FIFTH FIVE-YEAR REVIEW REPORT FOR ENTERPRISE AVENUE SUPERFUND SITE PHILADELPHIA COUNTY, PENNSYLVANIA

FEBRUARY 2017

Prepared by

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Region 3
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FEB 24 2017

Date

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I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Enterprise Avenue Superfund site (the Site). The triggering action for this policy review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This FYR evaluates the protectiveness of the Selected Remedy addressing the stock piled soil as described in the 1984 Record of Decision (ROD).

The FYR was led by representatives from the EPA Region 3, with assistance provided by an EPA contractor, the Pennsylvania Department of Environmental Protection (PADEP), and Philadelphia Division of Aviation (DOA) staff. The review began on April 14, 2016.

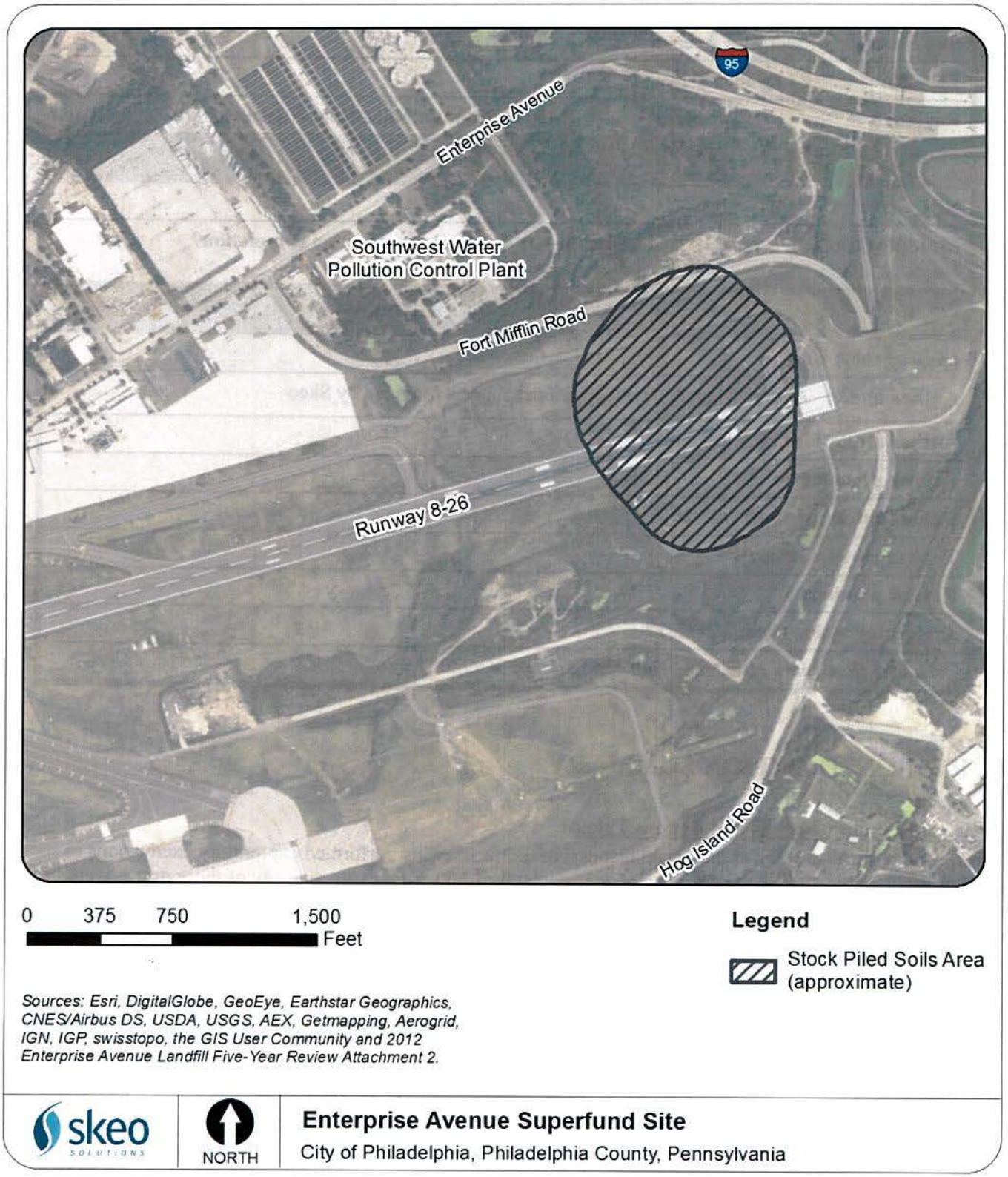
Site Background

The Site consists of approximately 57 acres of land at the Philadelphia International Airport in Philadelphia, Pennsylvania that was utilized by the City of Philadelphia (the City) for disposal of incinerator residue and fly ash between 1971 and 1976 (see Figure 1 and Appendix C). Also during that time period, drums containing industrial and chemical hazardous wastes were illegally disposed of at the Site by other unknown parties. Runway 8-26 was later constructed on top of a portion of the Site. This runway is primarily used for commuter flights.

LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
DOA	Philadelphia Division of Aviation
EPA	United States Environmental Protection Agency
FAA	United States Federal Aviation Administration
FONSI	Finding of No Significant Impact
FYR	Five-Year Review
IC	Institutional Control
KIA	Key Indicator Analysis
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
PWD	Philadelphia Water Department
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
SSA	Sole Source Aquifer
TCE	Trichloroethylene
VOC	Volatile Organic Compound

Figure 1: Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

Site Name: Enterprise Avenue		
EPA ID: PAD980552913		
Region: 3	**State:** PA	**City/County:** Philadelphia/Philadelphia
NPL Status: Deleted		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
Lead agency: EPA		
Author name: Andrew Haneiko, with additional support provided by Skeo		
Author affiliation: EPA Region 3		
Review period: 4/14/2016 – 3/26/2017		
Date of site inspection: 7/20/2016		
Type of review: Policy		
Review number: 5		
Triggering action date: 3/26/2012		
Due date *(five years after triggering action date)*: 3/26/2017		

II. RESPONSE ACTION SUMMARY

Basis for Response Actions and Actions Taken

In response to the discovery of the illegal disposal of drums, the City performed exploratory excavations in January 1979 and identified the presence of approximately 1,700 drums. The majority of these drums were broken and fragmented. Based on the results of soil and waste sample analytical data, the drums contained paint sludges, solvents, oils, resins, metal finishing waste, and solid inorganic wastes. The City performed initial response actions in 1982, including excavation of all contaminated soil and buried drums; offsite disposal of all drummed waste material; offsite disposal of about 226,000 gallons of contaminated water; and offsite disposal of 21,350 tons of contaminated soils. An additional 17,800 tons of contaminated soils were staged on the Site in two stockpiles following the initial response action by the City. Appendix B provides a chronology of activities at the Site.

The onsite soil stockpiles were contaminated with organic compounds. The larger pile, consisting of 11,700 tons, was contaminated primarily with trichloroethylene (TCE), tetrachloroethylene (PCE) and 1,1,1-trichloroethane. The smaller pile, consisting of 6,100 tons, was contaminated primarily with toluene, benzene and ethylbenzene. EPA identified a potential unacceptable risk to human health via direct contact (dermal contact, ingestion or inhalation) for the contaminated soil stockpiles. In addition, EPA identified a potential unacceptable risk to the environment if contaminants from the soil stockpiles leached into the groundwater.

EPA listed the Site on the National Priorities List (NPL) on September 8, 1983. EPA signed a ROD on May 10, 1984 to document the Selected Remedy and address the contaminated soil stockpiles. The Selected Remedy in the 1984 ROD consisted of the following components:

- Resampling and analysis of the stockpiled soils in 100-cubic-yard lots for key indicator parameters;
- Onsite containment of soils that do not exceed established parameter limits;
- Offsite disposal of soils that exceed established parameter limits at a Resource Conservation and Recovery Act (RCRA) approved facility;
- Grading, completion of a clay cap and cover, and vegetation of the Site.

The 1984 ROD generally described the objective of the remedy but did not provide specific remedial action objectives (RAOs). The general objective of the 1984 ROD was to "provide adequate protection of public health, welfare, and the environment." The 1984 ROD stated that the Selected Remedy "effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, and the environment."

The 1984 ROD established a key indicator analysis (KIA) to determine whether each 100-cubic-yard soil lot could remain onsite (see Table 1). Limits for organics were based on 75 times the maximum background level. The limits for metals were based on the Extraction Procedure Toxicity Test. If any of the limits in Table 1 were exceeded in a 100-cubic-yard soil lot, the lot was sent offsite for disposal at an approved RCRA landfill. If the limits were not exceeded, the soil lot remained onsite.

Table 1: Soil Cleanup Goals

Soil Contaminant	ROD Cleanup Goal (milligrams per kilogram)
Total organic halogens	25
Benzene	12
Toluene	15
Ethylbenzene	15
Arsenic	5
Barium	100
Cadmium	1
Chromium	5
Lead	5
Mercury	0.2
Selenium	1
Silver	5

The 1984 ROD stated that contamination at the Site was limited to the soil stockpiles. Therefore, the Selected Remedy addressed the stockpiled soils only. Results of groundwater and surface water sampling at that time did not indicate an impact to these media from the Site and no response actions were selected for surface water or groundwater. The 1984 ROD stated that a low-permeability layer consisting of silty clay, found under the Site, generally restricts contaminant movement into the deep water-bearing zone. However, the 1984 ROD recognized the potential for contaminants to leach into the deep water-bearing zone. The potential impact to that zone was expected to be mitigated by the Selected Remedy.

Status of Implementation

The City implemented the Selected Remedy from August 1984 through March 1985. In accordance with the 1984 ROD, the contaminated soils were sampled for key indicator parameters (see Table 1). Soils exceeding any key indicator parameter were sent offsite for disposal at an approved RCRA landfill. Soils not exceeding any key indicator parameters remained onsite. The portion of each soil stockpile that remained onsite was graded, covered with 9 to 12 inches of clay, covered with topsoil and seeded. The soil stockpiles that remained onsite and were capped are hereinafter referred to as the "capped area". The area where drums and other waste were disposed illegally is hereinafter referred to as the "former landfill". EPA deleted the Site from the NPL on March 7, 1986.

Additional Response Actions

Additional response actions were taken at the Site after its deletion from the NPL but were not components of the Selected Remedy. Therefore, the following response actions are not included in this FYR's protectiveness determination and are summarized below for informational purposes.

In 1986 and 1987, the City monitored the groundwater from nine wells along the perimeter of the former landfill as a requirement by the Pennsylvania Department of Environmental Resources (PADER, now the PADEP). Several volatile organic compounds (VOCs) were detected above Maximum Contaminant Levels (MCLs) at that time.

For a short period of time in the late 1980's, the Philadelphia Water Department (PWD) used the Site as a staging area for a sludge-to-compost project. PADER required the removal of the sludge in 1990 and the former landfill was subsequently regraded with an additional two to three feet of soil.

In 1994, the City received approval from the U.S. Federal Aviation Administration (FAA) for construction of a 5,000-foot-long commuter runway, Runway 8-26, part of which would be located over the capped area and former landfill. In order for the City to obtain federal funding for this project, EPA conducted an environmental review in accordance with the National Environmental Policy Act (NEPA). Additionally, because the project is located within the recharge zone boundaries of a designated Sole Source Aquifer (SSA) by the Safe Drinking Water Act (42 U.S.C. § 300h-2), EPA evaluated the groundwater impacts from this project.

As a result of the NEPA review, special conditions were established and EPA supported a Mitigated Finding of No Significant Impact (FONSI) in a letter dated September 16, 1994 to FAA, primarily to prevent potential impacts to the SSA. The special conditions in the Mitigated FONSI included provisions to: 1) dewater the former landfill, 2) cap the former landfill, and 3) develop a groundwater mitigation and monitoring plan.

The City dewatered the former landfill and installed a geosynthetic cap in September 1997. To dewater the former landfill, 150 extraction wells were installed and approximately seven million gallons of water were removed and discharged to the PWD Southwest Water Pollution Control Plant. During this period of time, the City installed a 30-foot high surcharge pile to accelerate the natural compaction of the soil and allow for the timely completion of Runway 8-26. The former landfill currently sits beneath a clay cap, a geosynthetic cap, approximately 30 feet of fill material and an airport runway. Groundwater monitoring was also required prior to, during, and after construction of the runway, from 1994 through 1999. Monitoring well locations are shown on Figure H-1 in Appendix H.

During the construction of the runway, the City identified two separate areas with elevated levels of benzene and VOCs adjacent to the former landfill. As a result, over 500 tons of soil were excavated from two separate areas and disposed offsite based on the Pennsylvania Land Recycling and Environmental Remediation Standards Act (PA Act 2) soil cleanup criteria for benzene of 800 µg/kg.

Additionally, groundwater contamination was identified during the above actions. Groundwater remediation and monitoring is currently being conducted in accordance with a June 5, 2002 Administrative Order on Consent for Removal Action (Docket Number III-2001-0007-DC) between the City and EPA. The City agreed to continue extraction and treatment of contaminated groundwater until the groundwater is restored to MCLs. At the City's

request, EPA modified the AOC in 2008 to allow the groundwater treatment system to be shut down for an evaluation of monitored natural attenuation (MNA) to address contaminated groundwater. The groundwater treatment system has remained shut down since September 2008 and the evaluation of MNA and alternative remedial technologies is currently ongoing. Groundwater monitoring data is included in Appendix H for reference purposes.

Institutional Control Review

The 1984 ROD did not require institutional controls (ICs) at the Site. However, restrictions are in place at the airport that help ensure the long-term protectiveness of the Selected Remedy. The first restriction is zoning. Currently, the Enterprise Avenue Site is zoned, "Least Restricted Industrial District" limiting the Site to industrial activities. (see The Philadelphia Code § 14-509(1)(a-u)) The prohibited uses include hotels, libraries, and public museums. (see The Philadelphia Code § 14-509(2)(a-d)) In 2012 the City re-zoned all of the Philadelphia International Airport including Runway 8-26 for "Airport Use" only. If there is a use change, Philadelphia City Council would have to approve an ordinance to re-zone the Philadelphia International Airport. The second restriction deals with funding. If the airport property is not used for airport purposes the federal funds provided from the Secretary of Transportation to the City would need to be returned to the federal government. (see 49 U.S.C. § 47107(c)(2)(B)(I) & (iii) and 49 U.S.C.§ 47107(d)). See Figure 2.

Considering that an excess of thirty feet of soil was placed onto the capped area and former landfill to accommodate adequate runway slope as well as the existing and reasonably expected future land use of the airport, EPA believes that no additional ICs are needed at the Site to ensure the long-term protectiveness of the Selected Remedy.

Figure 2: Institutional Control Map

Operation & Maintenance

The 1984 ROD stated that the City would assume full responsibility for operation and maintenance (O&M) of the remedy, including inspection of the Site and maintenance of the vegetated cover. As required by FAA regulations, the runway area over the capped area and former landfill is maintained by regular mowing as well as by filling and grading of surface holes made by wildlife. The portion of the capped area adjacent to and under Fort Mifflin Road is mowed as part of regular roadway maintenance. The northern edge of the capped area, which is on the wastewater treatment plant area, is maintained by the City; wastewater treatment plant employees visually monitor that area on a regular basis.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the previous FYR and the current status of those recommendations.

Table 2: Protectiveness Determination from the 2012 FYR

Protectiveness Determination	Protectiveness Statement
Protective	The remedy is protective of human health and the environment. The remedial action specified in the 1984 Record of Decision was successfully implemented and has eliminated exposure to contaminated soils at the site.

There were no issues and recommendations identified in the previous FYR.

IV. FIVE-YEAR REVIEW PROCESS

Appendix A lists documents reviewed during this FYR.

Community Notification, Involvement & Site Interviews

A public notice was made available by placing an ad in the Delaware County Daily Times, January 20, 2017, stating that a FYR was underway and inviting the public to submit any comments to EPA. Appendix D provides a copy of the public notice. This Report will be made available at the Site's information repository, located at EPA Region 3, 1650 Arch Street, Philadelphia, PA 19103-2029, and online at www.epa.gov/superfund/search-superfund-five-year-reviews.

During the FYR process, interviews were conducted with the Philadelphia International Airport Planning and Environmental Services Manager and the PWD Wastewater Treatment Plant Manager to document any perceived problems or successes with the remedy that has been implemented to date. The results of these interviews are summarized below. Appendix G provides the interview forms.

- Philadelphia Airport's Planning and Environmental Services Manager is satisfied with the cleanup project. The Airport continues to sample monitoring wells in accordance with the modified AOC. The Airport has regular communication with EPA.
- The Wastewater Treatment Plants Manager and Assistant Manager are aware of the Site. The PWD erected a guardrail and fence 3-4 years ago to prevent trespassing and illegal dumping.

Data Review

There is no monitoring data to review with respect to the Selected Remedy. The City continues to monitor groundwater pursuant to the modified AOC, which is not part of the Selected Remedy and therefore is not subject to this policy FYR. Appendix H provides groundwater monitoring data for 1995 through 2016 for informational purposes.

Site Inspection

The site inspection took place on July 20, 2016. In attendance were William Geiger, EPA's RPM for the Site at the time; Ellen Davies, PADEP Project Manager; Raymond Scheinfeld, Philadelphia International Airport's Planning and Environmental Services Manager; Melissa Shinbein, Philadelphia International Airport Environmental Engineer; and Amanda Goyne and Hagai Nassau, Skeo (EPA's FYR contractor). The purpose of the inspection was to assess the protectiveness of the remedy. For a full list of site inspection activities, see the Site Inspection Checklist in Appendix E. Site photographs are provided in Appendix F.

Site inspection participants met at the Philadelphia International Airport Authority office at 1 International Plaza, Suite 100. Participants discussed Site history and current Site status. Participants then traveled by car to restricted areas of the airport and viewed the capped area and former landfill area, including Runway 8-26, surrounding infield areas and adjacent wetlands. The capped area and former landfill area were in good condition. A portion of the capped area extends outside the airport property, under Fort Mifflin Road and onto the City's Southwest Water Pollution Control Plant. Participants accessed the Southwest Water Pollution Control Plant area to view the capped area and several groundwater monitoring wells.

The airport is highly secured with a fence and other security measures. The Southwest Water Pollution Control Plant area is also secured with a fence. Illegal dumping took place at the wastewater treatment plant area prior to erection of the fence. The Philadelphia International Airport's Planning and Environmental Services Manager, stated that the wastewater treatment plant's fence posts do not penetrate the cap because the cap is about 8-10 feet below the fence.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

The Selected Remedy in the 1984 ROD was offsite disposal of soils that exceeded defined parameters, and onsite containment and capping of remaining soils to prevent leaching of any residual contamination into groundwater. A geosynthetic cap was later installed as part of the construction of Runway 8-26. The capped area installed as a component of the Selected Remedy and the geosynthetic cap installed during runway construction prevent contact with contaminated soil and reduce leaching of residual contamination from the former landfill.

Fences and security measures at the airport and wastewater treatment plant area also prevent exposure to soil contamination and protect the cap.

Philadelphia International Airport maintains the runways and grassy areas to a high standard, in keeping with FAA requirements.

Considering the existing and reasonably expected future land use of the airport, EPA believes the ICs are adequate to ensure the long-term protectiveness of the Selected Remedy.

The City continues to monitor groundwater pursuant to the modified AOC, which was not part of the Selected Remedy and is therefore not subject to this policy FYR. The Site is within the recharge boundary zone of the Coastal Plain SSA in New Jersey, which is classified as a source of drinking water for central and southern New Jersey. There are no drinking water intakes downstream from any potential discharge from the Site, according to EPA's recent discussion with the City. In addition, no drinking water wells are impacted by the groundwater contamination.

QUESTION B: **Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives used at the time of the remedy selection still valid?**

All contaminated soil at the Site was either disposed of offsite or capped in place. In addition, the geosynthetic cap, the 30 feet of additional cover material, the fences and airport security restrict access to most of the capped area. The cleanup levels established by the KIA in the 1984 ROD differ from current EPA practice of performing a baseline risk assessment. However, changes in toxicity data and cleanup levels do not affect the remedy's protectiveness.

No other exposure assumptions have changed since the 1984 ROD. The capped area is still used as airport and wastewater treatment plant property. The airport's Capacity Enhancement Plan includes plans to extend Runway 8-26 about 2,000 feet to the east to accommodate larger aircraft; however, there are no near-term plans to

implement this extension. EPA will stay in communication with the airport's environmental staff to ensure that any construction activity does not negatively impact the Selected Remedy.

Although no RAOs were identified in the 1984 ROD, the general objective to "provide adequate protection of public health, welfare, and the environment," is still valid and has been achieved by the Selected Remedy.

Groundwater contamination has been identified at the Site. Exposure to contaminated groundwater is a new potential exposure route. However, there are no drinking water intakes downstream from any potential discharge from the Site, according to EPA's recent discussion with the City. In addition, no drinking water wells are impacted by the groundwater contamination. The City continues to monitor groundwater pursuant to the modified AOC and additional response actions to return the groundwater to beneficial reuse are currently being evaluated.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that calls into question the protectiveness of the Selected Remedy.

VI. ISSUES/RECOMMENDATIONS

OU(s) without Issues/Recommendations Identified in the FYR:
Sitewide

This FYR did not identify any issues and recommendations.

VII. PROTECTIVENESS STATEMENT

Protectiveness Determination: Protective
Protectiveness Statement: The Selected Remedy is protective of human health and the environment. All contaminated soil at the Site was either disposed of offsite or capped. The capped area installed as a component of the Selected Remedy and the geosynthetic cap installed during runway construction prevent direct contact with contaminated soil and reduce leaching of residual contamination from the former landfill. Fences and security measures at the airport and wastewater treatment plant area also prevent exposure to soil contamination and protect the capped area and former landfill.

VIII. NEXT REVIEW

The next FYR Report for the Enterprise Avenue Superfund site will be conducted five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

EPA. May 10, 1984. Record of Decision: Enterprise Avenue Site. https://semspub.epa.gov/work/03/449729.pdf.

EPA. December 31, 1985. Notice of Intent to Delete Sites from the National Priorities List. https://semspub.epa.gov/work/03/900053.pdf.

EPA. March 26, 2012. Fourth Five-Year Review Report for Enterprise Avenue Landfill Superfund Site. https://semspub.epa.gov/work/03/2136782.pdf.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Based on reports of illegal drum dumping, City conducted investigation	January 1979
City conducted study of landfill	1979 – 1982
City conducted initial remedial work	March – November 1982
EPA listed Site on Superfund program's National Priorities List (NPL)	September 8, 1983
EPA completed feasibility study for stockpiled soils	February 1984
EPA issued Site's Record of Decision (ROD)	May 10, 1984
City's contractor mobilized to start construction	July 23, 1984
City completed all on-site work, including final grading and seeding	March 22, 1985
EPA deleted Site from NPL	March 7, 1986
EPA recommended mitigated Finding of No Significant Impact for the construction of a new commuter runway, Runway 8-26, partially located over the top of the landfill	September 16, 1994
Airport started Runway 8-26 construction activities	September 1995
City excavated contaminated soil	September 26 – October 4, 1996
City activated groundwater pump-and-treat system	April 1997
EPA issued Site's first FYR Report	July 14, 1997
Airport completed installation of landfill geosynthetic cap as part of a National Environmental Policy Act review	September 1997
Airport completed Runway 8-26 construction	December 3,1999
EPA issued AOC for groundwater remediation	June 5, 2002
EPA signed Site's second FYR Report	September 18, 2002
EPA signed Site's third FYR Report	March 29, 2007
EPA modified 2002 AOC to include evaluation of monitored natural attenuation for groundwater remediation	September 12, 2008
EPA signed Site's fourth FYR Report	March 26, 2012

APPENDIX C – SITE MAP

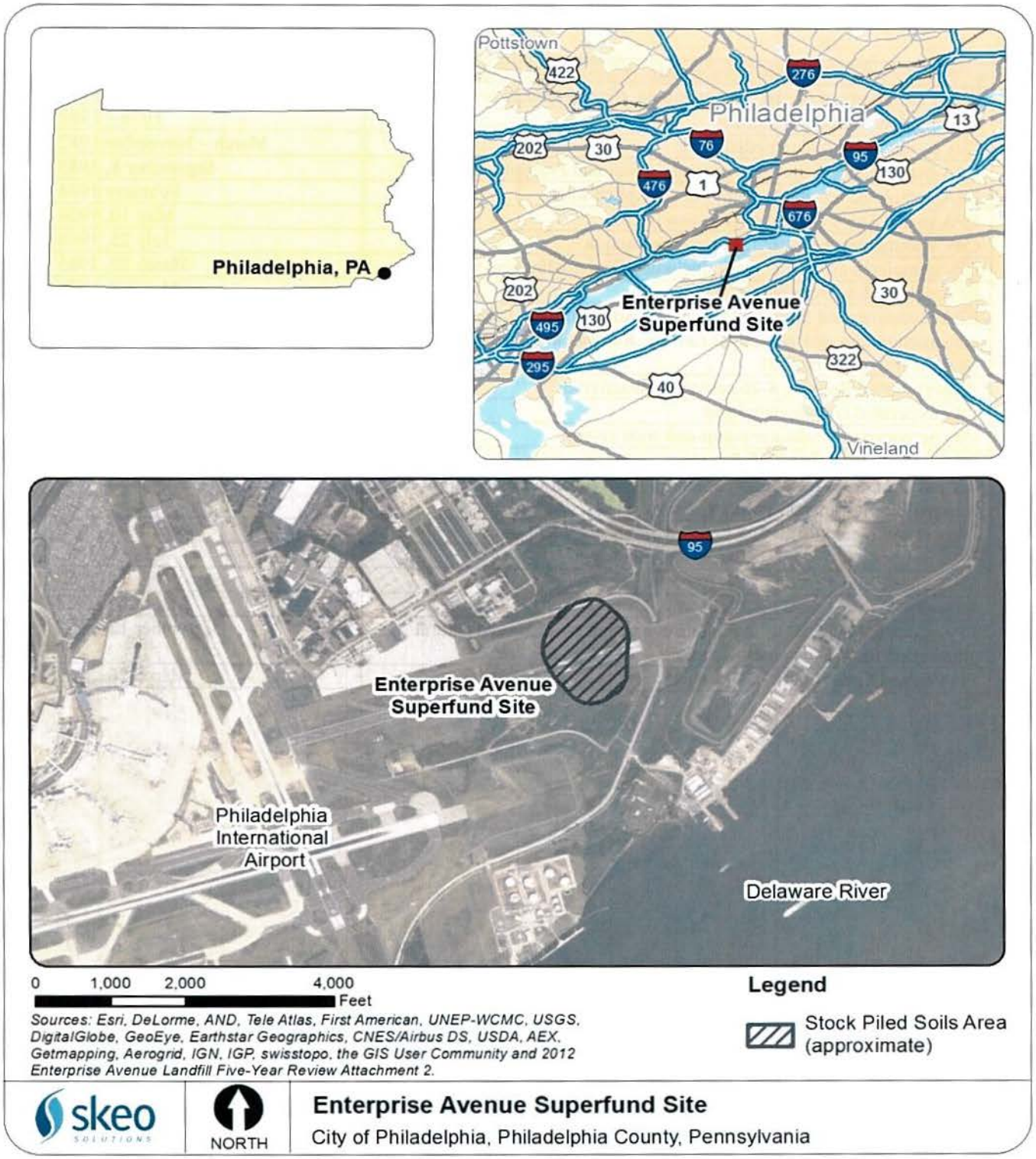


Figure C-1: Site Vicinity Map

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

APPENDIX D – PRESS NOTICE

EPA REVIEWS CLEANUP

Enterprise Ave Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting a Five-Year Review of the Enterprise Avenue Superfund Site located in southwest Philadelphia. EPA inspects sites regularly to ensure that cleanups conducted remain fully protective of public health and the environment. This site's cleanup construction was completed in 1997, with several Five-Year Reviews following. The site was removed from the National Priorities List of the nation's most hazardous waste sites in 1986. EPA's most recent Five-Year Review in 2012 determined that the remedy continues to be protective in the long-term. Results of the current Five-Year Review will be available to the public by April 2017.

To access results of the review (starting April 2017):
http://epa.gov/5yr

To learn detailed site and contact information:
http://go.usa.gov/x9YN7

To ask questions or provide site-related information:
Contact: Andrew Haneiko **Phone**: 215-814-3162
Email: haneiko.andrew@epa.gov

Protecting human health and the environment

APPENDIX E – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Enterprise Avenue	**Date of Inspection:** 07/20/2016
Location and Region: Philadelphia PA, Region 3	**EPA ID:** PAD980552913
Agency, Office or Company Leading the Five-Year Review: EPA Region 3	**Weather/Temperature:** clear, about 75°F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Raymond Scheinfeld (Name) | Airport Planning & Environmental Services Manager (Title) | 11/22/2016 (Date)

   Interviewed ☐ at site ☒ at office ☐ by phone Phone: _____

   Problems, suggestions ☐ Report attached: see Appendix G

2. **O&M Staff** _____ (Name) | _____ (Title) | _____ (Date)

   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____

   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____Name _____ _____ _____
Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☒ Report attached: see Appendix G

Mary Ellen Senss, Wastewater Treatment Manager – Operations; Mohammad Ibrahim, Assistant Plant Manager

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
7.	**Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A
	Remarks: Most of capped area is located within highly secured airport.			

IV. O&M COSTS

1.	**O&M Organization**	
	☐ State in-house	☐ Contractor for state
	☒ PRP in-house	☐ Contractor for PRP
	☐ Federal facility in-house	☐ Contractor for Federal facility
	☐ _____	

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☒ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Airport is fenced and highly secured. Wastewater treatment plant is fenced.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: "No Trespassing" signs on fences at airport and wastewater treatment plant.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ☒ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: Illegal dumping took place at the wastewater treatment plant area prior to the erection of fencing.

2. **Land Use Changes On Site** ☐ N/A

Remarks: Airport may extend runway 8-26 at some point. No changes anticipated at wastewater treatment plant area.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☒ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☒ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☒ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☒ Grass	☒ Cover properly established
	☒ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☒ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

C. Letdown Channels ☐ Applicable ☒ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement
   Arial extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type:_____ Arial extent: _____
   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Arial extent: _____ Depth: _____
   Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Arial extent: _____ Depth: _____
   Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions
   ☐ Location shown on site map Arial extent: _____
   Size: _____
   Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Arial extent: _____
   Remarks: _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). The Selected Remedy in the 1984 ROD was offsite disposal of soils that exceeded defined parameters, and onsite containment and capping of remaining soils to prevent leaching of any residual contamination into groundwater. A geosynthetic cap was later installed as part of the construction of Runway 8-26. The capped area installed as a component of the Selected Remedy and the geosynthetic cap installed during runway construction prevent contact with contaminated soil and reduce leaching of residual contamination from the landfill. However, some leaching of contamination into groundwater may be occurring. The City continues to monitor groundwater pursuant to the modified AOC. No drinking water wells are impacted by the groundwater contamination.
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Philadelphia International Airport maintains the runway and grassy areas to a high standard, in keeping with FAA requirements.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None identified.

Site inspection attendees:
William Geiger, EPA RPM at time of site inspection
Ellen Davies, PADEP Project Manager
Raymond Scheinfeld, Philadelphia International Airport, Airport Planning and Environmental Services manager
Melissa Shinbein, Philadelphia International Airport, Environmental Engineer
Amanda Goyne, Skeo
Hagai Nassau, Skeo

APPENDIX F – SITE INSPECTION PHOTOS

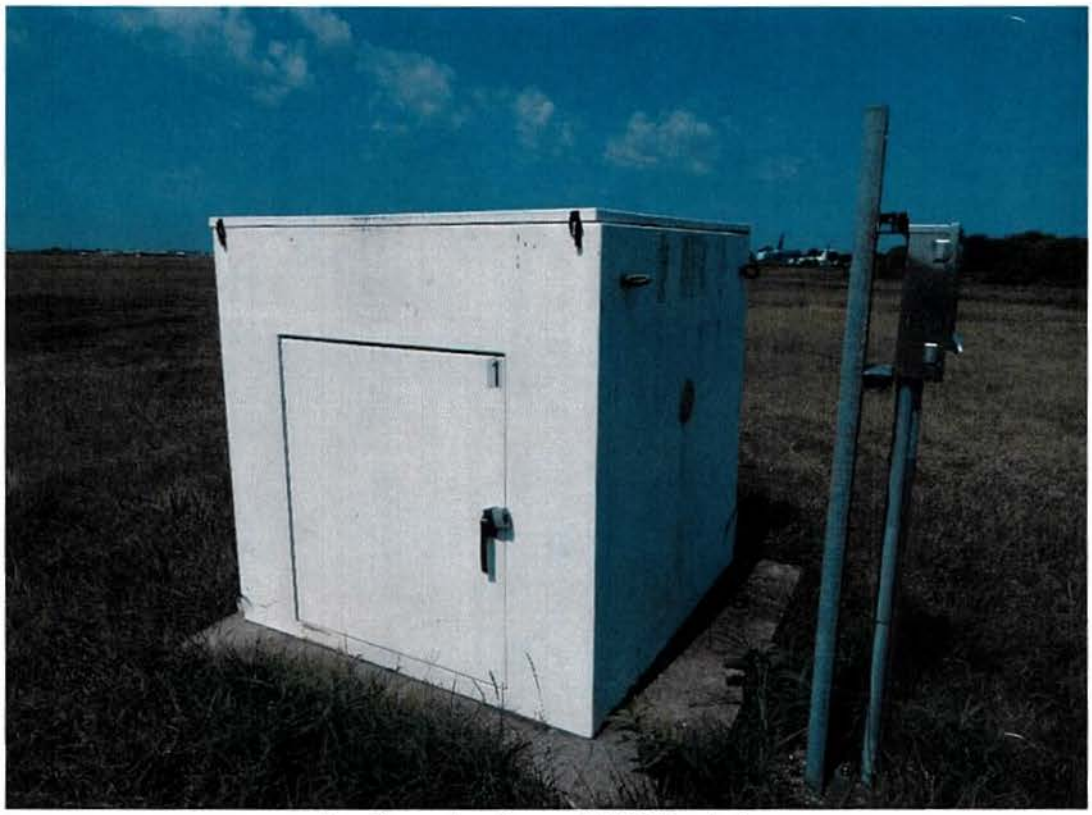
Looking east from Runway 8-26 capped area

Looking west toward airport terminal from Runway 8-26 capped area

Vegetated runway infield capped area north of Runway 8-26

Vegetated runway infield capped area south of Runway 8-26

Runway 8-26



Inactive extraction well EW-1 exterior

Inactive extraction well EW-1 interior

Northern edge of capped area on wastewater treatment plant area and Fort Mifflin Road

Sign on fence surrounding airport area

Runway 8-26 viewed from airport control tower

APPENDIX G – INTERVIEW FORMS

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Raymond Scheinfeld	Airport Planning & Environmental Services Manager	City of Philadelphia	November 22, 2016
Mary Ellen Senss	Wastewater Treatment Manager- Operations	City of Philadelphia-Water Department	November 22, 2016
Mohammad Ibrahim	Assistant Plant Manager- Southwest Plant	City of Philadelphia-Water Department	November 22, 2016

INTERVIEW RECORD

Site Name: Enterprise Avenue		**EPA ID No.: PAD980552913**	
Subject: Five Year Review		**Time:**	**Date:**
Type: Telephone **Visit** Other **Location of Visit: Philadelphia International Airport Plaza Bldg**		Incoming Outgoing	
Contact Made By:			
Name: Kimberly Scharl	**Title: Community Involvement Coordinator**	**Organization: US EPA**	
Individual Contacted:			
Name: Raymond Scheinfeld	**Title: Airport Planning & Environmental Services Manager**	**Organization: City of Philadelphia**	
Telephone No: 215-906-7604 **Fax No: 215-937-5576** **E-Mail Address: Raymond.scheinfeld@phl.org**		**Street Address: Philadelphia International Airport** **City, State, Zip: Philadelphia, PA 19153**	

Summary of Conversation

1. What is your overall impression of the project? (general sentiment)
   The project was well done and the clean-up effort was protective of human health and the environment.

2. Have there been routine communications or activities (site visits, inspections, reporting, activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.
   Yes. Management is fully aware of what is going on at the site, although it is no longer mentioned in the press. There is regular communication with EPA. Wells were last tested in May/ June, 2016, and a report of the tests was submitted to EPA.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of responses.
   None noted.

4. Do you have any concerns related to the site?
   No concerns.

5. Do you feel the Record of Decision is still effective in protecting human health and the environment?
   Yes.

INTERVIEW RECORD

Site Name: Enterprise Avenue	**EPA ID No.: PAD980552913**	
Subject: Five Year Review	**Time:**	**Date:**
Type: Telephone **Visit** Other **Location of Visit: City of Philadelphia Southwest Treatment Plant**	Incoming Outgoing	

Contact Made By:

Name: Kimberly Scharl	**Title: Community Involvement Coordinator**	**Organization: US EPA**

Individual Contacted:

Name: Mary Ellen Senss/ Mohammad Ibrahim	**Title: Wastewater Treatment Manager- Operations/ Assistant Plant Manager**	**Organization: City of Philadelphia Water Department**
Telephone No: 215-685-6258 **Fax No: 215-685-6207** **E-Mail Address: Maryellen.senss@phila.gov**	**Street Address: 1101 Market Street, 4th Floor** **City, State, Zip: Philadelphia, PA 19107**	

Summary Of Conversation

1. Are you familiar with the Enterprise Avenue Superfund site (part of which is located on your property)?
   Yes

2. Are you aware of any concerns regarding the site or its operation and administration?
   Security could still be a concern. Employees of the southwest plan monitor the fence from time to time to ensure there are no trespassers.

3. Are you aware of any events, incidents, or activities at the site such as trespassing or emergency response?
   None recently. We put a guardrail and fence up approximately 3 to 4 years ago to protect the area from trespassing and illegal dumping.

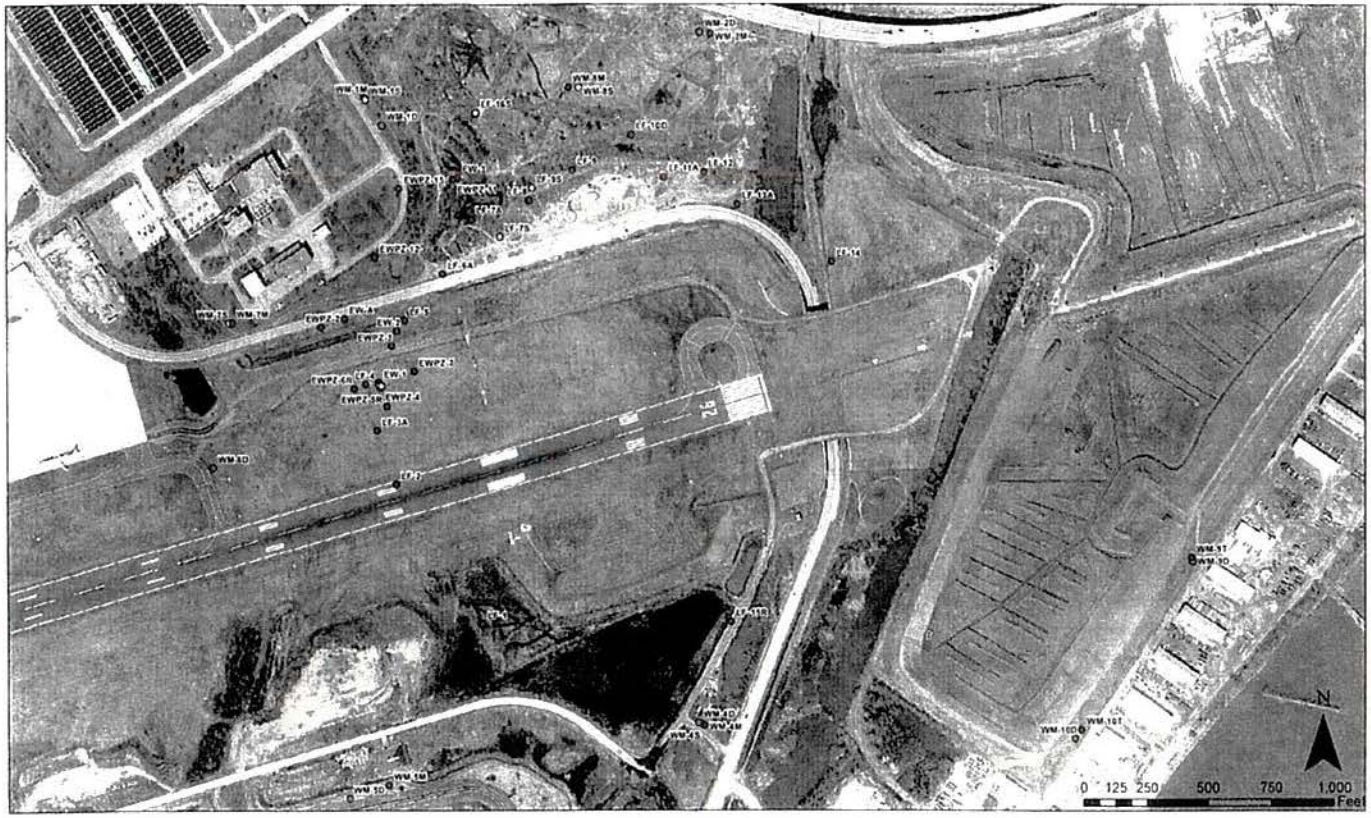
4. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
   No. We met with police to see if there was anything else that could be done regarding security. It is a remote area, so there were limited options.

5. Do you perform operation and maintenance of the portion of the site that is located on your property?
   No.

6. Our latest 5-year review shows the remedy now in place is working. Do you have an opinion as to anything we should currently be doing?
   No, I can't think of anything that could be done that would affect their portion of the property.

APPENDIX H – GROUNDWATER DATA FROM NON-CERCLA CLEANUP ACTION

Figure H-1: Well Location Map



EAL WELLS OVERVIEW MAP

Table H-1: Selected Volatile Organic Compounds in Well LF-2, 1995 to 2016

	Date Sampled																																											
VOLATILES (µg/l)	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	6/09	11/09	8/10	3/14	8/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	520	580	620	400J	660	1,300	1,400	3,600	1,900	1,100	640	1,400J	1,000	640J	640	550J	390	360J	200J/D	10	630D	230	220J/D	600D	580D	600J/D	660D	480D	370	460	650D	1,750	2,420	1,330	2800	1,200	1,200	170J	170	40	U	U	U	110
1,1 DCE	31	1,000U	1,000U	500U	500U	36	6	51J	160	14J	70J	84	1,000U	1,000U	80	1,000U	29J	500U	15	10U	25	11	9J	-	-	-	-	-	-	-	-	-	10	6	4	2	U	U	1	U	U	U	U	U
1-2 DCE	13,000	13,000	12,000	10,000	12,000	9,000	2,100	14,000	32,000	6,400	15,000	13,000	14,000	11,000	9,200	6,600	9,200	8,000	5,100D	140	5,700D	3,000D	2,900D	4,400D	3,402DJ	2,003J/D	3,407D	3,905J/D	1,600	3,700	3,100D	3,692	4,149	2,287	1885	U	U	U	U	U	U	U	U	U
Benzene	650	890	850J	760	940	1,600	560	3,300	3,000	1,400	1,500	1,100J	1,100	810J	820	560J	700	460J	310J/D	10	450J/D	240	190D	360J/D	370D	360J/D	400D	330D	190	360	330D	625	640	522	770	440	940	770	800J	970	760	520	850	670
Chlorobenzene	4,500	4,400	4,300	4,100	4,600	5,500	1,400	6,300	11,000	3,100	5,800	6,400	5,700	4,400	4,000	3,200	3,600	2,900	2,000D	55	2,700D	1,400D	1,500D	2,200D	2,600D	1,300D	2,800D	2,700D	1,100	2,700	5008D	5,020	5,500	4,870	6820	3,900	8,600	7,600	1,300	9,900	7,100	8,700	9,100	6,100
1,3 DCB	140	180J	200	170J	180J	140		140	120	56	110J	120J	100J	89	71	170J	77J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	204	232	215	46	64	33	34	22	U	11	12	22
1,4 DCB	2,300	3,100	3,200	2,600	3,200	2,500		7,300	2,900	770	2,900	2,300	2,400	2,100	1,500	3,600D	1,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	109	106	106	110	330	31	42	37	U	16	23	25
1,2 DCB	1,500	2,300	2,300	1,700	2,100	1,600		1,600	2,000	570	1,700	1,700	1,700	1,400	950	2,500D	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	355	370	281	64	62	6	5	U	U	U	U	7

NS = Not Sampled
- = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required

Table H-2: Selected Volatile Organic Compounds in Well LF-3, 1995 to 2016

	Date Sampled																																											
VOLATILES (µg/l)	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	6/09	11/09	8/10	3/14	8/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	600	340	730	740	690	470	5J	10UJ	10UJ	10UJ	200	690	350	180	140	230	130	180	170D	190D	310D	140	180	160	120	88	85	57	47	19	13	7	13	6	5	U	U	1	1	3	U	4	2	1
1,1 DCE	2J	50U	100UJ	82UJ	50UJ	50UJ	5UJ	10UJ	10UJ	10UJ	2J	50UJ	29J	18J	3J	7J	6J	7J	9J	5J	5J	3	3J	-	-	-	-	-	-	-	-	-	1UJ	1UJ	1UJ	U	U	1	U	1	U	2	1	U
1-2 DCE	1,100	950	1,200	1,300	1,600	600	3J	1J	2J	1J	640	1,300	820	440	140	19J	35	13	29	250D	370	400	46	88	88	40	45	49	38	20	17	4	5	3	1U	U	U	U	U	U	U	U	U	U
Benzene	140	100	130	140	130	150	3J	2J	12	3J	170	220	110	46J	21J	7J	10J	6J	6J	13	26	8	7J	12	13	9	12	12	10	9	11	45	145	126	40	40	38	27	33	34	63	U	64	53
Chlorobenzene	1,000	770	960	1,000	1,100	770	11	15	16	2J	370	770	730	510	300	48J	84	16	14	170	520D	44D	27	40	180D	130	77	41	39	55	1408D	696	1,490	1,320	664	1,900	2,000	1,000	1,100	770	1,500	540	1,200	1000
1,3 DCB	38	33J	41J	37J	43J	33J		2J	2J	10UJ	10	15	14J	14	11	3J	4J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	26	4	21	22	11	13	9	U	3	10	11
1,4 DCB	640	560	700	650	740	540	-	22	21	4J	160	220	290	420	230	54	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	24	6	11	7	8	8	12	U	9	15	15
1,2 DCB	380	340	370	360	400	290		11	11	2J	97	160	220	290	140	34	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	353	234	92	2	U	2	2	3	U	3	2	2

NS = Not Sampled
- = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required

Table II-3: Selected Volatile Organic Compounds in Well LF-4, 1995 to 2016

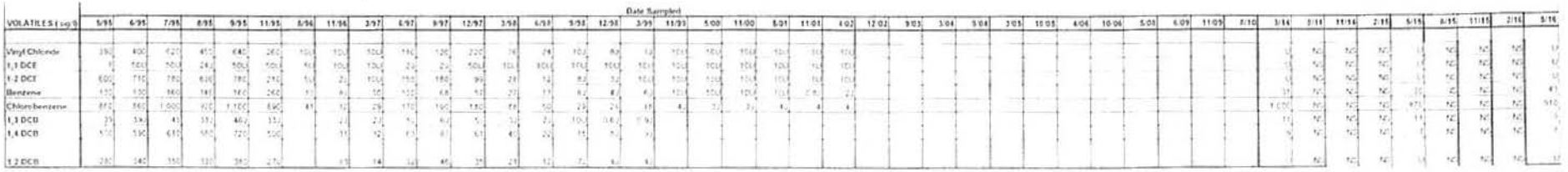


Table II-4: Selected Volatile Organic Compounds in Well LF-5, 1995 to 2016

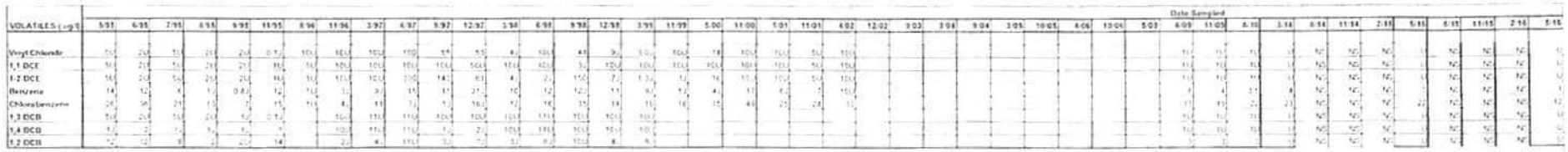


Table H-5: Selected Volatile Organic Compounds in Well LF-6, 1995 to 2016

	Date Sampled																																										
VOLATILES (µg/l)	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	6/09	11/09	8/10	3/14	8/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	4J	1U	1	2U	2U	0.5J	1J	12U	14J	5J	45U	1.5U	5U	1J	43U	160U	12U	1.6U	340U	10U	1J	0.3J	10U	2.2U	5J	1J	6J	40U	1.9U	10U	1.4J	1U	1U	1U	1U									
1,1 DCE	5U	1U	1U	2U	2U	0.2J	2J	10U	1J	10U	25U	5U	10U	5U	25U	25U	10U	25U	25U	10U	10U	1U	10U											1U	1U	1U									
1-2 DCE	3J	2J	1	2U	2U	0.3J	1U	9J	4.0J	9J	42U	46U	6J	7J	41U	38U	11U	1.6U	1.05U	2J	1J	1U	10U	1.9U	2J	1J	2J	19U	1.3U	1U	0.6J	1U	1U	1U	1U									
Benzene	4J	2J	2	1J	0.5J	0.3J	1U	5J	4J	6J	4J	4J	2J	1J	3J	26J	2J	4U	5J	1J	1J	1J	4J	1U	3J	2U	1J	1J	2U	1U	4J	4J	3J	1U	1U	1U								
Chlorobenzene	5U	1U	0.5J	2U	2U	1U	1U	12U	10U	10U	25U	5U	10U	5U	25U	25U	10U	25U	25U	10U	10U	0.5J	10U	1.0U	5U	1U	1U	2U	1U	1U	0.5J	1U	2J	1U	1U									
1,3 DCB	5U	1U	1U	2U	2U	1U		10U	10U	10U	10U	5U	10U	5U	10U	10U																	1U	1U	1U									
1,4 DCB	5U	1U	1U	2U	2U	1U		10U	10U	10U	10U	5U	10U	5U	10U	10U																	1U	1U	1U									
1,2 DCB	5U	1U	1U	2U	2U	1U		10U	2J	10U	10U	5U	10U	5U	6J	27U																	1U	1U	1U									

J = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required

Table H-6: Selected Volatile Organic Compounds in Well LF-7, 1995 to 2016

	Date Sampled																																										
VOLATILES (µg/l)	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	6/09	6/09 DUP	11/09	8/10	3/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	1U	1U	2U	1U	2U	2	10U	10U	10U	10U	10U	10U	12	27	10U	2J	10U	10U	10U	10U	10U	0.4J	10U										1U	1U	1U	1U								
1,1 DCE	1U	1U	2U	1U	2U	1U	5U	10U	10U	10U	10U	10U	10U	10U	50U	10U	10U	10U	10U	10U	10U	1U	10U										1U	1U	1U	1U								
1-2 DCE	1U	1U	2U	1U	2U	4	3U	10U	10U	10U	2J	10U	18	42	50U	2J	10U	1J	10U	10U	10U	0.3J	10U										1	1	1	5U								
Benzene	1U	1J	2J	1J	1J	1	2U	2J	1J	4J	1J	1J	1J	1J	6J	6J	4J	1J	2J	10U	0.3J	0.3J	1.0U										1	1	1	5U								
Chlorobenzene	1U	1U	0.5J	1U	2U	1U	3J	10U	3J	32U	3J	1U	3J	10U	45U	1J	2J	1J	10U	10U	10U	0.3J	1.0U										1U	1U	1U	1U								
1,3 DCB	1U	1U	2U	1U	2U	1U		10U	2J	10U	9J	3J	0.6J	11U	1J	3J	0.8J																1U	1U	1U	1U								
1,4 DCB	1U	1U	2U	1U	2U	1U		4J	1J	0.7J	43U	4J	1J	3J	2J	8J	3J	2J															1U	1U	1U	1U								
1,2 DCB	0.2J	1U	2U	1U	2U	1U		1J	2J	1J	1J	10U	10U	11U	0.9J	10J	10U																1U	1U	1U	1U								

J = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required

Table H-7: Selected Volatile Organic Compounds in Well LF-8, 1995 to 2016

VOLATILES (µg/l)	Date Sampled																																												
	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	5/08 DUP	6/09	11/09	8/10	3/14	8/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	1U	2U	2U	2U	2U	2U	--	0.1J	50U	1U	0.1J	0.2J	1U	2	25U	0.4J	1U	5U	5U	1U	5U	50U	50U	1U	10U	2J	10	10U	20U	10U	2U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,1 DCE	1U	2U	2U	2U	2U	2U	--	1U	50U	1U	1U	1U	1U	1U	25U	1U	1U	5U	5U	5U	5U	50U	50U	--	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,2 DCE	1U	2U	2U	2U	2U	2U	--	0.1J	50U	1U	0.1J	0.2J	1U	1U	25U	1U	1U	5U	5U	5U	5U	50U	50U	1U	5U	4J	5U	5U	10U	5U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--
Benzene	1U	2U	2U	2U	2U	110	--	200	64	82	60	97	69	81	76	42JD	30JD	1J	8	23	5U	86	260	130D	90	2J	11	8J	66	42	13	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--
Chlorobenzene	41	45	46	42	38	190	--	830	690	320	630	730	660	690	480	670D	620	140	460D	300D	67	620	1,300D	1U	500D	300D	380D	270D	980D	60U	1700D	81.7	84.5	53	52	40	--	--	--	--	--	--	--	--	--
1,3 DCB	0.7J	2U	2U	0.3J	1U	0.9J	--	5	50U	1	1	4	2	2	25U	2	2	1U	1	1	5U	50U	50U	--	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,4 DCB	1	1U	1J	1J	1U	11	--	36J	47J	6	9	15	11	13	5J	13	9	2	4	3	2J	50U	11J	--	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,2 DCB	1U	2U	2U	2U	2U	1J	--	5	50U	0.6J	1	5	2	1	25U	2	2	0.4J	1	0.6J	5U	50U	50U	--	--	--	--	--	--	--	--	--	--	1	1U	1U	--	--	--	--	--	--	--	--	--

-- = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required

Table H-8: Selected Volatile Organic Compounds in Well LF-9, 1995 to 2016

VOLATILES (µg/l)	Date Sampled																																										
	5/95	6/95	7/95	8/95	9/95	11/95	8/96	11/96	3/97	6/97	9/97	12/97	3/98	6/98	9/98	12/98	3/99	11/99	5/00	11/00	5/01	11/01	4/02	12/02	9/03	3/04	9/04	3/05	10/05	4/06	10/06	5/08	6/09	11/09	8/10	3/14	8/14	11/14	2/15	5/15	8/15	11/15	2/16	5/16
Vinyl Chloride	1U	1U	1U	1U	1U	1U	--	25U	1U	2U	0.1J	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,1 DCE	1U	1U	1U	1U	1U	1U	--	25U	1U	2U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,2 DCE	1U	1U	1U	1U	1U	0.5J	--	25U	1U	2U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
Benzene	3	4J	4	4	4	24	--	730	[illegible]	34	130	[illegible]	2	2	5	110D	0.6J	0.5J	0.1J	0.5J	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
Chlorobenzene	0.9J	0.7J	0.5J	1	1	1	--	3J	0.2J	0.6J	0.7J	2	0.3J	0.2J	0.3J	2	0.2J	0.3J	1U	0.1J	1U	1U	1U	--	--	--	--	--	--	--	--	--	2	1U	1U	--	--	--	--	--	--	--	--	--
1,3 DCB	1U	1U	1U	1U	1U	0.1J	--	25U	1U	2U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,4 DCB	1U	1U	1U	1U	1U	0.1J	--	25U	1U	2U	1U	1U	1U	1U	1U	1U	1U	0.1J	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--
1,2 DCB	1U	1U	1U	1U	1U	0.1J	--	25U	1U	2U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	--	--	--	--	--	--	--	--	--	1U	1U	1U	--	--	--	--	--	--	--	--	--

-- = Not Analyzed
U = Not Detected
J = Estimated Concentration
D = Dilution Required