		200	1	ND	U	100	1	4500		200	3
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	330		110	1	ND	U	5.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	250	5	ND	U	110	1	ND	U	5.6	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	330		100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	50700		1000	1	44800		48	1	39100		2000	10	50700		4000	20	45700		1000	1	38100		48	1	29200		1000	5	33400		2000	10	33200		1000	1	31200		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	ND	U	5000	1	ND	U	380	1	ND	U	1500	5	ND	U	1500	5	ND	U	5000	1	ND	U	380	1	ND	U	1500	5	3300	J	1500	5	ND	U	5000	1	1900	B	380	1
Sulfide	18496-25-8	5	ug/l	ND	U	2000	1	***1300***	B	280	1	ND	U	54	1	ND	U	**54**	1	ND	U	2000	1	***1300***	B	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	2000	1	ND	U	280	1
Fluoride	16984-48-8	4000	ug/l	340		100	1	290		5.1	1	520		400	5	ND	U	400	5	390		100	1	390		5.1	1	ND	U	400	5	ND	U	400	5	250		100	1	170	B	5.1	1

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved resutls for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

Table 5 - Summary of Attainment Sampling Deep Groundwater Analytical Results 2012 - 2013
AOI-11
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Residential Used Aquifer, TDS >2500 mg/l Groundwater MSC[1]	Location	S-8				S-8				S-8				S-8				S-80D				S-80D				S-80D				S-80D			
			Sample Date	5/24/2012				8/16/2012				11/1/2012				3/29/2013				5/22/2012				8/15/2012				10/26/2012				3/27/2013			
			Sample ID	S-8_52412				S-8_081612				S-8_110112				S-8_32913				S-80D_5-22-12				S-80D_081512				S-80D_102612				S-80D_32713			
			Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																			
1,2,4-Trimethylbenzene	95-63-6	62	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.19	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.19	1
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	ug/l	NA				NA				ND	U	0.015	1	NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	ug/l	ND	U	0.0097	1	ND	U	0.0097	1	ND	U	0.015	1	ND	U	0.011	1	ND	U	0.0097	1	ND	U	0.0098	1	ND	U	0.02	1	ND	U	0.011	1
1,2-Dichloroethane	107-06-2	5	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	5	1	ND	U	0.36	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.36	1
Benzene	71-43-2	5	ug/l	4		0.5	1	***8***		0.5	1	0.58		0.5	1	2.8		0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	0.87	J	0.24	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.24	1
Ethylbenzene	100-41-4	700	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Isopropylbenzene (Cumene)	98-82-8	3500	ug/l	ND	U	0.5	1	0.6	J	0.5	1	ND	U	5	1	ND	U	0.45	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	2	1	ND	U	0.45	1
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4	20	ug/l	***36***		0.5	1	***69***		0.5	1	19.5		1	1	***27.3***		0.16	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.16	1
Toluene	108-88-3	1000	ug/l	ND	U	0.5	1	ND	U	0.5	1	0.6	J	1	1	0.5	J	0.23	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.23	1
Semi-Volatile Organic Compounds																																			
Anthracene	120-12-7	66	ug/l	NA				ND	U	0.09	1	0.087	J	0.1	1	ND	U	0.02	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.02	1
Benzo(A)Anthracene	56-55-3	3.6	ug/l	NA				ND	U	0.09	1	0.19		0.05	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	2	1	ND	U	0.012	1
Benzo(A)Pyrene	50-32-8	0.2	ug/l	NA				ND	U	0.09	1	0.047	J	0.1	1	ND	U	0.012	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1
Benzo(B)Fluoranthene	205-99-2	1.2	ug/l	NA				ND	U	0.09	1	0.1		0.05	1	ND	U	0.01	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.01	1
Benzo(G,H,I)Perylene	191-24-2	0.26	ug/l	NA				ND	U	0.09	1	ND	U	0.1	1	ND	U	0.016	1	NA				ND	U	0.09	1	ND	U	**2**	1	ND	U	0.016	1
Chrysene	218-01-9	1.9	ug/l	ND	U	0.09	1	ND	U	0.09	1	ND	U	0.1	1	ND	U	0.012	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	**2**	1	ND	U	0.012	1
Fluorene	86-73-7	1900	ug/l	ND	U	0.09	1	ND	U	0.09	1	0.062	J	0.1	1	ND	U	0.017	1	ND	U	0.09	1	0.2	J	0.09	1	ND	U	2	1	ND	U	0.017	1
Naphthalene	91-20-3	100	ug/l	0.1	J	0.09	1	ND	U	0.09	1	0.063	J	0.1	1	0.361		0.036	1	ND	U	0.09	1	0.1	J	0.09	1	ND	U	5	1	ND	U	0.036	1
Phenanthrene	85-01-8	1100	ug/l	ND	U	0.09	1	ND	U	0.09	1	0.39		0.05	1	ND	U	0.021	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.021	1
Pyrene	129-00-0	130	ug/l	ND	U	0.09	1	ND	U	0.09	1	0.17		0.1	1	ND	U	0.015	1	ND	U	0.09	1	ND	U	0.09	1	ND	U	2	1	ND	U	0.015	1
2-Hexanone	591-78-6	44	ug/l	NA				NA				NA				NA				NA				NA				NA				NA			
Indeno(1,2,3-C,D)Pyrene	193-39-5	3.6	ug/l	NA				NA				NA				NA				NA				NA				NA				NA			
Metals - Dissolved																																			
Arsenic (Dissolved)	7440-38-2	10	ug/l	ND	U	2	1	ND	U	2	1	ND	U	4	1	2.7	B	0.97	1	ND	U	2	1	ND	U	2	1	ND	U	3	1	ND	U	1.9	2
Cobalt (Dissolved)	7440-48-4	31	ug/l	11.8		5	1	***35.3***		5	1	10.7	B	50	1	26.7	B	0.59	1	ND	U	5	1	ND	U	5	1	ND	U	50	1	ND	U	0.59	1
Iron (Dissolved)	7439-89-6	300	ug/l	***2550***		200	1	***4300***		200	1	***1350***		100	1	***7200***		24	1	***37000***		200	1	***39600***		200	1	***40400***		100	1	***43600***		24	1
Lead (Dissolved)	7439-92-1	5	ug/l	ND	U	1	1	ND	U	1	1	ND	U	5	1	ND	U	1.7	1	ND	U	1	1	ND	U	1	1	ND	U	3	1	1.7	B	1.7	1
Manganese (Dissolved)	7439-96-5	300	ug/l	***1380***		5	1	***2710***		5	1	***1340***		15	1	***2010***		0.4	1	***10300***		5	1	***10400***		10	2	***10200***		30	2	***11100***		0.8	2
Mercury (Dissolved)	7439-97-6	2	ug/l	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1	NA				ND	U	0.2	1	ND	U	0.2	1	ND	U	0.095	1
Metals - Total																																			
Arsenic	7440-38-2	10	ug/l	3.2		0.95	1	4		0.4	1	6.6		4	1	1.5	B	0.97	1	ND	U	0.95	1	ND	U	0.4	1	ND	U	3	1	ND	U	1.9	2
Cobalt	7440-48-4	31	ug/l	12.9		0.62	1	***39.7***		0.66	1	***78.9***		50	1	7.6	B	0.59	1	ND	U	0.62	1	0.98	J	0.66	1	ND	U	50	1	ND	U	0.59	1
Iron	7439-89-6	300	ug/l	***9080***		14.1	1	***12900***		33.3	1	***52500***		100	1	***3220***		24	1	***39300***		14.1	1	***40500***		33.3	1	***40400***		100	1	***44500***		24	1
Lead	7439-92-1	5	ug/l	3.3		0.08	1	***10.5***		0.034	1	***225***		5	1	***10.2***		1.7	1	0.17	J	0.08	1	0.041	J	0.034	1	ND	U	3	1	ND	U	1.7	1
Manganese	7439-96-5	300	ug/l	***1380***		0.44	1	***2990***		0.83	1	***2680***		15	1	***633***		0.4	1	***10400***		0.44	1	***10400***		1.7	2	***10500***		30	2	***11100***		0.8	2
Mercury	7439-97-6	2	ug/l	NA				0.049	J	0.0081	1	0.16	B	0.2	1	ND	U	0.095	1	NA				0.047	J	0.0081	1	ND	U	0.2	1	ND	U	0.095	1
General Chemistry																																			
Alkalinity To Ph 4.5	ALK4.5	NS	ug/l CaCO3	146000		700	1	173000		700	1	NA				NA				144000		700	1	139000		700	1	NA				NA			
Alkalinity To Ph 8.3	ALK8.3	NS	ug/l CaCO3	ND	U	700	1	ND	U	700	1	NA				NA				ND	U	700	1	ND	U	700	1	NA				NA			
Alkalinity, Bicarbonate (As Caco3)	ALKB	NS	ug/l CaCO3	146000		700	1	173000		700	1	113000		5000	1	179000		5000	1	144000		700	1	139000		700	1	137000		5000	1	149000		5000	1
Alkalinity, Total (As Caco3)	ALK	NS	ug/l CaCO3	NA				NA				113000		5000	1	180000		2800	1	NA				NA				137000		5000	1	149000		1400	1
Total Carbon	7440-44-0	NS	ug/l	NA				NA				6200		1000	1	4800		240	1	NA				NA				NA				4600		240	1
Total Dissolved Solids (Residue, Filterable)	TDS	NS	ug/l	231000		9700	1	268000		9700	1	175000		10000	1	221000		1800	1	924000		38800	1	940000		38800	1	818000		10000	1	901000		1800	1
Total Organic Carbon	TOC	NS	ug/l	8600		500	1	10500		500	1	NA				NA				4000		500	1	4300		500	1	4000		1000	1	NA			
Nitrogen, Ammonia (As N)	7664-41-7	30000	ug/l	750		200	1	ND	U	200	1	320		100	1	3300		130	2	ND	U	200	1	ND	U	200	1	200		200	1	320		66	1
Nitrogen, Nitrate (As N)	14797-55-8	10000	ug/l	ND	U	250	5	ND	U	250	5	410		110	1	770		6.6	1	ND	U	250	5	ND	U	250	5	ND	U	110	1	ND	U	5.6	1
Nitrogen, Nitrate-Nitrite	NO3NO2N	NS	ug/l	NA				NA				410		100	1	940		4.6	1	NA				NA				ND	U	100	1	ND	U	4.6	1
Nitrogen, Nitrite	14797-65-0	1000	ug/l	ND	U	400	5	ND	U	400	5	ND	U	10	1	170		2	2	ND	U	400	5	ND	U	400	5	ND	U	10	1	ND	U	1	1
Chloride (As Cl)	16887-00-6	NS	ug/l	32600		2000	10	40400		2000	10	28700		1000	1	10600		48	1	60000		10000	50	72100		10000	50	68800		2000	1	70700		48	1
Sulfate (As So4)	14808-79-8	NS	ug/l	12600		1500	5	4500	J	1500	5	12400		5000	1	7400	B	380	1	412000		15000	50	426000		15000	50	430000		20000	2	433000		750	2
Sulfide	18496-25-8	5	ug/l	ND	U	**54**	1	ND	U	54	1	ND	U	2000	1	ND	U	280	1	ND	U	**54**	1	ND	U	**54**	1	ND	U	**2000**	1	***480***	B	280	1
Fluoride	16984-48-8	4000	ug/l	ND	U	400	5	580		400	5	260		100	1	170	B	5.1	1	ND	U	400	5	ND	U	400	5	ND	U	200	1	34	B	5.1	1

Notes:
[1]PADEP Non-Residential Used Aquifer TDS less than or equal to 2500 mg/l groundwater MSC (last updated January 2011).
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
MSC - Medium Specific Concentration
RSL - Regional Screening Level
TDS - Total Dissolved Solids
Q - Qualifier
DL - Detection Limit (Limit may be either the method detection limit or the reporting limit)
DF - Dilution Factor
ug/l - micrograms per liter
mg/l - milligram per liter
NS - No Standard
NA - Not Analyzed
ND - Not Detected
The metals criteria are intended for total metals but are included with the dissolved results for reference.
Results are only screened against the EPA RSL if the PADEP MSC is exceeded.
Results for Iron and Dissolved Iron were screened against the EPA Secondary Maximum Containment Level

Qualifiers:
J - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate.
U - Compound analyzed but not detected.
B - Compound was detected in method blank. (Organics Only)
B - Compound analyzed but not detected above the reporting limit. Result should be considered an estimate. (Inorganics Only)

Exceedences:
25 - Result exceeds the PADEP groundwater MSC.
25 - Result exceeds the PADEP groundwater MSC and the EPA Tapwater RSL.

TABLE 6

REGIONAL WIDE GROUNDWATER CHEMISTRY

1991-2013

PES Facility

Compound	Iron (dissolved)	Manganese (dissolved)	Sulfate	TDS	Ammonia	Nitrate/ Nitrite	Alkalinity	Chloride	Fluoride	Sulfide	TOC
Units	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**	**ug/l**
USGS Average (1991)	17,000	1,700	161,000	778,000	2,100	NA	NA	NA	NA	NA	NA
ENSR Average (1994)	33,150	2,100	NA	908,000	2,100	3,200	NA	NA	NA	NA	NA
Langan Average (2012-2013)	24,736	2,110	163,986	610,013	9,022	96	310,362	73,001	193	162	10,096
USGS Range (1991)	0 - 220,000	0 - 31,000	0.9 - 2,200,000	90 - 4,480,000	NA	NA	NA	NA	NA	NA	NA
ENSR Range (1994)	NA	NA	ND - 2,910,000	176,000 - 4,550,000	100 - 99,200	500 - 9,800	71,000 - 1,025,000	18,000 - 118,000	100 - 530	ND - 5,610	3,000 - 37,000
Langan Range (2012-2013)	100* - 453,000	5* – 14,200	ND - 4,500,000	41,300 – 6,400,000	ND - 95,700	ND - 1,500	ND - 1,210,000	2,500 - 1,000,000	ND - 1,600	ND – 1,900	ND - 53,600

**Note: low values for dissolved iron and manganese were modified to lab detection limits due to high observed detection limits.*

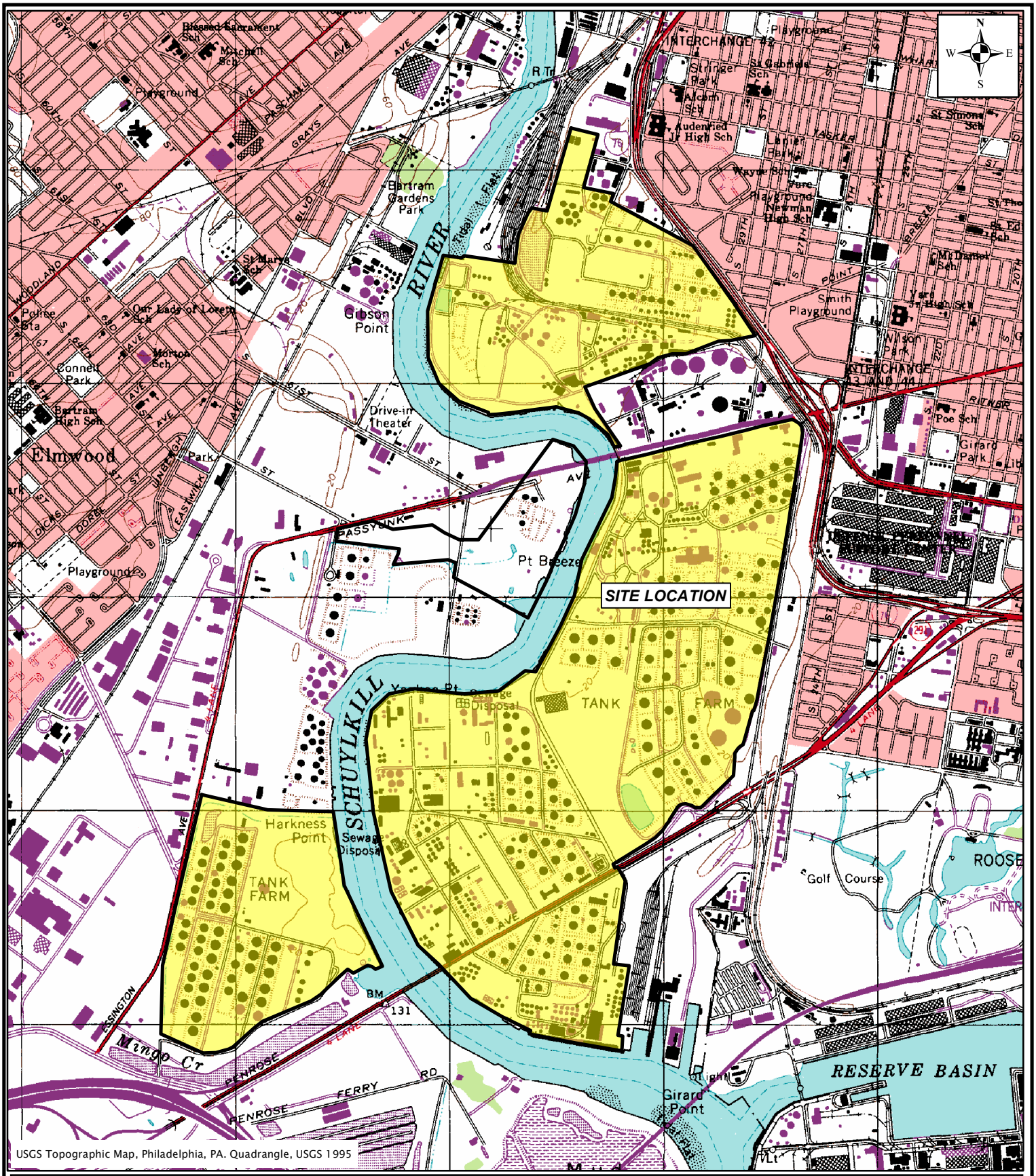
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FIGURES



SUNOCO

PHILADELPHIA ENERGY SOLUTIONS

Sunoco, Inc. (R&M) PES Facility

3144 Passyunk Avenue
Philadelphia, PA. 19145

Figure 1: Site Location Map
AOI-11 Final Report
PES Facility

Philadelphia Pennsylvania

Job Number	Scale: 1" = 2000'	Date
2574601	0 1,000 2,000 Feet	June 14, 2013

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 11 SCR\Final Report 2013\Figure 1- Site Location Map_6-14-13.mxd

AOI-8

Belmont Terminal

AOI-2

AOI-1

AOI -10

AOI -11

SCHUYLKILL RIVER

AOI-3

AOI-4

AOI-7

AOI-6

AOI-9

AOI-5

bing

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

Legend

AOI-11: Deep (Lower Sand) Aquifer

- AOI-1: Belmont Terminal/No.1 Tank Farm/No.2 Tank Farm
- AOI-2: Point Breeze Processing Area
- AOI-3: Impoundment Area
- AOI-4: No. 4 Tank Farm Area
- AOI-5: Girard Point South Tank Field Area
- AOI-6: Girard Point Chemical Processing Area
- AOI-7: Girard Point Fuels Processing Area
- AOI-8: Point Breeze Process Area North Yard
- AOI-9: Schuylkill River Tank Farm
- AOI -10: Point Breeze Processing Area West Yard

N W E S

Figure 2: Area of Interest Site Plan
AOI-11 Final Report
PES Facility
Philadelphia, Pennsylvania

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Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 500 1,000 Feet

SCALE: 1" = 500'
DATE: June 14, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

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N-4
N-9
N-13
N-38D
N-19
N-21
AOI-8
N-27
N-30
N-44D
N-46D
N-50D
S-294D
S-72D
S-80D
AOI-2
AOI-1
AOI -10
S-302D
S-46D
S-305D
S-59D
S-264D
S-280D
S-119D
C-129D
AOI-3
AOI-4
S-284D
C-65D
C-144D
S-69D
BF-108
C-50D
S-38D
S-38D2
AOI-7
BF-90D
S-13
S-22
S-8
S-6
C-134D
AOI-6
B-48D
A-19D
S-76D SRTF
AOI-9
B-134D
B-133D
S-74D2 SRTF
S-74D1 SRTF
B-132D
AOI-5
A-21D
A-13D
S-120D SRTF
S-106D SRTF

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

PENNSYLVANIA

Approximate Site Location

Legend

- Deep Monitoring Well
- Damaged/Abandoned/Unable to Locate Monitoring Well
- AOIs

Figure 3 - Deep Monitoring Well Location Plan
AOI-11 Final Report
PES Facility
Philadelphia, Pennsylvania

SUNOCO
PHILADELPHIA ENERGY SOLUTIONS

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 250 500 1,000 Feet

SCALE: 1" = 500'
DATE: June 14, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 11 SCRI\Final Report 2013\Figure 3 - Deep MW Location Plan_6-24-13.mxd

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AOI-8
AOI -10
AOI-2
AOI-1
AOI-3
AOI-4
AOI-7
AOI-6
AOI-5
AOI-9

N-4 6.18
N-9 4.40
N-13 6.40
N-38D 0.49
N-19 2.27
N-21 3.43
N-27 1.91
N-30
N-44D 3.76
N-46D
N-50D 4.66
S-294D 4.27
S-72D 1.62
S-80D 1.33
S-302D 1.00
S-305D 0.04
S-46D -6.53
S-59D 0.34
S-264D -0.09
S-280D -0.20
S-119D -0.23
C-129D -1.23
S-284D -0.20
C-65D
C-144D -4.80
S-69D -0.89
BF-108 -0.73
C-50D -0.83
S-38D -1.14
S-38D2 -1.17
BF-90D -0.77
S-13 -1.69
S-22 -1.53
S-8 -2.74
S-6
C-134D -2.41
B-48D -2.51
A-19D -3.87
S-76D SRTF -8.17
B-134D -4.09
B-133D -2.58
S-74D2 SRTF -5.94
S-74D1 SRTF -8.56
B-132D -6.45
A-21D -6.73
A-13D -3.37
S-120D SRTF -8.80
S-106D SRTF -8.93

6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6 -7 -8

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Wells gauged by Aquaterra, March 2013.
3. Wells S-46D and S-74D1 SRTF were omitted from contouring.

PENNSYLVANIA

Approximate Site Location

Legend

- Deep Monitoring Well
- Damaged/Abandoned/Unable to Locate Monitoring Well
- Groundwater Elevation Contour (ft amsl) (dashed where inferred)
- AOIs

Figure 4 - Deep Groundwater Elevation Contour Plan
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Philadelphia, Pennsylvania

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Philadelphia, PA.
19145

0 500 1,000 Feet

SCALE: 1" = 500'
DATE: June 14, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\PIT\data\P2574601\Arc\GIS\MapDocuments\AOI 11 SCRFinal Report 2013\Figure 4 - Deep Groundwater Contours March 2013_6-24-13.mxd

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N-4

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/15/2008 Result (ug/L)	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/17/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)									
Benzene	5	**ND**	**5**	ND	ND	ND	1	ND	ND

N-9

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/16/2008 Result (ug/L)	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	**8**	ND	ND	ND	ND	ND	ND

N-21

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/23/2008 Result (ug/L)	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	**16**	**20**	**110**	**110**	**110**	**97.8**	**124**

N-44D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/25/2008 Result (ug/L)	4/5/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	**6**	**10**	**7**	**7**	**9**	**9**	**6.7**

N-50D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/23/2008 Result (ug/L)	4/5/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzo(A)pyrene	0.2	NA	NA	NA	NA	**0.4 J**	**0.54**	**0.508**
Benzo(G,H,I)perylene	0.26	NA	NA	NA	NA	**0.3 J**	**0.41**	**0.398**
Chrysene	1.9	ND	**2**	**5**	**2**	0.4 J	0.68	0.553

S-46D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/15/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)							
Benzene	5	ND	ND	ND	ND	**24.3**	**17**
Methyl Tertiary Butyl Ether	20	1	2	1	1	**29.7**	**33.3**

S-294D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/23/2010 Result (ug/L)	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/26/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
1,2,4-Trimethylbenzene	62	15	ND	ND	3	ND	ND	**96**
Benzene	5	ND	ND	ND	ND	ND	ND	**88.6**
Semi-Volatile Organic Compounds (SVOCs)								
Benzo(A)Pyrene	100	NA	NA	NA	NA	0.1	ND	**0.282**
Naphthalene	100	**140**	ND	ND	48	0.4	20.6	**521**

BF-108

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/22/2010 Result (ug/L)	4/7/2011 Result (ug/L)	7/5/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/1/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Methyl Tertiary Butyl Ether	20	**120**	**55**	ND	**110**	**83**	**86.4**	**73.7**

S-38D2

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	5/3/2010 Result (ug/L)	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/25/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	ND	ND	**110**	**43**	**60**	**12.7**	**106**

S-22

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/16/2010 Result (ug/L)	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	6/1/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/25/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	**6**	**20**	**28**	**20**	**15**	**13.2**	**18.6**
Methyl Tertiary Butyl Ether	20	**48**	**75**	**49**	**56**	**60**	**72.3**	**67**

S-8

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	7/21/2010 Result (ug/L)	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Benzene	5	ND	0.5	ND	4	**8**	0.58	2.8
Methyl Tertiary Butyl Ether	20	1	**30**	8	**36**	**69**	19.5	**27.3**

S-13

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)					
Methyl Tertiary Butyl Ether	20	**33**	**42**	**47.4**	**47.6**

A-19D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/11/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)							
Methyl Tertiary Butyl Ether	20	**43**	**40**	**64**	**53**	**49.8**	**56.7**

S-120DSRTF

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	8/12/2009 Result (ug/L)	4/8/2011 Result (ug/L)	6/30/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Methyl Tertiary Butyl Ether	20	**21**	**37**	**30**	**36**	**39**	**42.9**	**47.1**

S-106DSRTF

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	8/12/2009 Result (ug/L)	4/8/2011 Result (ug/L)	6/30/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/20/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Volatile Organic Compounds (VOCs)								
Methyl Tertiary Butyl Ether	20	**98**	**300**	**260**	**100**	**87**	**89.3**	**55.6**

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

PENNSYLVANIA

Approximate Site Location

Legend

- BF-108 — Deep Groundwater Monitoring Well with no exceedances of PADEP Non-Res groundwater MSC's (March-April 2013)
- S-294D — Deep Groundwater Monitoring Well with exceedances of PADEP Non-Res groundwater MSC's (March-April 2013)
- S-6 — Abandoned or Damaged Monitoring Well
- Deep Groundwater Contours (Dashed Where Inferred) (March 2013)
- 98 — Exceedance of PADEP Non-Res groundwater MSC's
- Area of Interest (AOI)
- 55.6 — Attainment Events Occuring Between May 2012 to March 2013

Figure 5: Summary Volatile and Semi-Volatile Exceedances in Deep Groundwater - 2008 to 2013
AOI-11 Final Report
PES Facility
Philadelphia, Pennsylvania

SUNOCO
PHILADELPHIA ENERGY SOLUTIONS

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 275 550 1,100 Feet

SCALE: 1" = 550'
DATE: June 14, 2013
DRN. BY: MH
CKD. BY: DW
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 11 SCR\Final Report 2013\Figure 5 - Summary of VOC SVOC Exceedances with 2013 Contours_6-24-2013.mxd



N-4

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/27/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/17/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Manganese	300	**2850**	**2750**	**1230**	**1290**	**1950**	**1700**

N-13

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/27/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/21/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Manganese	300	**1370**	**1370**	**1240**	**1080**	**1210**	**897**

N-9

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/5/2011 Result (ug/L)	6/27/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Manganese	300	155	**1810**	**1880**	**2390**	**2110**	**2100**

N-19

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/5/2011 Result (ug/L)	6/27/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/15/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/25/2013 Result (ug/L)
Metals							
Manganese	300	**484**	251	212	254	**388**	282

N-21

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Cobalt	31	**36.1**	**228**	**211**	**211**	**151**	**191**
Manganese	300	**606**	**4830**	**4760**	**4240**	**3220**	**3940**
Arsenic	10	4.3	**54**	**34.9**	**34.2**	**14.4**	**19.2**

N-27

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/5/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Manganese	300	**5930**	**5850**	**5670**	**5450**	**5800**	**5890**

N-38D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Manganese	300	**356**	**340**	**347**	**334**	**353**	**365**

N-44D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/5/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Arsenic	10	**55.1**	**62.2**	**41.5**	**45.4**	**51.8**	**56.7**
Manganese	300	**486**	**605**	**645**	**584**	**639**	**691**

N-50D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/5/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Manganese	300	**1000**	**588**	**869**	**436**	54.6	**634**

S-72D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	**7.1**	ND
Manganese	300	**4020**	**3770**	**3840**	**3890**	**3450**	**3690**

S-294D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/26/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Manganese	300	**8210**	**8390**	**8730**	**8740**	**7930**	**485**

S-80D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/22/2012 Result (ug/L)	8/15/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Manganese	300	**11800**	**11900**	**10300**	**10400**	**10200**	**11100**

S-302D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	**5.5**	5
Manganese	300	**4140**	**3930**	**4020**	**4030**	**3720**	**4070**

S-46D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/15/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Arsenic	10	**34.6**	**11.1**	**22.9**	**16.5**	7.6	5.7
Manganese	300	**16400**	**20500**	**14200**	**14000**	**1350**	**1560**

S-305D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Arsenic	10	**39.6**	**51.9**	6.6	**66.2**	**293**	**103**
Lead	5	ND	ND	ND	ND	**7.4**	ND
Manganese	300	**1840**	**2160**	**2030**	**1920**	**1850**	**1290**

S-59D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Arsenic	10	**13.3**	**13.2**	**12.5**	**16.6**	**34.6**	**33.1**
Manganese	300	**2910**	**2440**	**2430**	**2120**	**1980**	**1950**

S-280D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Manganese	300	**694**	**661**	**464**	**974**	231	**726**

S-264

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/6/2011 Result (ug/L)	6/28/2011 Result (ug/L)	5/23/2012 Result (ug/L)	8/15/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/26/2013 Result (ug/L)
Metals							
Cobalt	31	29	**35.7**	**34.5**	24.6	ND	23.5
Manganese	300	**7420**	**8580**	**7200**	**7700**	**7220**	**6070**

C-129D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/1/2012 Result (ug/L)	4/2/2013 Result (ug/L)
Metals							
Manganese	300	ND	ND	ND	ND	ND	**1500**

S-284D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/25/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Manganese	300	**979**	**922**	**633**	**974**	**931**	**737**

S-69D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/17/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Manganese	300	**2940**	**2730**	**3260**	**2380**	**1480**	**3360**

BF-108

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/1/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Manganese	300	**1070**	262	**792**	**881**	**872**	**982**

S-38D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/25/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	**12.9**	ND	ND	ND
Manganese	300	ND	**430**	273	272	242	237

C-144D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/5/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/1/2012 Result (ug/L)	4/2/2013 Result (ug/L)
Metals							
Manganese	300	**2890**	**1490**	**1570**	**1170**	**1450**	84.9

S-38D2

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	10/25/2012 Result (ug/L)	3/25/2013 Result (ug/L)
Metals						
Manganese	300	**6730**	**6410**	**7270**	**10300**	**7970**

C-50D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/5/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/2/2012 Result (ug/L)	4/2/2013 Result (ug/L)
Metals							
Arsenic	300	2.8	5.4	ND	ND	2.5	**17.2**
Manganese	10	**2890**	**2970**	**3320**	**2940**	**1740**	**3310**

BF-90D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	7/5/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/17/2012 Result (ug/L)	10/26/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**5.2**
Manganese	300	167	**351**	ND	16.1	142	179

S-13

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals					
Lead	5	ND	1.3	ND	**5.3**
Manganese	300	464	442	615	**504**

B-134D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/2/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**6.6**
Manganese	300	229	235	227	**371**	293	219

S-8

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/7/2011 Result (ug/L)	6/29/2011 Result (ug/L)	5/24/2012 Result (ug/L)	8/16/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Cobalt	31	ND	ND	11.8	**35.3**	10.7	26.7
Manganese	300	**1140**	**368**	**1380**	**2710**	**1340**	**2010**

B-132D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/11/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**6.4**

A-19D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/11/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	10/26/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Arsenic	10	**11.4**	5.2	7.6	5.5	**15.9**	**22.7**
Lead	5	ND	ND	ND	ND	ND	**7.2**
Manganese	300	**3480**	**3130**	**2670**	**2860**	**2550**	**2680**

S-76DSRTF

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	6/30/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/20/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Manganese	300	**3900**	**3540**	**3550**	**3630**	**3310**	**3420**

B-48D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/1/2011 Result (ug/L)	6/1/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/2/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Lead	5	ND	0.96	ND	ND	ND	**5.2**
Manganese	300	**2050**	**1890**	**1960**	**1830**	**2490**	**2110**

C-134D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/2/2012 Result (ug/L)	4/1/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**6**
Manganese	300	ND	ND	**778**	**660**	**1360**	**711**

B-133D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/31/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/2/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**6**

A-13D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/11/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/27/2013 Result (ug/L)
Metals							
Manganese	300	**709**	**621**	**402**	**355**	187	**362**

S-120DSRTF

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	6/30/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/20/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Manganese	300	**1720**	**1710**	**1590**	**1510**	**1650**	**1490**

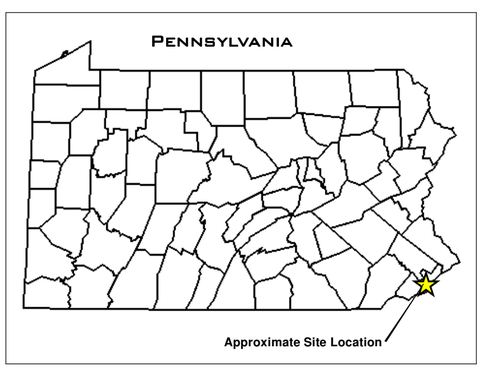
A-21D

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/11/2011 Result (ug/L)	7/1/2011 Result (ug/L)	5/30/2012 Result (ug/L)	8/21/2012 Result (ug/L)	11/1/2012 Result (ug/L)	3/29/2013 Result (ug/L)
Metals							
Lead	5	ND	ND	ND	ND	ND	**7.6**
Manganese	300	**708**	**611**	**787**	**608**	**669**	**634**

S-106DSRTF

Chemical Name	PADEP Non-Residential Used Aquifer MSC for Groundwater TDS<2,500	4/8/2011 Result (ug/L)	6/30/2011 Result (ug/L)	5/29/2012 Result (ug/L)	8/20/2012 Result (ug/L)	10/31/2012 Result (ug/L)	3/28/2013 Result (ug/L)
Metals							
Manganese	300	**1030**	**913**	**873**	**778**	**719**	**607**

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Results based on dissolved metal values.



Legend

- BF-108 — Deep Groundwater Monitoring Well with no exceedances of PADEP Non-Res groundwater MSC's (March-April 2013)
- BF-108 — Deep Groundwater Monitoring Well with exceedances of PADEP Non-Res groundwater MSC's (March-April 2013)
- S-6 — Abandoned or Damaged Monitoring Well
- Deep Groundwater Contours (Dashed Where Inferred) (March 2013)
- 913 — Exceedance of PADEP Non-Res groundwater MSC's
- Area of Interest (AOI)
- 607 — Attainment Events Occuring Between May 2012 to March 2013

Figure 6: Summary of Metal Exceedances in Deep Groundwater - 2008 to 2013
AOI-11 Final Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 325 650 1,300 Feet

SCALE: 1" = 650'
DATE: June 14, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 11 SCR\Final Report 2013\Figure 6 - Summary of Metal Exceedances in GW with 2013 Contours_6-24-13.mxd