

FINAL

# Tank Group 05 Closure Report Addendum

---

Former Philadelphia Energy Solutions Refinery  
3144 West Passyunk Avenue  
Philadelphia, Pennsylvania  
Incident #57203

*Prepared for*

Philadelphia Energy Solutions Refining and Marketing LLC  
3144 West Passyunk Avenue  
Philadelphia, PA 19153

*Prepared by*

Terraphase Engineering Inc.  
100 Canal Pointe Boulevard, Suite 110  
Princeton, New Jersey 08540

August 2023

Project Number P044.001.002



# Contents

Acronyms and Abbreviations.....	iii
Certification.....	iv
1 Introduction.....	1
2 Previous Releases.....	2
3 PADEP Requested Sampling and Analytical Results.....	4
3.1 Scope of Soil Sampling.....	4
3.2 Sample Methods and Analyses.....	4
3.3 Soil Analytical Results.....	5
3.4 Release Evaluation.....	5
4 Conclusion.....	7
5 References.....	8

## Tables

- 1 Aboveground Storage Tank Details
- 2 Summary of Supplemental Site Characterization Soil Analytical Results – AST PB 253

## Figures

- 1 Facility Location
- 2 Prior Release Areas
- 3 Soil Sampling Results, Tank Group 05 (AST PB 253)

## Appendices

- A Soil Boring Logs
- B Laboratory Data Package



# Acronyms and Abbreviations

25 Pa. Code	Title 25 Pennsylvania Code
Act 2	Pennsylvania Land Recycling and Environmental Remediation Standards Act
Act 32	Storage Tank and Spill Prevention Act
Addendum	<i>Tank Group 05 Closure Report Addendum</i>
AST	aboveground storage tank
AOI	area of interest
bgs	below ground surface
Evergreen	Evergreen Resources Group, LLC; includes Sunoco, Inc. n/k/a ETC Sunoco Holdings LLC, Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC n/k/a Energy Transfer (R&M), LLC and Evergreen collectively referred to as "Evergreen"
Facility	former Philadelphia Energy Solutions refinery facility
ft	feet
LNAPL	light non-aqueous phase liquid
MSC	medium-specific concentrations
PADEP	Pennsylvania Department of Environmental Protection
PESRM	Philadelphia Energy Solutions Refining and Marketing LLC
RIR	remedial investigation report
SCR	site characterization report
Tank Closure Report	<i>Tank Group 05 Closure Report</i>
the Site	Tank Group 05 location within the former Philadelphia Energy Solutions refinery facility
Terraphase	Terraphase Engineering Inc.



# Certification

Pursuant to the requirements of the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2), adopted May 19, 1995, which states:

*Interpretation of geologic and hydrogeologic data shall be prepared by a professional geologist licensed in this Commonwealth.*

I hereby attest that, as a Professional Geologist licensed in the Commonwealth of Pennsylvania, I am familiar with, and have reviewed and/or prepared the interpretation of the geology and hydrogeology presented in the attached report entitled, *Tank Group 05 Closure Report Addendum, Former Philadelphia Energy Solutions Refinery, 3144 West Passyunk Avenue, Philadelphia, Pennsylvania*, dated August 2023.

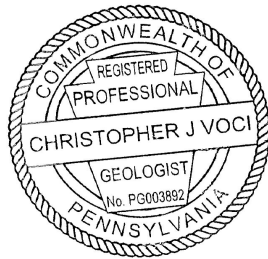
Based on the available data represented in the report, I believe that the geologic and hydrogeologic interpretations made herein are reasonable and accurate.



Chris Voci, PG  
Senior Principal Geologist

August 14, 2023

Date



# 1 Introduction

Terraphase Engineering Inc. (Terraphase) has prepared this *Tank Group 05 Closure Report Addendum* (Addendum), on behalf of Philadelphia Energy Solutions Refining and Marketing LLC (PESRM). This Report serves as an addendum to the *Tank Group 05 Closure Report* (Tank Closure Report) submitted to the Pennsylvania Department of Environmental Protection (PADEP) on December 23, 2022. This Addendum presents additional soil analytical results requested by PADEP at Tank Group 05 (the Site) which is located within the Former Philadelphia Energy Solutions refinery facility (the “Facility”). The Facility, which is undergoing closure activities in preparation for redevelopment, is located at 3144 West Passyunk Avenue, Philadelphia, Pennsylvania (**Figure 1**).

The Tank Closure Report submitted on December 23, 2022 was prepared in accordance with the Storage Tank and Spill Prevention Act (Act 32) and Title 25 Pennsylvania Code (25 Pa. Code) Chapter 245 (Subchapter D) and provided a summary of the Site Assessment and Site Characterization activities that were performed following the identification of potential releases to the environment during the demolition and removal of the Tank Group 05 aboveground storage tanks (ASTs). As discussed with PADEP, the report provided to PADEP on December 23, 2022, titled “Site Characterization Report,” was submitted to address what was believed to be a potential release from one tank in Tank Group 05 (PB 253). A notification of release was submitted to the PADEP on January 3, 2022. PADEP assigned the release in Tank Group 05 to Incident No. 57203. Additional site characterization soil sampling indicated that the contamination identified in the vicinity of PB 253 was not related to the tank but rather a historic release. The December 2022 Site Characterization Report (SCR) requested that Incident No. 57203 be closed, and the release identified near PB 253 would be addressed under the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2).

Because the contamination identified in this area was not related to ASTs in Tank Group 05, PADEP requested that PESRM provide a revised “Corrective Action Process Report/Plan Cover Sheet”; which was provided to PADEP on March 22, 2023. Therefore, the title of the previously provided SCR has been revised to “Tank Group 05 Closure Report” in accordance with the approved 2021 *Aboveground Storage Tank Closure Work Plan*.

Because soil samples collected from locations in the vicinity of PB 253 and associated pipe runs were collected from deeper intervals (i.e., > 3 feet [ft] below ground surface [bgs]), PADEP requested that shallower samples be collected along the pipe run to demonstrate that contamination observed in the area of PB 253 is from other historical releases and not from the regulated tank system. As such, this Addendum provides the results of the additional PADEP requested sampling which demonstrates that the contamination identified is not related to releases from Tank Group 05 ASTs.

Details regarding the site setting, tank infrastructure and removal are provided in the December 23, 2022 Tank Closure Report and are not repeated herein.



## 2 Previous Releases

Previous releases are known to have occurred in the vicinity of tank PB 253. The releases associated with the tank system have received closure from the PADEP through Act 32 and 25 Pa. Code Chapter 245 (Subchapter D) or have been determined to not be associated with the regulated storage tank system and are subject to Act 2.

The *Site Characterization Report/Remedial Action Completion Report for Aboveground Storage Tanks PB 843, PB 846, PB 881, PB 885, PB 848, PB 844, PB 823, PB 842, and PB 253* (area of interest [AOI] 4 SCR/Remedial Action Completion Report, Stantec 2017a), prepared on behalf of Evergreen Resources Group, LLC<sup>1</sup>; (Evergreen), indicates a release occurred in 1998, as described below:

*“Approximately 5,040 gallons of diesel fuel was released to the tank dike area of PB 253 on August 28, 1998 during filling of the tank. According to the [Notice of Reported Release], the overflow resulted from a high-level alarm failure and immediate corrective action was initiated, including the recovery of oil by vacuum trucks. During an internal file review conducted by Stantec, no soil disposal documentation was located for this incident. There was no documentation of characterization soil sampling conducted at the time of the release. Therefore, three soil borings (AOI4-BH-16-005, AOI4-BH-16-006, and AOI4-BH-16-007) were completed around the tank footprint during the AOI 4 [Remedial Investigation] activities in June 2016. Two samples were collected from each soil boring and analyzed for the Evergreen Petroleum Short List. None of the samples exceeded the [Statewide Health Standard {SHS}], [Non-Residential Direct Contact MSCs {NRDC MSCs}], or the lead [Site-Specific Standard {SSS}].”*

The Penrose Avenue Remediation System, operated by Evergreen as part of the site-wide remediation under Act 2 and the One Cleanup Program, is located to the southeast of PB 253. The location of the system is presented in **Figure 2**. Light non-aqueous phase liquid (LNAPL) has been identified in groundwater monitoring wells in the vicinity of PB 253 since as early as 2000. The source of the LNAPL in the area is unknown. The Penrose Avenue Remediation System began total-fluids extraction in 2013 and ceased operations in April 2020.

The *Area of Interest 4 Remedial Investigation Report* (AOI 4 RIR, Stantec 2017b), prepared on behalf of Evergreen, notes two historical releases of petroleum products outside the containment berm in the vicinity of tank PB 253. Evergreen’s AOI-4 RIR notes that:

*“[d]uring July/August 2016, product-soaked soil was identified at the ground surface around pipes which are associated with Tank 253 but outside the emergency containment dike, located north of well S-241. The area around the lines was excavated and product removed by PES personnel. In addition, there is a product line that is suspected to have leaked which runs north-south along the access road leading to the Penrose system wells, approximately bisecting AOI 4. This line is being excavated and replaced in sections by PES.”*

---

<sup>1</sup> Includes Sunoco, Inc. n/k/a ETC Sunoco Holdings LLC, Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC n/k/a Energy Transfer (R&M), LLC and Evergreen collectively referred to as “Evergreen.”



The releases identified by Evergreen have not received regulatory closure and are suspected to be the source of contamination identified adjacent to tank PB 253. Based on their location, the releases are planned to be addressed under Act 2 by PESRM. The approximate location of the July/August 2016 release is presented in **Figure 2**.

In addition, according to the *Site Characterization Report Soils Only §245.310(b) For PB 253* (Stantec 2018), prepared on behalf of PESRM, a release from piping located within the containment berm was reported in 2017. According to the report:

*“a release occurred to the tank containment dike on July 31, 2017. The release occurred during repair activities at the tank, which resulted from damage to a valve at the piping flange and release of product from the pipe. PADEP was notified of the release and Incident No. 50803 was assigned. Product was immediately removed via vacuum truck, a limited soil excavation was conducted, and a layer of stone was placed over the excavated area.*

*Stantec completed release assessment sampling in August 2017. Two soil samples were collected from the release area underneath the stone layer, and analyzed for the PADEP Southeast Regional Office (SERO) Crude Oil Parameters combined with the PADEP Short List of Petroleum Products (leaded and unleaded gasoline and No. 1, 2, 4, 5, and 6 fuel oils). Soil sample results did not exceed any of the applicable Statewide Health Standards (SHS).”*

According to the PADEP eFacts website<sup>2</sup>, this incident’s status is listed as “Cleanup Complete”. The approximate location of this release and the post-remediation soil sample locations are presented in **Figure 2**.

---

<sup>2</sup> [https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults\\_singleTankRemediation.aspx?LRPACT\\_ID=50803](https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleTankRemediation.aspx?LRPACT_ID=50803)



## 3 PADEP Requested Sampling and Analytical Results

This section discusses the PADEP requested soil sampling performed in June 2023, reported analytical results, and an interpretation of the results and additional evidence supporting that the release(s) were not from the TG05 (i.e., PB 253) regulated AST system.

### 3.1 Scope of Soil Sampling

Shallow soil samples were collected from five locations (PB-253-01, -02, -05, -10, and -22) shown on **Figure 3**. Three of these locations (PB-253-02, -05, and -10) are directly beneath former pipe runs inside the berm associated with Tank PB 253 where deeper samples were collected during the prior Site Assessment and Site Characterization sampling. PB-253-01 is directly beneath a former pipe run outside the berm associated with Tank PB-253, and PB-253-22 was a step out boring installed to delineate deeper contamination identified in the initial boring at PB-253-02. The objective of the shallow soil sampling at these locations was to confirm that contamination identified in deeper intervals at PB-253-01, PB-253-02, and PB-253-22 was not the result of a surficial release from the PB 253 tank system.

### 3.2 Sample Methods and Analyses

Prior to the initiation of the sampling activities, a review of available information provided by Facility representatives regarding the presence/absence of underground utilities was used in the proposed sampling locations. In addition, a private locate was performed using geophysical and electromagnetic techniques to identify potential utilities or subsurface structures at proposed drilling locations.

Soil borings were completed using direct-push (i.e., Geoprobe) drilling methods and advanced to 5 ft bgs, with the exception of soil boring PB-253-22R which was installed to 10 ft bgs. Continuous soil cores were collected, and field screened using a photoionization detector to identify potentially impacted zones. Soil boring logs are provided in **Appendix A**. Prior to collecting a soil sample, observations regarding the potential presence of a clay liner were made for each boring to ensure that samples were not collected from within the potential clay liner, but rather from native soil. None of the borings advanced contained a clay liner<sup>3</sup>; therefore, soil samples were collected from 2.0 to 2.5 ft bgs in each boring, consistent with the Confirmatory Sampling Protocol detailed in the *Closure Requirements for Aboveground Storage Tank Systems* (PADEP 2021) for above ground piping. This methodology and approach was discussed with the PADEP and memorialized in electronic mail correspondence dated March 29, 2023. Each soil sample was analyzed for benzene via USEPA Method 8260 and naphthalene via USEPA Method 8270.

---

<sup>3</sup> In one soil boring, PB-253-22R, a clayey soil was observed at the bottom of the first 5-foot soil core. To confirm if this material was/was not the clay liner, an additional 5-foot macrocore was advanced which confirmed the deeper soils consist of native material and were not indicative of a clay liner.





### 3.3 Soil Analytical Results

**Table 2** presents the soil analytical results from the June 2, 2023 sampling and compares the concentrations to the following PADEP Non-Residential Soil Medium-Specific Concentrations (MSCs):

- Nonresidential MSC for Direct Contact Exposure to Surface Soil (0-2 ft)
- Nonresidential MSC for Direct Contact Exposure to Subsurface Soil (2-15 ft)
- Nonresidential MSC for Soil to Groundwater (Used Aquifer)

**Figure 3** presents the spatial distribution of all the results collected as part of the Site Assessment and Site Characterization and the PADEP-requested soil sampling in the vicinity of PB 253. The most recent soil sampling results of the PADEP-requested sampling are shaded in yellow highlight on Figure 3.

Consistent with the initial soil analytical, the PADEP-requested soil sampling data shows no concentrations of benzene or naphthalene in shallow soil samples near PB 253 inside the berm (PB-253-02, -05, -10, and -22). The sampling result from 2-2.5 ft at PB-253-01 immediately outside the berm exceeded the benzene nonresidential MSC for Soil to Groundwater. However, the concentrations at this location are consistent with surrounding soils outside the berm, the shallow sampling results are similar to the results from deeper samples at the same location, and higher benzene concentrations were observed in adjacent borings outside the berm (e.g., PB-253-19 and PB-253-20). The sampling confirms that there is not a shallow source of contamination within the PB 253 berm and impacts previously identified are related to the documented past release(s) outside the tank area and not from PB 253.

Laboratory reports for the PADEP requested sampling are provided in **Appendix B**.

### 3.4 Release Evaluation

With consideration for the Site Assessment and Site Characterization sampling results, the contamination observed east of PB 253 does not appear to be associated with a release from PB 253. Instead, it is associated with historical releases which occurred east of PB 253. As a result, the contamination identified in proximity to PB 253 would not be subject to corrective action under Act 32.

In addition to the evaluation presented in the Tank Closure Report, the supplemental soil sampling data indicate that no surficial releases have resulted in contamination above PADEP Non-Residential SHS Soil MSCs. Any release that would have occurred from the PB 253 aboveground tank system or piping would have been a surficial release. Therefore, soil contamination identified at depths closer to the surface is likely nearer to the source area than contamination identified at greater depths. As depicted in **Figure 3**, benzene was the only contaminant identified in surficial soils (0-2.5 ft bgs) at a concentration greater than PADEP Non-Residential MSCs (PB-253-01 and PB-253-19). The soil borings with elevated surficial benzene concentrations are located outside of the tank containment area, while lower concentrations of contaminants have been detected inside of the containment area, and no concentrations exceeding PADEP Non-Residential MSCs were identified in surficial soil samples collected from directly beneath PB 253 piping inside the berm.



PESRM plans to further investigate, characterize, and address the contamination identified east of PB 253 under Act 2. PESRM plans to submit a Notice of Intent to Remediate under Act 2 for this release following PADEP approval of this report.



## 4 Conclusion

Terraphase has prepared this Tank Group 05 Closure Report Addendum, on behalf of PESRM, to detail the results of additional PADEP-requested soil sampling and to further support that the data adequately demonstrates the release(s) were not from PB 253.

Based on the information presented, PESRM has overcome the presumption of liability under Act 32 as detailed in 25 PA Code §245.303(d). PESRM respectfully requests that Storage Tank Incident No. 57203 be closed. The release identified near PB 253 will be addressed through Act 2. PESRM plans to submit a Notice of Intent to Remediate under Act 2 for this release following approval of this Tank Closure Report.



## 5 References

Pennsylvania Department of Environmental Protection (PADEP). 2021. Closure Requirements for Aboveground Storage Tank Systems. April 10.

———. 2021. *Land Recycling Program Technical Guidance Manual*. March 27.

———. 2022. *Site Assessment Sampling Requirements at Regulated Storage Tank System Closures*. February 7.

Stantec. 2017a. *Site Characterization Report/Remedial Action Completion Report for Aboveground Storage Tanks PB 843, PB 846, PB 881, PB 885, PB 848, PB 844, PB 823, PB 842, and PB 253*. February 15.

———. 2017b. *Remedial Investigation Report, Area of Interest 4*. March 24.

———. 2018. *Site Characterization Report Soils Only §245.310(b) For PB 253*. January 9.

Terraphase Engineering Inc. (Terraphase). 2021. *Aboveground Storage Tank Closure Work Plan*. March.

———. 2022. *Tank Group 05 Closure Report*. December.



# Tables

- 1 Aboveground Storage Tank Details
- 2 Summary of Supplemental Site Characterization Soil Analytical Results – AST PB 253



**Table 1**  
**Aboveground Storage Tank Details**  
**Tank Group 05**  
Philadelphia Energy Systems Refinery and Marketing, Philadelphia, PA

Facility	Tank Group	State Regulation Number	Tank Number	Design Capacity (gal)	Primary Product	Proposed Analyte List	Regulatory Status	Facility ID	Status Modification Date	Tank Type	Double Bottom	Diameter (ft)	Height (ft)	Remaining Liquid (gal)	GPS Survey Complete	Demo Complete	Storage Tanks Reg./Permit App Form Submitted	Release Notification	Incident No.	Int. Remedial/Corrective Action Required
Point Breeze	5	009A	PB 824	5,846,400	15MV2, Distillate	Short List 4	R	51-33620	2/2/2022	Cone Roof	Y, Removed	144	48		Y	Y	2/18/2022			
Point Breeze	5	010A	PB 835	5,359,200	Distillate, Untreated	Short List 3-5	R	51-33620	3/30/2022	IFR	Y, Removed	144	48		Y	Y	3/30/2022			
Point Breeze	5	042A	PB 253	2,818,200	15MV2, Distillate	Short List 4	R	51-33620	2/2/2022	Cone Roof	N	100	48		Y	Y	2/18/2022	1/3/2022	57203	No
Point Breeze	5	045A	PB 821	5,359,200	Light Cycle Oil	Short List 1-5	R	51-33620	1/26/2022	IFR	Y, Removed	144	48		Y	Y	2/3/2022			
Point Breeze	5	046A	PB 822	5,359,200	Light Cycle Oil	Short List 1-5	R	51-33620	1/31/2022	IFR	N	144	48		Y	Y	2/3/2022			
Point Breeze	5	047A	PB 823	5,846,400	Limited Slip Differential (LSD)	Short List 5	R	51-33620	12/3/2021	Cone Roof	Y, Removed	144	48		Y	Y	12/16/2021			
Point Breeze	5	048A	PB 825	3,985,632	15MV2, Distillate	Short List 4	R	51-33620	2/2/2022	Cone Roof	Y, Removed	120	48		Y	Y	2/18/2022			
Point Breeze	5	051A	PB 833	5,817,000	Vacuum Gas Oil	Short List 1-5	R	51-33620	2/2/2022	Cone Roof	Y, Removed	150	48		Y	Y	2/18/2022			
Point Breeze	5	052A	PB 836	5,817,000	Distillate, Untreated	Short List 3-5	R	51-33620	3/30/2022	IFR	Y, Removed	150	48		Y	Y	3/30/2022			

**Abbreviations:**  
IFR - Internal Floating Roof  
N - No  
R - Removed  
Y - Yes

**Table 2**  
**Summary of Supplemental Site Characterization Soil Analytical Results**  
**AST PB 253**  
Philadelphia Energy Solutions Refining and Marketing, LLC, Philadelphia, PA

Location	PB-253-01R		PB-253-01R		PB-253-02R		PB-253-05R		PB-253-10R		PB-253-22R	
Field Sample ID	Non-Res Direct	Non-Res Direct	Non-Res Used	PB-253-01R2-2.0-2.5	PB-253-01R2-2.0-2.5D	PB-253-02R2-2.0-2.5	PB-253-05R2-2.0-2.5	PB-253-10R-2.0-2.5	PB-253-22R-2.0-2.5			
Collection Depth (ft bgs)	Contact MSCs for	Contact MSCs for	Aquifer	2.0 - 2.5	2.0 - 2.5	2.0 - 2.5	2.0 - 2.5	2.0 - 2.5	2.0 - 2.5			
Sample Method	Surface Soil	Subsurface Soil	TDS ≤ 2500)	Grab	Grab	Grab	Grab	Grab	Grab			
Sample Date	(0-2 ft)	(2-15 ft)	Soil-to-GW MSC	6/2/2023	6/2/2023	6/2/2023	6/2/2023	6/2/2023	6/2/2023			
Comments	Field Duplicate											
<b>Volatile Organic Compounds</b>												
Benzene	280	330	0.5	2.8 (0.29)	0.92 (0.3)	ND (0.00048)	ND (0.00049)	0.069 (0.031)	0.075 (0.026)			
<b>Semivolatile Organic Compounds</b>												
Naphthalene	66	77	25	7.6 (0.039)	9.3 (0.2)	0.033 J (0.037)	ND (0.039)	ND (0.39)	7 (0.038)			

**Notes:**

- 1 All concentrations reported in mg/kg (ppm); detection limits in parentheses.
- 2 No concentrations exceed the Non-Res Direct Contact MSCs for Surface Soil (0-2 ft).
- 3 No concentrations exceed the Non-Res Direct Contact MSCs for Subsurface Soil (2-15 ft).
- 4 Grey shaded concentrations exceed the Non-Res Used Aquifer (TDS ≤ 2500) Soil-to-GW MSC.

**Abbreviations:**

- ND - Not Detected
- J - Estimated Concentration

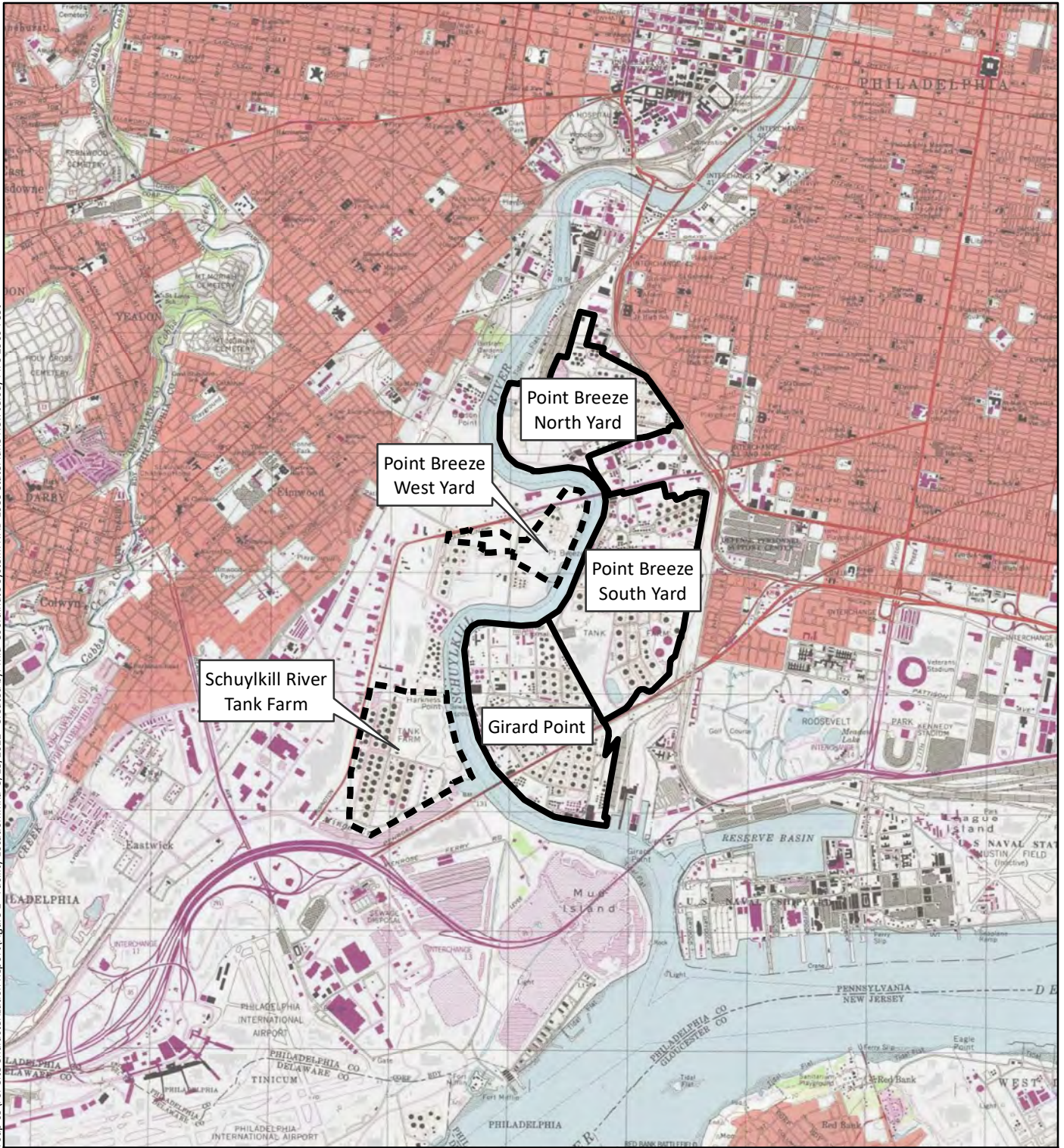
# Figures

- 1 Facility Location
- 2 Prior Release Areas
- 3 Soil Sampling Results, Tank Group 05 (AST PB 253)





File: N:\GIS\Prj\p044.001\_PESRM-PE\WXD\AST\Work\Tank Group 03\Facility Location Report\Figure 1 - Facility Location.mxd 3/15/2022. Created by: Mia. Coordinate System: NAD 1983 StatePlane New Jersey FIPS 2900 Feet



0 2,000 4,000 6,000  
Feet

1 inch = 4,000 feet



**Legend**

- Subject to AST Closure Plan
- Not Subject to AST Closure Plan

Base Map: USGS Philadelphia 1994 7.5 Minute Quadrangle.

**SAFETY FIRST**



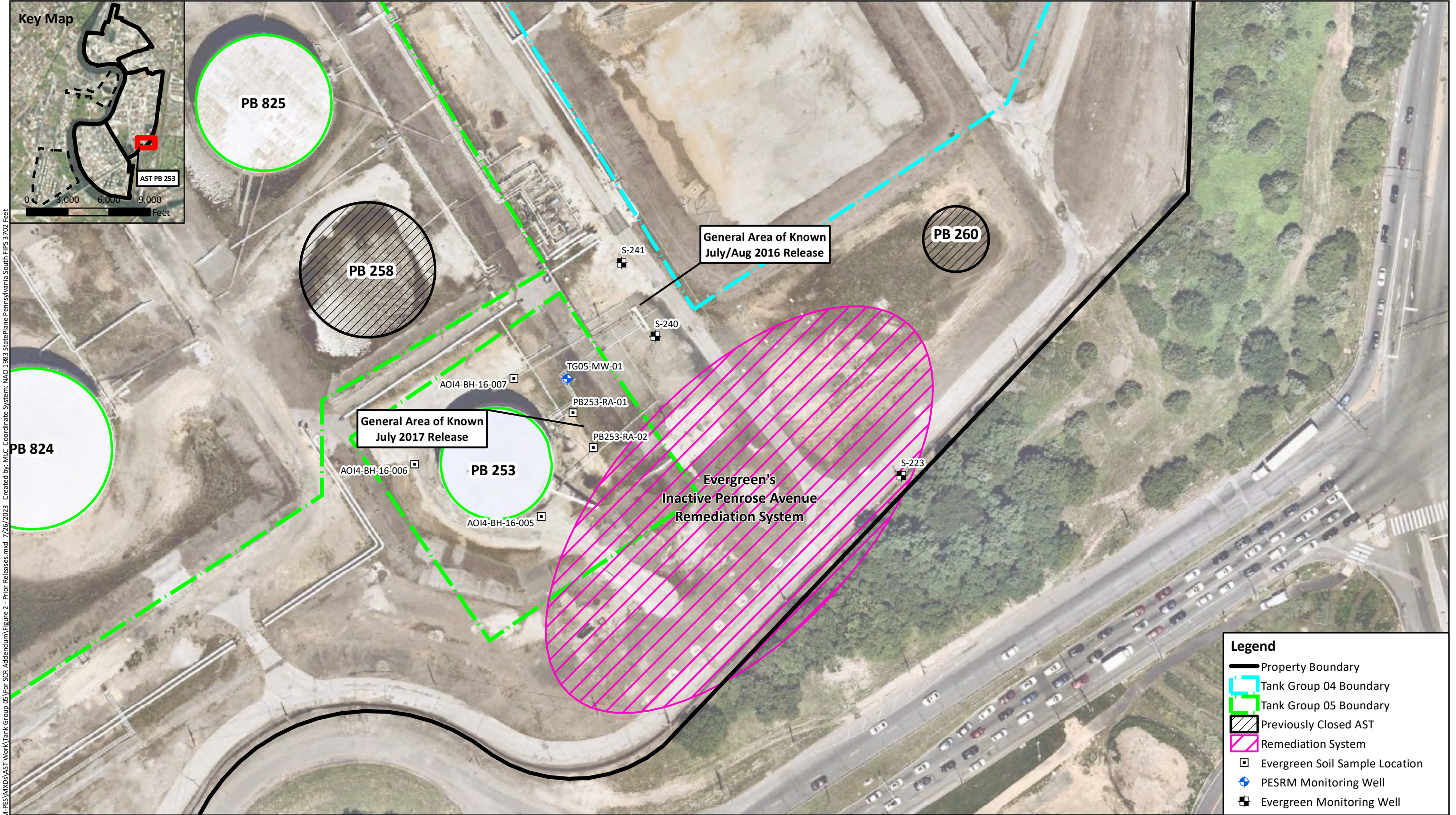
CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC

PROJECT: Aboveground Storage Tank Closure

PROJECT NUMBER: P044.001.002

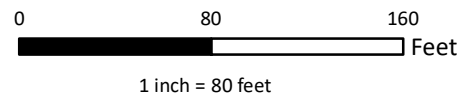
**Facility Location**

**Figure 1**



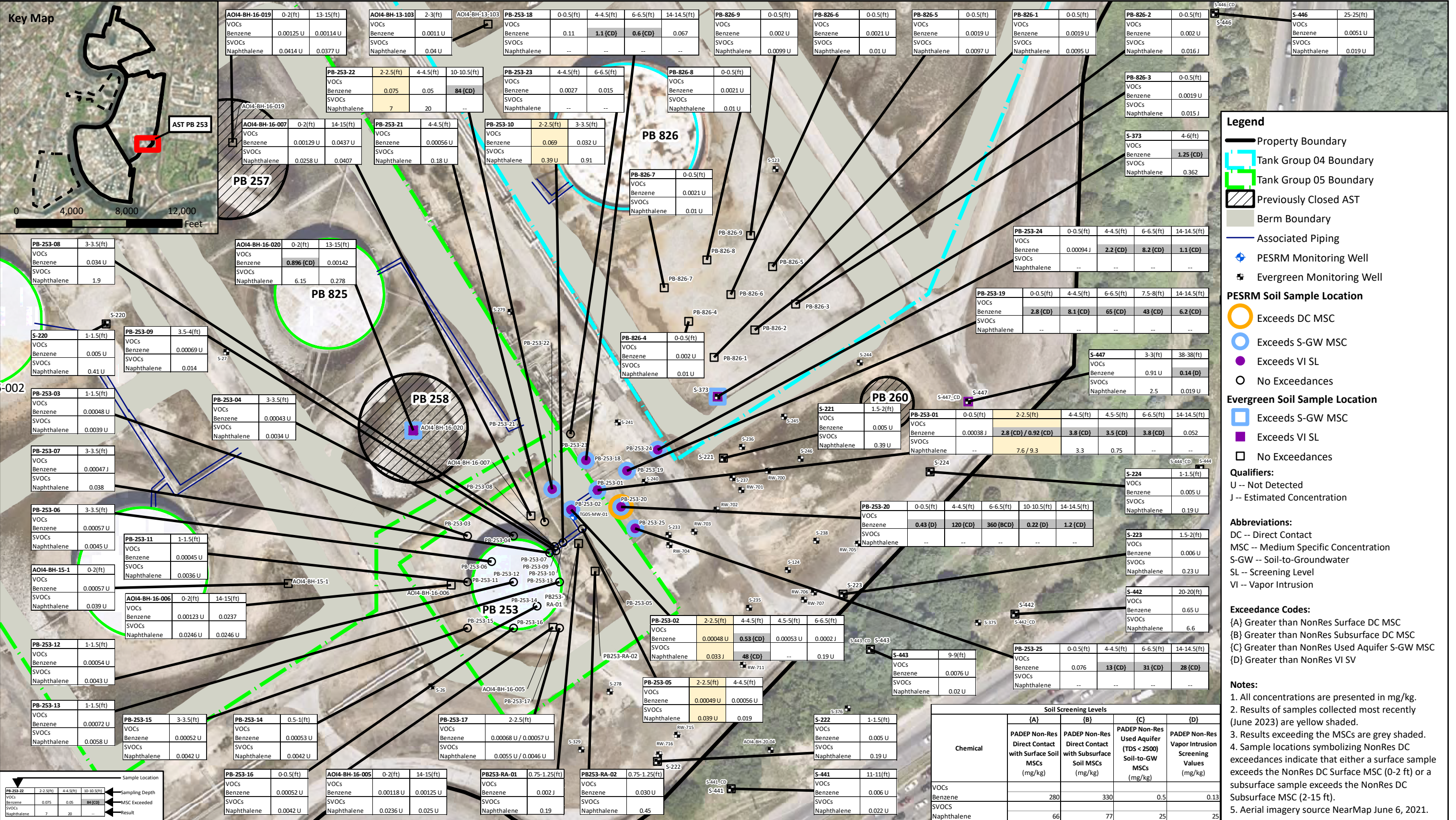
File: N:\GIS\PI\P044\_001\_PESRM-PBS\WXDS\AST Work\Tank Group 05 For SCR Addendum\Figure 2 - Prior Releases.mxd 7/26/2023 Created by: MIC Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

**Note:**  
Aerial imagery source NearMap June 6, 2021



 	CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC	<b>Prior Release Areas</b>  <b>Figure 2</b>
	PROJECT: Aboveground Storage Tank Closure	
	PROJECT NUMBER: P044.001.002	

File: N:\GIS\PA\044.001\_PESRM-RES-AST-Work\Tank Group 05 For SCR Addendum\Figure 3 - Soil Sampling Results w/Evergreen.mxd 7/26/2023 Created by: MLC Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet



### Legend

- Property Boundary
- Tank Group 04 Boundary
- Tank Group 05 Boundary
- Previously Closed AST
- Berm Boundary
- Associated Piping
- PESRM Monitoring Well
- Evergreen Monitoring Well

### PESRM Soil Sample Location

- Exceeds DC MSC
- Exceeds S-GW MSC
- Exceeds VI SL
- No Exceedances

### Evergreen Soil Sample Location

- Exceeds S-GW MSC
- Exceeds VI SL
- No Exceedances

### Qualifiers:

U -- Not Detected  
J -- Estimated Concentration

### Abbreviations:

DC -- Direct Contact  
MSC -- Medium Specific Concentration  
S-GW -- Soil-to-Groundwater  
SL -- Screening Level  
VI -- Vapor Intrusion

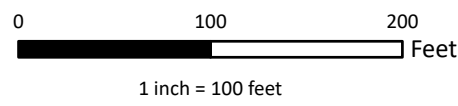
### Exceedance Codes:

{A} Greater than NonRes Surface DC MSC  
{B} Greater than NonRes Subsurface DC MSC  
{C} Greater than NonRes Used Aquifer S-GW MSC  
{D} Greater than NonRes VI SV

### Notes:

- All concentrations are presented in mg/kg.
- Results of samples collected most recently (June 2023) are yellow shaded.
- Results exceeding the MSCs are grey shaded.
- Sample locations symbolizing NonRes DC exceedances indicate that either a surface sample exceeds the NonRes DC Surface MSC (0-2 ft) or a subsurface sample exceeds the NonRes DC Subsurface MSC (2-15 ft).
- Aerial imagery source NearMap June 6, 2021.

Chemical	Soil Screening Levels			
	{A} PADEP Non-Res Direct Contact with Surface Soil MSCs (mg/kg)	{B} PADEP Non-Res Direct Contact with Subsurface Soil MSCs (mg/kg)	{C} PADEP Non-Res Used Aquifer (TDS < 2500) Soil-to-GW MSCs (mg/kg)	{D} PADEP Non-Res Vapor Intrusion Screening Values (mg/kg)
VOCs				
Benzene	280	330	0.5	0.13
SVOCs				
Naphthalene	66	77	25	25



**SAFETY FIRST**

CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC

PROJECT: Aboveground Storage Tank Closure

PROJECT NUMBER: P044.001.002

**Soil Sampling Results**

**Figure 3**

# Appendix A

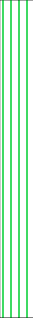
## Additional Boring Logs



Project: **PESRM AST Closure**  
 Project Location: **3144 W. Passyunk Ave**  
 Project Number: **P044.001.002**

**Log of Boring PB-253-01R2**  
**Sheet 1 of 1**

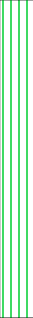
Date(s) Drilled <b>6/2/23</b>	Logged By <b>E. Johnston</b>	Checked By <b>M. McDonald</b>
Drilling Method <b>Direct Push</b>	Drill Bit Size/Type <b>5x2" Macrocore</b>	Total Depth of Borehole <b>5 feet bgs</b>
Drill Rig Type <b>7822DT</b>	Drilling Contractor <b>MB Drilling</b>	Approximate Surface Elevation <b>N/A</b>
Groundwater Level and Date Measured <b>N/A</b>	Sampling Method(s) <b>Grab</b>	Closest Tank <b>PB 253</b>
Borehole Backfill <b>Soil Cuttings</b>	Location	

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
0				ML		GRAVELLY SILT, dark gray, moist, firm, no plasticity, no dilatancy; petroleum like odor	6.9	
			PB-253-01R2-0.5-1.0				164.1	Sample PB-253-01R2-0.5-1.0 from 0.5-1.0' bgs
			PB-253-01R2-2.0-2.5				219.1	
	28/60						431.2	
							638.1	Sample PB-253-01R2-2.0-2.5 from 2.0-2.5' bgs
							967.6	
							892.3	
							1047	
5						End boring at 5 feet bgs.	669.1	
							648.1	
10								
15								

Project: **PESRM AST Closure**  
 Project Location: **3144 W. Passyunk Ave**  
 Project Number: **P044.001.002**

**Log of Boring PB-253-05R2**  
**Sheet 1 of 1**

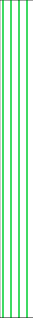
Date(s) Drilled <b>6/2/23</b>	Logged By <b>E. Johnston</b>	Checked By <b>M. McDonald</b>
Drilling Method <b>Direct Push</b>	Drill Bit Size/Type <b>5x2" Macrocore</b>	Total Depth of Borehole <b>5 feet bgs</b>
Drill Rig Type <b>7822DT</b>	Drilling Contractor <b>MB Drilling</b>	Approximate Surface Elevation <b>N/A</b>
Groundwater Level and Date Measured <b>N/A</b>	Sampling Method(s) <b>Grab</b>	Closest Tank <b>PB 253</b>
Borehole Backfill <b>Soil Cuttings</b>	Location	

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
0			PB-253-05R2-0.5-1.0	ML		CLAYEY SILT, dark gray, moist, firm, no plasticity, no dilatancy; petroleum like odor	0.0	
40/60			PB-253-05R2-2.0-2.5				1.1 1.5 2.7 5.7 16.0 46.2 27.8 27.3 8.9	Sample PB-253-05R2-0.5-1.0 from 0.5-1.0' bgs  Sample PB-253-05R2-2.0-2.5 from 2.0-2.5' bgs
5						End boring at 5 feet bgs.		
10								
15								

Project: **PESRM AST Closure**  
 Project Location: **3144 W. Passyunk Ave**  
 Project Number: **P044.001.002**

**Log of Boring PB-253-02R2**  
**Sheet 1 of 1**

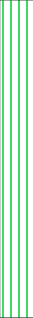
Date(s) Drilled <b>6/2/23</b>	Logged By <b>E. Johnston</b>	Checked By <b>M. McDonald</b>
Drilling Method <b>Direct Push</b>	Drill Bit Size/Type <b>5x2" Macrocore</b>	Total Depth of Borehole <b>5 feet bgs</b>
Drill Rig Type <b>7822DT</b>	Drilling Contractor <b>MB Drilling</b>	Approximate Surface Elevation <b>N/A</b>
Groundwater Level and Date Measured <b>N/A</b>	Sampling Method(s) <b>Grab</b>	Closest Tank <b>PB 253</b>
Borehole Backfill <b>Soil Cuttings</b>	Location	

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
0				ML		CLAYEY SILT, dark gray, moist, firm, no plasticity, no dilatancy; petroleum like odor	45.8	
			PB-253-02R2-0.5-1.0				70.6	Sample PB-253-02R2-0.5-1.0 from 0.5-1.0' bgs
							208.1	
							122.1	
	48/60		PB-253-02R2-2.0-2.5				30.7	Sample PB-253-02R2-2.0-2.5 from 2.0-2.5' bgs
							46.1	
							5.2	
							53.4	
5						End boring at 5 feet bgs.	188.1	
							110.3	
10								
15								

Project: **PESRM AST Closure**  
 Project Location: **3144 W. Passyunk Ave**  
 Project Number: **P044.001.002**

**Log of Boring PB-253-10R**  
**Sheet 1 of 1**

Date(s) Drilled: <b>6/2/23</b>	Logged By: <b>E. Johnston</b>	Checked By: <b>M. McDonald</b>
Drilling Method: <b>Direct Push</b>	Drill Bit Size/Type: <b>5x2" Macrocore</b>	Total Depth of Borehole: <b>5 feet bgs</b>
Drill Rig Type: <b>7822DT</b>	Drilling Contractor: <b>MB Drilling</b>	Approximate Surface Elevation: <b>N/A</b>
Groundwater Level and Date Measured: <b>N/A</b>	Sampling Method(s): <b>Grab</b>	Closest Tank: <b>PB 253</b>
Borehole Backfill: <b>Soil Cuttings</b>	Location	

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
0				ML		CLAYEY SILT, dark gray, moist, firm, no plasticity, no dilatancy; petroleum like odor	28.6	
			PB-253-10R-0.5-1.0				95.6	Sample PB-253-10R-0.5-1.0 from 0.5-1.0' bgs
			PB-253-10R-2.0-2.5				212.5	
	48/60						212.7	
							80.1	Sample PB-253-10R-2.0-2.5 from 2.0-2.5' bgs
							120.3	
							63.9	
							180.2	
							345.8	
5						End boring at 5 feet bgs.	235.8	
10								
15								



Date(s) Drilled <b>6/2/23</b>	Logged By <b>E. Johnston</b>	Checked By <b>M. McDonald</b>
Drilling Method <b>Direct Push</b>	Drill Bit Size/Type <b>5x2" Macrocore</b>	Total Depth of Borehole <b>10 feet bgs</b>
Drill Rig Type <b>7822DT</b>	Drilling Contractor <b>MB Drilling</b>	Approximate Surface Elevation <b>N/A</b>
Groundwater Level and Date Measured <b>N/A</b>	Sampling Method(s) <b>Grab</b>	Hammer Data <b>PB 253</b>
Borehole Backfill <b>Soil Cuttings</b>	Location	

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
0				ML		GRAVELLY SILT, dark gray, moist, firm, no plasticity, no dilatancy; petroleum like odor	10.5 17.9 86.5 95.0	Sample PB-253-22R-0.5-1.0 from 0.5-1.0' bgs
41/60			PB-253-22R-2.0-2.5				137.1 349.8 248.2	Sample PB-253-22R-2.0-2.5 from 2.0-2.5' bgs
5				ML		CLAYEY SILT, dark gray, moist, firm, low plasticity, no dilatancy	89.0 139.6 147.7 97.3 25.5 47.8 134.5	
48/60							57.3 73.1 61.2 10.6 5.6 4.6	
10						End boring at 10 feet bgs.		

Project: **PESRM AST Closure**  
 Project Location: **3144 W. Passyunk Ave**  
 Project Number: **P044.001.002**

**Key to Log of Boring**  
**Sheet 1 of 1**

Depth (feet)	Recovery	Sample Type	Sample Number	Material Type	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9

**COLUMN DESCRIPTIONS**

- 1** Depth (feet): Depth in feet below the ground surface.
- 2** Recovery : Percent Recovery
- 3** Sample Type: Type of soil sample collected at the depth interval shown.
- 4** Sample Number: Sample identification number.
- 5** Material Type: Type of material encountered.
- 6** Graphic Log: Graphic depiction of the subsurface material encountered.
- 7** MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
- 8** PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.
- 9** REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

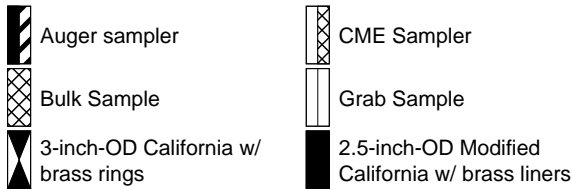
**FIELD AND LABORATORY TEST ABBREVIATIONS**

- CHEM: Chemical tests to assess corrosivity
- COMP: Compaction test
- CONS: One-dimensional consolidation test
- LL: Liquid Limit, percent
- PI: Plasticity Index, percent
- SA: Sieve analysis (percent passing No. 200 Sieve)
- UC: Unconfined compressive strength test, Qu, in ksf
- WA: Wash sieve (percent passing No. 200 Sieve)

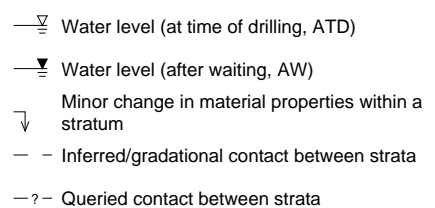
**MATERIAL GRAPHIC SYMBOLS**



**TYPICAL SAMPLER GRAPHIC SYMBOLS**



**OTHER GRAPHIC SYMBOLS**



**GENERAL NOTES**

- 1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

\\192.168.91.250\data\Projects\P044 - PESRM\PEST\Technical\Boring Logs\Penrose\2023.06.14\_TG05\_Penrose Boring Logs.bq4[PESRM...no well PID 18 ft.jp]

**Figure B-1**

# Appendix B

## Laboratory Data Package





## ANALYTICAL REPORT

Lab Number:	L2331063
Client:	Terraphase Engineering Inc. 1100 East Hector Street Suite 400 Conshohocken, PA 19428
ATTN:	Michael McDonald
Phone:	(484) 513-4910
Project Name:	PB 253 SUPPLEMENTAL CHARACTERI
Project Number:	P044.001.002
Report Date:	06/16/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

---

Eight Walkup Drive, Westborough, MA 01581-1019  
508-898-9220 (Fax) 508-898-9193 800-624-9220 - [www.alphalab.com](http://www.alphalab.com)



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2331063-01	PB-253-01R2-0.5-1.0	SOIL	3144 W. PASSYUNK AVE.	06/02/23 12:10	06/02/23
L2331063-02	PB-253-01R2-2.0-2.5	SOIL	3144 W. PASSYUNK AVE.	06/02/23 12:15	06/02/23
L2331063-03	PB-253-01R2-2.0-2.5D	SOIL	3144 W. PASSYUNK AVE.	06/02/23 12:15	06/02/23
L2331063-04	PB-253-22R-0.5-1.0	SOIL	3144 W. PASSYUNK AVE.	06/02/23 12:55	06/02/23
L2331063-05	PB-253-22R-2.0-2.5	SOIL	3144 W. PASSYUNK AVE.	06/02/23 13:14	06/02/23
L2331063-06	PB-253-02R2-0.5-1.0	SOIL	3144 W. PASSYUNK AVE.	06/02/23 14:30	06/02/23
L2331063-07	PB-253-02R2-2.0-2.5	SOIL	3144 W. PASSYUNK AVE.	06/02/23 14:32	06/02/23
L2331063-08	PB-253-05R2-0.5-1.0	SOIL	3144 W. PASSYUNK AVE.	06/02/23 14:40	06/02/23
L2331063-09	PB-253-05R2-2.0-2.5	SOIL	3144 W. PASSYUNK AVE.	06/02/23 14:45	06/02/23
L2331063-10	PB-253-10R-0.5-1.0	SOIL	3144 W. PASSYUNK AVE.	06/02/23 14:55	06/02/23
L2331063-11	PB-253-10R-2.0-2.5	SOIL	3144 W. PASSYUNK AVE.	06/02/23 15:00	06/02/23
L2331063-12	FB-230602	WATER	3144 W. PASSYUNK AVE.	06/02/23 14:35	06/02/23
L2331063-13	TB-230602	WATER	3144 W. PASSYUNK AVE.	06/02/23 14:50	06/02/23

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

### Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

**HOLD POLICY** - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

---

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

### Case Narrative (continued)

#### Report Submission

June 16, 2023: This final report includes the results of all requested analyses.

June 12, 2023: This is a preliminary report.

June 09, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

#### Volatile Organics

L2331063-11: The surrogate recovery is outside the acceptance criteria for 4-bromofluorobenzene (146%); however, the sample was not re-analyzed due to coelution with an obvious interference. A copy of the chromatogram is included as an attachment to this report.

#### Semivolatile Organics

L2331063-03D and -11D: The sample has an elevated detection limit due to the dilution required by the sample matrix.

The WG1786641-4/-5 MS/MSD recoveries, performed on L2331063-05, are outside the acceptance criteria for naphthalene (7%/0%). The unacceptable percent recoveries are attributed to the elevated concentration of target compound present in the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 06/16/23

# ORGANICS



# VOLATILES

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-02 D  
 Client ID: PB-253-01R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 12:15  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 10:18  
 Analyst: AJK  
 Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by EPA 5035 High - Westborough Lab						
--	--	--	--	--	--	--

Benzene	2.8		mg/kg	0.29	0.097	10
---------	-----	--	-------	------	-------	----

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	90		70-130
Dibromofluoromethane	77		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-03 D  
 Client ID: PB-253-01R2-2.0-2.5D  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 12:15  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 10:42  
 Analyst: AJK  
 Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
Benzene	0.92		mg/kg	0.30	0.099	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	84		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-05  
 Client ID: PB-253-22R-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 13:14  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 12:17  
 Analyst: AJK  
 Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by EPA 5035 High - Westborough Lab						
--	--	--	--	--	--	--

Benzene	0.075		mg/kg	0.026	0.0087	1
---------	-------	--	-------	-------	--------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	106		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-07  
 Client ID: PB-253-02R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:32  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/09/23 11:19  
 Analyst: MKS  
 Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by EPA 5035 Low - Westborough Lab						
---	--	--	--	--	--	--

Benzene	ND		mg/kg	0.00048	0.00016	1
---------	----	--	-------	---------	---------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	141	Q	70-130
Toluene-d8	93		70-130
4-Bromofluorobenzene	134	Q	70-130
Dibromofluoromethane	157	Q	70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-09  
 Client ID: PB-253-05R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:45  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/09/23 10:56  
 Analyst: MKS  
 Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by EPA 5035 Low - Westborough Lab						
---	--	--	--	--	--	--

Benzene	ND		mg/kg	0.00049	0.00016	1
---------	----	--	-------	---------	---------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	139	Q	70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	153	Q	70-130
Dibromofluoromethane	151	Q	70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-11  
 Client ID: PB-253-10R-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 15:00  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 11:53  
 Analyst: AJK  
 Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by EPA 5035 High - Westborough Lab						
--	--	--	--	--	--	--

Benzene	0.069		mg/kg	0.031	0.010	1
---------	-------	--	-------	-------	-------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	87		70-130
4-Bromofluorobenzene	146	Q	70-130
Dibromofluoromethane	96		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-12  
 Client ID: FB-230602  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:35  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Water  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 15:06  
 Analyst: MJV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by GC/MS - Westborough Lab						
Benzene	ND		ug/l	0.50	0.16	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	131	Q	70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	90		70-130
Dibromofluoromethane	122		70-130



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-13  
 Client ID: TB-230602  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:50  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Water  
 Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 15:27  
 Analyst: MJV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by GC/MS - Westborough Lab						
Benzene	ND		ug/l	0.50	0.16	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	130		70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	89		70-130
Dibromofluoromethane	117		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8260D  
Analytical Date: 06/08/23 09:54  
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 02-03,05,11 Batch: WG1788905-5					
Benzene	ND		mg/kg	0.025	0.0083

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	118		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	109		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis  
 Batch Quality Control**

Analytical Method: 1,8260D  
 Analytical Date: 06/08/23 09:33  
 Analyst: PID

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 12-13 Batch: WG1789126-5					
Benzene	ND		ug/l	0.50	0.16

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	123		70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	90		70-130
Dibromofluoromethane	117		70-130

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8260D  
Analytical Date: 06/09/23 10:32  
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 07,09 Batch: WG1789349-5					
Benzene	ND		mg/kg	0.00050	0.00017

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	91		70-130
Dibromofluoromethane	108		70-130

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI

**Lab Number:** L2331063

**Project Number:** P044.001.002

**Report Date:** 06/16/23

<b>Parameter</b>	<b>LCS %Recovery</b>	<b>Qual</b>	<b>LCSD %Recovery</b>	<b>Qual</b>	<b>%Recovery Limits</b>	<b>RPD</b>	<b>Qual</b>	<b>RPD Limits</b>
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 02-03,05,11 Batch: WG1788905-3 WG1788905-4								
Benzene	102		101		70-130	1		30

<b>Surrogate</b>	<b>LCS %Recovery</b>	<b>Qual</b>	<b>LCSD %Recovery</b>	<b>Qual</b>	<b>Acceptance Criteria</b>
1,2-Dichloroethane-d4	102		106		70-130
Toluene-d8	99		100		70-130
4-Bromofluorobenzene	92		92		70-130
Dibromofluoromethane	99		100		70-130

### Lab Control Sample Analysis

#### Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI

**Lab Number:** L2331063

**Project Number:** P044.001.002

**Report Date:** 06/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 12-13 Batch: WG1789126-3 WG1789126-4								
Benzene	100		100		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	116		115		70-130
Toluene-d8	96		96		70-130
4-Bromofluorobenzene	85		87		70-130
Dibromofluoromethane	113		114		70-130

### Lab Control Sample Analysis Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 07,09 Batch: WG1789349-3 WG1789349-4								
Benzene	107		113		70-130	5		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	100		102		70-130
Toluene-d8	97		96		70-130
4-Bromofluorobenzene	95		92		70-130
Dibromofluoromethane	98		99		70-130

## Matrix Spike Analysis

*Batch Quality Control*

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI

**Lab Number:** L2331063

**Project Number:** P044.001.002

**Report Date:** 06/16/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 02-03,05,11 QC Batch ID: WG1788905-6 WG1788905-7 QC Sample: L2331063-05 Client ID: PB-253-22R-2.0-2.5												
Benzene	0.075	4.71	7.2	152	Q	7.5	157	Q	70-130	3		30

<i>Surrogate</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1,2-Dichloroethane-d4	94		100		70-130
4-Bromofluorobenzene	111		98		70-130
Dibromofluoromethane	87		98		70-130
Toluene-d8	103		96		70-130



# SEMIVOLATILES

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-02  
 Client ID: PB-253-01R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 12:15  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/07/23 07:58  
 Analyst: JG  
 Percent Solids: 85%

Extraction Method: EPA 3546  
 Extraction Date: 06/03/23 16:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Semivolatile Organics by GC/MS - Westborough Lab						
--	--	--	--	--	--	--

Naphthalene	7.6		mg/kg	0.039	0.024	1
-------------	-----	--	-------	-------	-------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	128	Q	23-120
2-Fluorobiphenyl	77		30-120
4-Terphenyl-d14	52		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-03 D  
 Client ID: PB-253-01R2-2.0-2.5D  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 12:15  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/09/23 14:59  
 Analyst: JG  
 Percent Solids: 84%

Extraction Method: EPA 3546  
 Extraction Date: 06/03/23 16:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Semivolatile Organics by GC/MS - Westborough Lab						
Naphthalene	9.3		mg/kg	0.20	0.12	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	128	Q	23-120
2-Fluorobiphenyl	94		30-120
4-Terphenyl-d14	88		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-05  
 Client ID: PB-253-22R-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 13:14  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/07/23 07:25  
 Analyst: JG  
 Percent Solids: 87%

Extraction Method: EPA 3546  
 Extraction Date: 06/03/23 16:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

## Semivolatile Organics by GC/MS - Westborough Lab

Naphthalene	7.0		mg/kg	0.038	0.023	1
-------------	-----	--	-------	-------	-------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	107		23-120
2-Fluorobiphenyl	83		30-120
4-Terphenyl-d14	66		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-07  
 Client ID: PB-253-02R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:32  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/07/23 07:08  
 Analyst: JG  
 Percent Solids: 87%

Extraction Method: EPA 3546  
 Extraction Date: 06/03/23 16:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

## Semivolatile Organics by GC/MS - Westborough Lab

Naphthalene	0.033	J	mg/kg	0.037	0.023	1
-------------	-------	---	-------	-------	-------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	86		23-120
2-Fluorobiphenyl	67		30-120
4-Terphenyl-d14	74		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-09  
 Client ID: PB-253-05R2-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:45  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/12/23 02:13  
 Analyst: ALS  
 Percent Solids: 83%

Extraction Method: EPA 3546  
 Extraction Date: 06/09/23 16:49

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Semivolatile Organics by GC/MS - Westborough Lab						
--	--	--	--	--	--	--

Naphthalene	ND		mg/kg	0.039	0.024	1
-------------	----	--	-------	-------	-------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	50		23-120
2-Fluorobiphenyl	53		30-120
4-Terphenyl-d14	59		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-11 D  
 Client ID: PB-253-10R-2.0-2.5  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 15:00  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil  
 Analytical Method: 1,8270E  
 Analytical Date: 06/12/23 13:50  
 Analyst: CMM  
 Percent Solids: 83%

Extraction Method: EPA 3546  
 Extraction Date: 06/09/23 16:49

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Semivolatile Organics by GC/MS - Westborough Lab						
--	--	--	--	--	--	--

Naphthalene	ND		mg/kg	0.39	0.24	10
-------------	----	--	-------	------	------	----

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	168	Q	23-120
2-Fluorobiphenyl	89		30-120
4-Terphenyl-d14	70		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

Lab ID: L2331063-12  
 Client ID: FB-230602  
 Sample Location: 3144 W. PASSYUNK AVE.

Date Collected: 06/02/23 14:35  
 Date Received: 06/02/23  
 Field Prep: Not Specified

Sample Depth:

Matrix: Water  
 Analytical Method: 1,8270E-SIM  
 Analytical Date: 06/07/23 12:48  
 Analyst: CMM

Extraction Method: EPA 3510C  
 Extraction Date: 06/06/23 12:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Semivolatile Organics by GC/MS-SIM - Westborough Lab						
--	--	--	--	--	--	--

Naphthalene	ND		ug/l	0.10	0.05	1
-------------	----	--	------	------	------	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	67		23-120
2-Fluorobiphenyl	74		15-120
4-Terphenyl-d14	77		41-149



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis**  
**Batch Quality Control**

Analytical Method: 1,8270E  
Analytical Date: 06/03/23 16:16  
Analyst: IM

Extraction Method: EPA 3546  
Extraction Date: 06/02/23 19:36

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 02-03,05,07 Batch: WG1786641-1					
Naphthalene	ND		mg/kg	0.033	0.020

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-120
Phenol-d6	58		10-120
Nitrobenzene-d5	53		23-120
2-Fluorobiphenyl	61		30-120
2,4,6-Tribromophenol	65		10-136
4-Terphenyl-d14	70		18-120

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8270E-SIM  
Analytical Date: 06/07/23 12:14  
Analyst: CMM

Extraction Method: EPA 3510C  
Extraction Date: 06/06/23 12:17

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 12 Batch: WG1787792-1					
Naphthalene	ND		ug/l	0.10	0.05

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	82		23-120
2-Fluorobiphenyl	88		15-120
4-Terphenyl-d14	91		41-149

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**Method Blank Analysis  
Batch Quality Control**

Analytical Method: 1,8270E  
Analytical Date: 06/12/23 01:03  
Analyst: ALS

Extraction Method: EPA 3546  
Extraction Date: 06/09/23 16:49

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09,11 Batch: WG1789471-1					
Naphthalene	ND		mg/kg	0.033	0.020

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	54		23-120
2-Fluorobiphenyl	60		30-120
4-Terphenyl-d14	66		18-120

## Lab Control Sample Analysis

### Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI

**Lab Number:** L2331063

**Project Number:** P044.001.002

**Report Date:** 06/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 02-03,05,07 Batch: WG1786641-2 WG1786641-3								
Naphthalene	64		68		40-140	6		50

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	64		66		25-120
Phenol-d6	63		66		10-120
Nitrobenzene-d5	61		63		23-120
2-Fluorobiphenyl	68		70		30-120
2,4,6-Tribromophenol	74		75		10-136
4-Terphenyl-d14	75		79		18-120

### Lab Control Sample Analysis Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 12 Batch: WG1787792-2 WG1787792-3								
Naphthalene	45		64		40-140	35		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	48		70		23-120
2-Fluorobiphenyl	55		78		15-120
4-Terphenyl-d14	66		85		41-149

### Lab Control Sample Analysis Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09,11 Batch: WG1789471-2 WG1789471-3								
Naphthalene	63		60		40-140	5		50

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	57		52		23-120
2-Fluorobiphenyl	66		61		30-120
4-Terphenyl-d14	70		64		18-120

### Matrix Spike Analysis Batch Quality Control

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

<b>Parameter</b>	<b>Native Sample</b>	<b>MS Added</b>	<b>MS Found</b>	<b>MS %Recovery</b>	<b>Qual</b>	<b>MSD Found</b>	<b>MSD %Recovery</b>	<b>Qual</b>	<b>Recovery Limits</b>	<b>RPD</b>	<b>Qual</b>	<b>RPD Limits</b>
Semivolatiles Organics by GC/MS - Westborough Lab Associated sample(s): 02-03,05,07 QC Batch ID: WG1786641-4 WG1786641-5 QC Sample: L2331063-05 Client ID: PB-253-22R-2.0-2.5												
Naphthalene	7.0	1.53	7.1	7	Q	6.1	0	Q	40-140	15		50

<b>Surrogate</b>	<b>MS</b>		<b>MSD</b>		<b>Acceptance Criteria</b>
	<b>% Recovery</b>	<b>Qualifier</b>	<b>% Recovery</b>	<b>Qualifier</b>	
2-Fluorobiphenyl	69		64		30-120
4-Terphenyl-d14	58		58		18-120
Nitrobenzene-d5	100		97		23-120

# **INORGANICS & MISCELLANEOUS**



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-02  
**Client ID:** PB-253-01R2-2.0-2.5  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 12:15  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	84.6		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-03  
**Client ID:** PB-253-01R2-2.0-2.5D  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 12:15  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	84.0		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-05  
**Client ID:** PB-253-22R-2.0-2.5  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 13:14  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	86.9		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-07  
**Client ID:** PB-253-02R2-2.0-2.5  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 14:32  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	86.8		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-09  
**Client ID:** PB-253-05R2-2.0-2.5  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 14:45  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	83.0		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

**SAMPLE RESULTS**

**Lab ID:** L2331063-11  
**Client ID:** PB-253-10R-2.0-2.5  
**Sample Location:** 3144 W. PASSYUNK AVE.

**Date Collected:** 06/02/23 15:00  
**Date Received:** 06/02/23  
**Field Prep:** Not Specified

**Sample Depth:**  
**Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
<b>General Chemistry - Westborough Lab</b>										
Solids, Total	83.1		%	0.100	NA	1	-	06/03/23 10:07	121,2540G	ROI



### Lab Duplicate Analysis *Batch Quality Control*

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI

**Project Number:** P044.001.002

**Lab Number:** L2331063

**Report Date:** 06/16/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-03,05,07,09,11 QC Batch ID: WG1786749-1 QC Sample: L2331062-02 Client ID: DUP Sample						
Solids, Total	86.6	90.1	%	4		20

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI**Lab Number:** L2331063**Project Number:** P044.001.002**Report Date:** 06/16/23**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

**Cooler Information**

<b>Cooler</b>	<b>Custody Seal</b>
A	Absent
B	Absent
C	Absent
D	Absent
E	Absent
F	Absent

**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2331063-01A	Vial MeOH preserved	D	NA		3.6	Y	Absent		HOLD-8260HLW(14)
L2331063-01B	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-01C	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-01D	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		HOLD-WETCHEM()
L2331063-01E	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		HOLD-8270(14)
L2331063-02A	Vial MeOH preserved	D	NA		3.6	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-02B	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-02C	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-02D	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		TS(7)
L2331063-02E	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		PA-PAH(14)
L2331063-03A	Vial MeOH preserved	D	NA		3.6	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-03B	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-03C	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-03D	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		TS(7)
L2331063-03E	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		PA-PAH(14)
L2331063-04A	Vial MeOH preserved	D	NA		3.6	Y	Absent		HOLD-8260HLW(14)
L2331063-04B	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI**Lab Number:** L2331063**Project Number:** P044.001.002**Report Date:** 06/16/23**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2331063-04C	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-04D	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		HOLD-WETCHEM()
L2331063-04E	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		HOLD-8270(14)
L2331063-05A	Vial MeOH preserved	C	NA		4.3	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-05A1	Vial MeOH preserved	D	NA		3.6	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-05A2	Vial MeOH preserved	D	NA		3.6	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-05B	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05B1	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05B2	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05C	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05C1	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05C2	Vial water preserved	D	NA		3.6	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-05D	Plastic 120ml unpreserved	C	NA		4.3	Y	Absent		TS(7)
L2331063-05D1	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		TS(7)
L2331063-05D2	Plastic 120ml unpreserved	D	NA		3.6	Y	Absent		TS(7)
L2331063-05E	Glass 120ml/4oz unpreserved	C	NA		4.3	Y	Absent		PA-PAH(14)
L2331063-05E1	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		PA-PAH(14)
L2331063-05E2	Glass 120ml/4oz unpreserved	D	NA		3.6	Y	Absent		PA-PAH(14)
L2331063-06A	Vial MeOH preserved	C	NA		4.3	Y	Absent		HOLD-8260HLW(14)
L2331063-06B	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-06C	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-06D	Plastic 120ml unpreserved	C	NA		4.3	Y	Absent		HOLD-WETCHEM()
L2331063-06E	Glass 120ml/4oz unpreserved	C	NA		4.3	Y	Absent		HOLD-8270(14)
L2331063-07A	Vial MeOH preserved	E	NA		2.2	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-07B	Vial water preserved	E	NA		2.2	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-07C	Vial water preserved	E	NA		2.2	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-07D	Plastic 120ml unpreserved	E	NA		2.2	Y	Absent		TS(7)
L2331063-07E	Glass 120ml/4oz unpreserved	E	NA		2.2	Y	Absent		PA-PAH(14)

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI**Lab Number:** L2331063**Project Number:** P044.001.002**Report Date:** 06/16/23**Container Information**

<b>Container ID</b>	<b>Container Type</b>	<b>Cooler</b>	<b>Initial pH</b>	<b>Final pH</b>	<b>Temp deg C</b>	<b>Pres</b>	<b>Seal</b>	<b>Frozen Date/Time</b>	<b>Analysis(*)</b>
L2331063-08A	Vial MeOH preserved	C	NA		4.3	Y	Absent		HOLD-8260HLW(14)
L2331063-08B	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-08C	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-08D	Plastic 120ml unpreserved	C	NA		4.3	Y	Absent		HOLD-WETCHEM()
L2331063-08E	Glass 120ml/4oz unpreserved	C	NA		4.3	Y	Absent		HOLD-8270(14)
L2331063-09A	Vial MeOH preserved	C	NA		4.3	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-09B	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-09C	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-09D	Plastic 120ml unpreserved	C	NA		4.3	Y	Absent		TS(7)
L2331063-09E	Glass 120ml/4oz unpreserved	C	NA		4.3	Y	Absent		PA-PAH(14)
L2331063-10A	Vial MeOH preserved	E	NA		2.2	Y	Absent		HOLD-8260HLW(14)
L2331063-10B	Vial water preserved	E	NA		2.2	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-10C	Vial water preserved	E	NA		2.2	Y	Absent	03-JUN-23 05:42	HOLD-8260HLW(14)
L2331063-10D	Plastic 120ml unpreserved	E	NA		2.2	Y	Absent		HOLD-WETCHEM()
L2331063-10E	Glass 120ml/4oz unpreserved	E	NA		2.2	Y	Absent		HOLD-8270(14)
L2331063-11A	Vial MeOH preserved	C	NA		4.3	Y	Absent		PA-8260HLW-BTEX(14)
L2331063-11B	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-11C	Vial water preserved	C	NA		4.3	Y	Absent	03-JUN-23 05:42	PA-8260HLW-BTEX(14)
L2331063-11D	Plastic 120ml unpreserved	C	NA		4.3	Y	Absent		TS(7)
L2331063-11E	Glass 120ml/4oz unpreserved	C	NA		4.3	Y	Absent		PA-PAH(14)
L2331063-12A	Vial HCl preserved	E	NA		2.2	Y	Absent		PA-8260(14)
L2331063-12B	Vial HCl preserved	E	NA		2.2	Y	Absent		PA-8260(14)
L2331063-12C	Vial HCl preserved	E	NA		2.2	Y	Absent		PA-8260(14)
L2331063-12D	Amber 250ml unpreserved	E	7	7	2.2	Y	Absent		PA-PAHSIM-LVI(7)
L2331063-12E	Amber 250ml unpreserved	E	7	7	2.2	Y	Absent		PA-PAHSIM-LVI(7)
L2331063-13A	Vial HCl preserved	D	NA		3.6	Y	Absent		PA-8260(14)
L2331063-13B	Vial HCl preserved	D	NA		3.6	Y	Absent		PA-8260(14)

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

## GLOSSARY

### Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)  Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

### Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

### Terms

**Analytical Method:** Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

**Chlordane:** The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

**Difference:** With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

**Final pH:** As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

**Frozen Date/Time:** With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

**Gasoline Range Organics (GRO):** Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

**Initial pH:** As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

**PAH Total:** With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

**PFAS Total:** With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

**Total:** With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

### Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers



**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

#### **Data Qualifiers**

Identified Compounds (TICs).

- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

**Project Name:** PB 253 SUPPLEMENTAL CHARACTERI  
**Project Number:** P044.001.002

**Lab Number:** L2331063  
**Report Date:** 06/16/23

## REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

## LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



## Certification Information

---

The following analytes are not included in our Primary NELAP Scope of Accreditation:

### Westborough Facility

**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene

**EPA 625/625.1:** alpha-Terpineol

**EPA 8260C/8260D:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

**EPA 8270D/8270E:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO<sub>2</sub>, NO<sub>3</sub>.

### Mansfield Facility

**SM 2540D:** TSS

**EPA 8082A:** NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

**Biological Tissue Matrix:** EPA 3050B

---

The following analytes are included in our Massachusetts DEP Scope of Accreditation

### Westborough Facility:

#### Drinking Water

**EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

**EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

**EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

#### Non-Potable Water

**SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

**SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

**EPA 624.1:** Volatile Halocarbons & Aromatics,

**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

### Mansfield Facility:

#### Drinking Water

**EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

**EPA 522, EPA 537.1.**

#### Non-Potable Water

**EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

**EPA 245.1 Hg.**

**SM2340B**

---

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



# CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 6/3/23

ALPHA Job #: L2331063

### Project Information

Project Name: PB253 Supplemental characterization  
 Project Location: 3144 W. Passyunk Ave., Philadelphia, PA  
 Project #: P044.001.002  
 Project Manager: Michael McDonald  
 ALPHA Quote #: 22705

### Report Information - Data Deliverables

FAX  EMAIL  
 ADEX  Add'l Deliverables

### Billing Information

Same as Client info PO #:

### Client Information

Client: Terraphase Engineering Inc.  
 Address: 1100 East Hector St., Ste 400  
Conshohocken, PA 19428  
 Phone: 484-513-4910  
 Fax:  
 Email: michael.mcdonald@terrphase.com

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved)

Date Due: Time:

These samples have been previously analyzed by Alpha

### Other Project Specific Requirements/Comments/Detection Limits:

please email EDD @ terrphase .com  
TEI equis EDD

### Regulatory Requirements/Report Limits

State /Fed Program Criteria

ANALYSIS	Benzene (8260)	Naphthalene (8270)	TOTAL # BOTTLES
	<b>SAMPLE HANDLING</b> Filtration _____ <input type="checkbox"/> Done <input type="checkbox"/> Not needed <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please specify below)		

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials	ANALYSIS		TOTAL # BOTTLES
		Date	Time			Benzene (8260)	Naphthalene (8270)	
31063-01	PB-253-01R2-0.5-1.0	6/2/2023	1210	So	EEJ	Hold	Hold	
	02 PB-253-01R2-2.0-2.5	6/2/2023	1215	So	EEJ	X	X	
	03 PB-253-01R2-2.0-2.5 D	6/2/2023	1215	So	EEJ	X	X	
	04 PB-253-22R-0.5-1.0	6/2/2023	1255	So	EEJ	Hold	Hold	
	05 PB-253-22R-2.0-2.5	6/2/2023	1314	So	EEJ	X	X	
	↓ PB-253-22R-2.0-2.5 MS	6/2/2023	1314	So	EEJ	X	X	
	↓ PB-253-22R-2.0-2.5 MSD	6/2/2023	1314	So	EEJ	X	X	
	06 PB-253-02R2-0.5-1.0	6/2/2023	1430	So	EEJ	Hold	Hold	
	07 PB-253-02R2-2.0-2.5	6/2/2023	1432	So	EEJ	X	X	
	08 PB-253-05R2-0.5-1.0	6/2/2023	1440	So	EEJ	Hold	Hold	

6/3/23 0215  
6/3/23 0215

Container Type

Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Ellen Johnson</u>	<u>6/2/2023 1557</u>	<u>[Signature]</u>	<u>06/02/23 1557</u>
<u>[Signature]</u>	<u>06/02/23 1557</u>	<u>[Signature]</u>	<u>6/2/23 1557</u>
<u>[Signature]</u>	<u>6/2/23 2100</u>	<u>[Signature]</u>	<u>6/2 2100</u>

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.





# CHAIN OF CUSTODY

PAGE 2 OF 2

WESTBORO, MA  
TEL: 508-898-9220  
FAX: 508-898-9193

MANSFIELD, MA  
TEL: 508-822-9300  
FAX: 508-822-3288

### Project Information

Project Name: PB253 Supplemental Characterization  
Project Location: 3144 W. Passyunk Ave. Phila, PA  
Project #: P044.001 002  
Project Manager: Michael McDonald  
ALPHA Quote #: 22705

### Report Information - Data Deliverables

FAX  EMAIL  
 ADEX  Add'l Deliverables

### Billing Information

Same as Client info PO #:

### Client Information

Client: Terraphase Engineering, Inc.  
Address: 1100 E. Hector Street, Ste 400  
Conshohocken, PA 19428  
Phone: 484-513-4910  
Fax:  
Email: michael.mcdonald@terrphase.com

### Turn-Around Time

Standard  RUSH (only confirmed if pre-approved)

Date Due: Time:

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:  
please email EDD@terrphase.com  
TEI Equis EDD

### Regulatory Requirements/Report Limits

State /Fed Program Criteria

*ANALYSIS*  
*Benzene (8260)*  
*Naphthalene (8270)*

### SAMPLE HANDLING

- Filtration \_\_\_\_\_  
 Done  
 Not needed  
 Lab to do  
Preservation  
 Lab to do  
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials	Sample Specific Comments														
		Date	Time																	
31063-09	PB-253-052R-2.0-2.5	6/2/2023	1445	S <sub>o</sub>	EEJ	X	X													
10	PB-253-10R-0.5-1.0	6/2/2023	1455	S <sub>o</sub>	EEJ	HOLD	HOLD													
11	PB-253-10R-2.0-2.5	6/2/2023	1500	S <sub>o</sub>	EEJ	X	X													
12	FB-230602	6/2/2023	1435	S <sub>o</sub> W	EEJ	X	X													
13	TB-230602	6/2/2023	1450	W	EEJ	X														

6/3/23 0215

Container Type

Preservative

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Ellie [Signature]</u>	<u>6/2/2023 1557</u>	<u>[Signature] ARL</u>	<u>6/2/23 1557</u>
<u>[Signature]</u>	<u>6/2/23 1800</u>	<u>[Signature]</u>	<u>6/2/23 1800</u>
<u>[Signature]</u>	<u>6/2/23 210</u>	<u>[Signature]</u>	<u>6/2 2100</u>

## Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES\VOA131\2023\230608A\  
Data File : V31230608A11.D  
Acq On : 08 Jun 2023 11:53 am  
Operator : VOA131:AJK  
Sample : L2331063-11,31H,5.72,5,0.100,,A  
Misc : WG1788905,ICAL19865  
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jun 08 12:28:27 2023  
Quant Method : I:\VOLATILES\VOA131\2023\230608A\V31\_230328A\_8260.m  
Quant Title : VOLATILES BY GC/MS  
QLast Update : Wed Mar 29 10:40:23 2023  
Response via : Initial Calibration

Sub List : 8260-Benzene - benzene only3\230608A\V31230608A01.D•

