

Road Occupancy Permit Application Package Upper Makefield Township, PA

Project: Multiphase Extraction (MPE) Pilot Test

Please find the attached Road Occupancy Permit application and supporting documentation/plans for the MPE Pilot Test. This package is being submitted for review by Upper Makefield Township in connection with the proposed road occupancy and other related pilot test activities.

The permit package submittal includes the following:

- Completed Application for Township Road Occupancy
- Multiphase Extraction Pilot Test Operations Plan
 - Planned Layout for Multiphase Extraction Pilot Test
 - Proposed Cross Sections
- Traffic Control Plan
- Sound Management Plan
- Air Monitoring and Sampling Plan for Multiphase Extraction (MPE) Pilot Test
- Pilot Test Domestic Well Monitoring Work Plan
- Waste Management Plan

Upper Makefield Township

1076 Eagle Road | Newtown, PA 18940 | p 215.968.3340 | f 215.968.9228 | www.uppermakefield.org

APPLICATION FOR TOWNSHIP ROAD OCCUPANCY

IMPORTANT

The terms and conditions embodied in this permit to complete this work by the date specified in the permit. Where permit holder fails to comply with the condition as to completion of work by the time specified, the following rules will govern:

- Failure to start work by date specified for completion. Permit will be cancelled unless permit holder desires an extension of time, in which case a supplemental permit may be issued.
- Work started and not completed by specified date. Permit holder will notify Township, prior to expiration of allotted time of inability to complete the work on or before the date specified and request an extension of time. Such request shall be accompanied by the prescribed fee.
- Permit holder not desirous of carrying out proposed work on account of change in conditions affecting it. Permit holder will notify the Township prior to the date specified for completion that work will not be carried forward, returning the permit with such notice. The fee for inspection of the work will be refunded by the Township, provided that they have been notified of cancellation prior to the expiration date.

The fees to be paid under the conditions in (a), (b) and (c) apply only to permits for which fees are collected in accordance with the fixed schedule.

All notices relative to time extensions or cancellation shall be forwarded to the Township which issued the original permit.

Date: AUGUST 14, 2026

Fee: _____

Applicant Name: SUNOCO PIPELINE L.P.

Address: 100 GREEN ST., MARCUS HOOK, PA 19061

Tele #: 610-340-8741 Fax #: _____ Email: joseph.massara@energystartransfer.com

Township Route #, Road or Street where work is to be done:

WALKER RD cul-de-sac & portion of GLENWOOD DR. between WALKER RD. & SPENCER RD.

Under and subject to all the conditions, restrictions and regulations prescribed by the Township and on the general provisions and specifications, a true copy whereof is attached and made a part hereof, with the same force and effect as it's written or printed herein and under and subject to the special conditions, restrictions and regulations hereinafter set forth.

Description and Purpose of Work:

INSTALLATION OF THE PILOT TEST EQUIPMENT AND ABOVE GROUND PIPING ASSOCIATED WITH THE MULTI PHASE EXTRACTION PLAN. PURPOSE OF THE WORK IS TO ALLEVIATE THE IMPACTS OF THE PIPELINE RELEASE, UTILIZING A PUMP SYSTEM. ATTACHED W/ROAD OCCUPANCY PERMIT: OPERATIONAL PLAN; TRAFFIC CONTROL PLAN, SIGHT CONTROL PLAN, DOMESTIC WELL MONITORING PLAN, & AIR MONITORING PLAN.

Approved Date

Signature of Township or Seal

**MULTIPHASE
EXTRACTION PILOT
TEST OPERATIONS
PLAN**

Multiphase Extraction Pilot Test Operations Plan

Location

Multiphase extraction (MPE) pilot testing is planned to occur near the intersection of Glenwood Drive and Walker Road. Testing of wells Well A, RW-3, RW-2, and Well C are currently planned. Testing of Well B and Well D may be added to the testing plan based on data collected prior to or during the pilot testing. Testing equipment will be staged in the northern portion of the cul-de-sac at the western end of Walker Road (attached figure). Test wells will be connected to the testing equipment with piping, tubing, and hoses placed along the street against the northern curb of Walker Road and the western curb of Glenwood Drive (attached figure and cross sections). Access to the driveway at 121 Glenwood Drive will be facilitated by using a ramp over the lines. Traffic control and sound mitigation/security plans are provided under separate cover.

Timing and Duration¹

MPE pilot testing is planned on four recovery/multipurpose wells individually – each for a five-day period. Individual well testing is anticipated to occur on Monday through Friday with operations 24 hours each day. Following the four individual well tests, pilot testing of multiple wells simultaneously is planned for a period of approximately seven days. The multiple well testing will have operations 24 hours each day for the testing period.

The anticipated duration of operational testing is approximately 27 days. With the planned recovery time between each of the individual tests, the planned testing duration will be approximately 35 days. The operation of the pilot test system may be extended if additional pilot test data is needed or should results indicate that continued implementation provides significant interim remedial progress. If operation of the pilot test system extends beyond the planned 35 days from initiation (startup of the testing equipment), an extension notification will be provided to Upper Makefield Township (UMT) with an explanation for the extension prior to initiating the extension.

Installation of traffic control measures, pilot testing equipment, and sound mitigation/security measures before the testing and removal of these measures and equipment following the testing along with the testing itself is planned to be performed between September 15 and November 30, 2026.

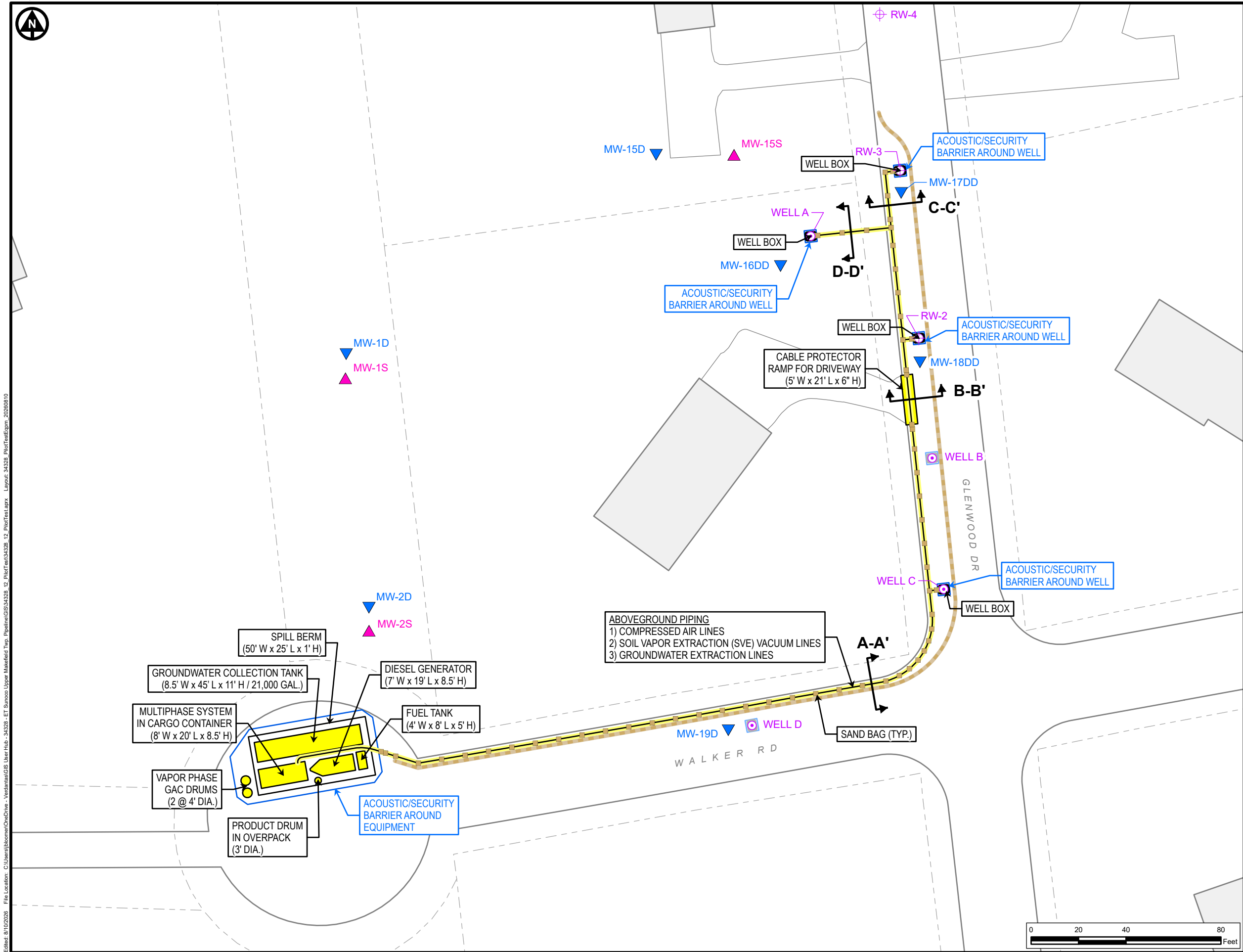
General Operational Information

Ancillary activities to support the pilot testing are planned to be conducted during the normal working hours (between 9am and 5pm). Ancillary activities include fueling of the generator, scheduled maintenance of the pilot test equipment, removal of pumped water and light non-aqueous phase liquid, and the change-out of vapor-phase carbon vessels/media.

Liquid level and vacuum measurements will be collected from testing and observation wells during the entire testing period. Data collection during each test will begin with hourly measurements and progress to measurement intervals up to six hours.

Community air monitoring and potable water supply well monitoring will be performed in accordance with the specific plans prepared for those purposes attached to the permit application.

¹ The information presented above is the current plan for the pilot test activities. Weather conditions, equipment malfunctions, and data obtained during testing may cause changes in the pilot test plan.



- LEGEND**
- Shallow Monitoring Well
 - Deep Monitoring Well
 - Recovery Well
 - Multipurpose Well
 - Cross Section Cut
 - Proposed Sand Bag
 - Aboveground Pilot Test Line
 - Proposed Equipment
 - Proposed Equipment
 - Proposed Well Box
 - Potential Proposed Well Box
 - Proposed Acoustic/Security Barrier
 - Potential Proposed Acoustic/Security Barrier
 - Traffic Control Measures
 - Parcel Boundary (approx.)
 - Existing Building
 - Edge of Roadway (approx.)

- NOTES:**
- 1) Traffic control measures specified in Traffic Control Plan.
 - 2) Acoustic/security barriers specified in Sound Mitigation Plan.
 - 3) Sand bags are approx. 14"x26", 35-50 lbs., placed approx. every 10' on straight runs and placed approx. every 5' on curve. Additional sand bags to be placed near edges of cable protector ramp and near well boxes.
 - 4) Well boxes are approx. 2'Wx3'Lx2'H.

DISCLAIMER: Verdantas LLC has furnished this map to the Client for its sole and exclusive use as a preliminary planning and screening tool. This map is reproduced from geospatial information compiled from third-party sources which may change over time and are not accurate as to mapping, surveying or engineering standards. Verdantas LLC makes no representation or warranty as to the content, accuracy, timeliness or completeness of any information. In no event will Verdantas LLC, its owners, officers, employees or agents, be liable for damages of any kind arising out of the use of this map by Client or any other party.

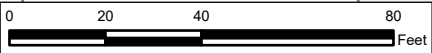


Twin Oaks - Newark 14" Diameter Pipeline

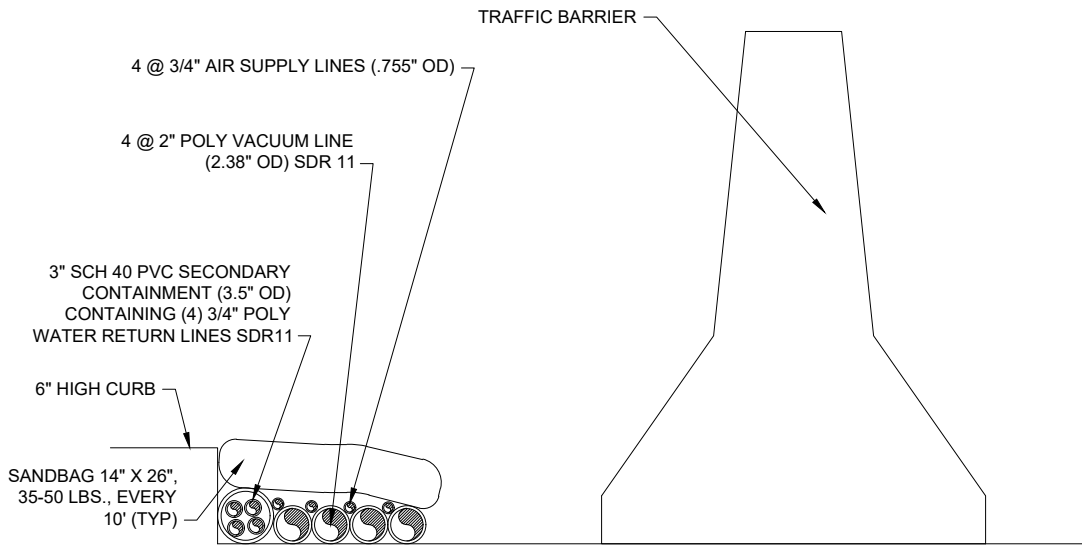
**Planned Layout for
Multiphase Extraction
Pilot Test**

Upper Makefield Township
Bucks County, Pennsylvania

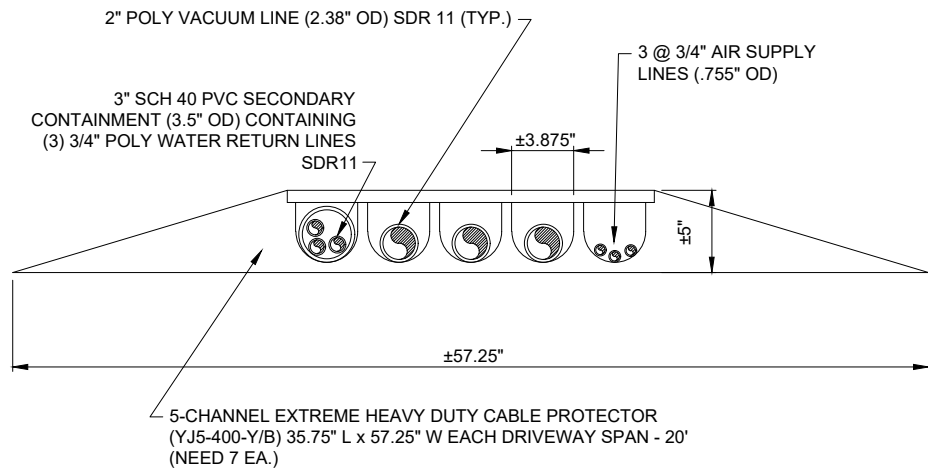
Project Number	006.0000034328
Date	08/2026
Author	jbloomer
Scale	1 in = 40 ft
Figure	



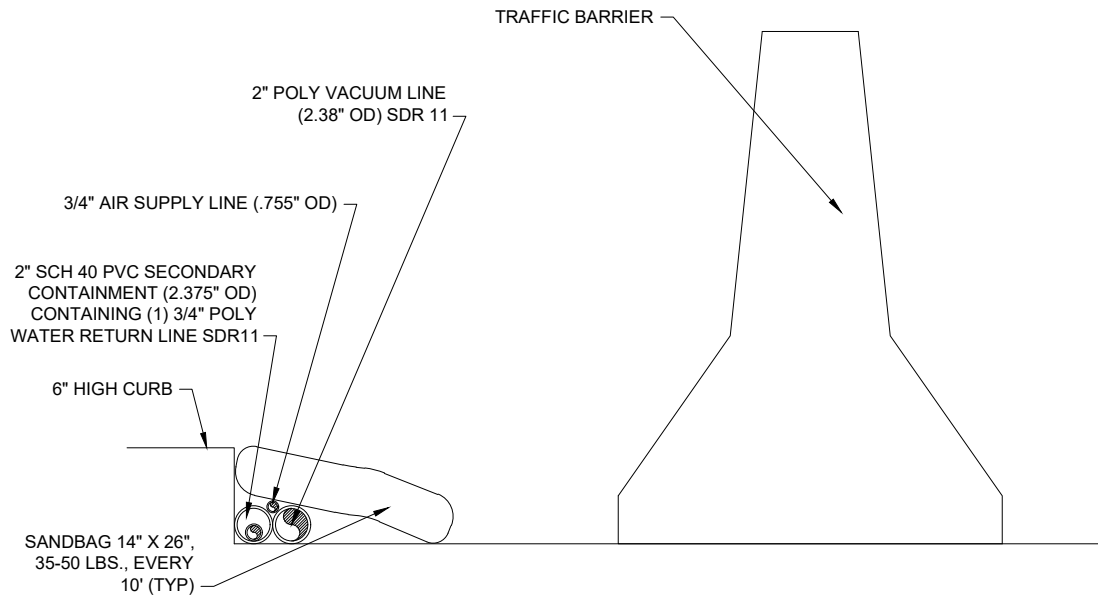
z:\project files\ea-fz\energy t2\34328 - et sunoco upper makefield twp. pipeline\working\pilot test\drawings\layout\actvelc_34328 - proposed cross sections - 20260807.dwg 8/10/2026 2:19 PM



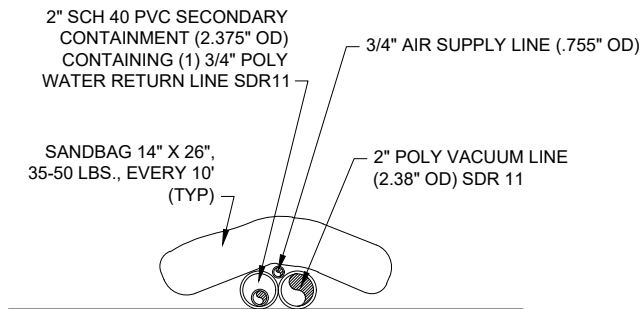
SECTION A-A'



SECTION B-B'



SECTION C-C'



SECTION D-D'

verdantas

2550 INTERSTATE DRIVE, SUITE 303
HARRISBURG, PA 17110
(717) 652-6832

DESIGNED BY
FSC

DRAWN BY
FSC/JPB

CHECKED BY
FSC

PROJECT NO.
34328

UPPER MAKEFIELD TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

**PROPOSED CROSS SECTIONS
A-A', B-B', C-C', AND D-D'**

TWIN OAKS - NEWARK 14" DIAMETER PIPELINE

DATE
08/10/2026

SCALE
NOT TO SCALE

SHEET

TRAFFIC CONTROL PLAN



SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

MULTIPHASE EXTRACTION PILOT TEST

UPPER MAKEFIELD TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA
TRAFFIC CONTROL DOCUMENTS
CIVIL CONSTRUCTION PLANS



AED ES PROJECT NO. AA0861

AUGUST 2026



PROJECT LOCATION MAP
SCALE: 1" = 2000'

USGS QUADRANGLES: LAMBERTVILLE, NJ, PA (2026) & PENNINGTON, NJ, PA (2026)

INDEX OF DRAWINGS

AA0861-TCP-100	COVER SHEET
AA0861-TCP-101	OVERALL SITE PLAN
AA0861-TCP-102	TRAFFIC CONTROL PLAN OPTION A
AA0861-TCP-103	TRAFFIC CONTROL PLAN OPTION B
AA0861-TCP-104	SIGNAGE DETAILS



Know what's below.
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GRAPHIC SCALE

1"=80'

80' 0 80' 160'

1. THIS WORK CONSISTS OF THE MAINTENANCE OF TRAFFIC AND THE PROTECTION OF THE TRAVELING PUBLIC APPROACHING THE CONSTRUCTION AREA AND WITHIN THE LIMITS OF CONSTRUCTION.
2. THE SAFETY FOR PEDESTRIANS WILL ALSO BE MAINTAINED AT ALL TIMES WITHIN THE LIMIT OF CONSTRUCTION AND APPROACHING THE CONSTRUCTION AREA.
3. FURNISH, ERECT, PLACE AND MAINTAIN TRAFFIC CONTROL SIGNS AND DEVICES. MAINTAIN TRAFFIC DURING HOURS OF CONSTRUCTION AND AT ALL OTHER TIMES CONSISTENT WITH THE METHODS INDICATED ON THESE DRAWINGS AND THE FOLLOWING:
 - PENNDOT PUBLICATION 35;
 - PENNDOT PUBLICATION 46;
 - PENNDOT PUBLICATION 72M;
 - PENNDOT PUBLICATION 111;
 - PENNDOT PUBLICATION 212;
 - PENNDOT PUBLICATION 213;
 - PENNDOT PUBLICATION 236;
 - PENNDOT PUBLICATION 408; AND
 - MUTCD, CURRENT EDITION
4. MAINTAIN ALL OFFICIAL EXISTING ROADWAY SIGNS.
5. REFER TO THE CONSTRUCTION REQUIREMENTS, CONSTRUCTION RESTRICTIONS, AND HOLIDAY RESTRICTIONS, WITHIN THE PROJECT CONTRACT, FOR ADDITIONAL INFORMATION PERTAINING TO THIS PROJECT.
6. SIGNS MAY BE SLIGHTLY ADJUSTED IN THE FIELD IN ORDER TO AVOID OBSTRUCTING DRIVEWAYS OR CLEAR SIGHT DISTANCES.
7. INSPECT ALL TRAFFIC CONTROL DEVICES PRIOR TO START OF WORK.
8. COVER OR REMOVE ALL CONFLICTING SIGNS AND ERADICATE ALL CONFLICTING PAVEMENT MARKINGS.
9. MOUNT ALL LONG-TERM ADVANCE WARNING SIGNS ON TYPE III BARRICADES UNLESS OTHERWISE NOTED OR INSTRUCTED BY MUNICIPAL OFFICE.
10. ALL SIGNS AND DEVICES TO BE MAINTAINED IN NEW OR LIKE NEW CONDITION.
11. DRIVEWAYS WILL BE KEPT ACCESSIBLE AT ALL TIMES. LOCATE ALL SIGNS SO THAT SIGHT DISTANCES WILL NOT BE OBSTRUCTED AT DRIVEWAYS AND LOCAL ROADS.
12. REMOVE ALL SHORT-TERM WORK ZONE TRAFFIC CONTROL SIGNING UPON COMPLETION OF THAT DAY'S WORK PERIOD. COVER OR REMOVE ALL SIGNS NOT IN USE.

WALKER ROAD: 25 MPH
GLENWOOD DRIVE: 25 MPH

<u>SYMBOL</u>	<u>DESCRIPTION</u>
	EXISTING ENERGY SUPPORT PIPELINES
	EXISTING PROPERTY LINES
	EXISTING EDGE OF ROAD
	EXISTING PAVED DRIVEWAY
	ACOUSTIC/SECURITY BARRIER
	CABLE PROTECTOR RAMP
	WATER FILLED TRAFFIC BARRIERS OR LONG-TERM CHANNELIZING DEVICES (SEE PLAN SHEET 104)
	NORMAL TRAFFIC FLOW
	SIGN
	TRAFFIC CONE
	TRAFFIC FLOW DURING CONSTRUCTION



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THE LOCATION OF THE PIPELINE FACILITIES AS SHOWN HEREON MUST BE CONSIDERED AS APPROXIMATE ONLY. BEFORE DIGGING OR FOR AN EXACT LOCATION PLEASE CONTACT YOUR STATES UNDERGROUND UTILITY LOCATION SERVICE.

AED ES PROJECT No.: AA0861

REV	DESCRIPTION	BY	DATE	CHK'D APP'D

25

	BY	DATE

DRAWN	BFC	08/2026
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CHECK	AM	08/2026
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APPROVED	WKS	08/2026
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SCALE: AS NOTED



SUNOCO PIPELINE LP
MULTIPHASE EXTRACTION PILOT TEST
OVERALL SITE PLAN

UPPER MAKEFIELD TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

AFE NO.

OLD DRAWING NO.

DRAWING NO.
AA0861-TCP-101

REV. NO.



LEGEND

LEGEND

DESCRIPTION

	EXISTING ENERGY TRANSFER PIPELINES
	EXISTING PROPERTY LINES
	EXISTING EDGE OF ROAD
	EXISTING PAVED DRIVEWAY
	ACOUSTIC/SECURITY BARRIER
	CABLE PROTECTOR RAMP
	WATER FILLED TRAFFIC BARRIERS OR LONG-TERM CHANNELIZING DEVICES (SEE PLAN SHEET 104)
	NORMAL TRAFFIC FLOW
	SIGN
	TRAFFIC CONE
	TRAFFIC FLOW DURING CONSTRUCTION

GRAPHIC SCALE

1"=60'

60' 0 60' 120'



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NOTES/REFERENCE DRAWINGS



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AED ES PROJECT No.: AA0861

[illegible]FACILITY CODE
OR ACCOUNT NO.

CONSTRUCTION YEAR

	8
--	---

DRAWN	E
-------	---

CHECK	

SCALE: AS NOTED



SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

SUNOCO PIPELINE LP
MULTIPHASE EXTRACTION PILOT TEST
TRAFFIC CONTROL PLAN OPT. A

UPPER MAKEFIELD TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

AFE NO.

OLD DRAWING NO

DRAWING

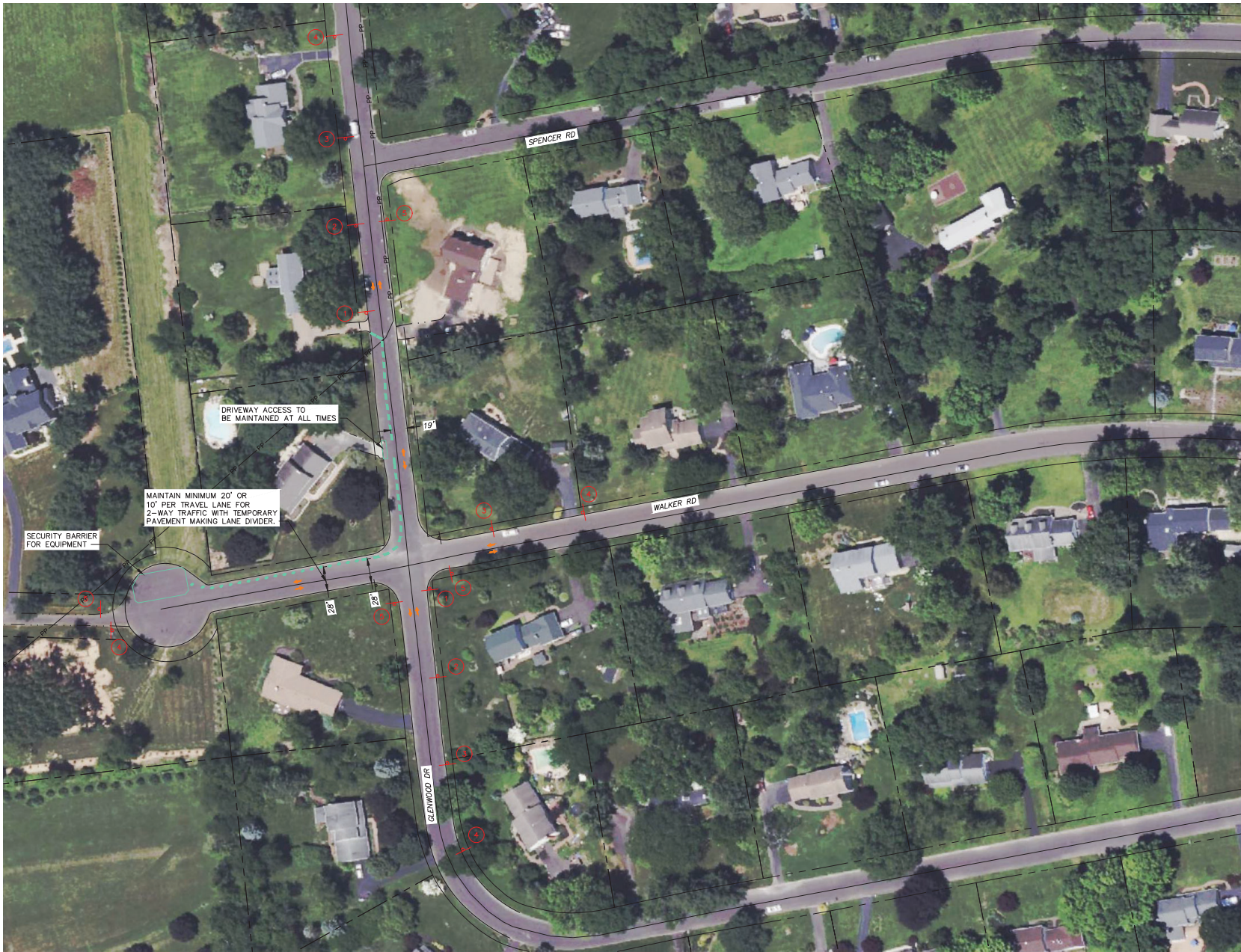
AA0861-TCP-102

REV. NO.

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FILENAME: C:\VA0861 ET Upper Material Traffic Control\UR_CAD Model And Sheets\VA0861-205-TCP-C-2.dwg PLOTTED BY: PLOTTED: 8/14/2026 8:02:47 AM



PLAN OPTION B
SCALE: 1"=60'

MAINTENANCE AND PROTECTION OF TRAFFIC GENERAL NOTES

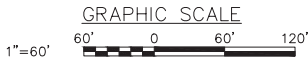
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SPEED LIMIT:

WALKER ROAD: 25 MPH
GLENWOOD DRIVE: 25 MPH

LEGEND

SYMBOL	DESCRIPTION
PP ——— PP	EXISTING ENERGY TRANSFER PIPELINES
---	EXISTING PROPERTY LINES
---	EXISTING EDGE OF ROAD
---	EXISTING PAVED DRIVEWAY
---	ACOUSTIC/SECURITY BARRIER
---	CABLE PROTECTOR RAMP
---	WATER FILLED TRAFFIC BARRIERS OR LONG-TERM CHANNELIZING DEVICES (SEE PLAN SHEET 104)
➔	NORMAL TRAFFIC FLOW
①	SIGN
●	TRAFFIC CONE
➔	TRAFFIC FLOW DURING CONSTRUCTION



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AED ES PROJECT No.: AA0861

REV	DESCRIPTION	BY	DATE	CHK'D	APP'D

FACILITY CODE OR ACCOUNT NO:		
CONSTRUCTION YEAR:		
DRAWN	BY	DATE
CHECK	AM	08/2026
APPROVED	WKS	08/2026
SCALE: AS NOTED		



SUNOCO PIPELINE
An Energy Transfer Partnership

SUNOCO PIPELINE LP
MULTIPHASE EXTRACTION PILOT TEST
TRAFFIC CONTROL PLAN OPT. B

UPPER MAKEFIELD TOWNSHIP, BUCKS COUNTY, PENNSYLVANIA

A/E NO.	
OLD DRAWING NO.	
DRAWING NO.	AA0861-TCP-103
REV. NO.	-

SOUND MANAGEMENT PLAN

Washington Crossing Multiphase Extraction Pilot Test Sound Management Plan

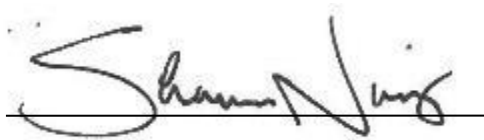
August 14, 2026

Prepared for:

Sunoco Pipeline, LP (SPLP)
525 Fritztown Road
Sinking Springs, PA 19608

Prepared by:

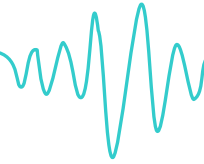
Behrens and Associates, Inc.
2320 Alaska Avenue
El Segundo California, 90245



Shaun Norris
Senior Acoustical Engineer



Jason Peetz
Engineering Manager



1. Introduction

The following report provides a noise modeling assessment of the proposed activities at the Washington Crossing Multiphase Extraction Pilot Test (“Washington Crossing MPE”) operated by Energy Transfer Partners (“Energy Transfer”) in relation to the Township of Upper Makefield Code of Ordinances noise level limits. The assessment includes a modeling analysis of the proposed Washington Crossing MPE site (74.8767908°W 40.2707300°N) located in Washington Crossing, Pennsylvania. The Washington Crossing MPE location and surrounding area are shown in Figure 1-1.

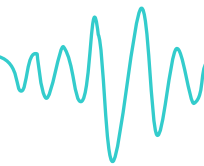
To assess the operational noise levels of the proposed Washington Crossing MPE site, field measured data and manufacture data of the Washington Crossing MPE Equipment was utilized in the noise modeling. The noise model was developed using SoundPLAN 9.1 software.

The following is provided in this report:

- A brief introduction of the fundamentals of sound.
- A review of applicable noise standards of Township of Upper Makefield.
- A discussion of noise modeling methodology.
- An assessment of the predicted operational sound levels in relation to the noise limits.



Figure 1-1 Washington Crossing MPE Location



2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a “rumble” or “boom”. At the higher end of the range are high-pitched sounds that might be described as a “screech” or “hiss”.

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level “background noise” in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Typical indoor and outdoor A-weighted sound levels are shown in Figure 2-1.

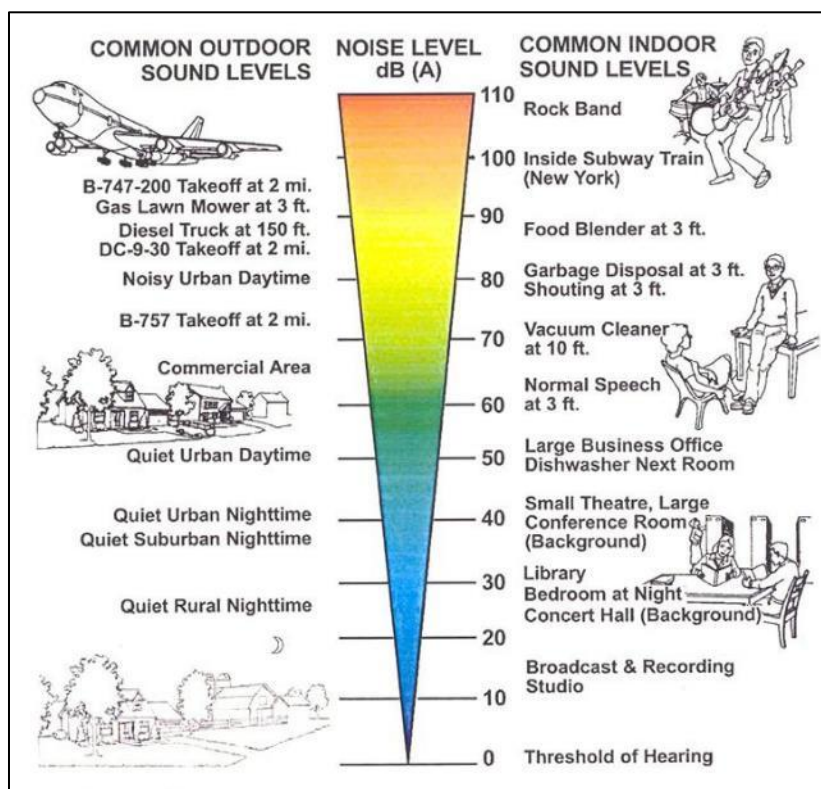
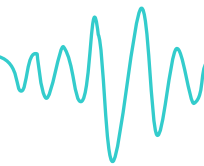


Figure 2-1 Typical Indoor and Outdoor A-Weighted Sound Levels



3. Noise Standards

Township of Upper Makefield has published a Code of Ordinances. The relevant portions of this document are shown below.

3.1 Township of Upper Makefield Code of Ordinances

The relevant portions of the Township of Upper Makefield Code of Ordinances Part 4 Noise Regulations [Adopted 9-15-2004 By Ord. No. 261] are found below:

§ 10-401. Standards and prohibitions.

The following provisions shall apply to all sound originating within the boundaries of Upper Makefield Township. The receiving districts are identified by reference to the Zoning Map of the Newtown Area Joint Municipal Zoning Ordinance.

A. Environmental performance standards.

- (1) Maximum permissible sound levels by receiving district. No person shall operate or cause to be operated on public or private property any source of continuous sound in such a manner as to create a sound level which exceeds the limits set forth for the receiving zoning category in the following table when measured at or within the property boundary of the receiving district. Sound levels exceeding the limits set in the following table are hereby declared to be a nuisance.

Maximum Continuous Sound Levels Within Receiving District		
Receiving District	From 7:00 a.m. to 7:00 p.m.	From 7:00 p.m. to 7:00 a.m.
	(dBA)	(dBA)
JM and CM, R1, R2, CR-1, CR-2, VR-1, VC-1, POS, EIR and MS	60	50
	65	55

The Washington Crossing MPE site is located and surrounded by Residential (CR-1) and Conservation Management (CM) Zoning Districts. The Township of Upper Makefield zoning map can be seen in Figure 3-1. The

Therefore, based on the Township of Upper Makefield Code of Ordinances, sound levels will be limited to 60 during the daytime hours (7:00 a.m. to 7:00 p.m.) and 50 dBA during the nighttime hours (7:00 p.m. to 7:00 a.m.) at the adjacent conservation management property lines. The sound levels at residential property lines will be limited to 65 dBA during the daytime hours and 55 dBA during the nighttime hours.





4. Washington Crossing MPE Noise Modeling

4.1 Noise Modeling Methodology

The noise modeling was completed with use of three-dimensional computer noise modeling software. All models in this report were developed with SoundPLAN 9.1 software using the ISO 9613-2 (2024) standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. To ensure a conservative assessment and compliance with ISO 9613-2 standards, light to moderate winds are assumed to be blowing from the source to receptor. The predicted noise levels represent only the contribution of the Washington Crossing MPE operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors. The modeled environmental conditions can be seen in Table 4-1.

Table 4-1 Modeled Environmental Conditions

Weather Parameter	Modeled Input
Temperature	10° C
Relative Humidity	70%
Air Pressure	1013.3 mbar
Wind Velocity	Per ISO 9613-2
Wind Direction	Source to receptor
Foliage	Not included
Ground Absorption	0.0 for roads 0.7 for general ground cover

The Atlas Copco 80kW-100kW QAS 125 was based on manufacturer data provided by Energy Transfer. The Multiphase System data was collected by BAENC on July 23, 2026 while the system was enclosed in a steel container. The operating conditions/load of the Multiphase System equipment surveyed was at maximum operating conditions. The system was modeled enclosed in a steel enclosure with Sound Transmission Class (STC) rating of 32 and Noise Reduction Coefficient (NRC) of 0.0.

As a worst-case scenario, the MPE was modeled with a single access door on the south side of the container open to represent on-site conditions during pilot testing when pilot data are collected. The predicted modeling results are dependent on equipment and mitigation orientation as indicated and only inclusive of the equipment listed in Table 4-2.

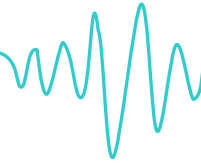
Table 4-2 Washington Crossing MPE Major Sound Emitting Equipment Included in Model

Equipment	Source	Quantity
MPE System Components in Container	Field Data	1
Atlas Copco 80kW-100kW QAS 125	Manufacturer Data	1

Changes or additions to any equipment or enclosures housing equipment may result in operational noise levels that are inconsistent with the modeling results.

4.2 Noise Sensitive Receptors

The noise sensitive receptors have been chosen to be consistent with the requirements of the Township of Upper Makefield Code of Ordinances noise standards. The ordinance states that sound levels will be limited to 60 during the daytime hours (7:00 a.m. to 7:00 p.m.) and 50 dBA during the nighttime hours (7:00 p.m. to 7:00 a.m.) at the adjacent conservation management property lines. The sound levels at the residential property lines will be limited



to 65 dBA during the daytime hours and 55 dBA during the nighttime hours. The locations of the noise sensitive receptors and surrounding environment can be seen in Figure 4-1.

In addition, noise sensitive receptors were placed 25 feet from the nearest residential building units to demonstrate the noise impact on the homes.

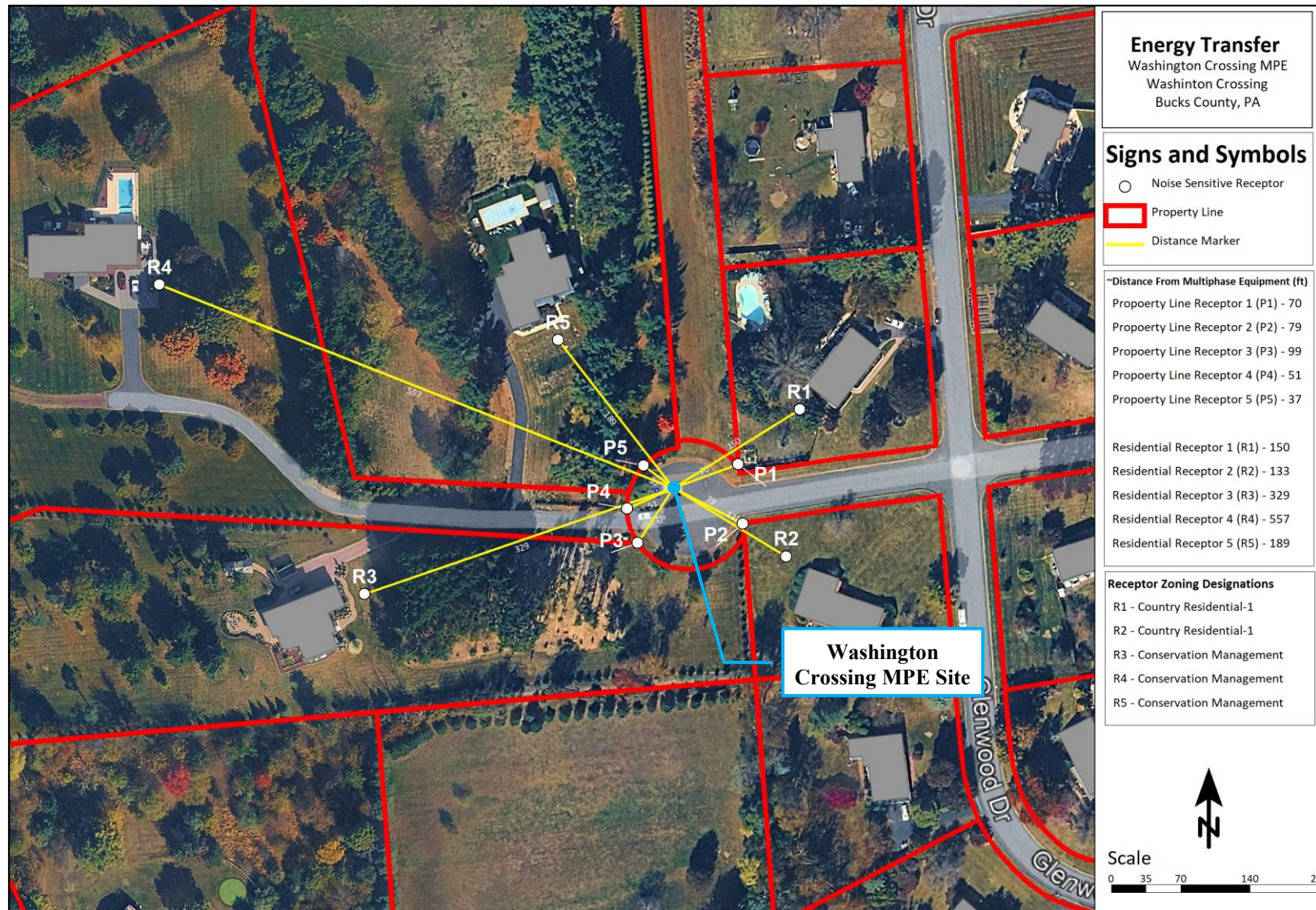
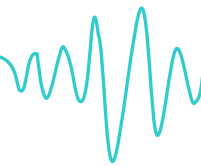


Figure 4-1 Site and Noise Sensitive Receptor Locations



4.3 Unmitigated – Washington Crossing MPE Noise Modeling Results

The unmitigated modeling is based off current Washington Crossing MPE plans and does not include sound walls or other third-party acoustical mitigation measures. The results of the unmitigated noise modeling are presented in Table 4-3. The locations in the tables correspond to the locations identified in Figure 4-1. The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Figure 4-2 shows the Unmitigated Washington Crossing MPE Noise Contour Map in dBA. The noise contours are provided in 3 dB increments with the color scale indicating the sound level of each contour.

The results of the unmitigated noise modeling indicate that the Washington Crossing MPE site operations are predicted to exceed the A-weighted noise level limit. Therefore, mitigation will be recommended for the Washington Crossing MPE site operations. To demonstrate the reduction in noise levels achieved by the two separate mitigation designs, two mitigation scenarios were created.

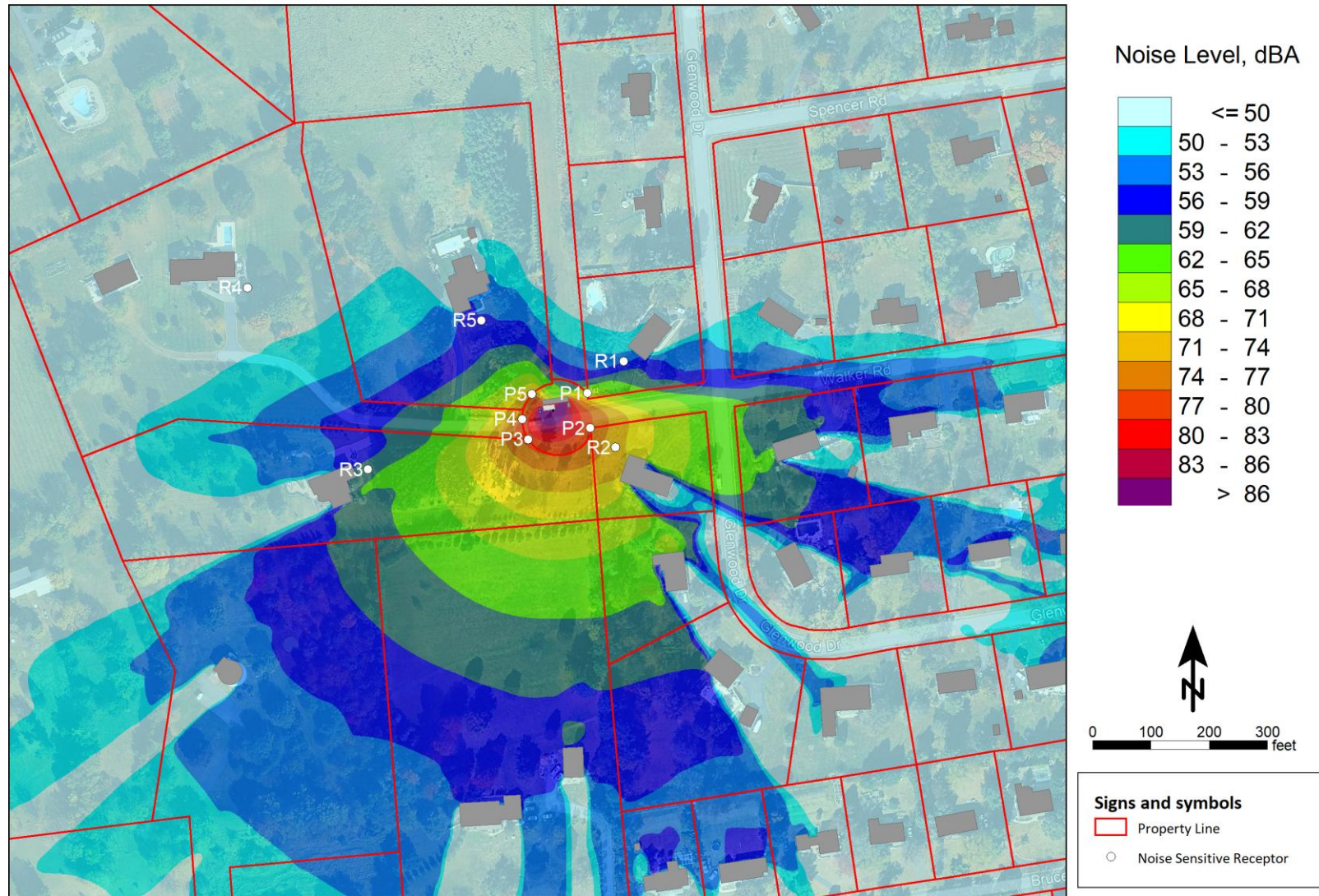
Table 4-3 Unmitigated – Property Line Washington Crossing MPE Site Noise Modeling Results (dBA)

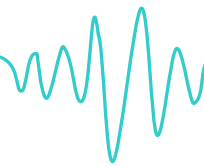
Receptor	Predicted Sound Pressure Level	Noise Level Limit Daytime/Nighttime
P1	70	65 / 55
P2	77	65 / 55
P3	79	60 / 50
P4	78	60 / 50
P5	73	60 / 50

Table 4-4 Unmitigated – Residential Properties Washington Crossing MPE Site Noise Modeling Results (dBA)

Receptor	Predicted Sound Pressure Level
R1	56
R2	72
R3	62
R4	47
R5	56

The results of the unmitigated noise modeling indicate that the Washington Crossing MPE site operations are predicted to range from 47 dBA to 72 dBA at the adjacent residential properties.





4.4 Mitigated Scenario 1 - Washington Crossing MPE Site Modeling Results

Sound mitigation for the Washington Crossing MPE operations has been included in the modeling to reduce noise levels in the surrounding environment. The MPE was modeled with a single access door on the south side of the container open to represent on-site conditions during pilot testing when pilot data are collected. The sound mitigation included in the modeling is described below:

- Approximately 184 total linear feet of 16-foot-high, with a minimum Sound Transmission Class (STC) 32 or better panels with a Noise Reduction Coefficient (NRC) of 0.5 installed on the perimeter of the site.
- Approximately 40 total linear feet of 12-foot-high, Sound Transmission Class (STC) 25 panels with a Noise Reduction Coefficient (NRC) of 0.85 installed on the north, west and south side of the generator.
- A silencer will be installed on the container replacing the standard louver. The minimum insertion loss for the recommended silencer can be seen in:

Table 4-5 S1 Silencer –Minimum Dynamic Insertion Loss

63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
0	0	0	6	15	18	12	4

- The interior of the MPE system container (ceiling and walls) will be lined with acoustical absorption with a Noise Reduction Coefficient (NRC) of 0.85.

The layout for the modeled mitigation scenario is shown in Figure 4-3.

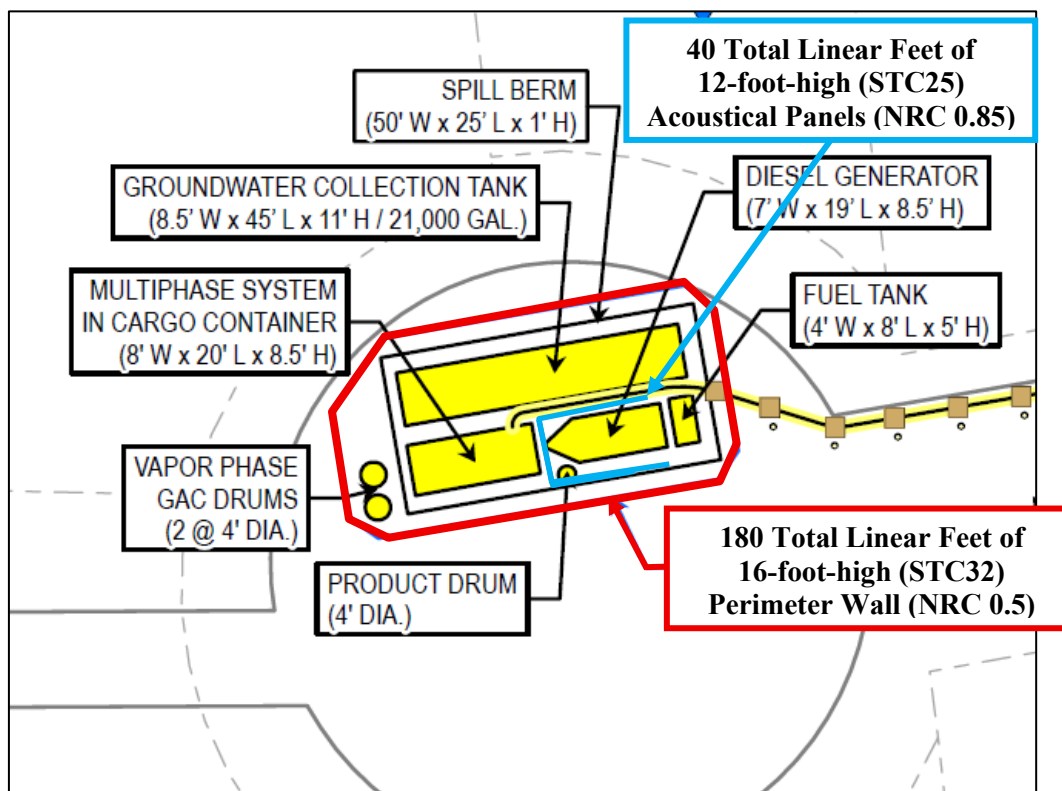
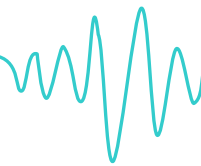


Figure 4-3 Washington Crossing MPE Mitigation Layout – South Access Door Open



The mitigated modeling includes the acoustical mitigation shown in Figure 4-3. The results of the mitigated noise modeling are presented in Table 4-6. The locations in the tables correspond to the locations identified in Figure 4-1. The predicted noise levels represent only the contribution of the Washington Crossing MPE site operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the Washington Crossing MPE operations are predicted to comply with the daytime noise level limit but exceed the nighttime noise level limit.

Table 4-6 Mitigated – Property Line Washington Crossing MPE Site Noise Modeling Results (dBA)

Receptor	Unmitigated	Mitigated	Noise Level Limit Daytime/Nighttime
P1	72	57	65 / 55
P2	78	57	65 / 55
P3	88	56	60 / 50
P4	87	57	60 / 50
P5	88	58	60 / 50

Table 4-7 Mitigated – Residential Properties Washington Crossing MPE Site Noise Modeling Results (dBA)

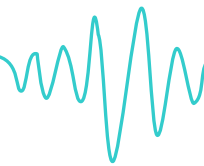
Receptor	Unmitigated	Mitigated
R1	56	51
R2	72	52
R3	62	43
R4	47	39
R5	56	46

The results of the Scenario 1 mitigated noise modeling indicate that the Washington Crossing MPE site operations are predicted to range from 39 dBA to 52 dBA at the adjacent residential properties. In addition, sound monitoring will be conducted as deemed necessary in the field during operations.

The results of the mitigated noise modeling are also shown as a noise contour map. Figure 4-4 shows the Mitigated Washington Crossing MPE Noise Contour Map in the A-weighted scale. The noise contours are provided in 3 dB increments with the color scale indicating the sound level of each contour.



Figure 4-4 Mitigated Washington Crossing MPE Noise Contour Map at 5-feet – South Access Door Open (dBA)



4.5 Mitigated Scenario 2 - Washington Crossing MPE Site Mitigated Modeling Results

Sound mitigation for the Washington Crossing MPE operations has been included in the modeling to reduce noise levels in the surrounding environment. The sound mitigation included in the modeling is described below:

- Approximately 184 total linear feet of 16-foot-high, with a minimum Sound Transmission Class (STC) 32 or better panels with a Noise Reduction Coefficient (NRC) of 0.5 installed on the perimeter of the site.
- Approximately 40 total linear feet of 12-foot-high, Sound Transmission Class (STC) 25 panels with a Noise Reduction Coefficient (NRC) of 0.85 installed on the north, west and south side of the generator.
- A silencer will be installed on the container replacing the standard louver. The minimum insertion loss for the recommended silencer can be seen in:

Table 4-8 Silencer –Minimum Dynamic Insertion Loss

63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
0	0	0	6	15	18	12	4

- The interior of the MPE system container (ceiling and walls) will be lined with acoustical absorption with a Noise Reduction Coefficient (NRC) of 0.85.
- The access door was closed, and the container has no opening or gaps.

The layout for the modeled mitigation scenario is shown in Figure 4-5.

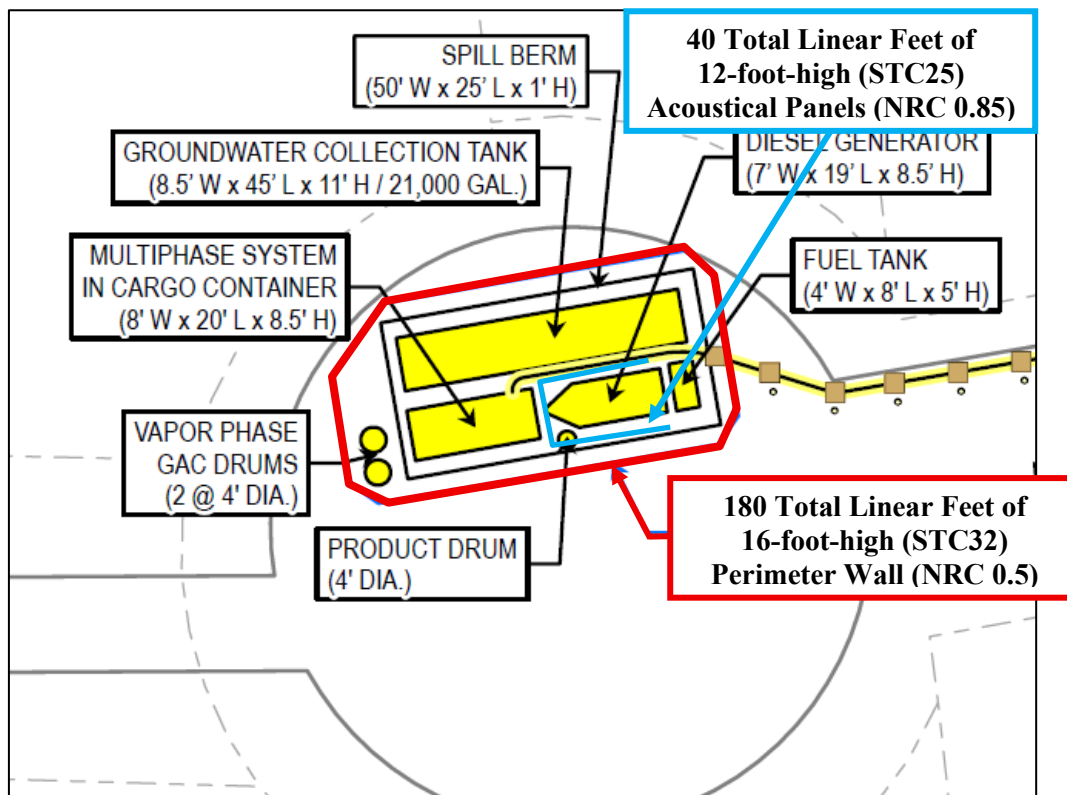
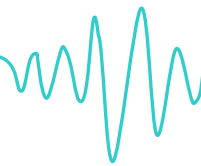


Figure 4-5 Washington Crossing MPE Mitigation Layout



The mitigated modeling includes the acoustical mitigation shown in Figure 4-5. The results of the mitigated noise modeling are presented in Table 4-9. The locations in the tables correspond to the locations identified in Figure 4-1. The predicted noise levels represent only the contribution of the Washington Crossing MPE site operations and do not include ambient noise or noise from other facilities. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation the Washington Crossing MPE operations are predicted to comply with the Township of Upper Makefield noise level limits.

Table 4-9 Mitigated - Property Line Washington Crossing MPE Site Noise Modeling Results (dBA)

Receptor	Unmitigated	Mitigated	Noise Level Limit Daytime/Nighttime
P1	72	50	65 / 55
P2	78	48	65 / 55
P3	88	47	60 / 50
P4	87	48	60 / 50
P5	88	49	60 / 50

Table 4-10 Mitigated – Residential Properties Washington Crossing MPE Site Noise Modeling Results (dBA)

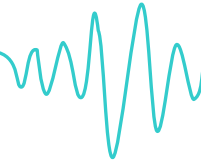
Receptor	Unmitigated	Mitigated
R1	56	43
R2	72	44
R3	62	37
R4	47	32
R5	56	40

The results of the Scenario 2 mitigated noise modeling indicate that the Washington Crossing MPE site operations are predicted to range from 32 dBA to 44 dBA at the adjacent residential properties. In addition, sound monitoring will be conducted as deemed necessary in the field during operations.

The results of the mitigated noise modeling are also shown as a noise contour map. Figure 4-6 shows the Mitigated Washington Crossing MPE Noise Contour Map in the A-weighted scale. The noise contours are provided in 3 dB increments with the color scale indicating the sound level of each contour.



Figure 4-6 Mitigated Washington Crossing MPE Noise Contour Map at 5-feet – South Access Door Closed (dBA)



5. Conclusion

A noise model representing the proposed operations at the Washington Crossing MPE site was created to assess the predicted operational noise levels with the Township of Upper Makefield Code of Ordinances. The results of the unmitigated noise modeling indicate that the Washington Crossing MPE site operations were predicted to exceed the A-weighted noise level limit. Therefore, mitigation was recommended for the Washington Crossing MPE site operations.

The results of the mitigated noise modeling indicate that with the implementation of the recommended mitigation, the Washington Crossing MPE operations are predicted to comply with the A-weighted noise level limit. In addition, sound monitoring will be conducted as deemed necessary in the field during operations.

AIR MONITORING AND SAMPLING PLAN FOR MPE PILOT TEST

Air Monitoring and Sampling Plan for Multiphase Extraction (MPE) Pilot Test

Upper Makefield Response – Washington Crossing, Pennsylvania

Prepared for: Sunoco Pipeline LP

Prepared by: Onterris Response and Recovery, LLC f/k/a CTEH

August 14, 2026

Version 1.0

Air Monitoring and Sampling Plan for Multiphase Extraction (MPE) Pilot Test

Upper Makefield Response – Washington Crossing, Pennsylvania

Prepared for: Sunoco Pipeline LP

August 14, 2026

A handwritten signature in black ink, appearing to read "SMB", with a long horizontal stroke extending to the right.

Sarah Burnett, PhD
Project Toxicologist

▮ Version Control

Version	Date	Author	Reviewer	Summary of Changes

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Appendices

Appendix A Laboratory Accreditation Certificate

1 Introduction and Purpose

This Air Monitoring and Sampling Plan for Multiphase Extraction (MPE) Pilot Test (hereinafter referred to as “Plan”) was developed by Onterris Response and Recovery, LLC f/k/a CTEH (Onterris) personnel on behalf of Sunoco Pipeline LP (Sunoco Pipeline) in relation to the Upper Makefield Response in Washington Crossing, Pennsylvania. A release from a pipeline that transports refined petroleum products, including jet fuel, was identified in January 2025.

This Plan outlines a strategy for outdoor air monitoring and sampling that will be implemented during the MPE Pilot Test in public areas and near private properties/residences in the Mt. Eyre Manor neighborhood in Washington Crossing, Pennsylvania. Air monitoring and sampling will generally occur immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations. Air monitoring and sampling may be performed in public areas between MPE operations (e.g., wells in which MPE operations are occurring; equipment, piping, and storage containers associated with MPE operations) and nearby private properties/residences. Air monitoring and sampling will be performed by environmental consultants retained by Sunoco Pipeline (e.g., Stantec, Inc.).

The objectives of this air monitoring and sampling program are to:

1. Conduct real-time air monitoring immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations to evaluate potential impacts to outdoor air related to the MPE Pilot Test; and
2. Collect outdoor air samples at strategically positioned locations immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations to further evaluate potential impacts to outdoor air related to the MPE Pilot Test.

2 Health and Safety

Field personnel will review and adhere to the applicable site-specific Health and Safety Plan(s) (HASP). Air monitoring and sampling and other field activities will only be conducted under weather and other conditions that do not create an unsafe working environment.

3 Data Quality Objectives

The data collected during air monitoring and sampling activities will be used to assess potential impacts to the outdoor environment related to the MPE Pilot Test, specifically with respect to air quality.

A strategic planning approach based on the scientific method will be employed for data collection activities, providing a systematic procedure to ensure that the type, quantity, and quality of data used in decision-making are appropriate for the intended application.

4 Real-Time Air Monitoring Strategy

Real-time air monitoring refers to the use of direct-reading instruments to provide a near-instantaneous readout of a chemical concentration in air. Real-time air monitoring will be conducted immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations. When MPE Pilot Test operations begin, real-time air monitoring will be conducted 24 hours per day. If real-time air monitoring does not indicate consistent detections of compounds at/above the site-specific action levels (see more detail in **Table 1**), a data-driven reduction and/or discontinuation of real-time air monitoring may occur (e.g., real-time air monitoring may be reduced to daytime operational hours only; real-time air monitoring may be discontinued completely). The general locations of real-time air monitoring will be selected to prioritize areas immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations and to provide coverage between these areas and nearby private properties/residences. Real-time air monitoring locations will also include consideration of site and environmental (i.e., wind) conditions.

Real-time air monitoring will be conducted using handheld instruments at a height representative of the human breathing zone. All instrumentation will be calibrated prior to use or per manufacturer recommendations. The presence or absence of odors, including odor characteristics and description if an odor is detected, will be documented with every handheld real-time air monitoring reading.

Target compounds for real-time air monitoring have been selected to include compounds potentially related to jet fuel, MPE Pilot Test operations, and the use of fuel-powered heavy equipment. Target compounds are total volatile organic compounds (VOCs), benzene, carbon monoxide (CO), and particulate matter with a diameter of 2.5 microns or less (PM_{2.5}). Real-time air monitoring for some compounds or indicators may be added, conducted less frequently, or discontinued as operational milestones are achieved and/or as real-time air monitoring results indicate that these compounds or indicators are not of concern.

Site-specific action levels are employed to provide information for corrective action to limit potential exposures. These values do not replace community exposure standards or guidelines but, rather, are intended to represent a concentration limit that triggers a course of action to better address public safety. Any detections of compounds at/above the site-specific action levels will be communicated to the designated project contact (e.g., the Stantec field lead; the Onterris Project Technical Director [PTD]). Work practices will be assessed and adjusted as necessary.

The target compounds, instrumentation, and site-specific action levels and associated actions that will be employed for real-time air monitoring are outlined in **Table 1**.

Table 1 Real-Time Air Monitoring Methodologies and Action Levels

Analyte ¹	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total volatile organic compounds (VOCs)	0.5 ppm 5 minutes	Document odors and potential sources of VOCs; Report reading to the designated project contact for consideration of adjustment to work practices	Approximate background concentration of VOCs	MultiRAE PID (10.6 eV lamp)	0.1 ppm	Range: 0 – 5,000 ppm	Variable ²
Benzene	Detection	Confirm reading with secondary instrument (if available); Report reading to the designated project contact for consideration of adjustment to work practices	To inform of potential off-site impact	UltraRAE	0.01 ppm	Range: 0 – 200 ppm	NA
				Gastec tube #121L	0.05 ppm	Range: 0.1 – 65 ppm Volume: Pull 5 100-mL pump strokes	Variable ³
Carbon monoxide (CO)	Detection	Confirm reading with secondary instrument (if available); Report reading to the designated project contact for consideration of adjustment to work practices	To inform of potential off-site impact	MultiRAE Sensor	1 ppm	Range: 0 – 500 ppm	NA
Particulate matter with a diameter of 2.5 microns or less (PM _{2.5})	0.055 mg/m ³ 5 minutes	Confirm reading with secondary instrument (if available); Continue monitoring in the area for 15 minutes to determine if PM _{2.5} is sustained for 15 minutes; Report reading to the designated project contact for consideration of adjustment to work practices	Upper-bound breakpoint of US EPA AQI category considered Unhealthy for Sensitive Groups (based on 24-hour average PM _{2.5} concentration)	TSI SidePak Personal Aerosol Monitor AM520	0.001 mg/m ³	Range: 0.001 – 100 mg/m ³ PM _{2.5} impactor: 50% cut-off at 2.5 microns	0.38 ⁴

¹ The concentrations of benzene and carbon monoxide that are Immediately Dangerous to Life and Health (IDLH) are 500 ppm (benzene) and 1,200 ppm (carbon monoxide), per the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards. Protective Action Criteria (PAC) are established by the Department of Energy (DOE) and employ a hierarchy-based system of three common public exposure guideline systems, namely the Acute Exposure Guideline Levels (AEGs) established by the United States Environmental Protection Agency (US EPA), the Emergency Response Planning Guidelines (ERPGs) established by the American Industrial Hygiene Association (AIHA), and the Temporary Emergency Exposure Limits (TEELs) established by the DOE. The PAC-1 values for benzene and carbon monoxide are 52 ppm and 75 ppm, respectively.

² Readings collected using the MultiRAE PID are recorded as uncorrected (raw) concentrations. Correction factors for various compounds are listed in Honeywell Technical Note TN-106B.

³ Readings collected using Gastec tubes are recorded as corrected concentrations. Correction factors for readings collected using Gastec tubes are dependent upon air volume (number of pump strokes); correction factors are listed in each Gastec sheet.

⁴ Readings collected using the TSI SidePak Personal Aerosol Monitor AM520 are recorded as corrected concentrations. A Photometric Calibration Factor (PCF) of 0.38 is used, which TSI indicates is appropriate for ambient/fugitive emissions monitoring applications. Photometric instruments will overstate the mass of an aerosol compared to its gravimetric weight due to humid conditions; PM_{2.5} is especially prone to interference from high humidity. Information about aerosol-specific correction factors can be found in information and technical notes published by the instrument manufacturer.

Abbreviations: VOCs = volatile organic compounds; CO = carbon monoxide; PM_{2.5} = particulate matter with a diameter of 2.5 microns or less; ppm = parts per million; mg/m³ = milligrams per cubic meter; US EPA = United States Environmental Protection Agency; AQI = Air Quality Index; PID = photoionization detector; eV = electron volt; mL = milliliters

5 Air Sampling Strategy

Air sampling refers to the collection of discrete quantities of air using containers or chemical-specific media that are sent to an off-site laboratory for chemical analysis. Air sampling will be conducted immediately surrounding wells in which MPE operations are occurring and at strategically positioned locations along/around equipment, piping, and storage containers associated with MPE operations. When MPE Pilot Test operations begin, air samples will be collected for consecutive 24-hour durations. If air sampling does not indicate consistent detections of compounds at/above the screening values (see more detail in **Table 3**), a data-driven reduction and/or discontinuation of air sampling may occur (e.g., air sampling locations may be reduced to a subset of strategically positioned locations; air sampling may be discontinued completely). The general locations of air sampling will be selected to prioritize areas immediately surrounding wells in which MPE operations are occurring and along/around equipment, piping, and storage containers associated with MPE operations and to provide coverage between these areas and nearby private properties/residences. Locations of air sampling will also include consideration of site and environmental (i.e., wind) conditions.

Air samples will be collected using 6-liter Selected Ion Monitoring (SIM)-certified evacuated canisters equipped with 24-hour regulators. Prior to air sample deployment, each canister will be inspected for damage, a leak test will be performed, and the initial pressure of the canister will be recorded. Air samples will be collected for a duration of approximately 24 hours at a height that is representative of the human breathing zone (i.e., the canister inlet will be located four to six feet above the ground). At the end of the air sampling period, the final pressure of the canister will be recorded. Air samples will be labeled and sent under chain-of-custody to Pace Analytical in Mansfield, Massachusetts, a National Environmental Laboratory Accreditation Program (NELAP)-accredited laboratory. The laboratory accreditation certificate is provided in **Appendix A**. The laboratory scope of accreditation is also available.

Air samples will be analyzed for select VOCs using United States Environmental Protection Agency (US EPA) Method TO-15, as outlined in **Table 2**. The selected VOCs were based primarily on the Short List of Petroleum Products in the Land Recycling Program Technical Guidance Manual established by the Pennsylvania Department of Environmental Protection (PA DEP). Target analytes are the following VOCs: benzene, toluene, ethylbenzene, xylene (both m&p-xylene and o-xylene), isopropylbenzene, methyl tert-butyl ether (also known as methyl tertiary butyl ether or MTBE), naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dichloroethane (also known as ethylene dichloride or EDC), 1,2-dibromoethane (also known as ethylene dibromide or EDB), hexane, and cyclohexane.

Table 2 Air Sampling Methodology

Analyte	Media	Method
Select VOCs ¹	Evacuated canisters (6-liter, SIM-certified)	US EPA Method TO-15, US EPA Method TO-15 SIM for select analytes ²

¹ Benzene, toluene, ethylbenzene, m&p-xylene, o-xylene, isopropylbenzene, methyl tert-butyl ether, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dichloroethane, 1,2-dibromoethane, hexane, and cyclohexane

² Benzene, naphthalene, 1,2-dichloroethane, and 1,2-dibromoethane will be analyzed using US EPA Method TO-15 in Selected Ion Monitoring (SIM) mode.

Abbreviations: VOCs = volatile organic compounds; SIM = Selected Ion Monitoring; US EPA = United States Environmental Protection Agency

Air sampling results will be compared to Minimal Risk Levels (MRL) for acute inhalation established by the Agency for Toxic Substances and Disease Registry (ATSDR). Acute MRLs are health-protective guideline values that describe an estimate of the daily human exposure that is likely to be without appreciable risk of adverse non-cancer health effects for an exposure of 1 to 14 days in duration.

Target analytes and their respective laboratory method detection limits (MDL), laboratory reporting limits (RL), and MRLs for acute inhalation are outlined in **Table 3**. For reference, the MRLs for intermediate inhalation are also shown. Intermediate MRLs are health-protective guideline values that describe an estimate of the daily human exposure that is likely to be without appreciable risk of adverse non-cancer health effects for an exposure of 15 to 364 days in duration.

Table 3 Target Analytes, Detection Limits, and Minimal Risk Levels

Analyte	CAS RN	MDL ² (ppb)	RL ² (ppb)	ATSDR Acute MRL (ppb)	ATSDR Intermediate MRL (ppb)
Benzene ¹	71-43-2	0.030	0.100	9	7
Toluene	108-88-3	0.087	0.200	2,000	NE
Ethylbenzene	100-41-4	0.058	0.200	5,000	2,000
m&p-Xylene	1330-20-7	0.125	0.400	2,000 ³	600 ³
o-Xylene	95-47-6	0.062	0.200		
Isopropylbenzene	98-82-8	0.062	0.200	NE	NE
Methyl tert-butyl ether	1634-04-4	0.045	0.200	2,000	1,000
Naphthalene ¹	91-20-3	0.021	0.050	0.06	NE
1,2,4-Trimethylbenzene	95-63-6	0.058	0.200	NE	NE
1,3,5-Trimethylbenzene	108-67-8	0.060	0.200	NE	NE
1,2-Dichloroethane ¹	107-06-2	0.008	0.020	100	100
1,2-Dibromoethane ¹	106-93-4	0.009	0.020	NE	NE
Hexane	110-54-3	0.074	0.200	6,000	400
Cyclohexane	110-82-7	0.073	0.200	NE	NE

¹ Analyte will be analyzed using US EPA Method TO-15 in Selected Ion Monitoring (SIM) mode.

² Method detection limits (MDL) and reporting limits (RL) at Pace Analytical in Mansfield, Massachusetts.

³ ATSDR MRLs are established for total xylenes. If not reported by the laboratory, the concentration of total xylenes will be calculated by adding the concentrations of m&p-xylene and o-xylene.

Abbreviations: CAS RN = Chemical Abstracts Service Registry Number; MDL = method detection limit; RL = reporting limit; ATSDR = Agency for Toxic Substances and Disease Registry; MRL = Minimal Risk Level; ppb = parts per billion (by volume); US EPA = United States Environmental Protection Agency; SIM = Selected Ion Monitoring

It is important to note that there are some target analytes for which no MRL for acute or intermediate inhalation have been established by the ATSDR (isopropylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dibromoethane, and cyclohexane).

5.1 Air Sample Labeling

Air samples will be clearly labeled with the following information:

- Unique sample identification, including UMPA (Upper Makefield, PA)
- Sample type
- Start/stop date
- Start/stop time
- Start/stop pressure

The unique sample designation will include the following: four-letter site prefix, two-digit month, two-digit day, two-digit year, sample type, and three-digit numerical designation.

5.2 Air Sample Handling

Samples will be collected using laboratory-supplied, SIM-certified clean evacuated canisters and labeled with sample identification number and sample date. Laboratory chain-of-custody (COC) will contain sample identification number, sample date, analysis and methodology requested, and time of sample collection. Custody seals will be placed on each sample container, if necessary, and chain-of-custody procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity. Shipping or transport of samples to the laboratory will be done within a timeframe to meet the recommended holding times (i.e., 30 days from collection to preparation; 5 days from preparation to analysis).

6 Quality Assurance

Air monitoring and sampling will be carried out in conjunction with a well-defined quality assurance (QA) program. The QA program refers to the sampling, analysis, and data validation procedures for generating valid and defensible data. The types of quality control (QC) measures and samples that will be conducted are outlined below.

6.1 Field Calibration

Instruments used in the field may consist of RAE Systems by Honeywell MultiRAE and UltraRAE instruments, Gastec GV-100 piston pumps with colorimetric detector tubes, and TSI SidePak AM520 instruments (or equivalent instrumentation). Handheld data collection devices such as tablets/smartphones may also be used. All instruments will be maintained and calibrated daily in accordance with manufacturer recommendations and instructions. Operators of each instrument are responsible for maintaining (including proper battery charge) and operating the equipment such that it conforms to manufacturer specifications.

6.2 Laboratory Quality Assurance

Laboratory QC procedures will be conducted in accordance with the laboratory Standard Operating Procedures (SOP). Deliverables will contain the supporting documentation necessary for data validation. Internal laboratory QC checks may include method blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, surrogate samples, calibration standards, and laboratory control standards (LCS).

6.3 Data Validation

Data validation will be performed by Environmental Standards, Inc. *dba* Onterris. Data validation will include, at a minimum, sample holding times, accuracy, precision, contamination of laboratory method blanks, and surrogate compound recovery. Accuracy will be determined by evaluating LCS and MS recovery. Precision will be determined by evaluating MS/MSD samples.

Level II data validation will be performed on 100% of sample delivery groups (SDGs). In addition, Level IV data validation will be performed on at least 10% of SDGs. The components of data validation are summarized in **Table 4**.

Table 4 Summary of Data Validation Levels

Data Validation Level	Definition
Level I	Sample data reporting only
Level II	Complete QC, including data blanks, spikes, duplicates (including matrix spike duplicates), laboratory control samples, relative percent difference (RPD), and percent recovery
Level III	Items listed in Level II plus QC limits and QA batch cross-reference table
Level IV	Items listed in Levels II and III, including sample raw data and chromatograms

Abbreviations: QC = quality control; QA = quality assurance; RPD = relative percent difference

7 Waste Disposal

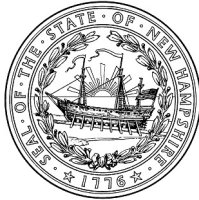
All waste produced on site (if applicable) will be managed and disposed of in accordance with the site-specific Waste Management Plan.

8 Records Management

Records management refers to the procedures for generating, controlling, and archiving project-specific records and records of field activities. Project records, particularly those that are anticipated to be used as evidentiary data, directly support current or ongoing technical studies and activities, and provide historical evidence needed for later reviews and analyses, will be legible, identifiable, retrievable, and protected against damage, deterioration, and loss on a centralized electronic database. Handwritten records will be written in indelible ink. Records may include, but are not limited

to, the following: bound field notebooks on pre-numbered pages, sample collection forms, personnel qualification and training forms, sample location maps, equipment maintenance and calibration forms, chain-of custody forms, maps and drawings, transportation and disposal documents, reports issued as a result of the work, procedures used, correspondences, and any deviations from the procedural records. Documentation errors will be corrected by drawing a single line through the error so that it remains legible and writing the correction adjacent to the error; the change will be initialed by the responsible individual, along with the date of change.

Appendix A Laboratory Accreditation Certificate



State of New Hampshire
Environmental Laboratory Accreditation Program

Awards

PRIMARY NH ELAP ACCREDITATION

to

PACE ANALYTICAL SERVICES LLC MANSFIELD MA (120 FORBES)

of

MANSFIELD, MA



For the matrix, method and analytes listed on the latest Analyte List in accordance
with the provisions on the 2016 TNI Standards and Env-C 300.

Certificate Number: 224925

Effective Date: 9/6/2025

Expiration Date: 9/5/2026

Laboratory ID: 2249


PACE ANA9/4/2025

Brian Lamarsh
NH ELAP Program Specialist

Method accreditation does not imply acceptance for NHDES compliance testing. Laboratory is required to use EPA-approved methods required by regulation.

Continuing accreditation status is dependent on successful ongoing participation in the program. Customers may verify the laboratory's current accreditation status by calling (603) 271-2998 or by visiting the NH ELAP website (<https://www.des.nh.gov/water/drinking-water/new-hampshire-environmental-laboratory-accreditation-program>).

PILOT TEST DOMESTIC WELL MONITORING WORK PLAN

Sunoco Pipeline LP

Pilot Test Domestic Well Monitoring Work Plan

Mt. Eyre Manor Neighborhood, Washington Crossing,
PA 18977

Upper Makefield Township
Bucks County, PA

August 14, 2026



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Figure

Figure 1 – Site Map

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Table 1 – Liquid-Level Gauging Data Summary

Attachments

Attachment 1 – Standard Operating Procedure



1 General

Groundwater & Environmental Services, Inc. (GES), on behalf of Sunoco Pipeline LP (SPLP), has prepared this *Pilot Test Domestic Well Monitoring Work Plan* for monitoring domestic supply wells during the planned Pilot Test on Glenwood Drive in the Mt. Eyre Neighborhood, Washington Crossing, Upper Makefield Township, Bucks County, Pennsylvania.

All activities will be performed in accordance with GES Standard Operating and Health and Safety Procedures. The tasks are detailed below. All work will be performed by qualified GES staff and will be approved by a Pennsylvania-licensed Professional Geologist.

1.1 Site Overview

The Site is situated in a rural residential area in Upper Makefield Township, Bucks County, Pennsylvania at geographic coordinates 40.27033, -74.87508. In January 2025, SPLP identified a release of petroleum hydrocarbons (jet fuel) from the Twin Oaks – Newark 14-inch diameter pipeline, which was subsequently exposed for repairs. During the initial rapid response, light non-aqueous phase liquid (LNAPL) from the release was detected on groundwater and Site investigation and remediation efforts were initiated. A Remedial Action Plan (RAP) was submitted to the Pennsylvania Department of Protection (PADEP) on June 19, 2026. This *Pilot Test Domestic Well Monitoring Work Plan* provides procedures and additional details regarding the monitoring of domestic wells during the pilot test implementation.

1.2 Site Geology

According to Pennsylvania Geological Survey mapping of the area, the bedrock formation beneath the Project Area is the Triassic-aged Lockatong Formation. The Lockatong Formation is described in Geyer and Wilshusen (1982) as dark gray to black argillite having some zones of black shale and locally, thin layers of impure calcareous shale. The primary porosity and permeability of the weathered and un-weathered rock in the Lockatong Formation are described as low, with joint openings providing secondary porosity.

2 Domestic Supply Well Monitoring

2.1 Domestic Supply Well Monitoring

Nearby domestic supply wells located on Glenwood Drive and Walker Road will be monitored during the pilot testing activities outlined in the RAP, if landowner consent and access is provided. Liquid level data and wellhead photoionization detector (PID) readings will be recorded for each domestic well monitored, if the wellhead is accessible. An interface probe and a PID will be used to record liquid level data and wellhead screening multiple times from various domestic well locations on the properties shown on **Figure 1**. In addition, water may be collected from various domestic well locations on a routine basis with a bailer for visual inspection if the PID wellhead screening is greater than 1 part per million (ppm). However, it should be noted that due to spacers

and/ or wire guards existing in certain domestic wells, a bailer may not be deployed for visual inspection. All data obtained from domestic well monitoring will be documented. The SOP for water level gauging and visual inspections is provided in **Attachment 1**. This method of monitoring will provide real-time data and, if adverse influence is observed, immediate changes can be made during the pilot test operations (i.e., reduce pumping, reduce air flow or stop work, if needed).

2.2 Domestic Supply Well Monitoring Frequency

The domestic well monitoring will occur every 2 to 4 hours during the pilot test operation during daytime hours (i.e., 7 am to 7 pm). While the pilot test may also operate overnight, domestic well monitoring will not occur during overnight hours. It should be noted that there is sufficient daylight during these hours during Daylight Savings Time (through November 1, 2026). The pilot test is proposed to operate during 5 consecutive days (i.e., Monday through Friday). In the event there is operation on the weekends, the domestic well monitoring shall also be conducted during daytime hours on the weekend as needed.

2.3 Data Management and Evaluation

The selected domestic wells for monitoring, as shown on **Figure 1**, were also monitored during the drilling of multipurpose wells A through E and monitoring wells MW-15S, MW-15D, MW-16DD, MW-17DD, MW-18DD, MW-19D, and MW-20D in April through June 2026. As shown in **Table 1**, there were minimal changes noted in liquid levels obtained from the domestic supply wells gauged during those drilling activities. However, it should be noted that factors inside the home cannot be controlled (i.e., water usage) and therefore, the data collected as outlined in this plan will only be tracked. In the event any of these target wells are observed to have adverse impacts attributable to the pilot test, SPLP will evaluate the conditions, and implement an appropriate remedy.

2.4 Investigation-Derived Waste Management

Decontamination water generated during tool cleaning associated with these well monitoring activities will be containerized in steel buckets for disposal in accordance with the Waste Management Plan (March 4, 2025). The buckets of decontamination water will be emptied at the Bucks Pump Station. All waste generated will be transported off-Site for disposal at a PADEP-permitted waste facility as outlined in the Waste Management Plan.

2.5 Health, Safety, and Security

All GES field activities will be conducted in accordance with the site-specific Health and Safety Plan (HASP) prepared by GES for this site. GES personnel engaged in on-Site activities will have the training necessary to perform each of the prescribed tasks. Familiarity with the guidance documents and standards listed below is required prior to engaging in on-Site activities:

- Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (OSHA 29CFR1910.120)

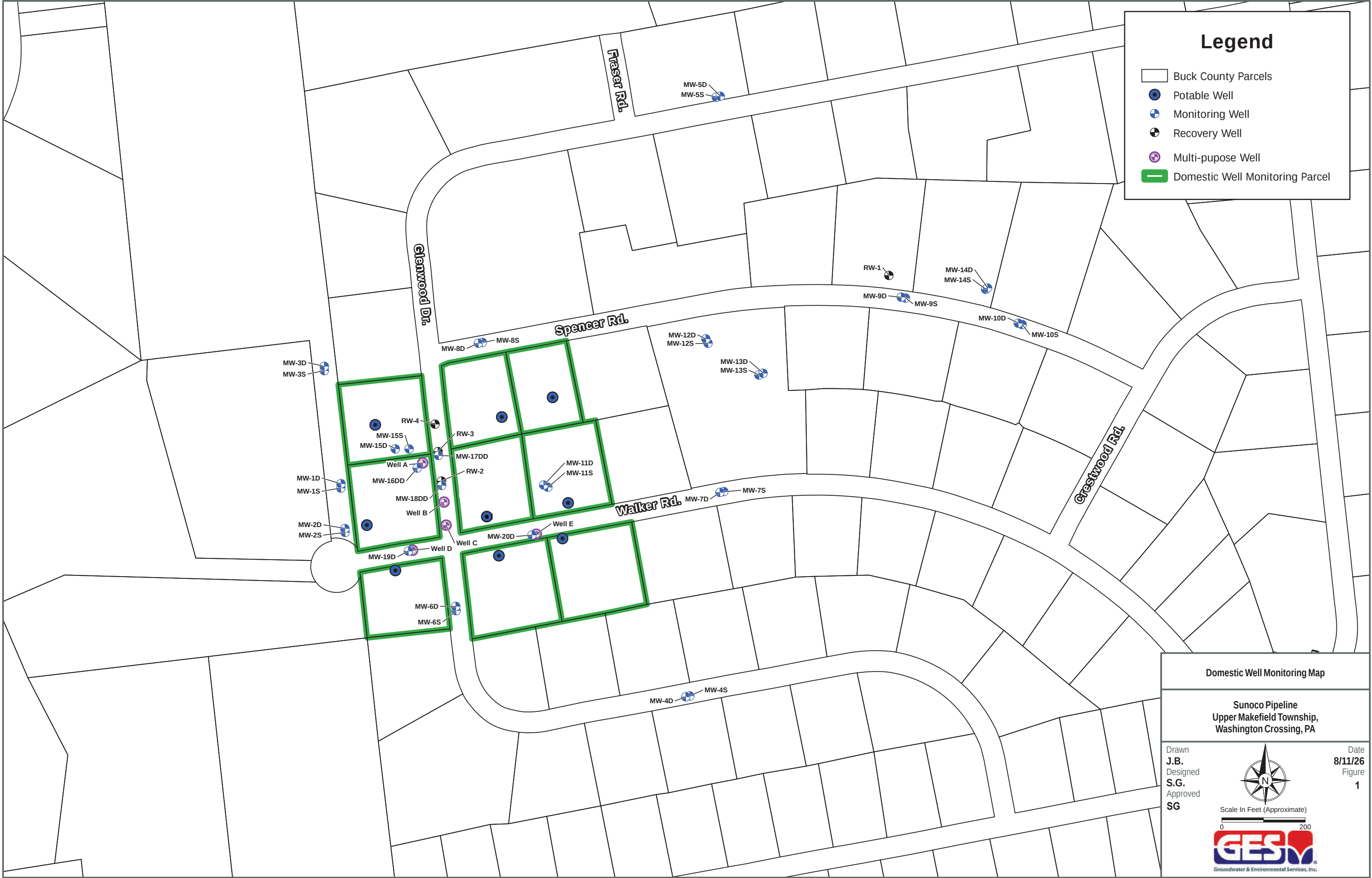
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985) (NIOSH/OSHA/USCG/EPA)
- Health and Safety Requirements for Employees Engaged in Field Activities (EPA Order 1440.2)

Safety measures will be implemented to manage traffic and pedestrian flow during completion of the work described herein. Clear and safe routes of personnel ingress and egress will be established by work zone separation, visibility, signage, barriers (including sound mitigation), training, and communication. Daily health, safety, and security meetings will be conducted to review training, standard operating procedures, job hazard analysis, work scopes, and hazard communication. A Traffic Control Plan is included as a separate plan.

3 References

Geyer, A.R., and J.P. Wilshusen. 1982. *Engineering Characteristics of the Rocks of Pennsylvania, Second Edition*, Pennsylvania Geologic Survey, Harrisburg, PA.

Figure



Table



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:55 AM	0.0	-	-	-	Spacers / wire guard preventing gauging
	4/16/2025	12:42 PM	0.0	-	-	-	Spacers / wire guard preventing gauging
	4/17/2025	8:58 AM	0.0	-	-	-	Spacers / wire guard preventing gauging
	4/17/2025	10:56 AM	0.0	-	56.71	-	-
	4/17/2025	12:32 PM	0.0	-	54.22	-	-
	4/17/2025	2:25 PM	0.0	-	52.20	-	-
	4/20/2026	9:06 AM	2.8	-	69.70	-	Bailer check clear
	4/20/2026	10:58 AM	0.0	-	61.76	-	-
	4/20/2026	12:58 PM	0.0	-	55.81	-	-
	4/22/2026	12:27 PM	0.6	-	50.29	-	-
	4/22/2026	2:16 PM	0.5	-	49.04	-	-
	4/23/2026	9:16 AM	0.0	-	45.22	-	-
	4/23/2026	12:35 PM	0.0	-	44.85	-	-
	4/23/2026	2:39 PM	0.0	-	44.78	-	-
	4/24/2026	9:04 AM	0.0	-	54.72	-	-
	4/24/2026	12:46 PM	0.6	-	54.41	-	-
	4/24/2026	2:34 PM	0.4	-	57.05	-	-
	4/27/2026	9:55 AM	0.3	-	50.90	-	-
	4/28/2026	9:15 AM	0.3	-	49.73	-	-
	4/28/2026	11:06 AM	0.1	-	48.00	-	-
	4/28/2026	1:04 PM	0.1	-	47.68	-	-
	4/29/2026	10:45 AM	0.6	-	80.49	-	-
	4/29/2026	12:05 PM	0.3	-	56.89	-	-
	4/29/2026	1:56 PM	0.0	-	61.58	-	-
	4/30/2026	10:25 AM	0.8	-	80.52	-	-
	4/30/2026	12:55 PM	0.6	-	62.47	-	-
	4/30/2026	3:05 PM	0.0	-	72.80	-	-
	5/1/2026	1:45 PM	0.5	-	55.24	-	-
	5/4/2026	9:10 AM	1.9	-	55.45	-	Bailer check clear
	5/4/2026	11:03 AM	3.8	-	52.45	-	Bailer check clear
	5/4/2026	1:10 PM	0.0	-	50.37	-	-
	5/5/2026	9:00 AM	0.1	-	57.12	-	-
	5/5/2026	12:00 PM	0.2	-	58.31	-	-
	5/6/2026	9:11 AM	4.3	-	57.76	-	Bailer check clear
	5/6/2026	11:08 AM	0.5	-	-	-	Could not measure past pump spacer >65 feet
	5/6/2026	1:11 PM	1.0	-	64.42	-	-
	5/7/2026	8:20 AM	2.9	-	56.25	-	Bailer check clear
	5/7/2026	11:51 AM	0.5	-	78.95	-	-
	5/12/2026	10:05 AM	0.3	-	67.76	-	-
	5/12/2026	11:55 AM	0.0	-	65.05	-	-
	5/12/2026	2:00 PM	0.0	-	65.20	-	-
	5/12/2026	4:10 PM	0.0	-	58.89	-	-
	5/13/2026	9:05 AM	0.0	-	60.05	-	-
	5/13/2026	11:15 AM	0.0	-	66.07	-	-
	5/13/2026	12:40 PM	0.0	-	62.39	-	-
	5/14/2026	9:10 AM	0.3	-	59.19	-	-
	5/14/2026	1:05 PM	0.0	-	57.77	-	-
	5/15/2026	9:30 AM	0.4	-	60.23	-	-
	5/15/2026	11:05 AM	0.3	-	55.24	-	-
	5/18/2026	9:25 AM	0.2	-	60.83	-	-
	5/18/2026	11:05 AM	0.0	-	61.55	-	-
	5/18/2026	1:00 PM	0.6	-	60.90	-	-
	5/19/2026	9:25 AM	0.0	-	64.24	-	-
	5/19/2026	11:15 AM	0.0	-	65.72	-	-
	5/19/2026	1:05 PM	0.0	-	67.94	-	-
	5/19/2026	3:05 PM	0.0	-	61.64	-	-
	5/26/2026	9:20 AM	0.4	-	56.31	-	-
	5/27/2026	9:02 AM	0.0	-	49.43	-	-
	5/27/2026	11:05 AM	0.0	-	55.34	-	-
	5/27/2026	1:11 PM	0.0	-	58.98	-	-
	5/28/2026	8:54 AM	0.0	-	61.55	-	-
	5/28/2026	10:58 AM	0.1	-	56.39	-	-
	6/3/2026	2:10 PM	0.0	-	49.25	-	Bailer check clear
	6/4/2026	9:12 AM	0.0	-	53.45	-	-
	6/4/2026	11:08 AM	0.2	-	58.10	-	-
	6/4/2026	2:07 PM	0.1	-	60.70	-	-
	6/5/2026	9:02 AM	0.0	-	53.45	-	-
	6/5/2026	11:16 AM	0.1	-	66.50	-	-
	6/4/2026	9:17 AM	0.0	-	52.60	-	-
	6/4/2026	11:11 AM	0.0	-	51.00	-	-
	6/4/2026	2:12 PM	0.0	-	52.50	-	-
	6/5/2026	9:06 AM	0.0	-	52.25	-	-
	6/5/2026	11:30 AM	0.0	-	56.70	-	-



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:05 AM	0.0	-	23.75	-	-
	4/16/2025	12:15 PM	0.0	-	25.00	-	-
	4/17/2025	9:04 AM	0.0	-	26.30	-	-
	4/17/2025	11:03 AM	0.0	-	24.72	-	-
	4/17/2025	12:37 PM	0.0	-	24.28	-	-
	4/17/2025	2:29 PM	0.0	-	25.35	-	-
	4/20/2026	9:24 AM	0.0	-	23.60	-	-
	4/20/2026	11:02 AM	0.0	-	23.19	-	-
	4/20/2026	1:04 PM	0.0	-	26.64	-	-
	4/22/2026	12:24 PM	0.0	-	24.40	-	-
	4/22/2026	2:14 PM	0.0	-	25.27	-	-
	4/23/2026	9:13 AM	0.0	-	23.37	-	-
	4/23/2026	12:32 PM	0.0	-	25.07	-	-
	4/23/2026	2:35 PM	0.0	-	27.44	-	-
	4/24/2026	9:00 AM	0.0	-	23.99	-	-
	4/24/2026	12:53 PM	0.0	-	32.00	-	-
	4/24/2026	2:41 PM	0.0	-	32.27	-	-
	4/27/2026	11:42 AM	0.0	-	24.54	-	-
	4/28/2026	9:20 AM	0.0	-	23.50	-	-
	4/28/2026	11:09 AM	0.0	-	23.89	-	-
	4/28/2026	1:08 PM	0.0	-	23.26	-	-
	4/29/2026	9:58 AM	0.0	-	23.58	-	-
	4/29/2026	12:08 PM	0.0	-	26.13	-	-
	4/29/2026	2:00 PM	0.0	-	31.33	-	-
	4/30/2026	10:35 AM	0.0	-	23.40	-	-
	4/30/2026	1:00 PM	0.0	-	23.42	-	-
	4/30/2026	3:10 PM	0.0	-	23.31	-	-
	5/1/2026	1:55 PM	0.0	-	25.39	-	-
	5/4/2026	9:18 AM	0.0	-	23.84	-	-
	5/4/2026	11:08 AM	0.0	-	25.55	-	-
	5/4/2026	1:14 PM	0.0	-	26.82	-	-
	5/5/2026	9:07 AM	0.0	-	24.62	-	-
	5/5/2026	12:07 PM	0.0	-	25.71	-	-
	5/6/2026	9:19 AM	0.0	-	25.25	-	-
	5/6/2026	11:22 AM	0.0	-	24.35	-	-
	5/6/2026	1:16 PM	0.0	-	24.38	-	-
	5/7/2026	8:23 am	0.0	-	24.80	-	-
	5/7/2026	11:57 AM	0.0	-	25.18	-	-
	5/12/2026	10:10 AM	0.0	-	26.96	-	-
	5/12/2026	12:15 PM	0.0	-	25.00	-	-
	5/12/2026	1:55 PM	0.0	-	24.96	-	-
	5/12/2026	4:00 PM	0.0	-	25.55	-	-
	5/13/2026	9:15 AM	0.0	-	26.37	-	-
	5/13/2026	11:10 AM	0.0	-	29.84	-	-
	5/13/2026	12:45 PM	0.0	-	26.44	-	-
	5/14/2026	9:20 AM	0.0	-	24.77	-	-
	5/14/2026	1:10 PM	0.0	-	26.88	-	-
	5/15/2026	9:35 AM	0.0	-	24.71	-	-
	5/15/2026	11:11 AM	0.0	-	26.93	-	-
	5/18/2026	10:00 AM	0.0	-	25.55	-	-
	5/18/2026	11:10 AM	0.0	-	27.76	-	-
	5/18/2026	1:10 PM	0.0	-	26.35	-	-
	5/19/2026	9:20 AM	0.0	-	27.58	-	-
	5/19/2026	11:10 AM	0.0	-	25.97	-	-
	5/19/2026	1:00 PM	0.0	-	25.42	-	-
	5/19/2026	3:00 PM	0.0	-	25.64	-	-
	5/26/2026	9:15 AM	0.0	-	24.30	-	-
	5/27/2026	8:58 AM	0.0	-	23.68	-	-
	5/27/2026	11:02 AM	0.0	-	23.05	-	-
	5/27/2026	1:09 PM	0.0	-	23.91	-	-
	5/28/2026	8:50 AM	0.0	-	25.70	-	-
	5/28/2026	10:54 AM	0.0	-	23.19	-	-
	6/2/2026	10:05 AM	0.0	-	26.16	-	-
	6/2/2026	12:07 PM	0.0	-	32.25	-	-
	6/2/2026	2:15 PM	0.0	-	24.85	-	-
	6/2/2026	3:43 PM	0.0	-	24.10	-	-
	6/3/2026	9:17 AM	0.0	-	24.12	-	-
	6/3/2026	11:07 AM	0.0	-	24.40	-	-
	6/3/2026	2:02 PM	0.0	-	23.40	-	Bailer check clear
	6/4/2026	9:08 AM	0.0	-	25.80	-	-
	6/4/2026	11:04 AM	0.0	-	23.70	-	-
	6/4/2026	2:02 PM	0.0	-	25.45	-	-
	6/5/2026	8:58 AM	0.0	-	25.30	-	-
	6/5/2026	11:12 AM	0.0	-	24.15	-	-



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
[REDACTED]	4/16/2025	10:22 AM	128.6	-	27.95	-	See also Daily Gauging Table
	4/16/2025	12:15 PM	50.6	-	27.87	-	-
	4/17/2025	9:16 AM	33.3	28.94	28.95	0.01	See also Daily Gauging Table
	4/17/2025	11:30 AM	40.4	29.88	29.91	0.03	-
	4/17/2025	1:02 PM	51.9	34.28	34.30	0.02	-
	4/17/2025	3:00 PM	169.9	29.99	30.00	0.01	-
	4/20/2026	9:51 AM	101.4	28.28	28.29	0.01	See also Daily Gauging Table
	4/20/2026	11:19 AM	53.3	28.53	28.56	0.03	-
	4/20/2026	1:24 PM	41.7	29.70	29.74	0.04	-
	4/22/2026	12:47 PM	156.6	29.69	29.72	0.03	See also Daily Gauging Table
	4/22/2026	2:33 PM	164.0	29.89	30.02	0.13	-
	4/23/2026	9:33 AM	84.7	28.89	28.92	0.03	-
	4/23/2026	12:49 PM	49.9	30.28	30.29	0.01	-
	4/23/2026	3:01 PM	114.7	39.60	39.63	0.03	-
	4/23/2026	3:55 PM	72.2	36.14	36.16	0.02	-
	4/23/2026	4:25 AM	68.1	35.44	35.46	0.02	-
	4/24/2026	8:50 AM	93.3	29.57	29.59	0.02	See also Daily Gauging Table
	4/24/2026	12:39 PM	132.0	30.19	30.21	0.02	-
	4/24/2026	2:28 PM	62.8	31.98	32.00	0.02	-
	4/27/2026	10:25 AM	79.5	34.04	34.05	0.01	See also Daily Gauging Table
	4/28/2026	9:37 AM	145.9	29.52	29.56	0.04	See also Daily Gauging Table
	4/28/2026	11:21 AM	73.3	29.31	29.34	0.03	-
	4/28/2026	1:23 PM	45.9	32.02	32.03	0.01	-
	4/29/2026	9:30 AM	73.9	28.90	28.94	0.04	See also Daily Gauging Table
	4/29/2026	12:12 PM	123.4	30.09	30.12	0.03	-
	4/29/2026	2:18 PM	102.3	30.55	30.59	0.04	-
	4/30/2026	11:15 AM	34.9	45.91	45.94	0.03	-
	4/30/2026	1:25 PM	185.0	44.35	44.38	0.03	-
	4/30/2026	3:30 PM	114.7	36.57	36.58	0.01	-
	5/1/2026	2:20 PM	356.4	-	33.24	-	-
	5/4/2026	9:42 AM	1045	30.30	30.35	0.05	-
	5/4/2026	11:20 AM	67.0	31.59	31.60	0.01	-
	5/4/2026	1:31 PM	475.5	35.89	35.91	0.02	-
	5/5/2026	9:39 AM	212.7	-	31.31	-	-
	5/5/2026	12:30 PM	138.6	-	32.14	-	-
	5/6/2026	9:40 AM	416.2	31.15	31.20	0.05	-
	5/6/2026	11:39 AM	120.9	31.27	31.28	0.01	-
	5/6/2026	1:31 PM	71.1	31.30	31.31	0.01	-
	5/7/2026	8:38 AM	180.2	-	30.95	-	-
	5/7/2026	12:10 PM	123.0	36.12	36.13	0.01	-
	5/12/2026	10:25 AM	62.3	-	31.17	-	-
	5/12/2026	12:10 PM	38.1	-	31.28	-	-
	5/12/2026	2:10 PM	43.4	-	31.34	-	-
	5/12/2026	4:20 PM	62.6	-	31.83	-	-
	5/13/2026	10:00 AM	12.3	-	36.47	-	-
	5/13/2026	11:25 AM	7.8	34.23	34.24	0.01	See also Daily Gauging Table
	5/13/2026	1:00 PM	9.3	-	33.54	-	-
	5/14/2026	9:45 AM	158.0	32.13	32.14	0.01	-
	5/14/2026	1:30 PM	40.2	-	62.99	-	-
	5/15/2026	10:05 AM	20.8	-	41.19	-	-
	5/15/2026	11:25 AM	22.3	-	94.61	-	-
	5/18/2026	10:15 AM	88.9	-	30.53	-	-
	5/18/2026	11:20 AM	17.6	-	31.17	-	-
	5/18/2026	1:15 PM	6.8	-	71.10	-	-
	5/19/2026	9:25 AM	51.6	-	31.40	-	-
	5/19/2026	11:20 AM	27.6	-	31.45	-	-
	5/19/2026	1:15 PM	12.7	-	31.10	-	-
	5/19/2026	3:15 PM	61.1	-	31.10	-	-
	5/26/2026	9:33 AM	59.6	29.22	29.30	0.08	See also Daily Gauging Table
	5/27/2026	9:12 AM	49.7	28.60	28.65	0.05	See also Daily Gauging Table
	5/27/2026	11:16 AM	105.3	28.74	28.79	0.05	See also Daily Gauging Table
	5/27/2026	1:18 PM	44.4	28.84	28.88	0.04	See also Daily Gauging Table
	5/28/2026	9:05 AM	8.4	28.75	28.81	0.06	See also Daily Gauging Table
	5/28/2026	11:08 AM	9.8	28.77	28.83	0.06	See also Daily Gauging Table
	6/2/2026	10:10 AM	49.2	29.67	29.74	0.07	See also Daily Gauging Table
	6/2/2026	12:13 PM	11.8	30.75	30.84	0.09	See also Daily Gauging Table
	6/2/2026	2:20 PM	18.4	30.63	30.70	0.07	See also Daily Gauging Table
	6/2/2026	3:47 PM	61.2	30.11	30.17	0.06	See also Daily Gauging Table
	6/3/2026	9:21 AM	7.6	29.35	29.40	0.05	See also Daily Gauging Table
	6/3/2026	11:25 AM	56.2	29.01	29.07	0.06	See also Daily Gauging Table
	6/4/2026	9:24 AM	28.2	29.35	29.40	0.05	-
	6/4/2026	11:17 AM	29.9	29.14	29.19	0.05	-
	6/4/2026	2:17 PM	15.3	69.09	69.10	0.01	-
	6/5/2026	9:13 AM	49.9	29.37	29.44	0.07	See also Daily Gauging Table
	6/5/2026	11:42 AM	131.1	29.69	29.74	0.05	See also Daily Gauging Table
[REDACTED]	6/4/2026	9:00 AM	0.0	-	29.67	-	-
	6/4/2026	10:56 AM	0.0	-	28.68	-	-
	6/4/2026	1:54 PM	0.0	-	28.35	-	-
	6/5/2026	8:50 AM	0.0	-	29.25	-	-
	6/5/2026	10:56 AM	0.0	-	29.80	-	-



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:12 AM	0.0	-	24.60	-	-
	4/16/2025	12:01 PM	0.0	-	24.15	-	-
	4/17/2025	9:09 AM	0.0	-	31.15	-	-
	4/17/2025	11:07 AM	0.0	-	27.38	-	-
	4/17/2025	12:41 PM	0.0	-	28.00	-	-
	4/17/2025	2:23 PM	0.0	-	49.42	-	-
	4/20/2026	9:30 AM	0.0	-	34.52	-	-
	4/20/2026	11:06 AM	0.0	-	25.50	-	-
	4/20/2026	1:19 PM	0.0	-	28.09	-	-
	4/22/2026	12:20 PM	0.0	-	33.86	-	-
	4/22/2026	2:10 PM	0.0	-	36.86	-	-
	4/23/2026	9:10 AM	0.0	-	25.22	-	-
	4/23/2026	12:30 PM	0.0	-	34.08	-	-
	4/23/2026	2:30 PM	0.0	-	28.12	-	-
	4/24/2026	8:58 AM	0.0	-	25.77	-	-
	4/24/2026	12:57 PM	0.0	-	27.51	-	-
	4/24/2026	2:47 PM	0.0	-	28.85	-	-
	4/27/2026	11:48 AM	0.0	-	25.61	-	-
	5/12/2026	10:15 AM	0.0	-	30.70	-	-
	5/12/2026	12:00 PM	0.0	-	33.78	-	-
	5/12/2026	1:50 PM	0.0	-	27.05	-	-
	5/12/2026	3:55 PM	0.0	-	46.78	-	-
	5/13/2026	9:20 AM	0.0	-	29.68	-	-
	5/13/2026	11:05 AM	0.0	-	28.04	-	-
	5/13/2026	12:50 PM	0.0	-	29.12	-	-
	5/14/2026	9:25 AM	0.0	-	32.17	-	-
	5/14/2026	1:15 PM	0.0	-	27.04	-	-
	5/15/2026	9:27 AM	0.0	-	31.88	-	-
	5/15/2026	11:18 AM	0.0	-	27.23	-	-
	5/18/2026	10:40 AM	0.0	-	27.63	-	-
	5/18/2026	11:30 AM	0.0	-	27.45	-	-
	5/18/2026	1:20 PM	0.0	-	27.40	-	-
	5/19/2026	9:15 AM	0.0	-	27.93	-	-
	5/19/2026	11:05 AM	0.0	-	27.35	-	-
	5/19/2026	12:55 PM	0.0	-	27.41	-	-
	5/19/2026	2:55 PM	0.0	-	27.05	-	-
	5/26/2026	9:10 AM	0.0	-	30.65	-	-
	5/27/2026	8:54 AM	0.0	-	28.55	-	-
	5/27/2026	10:58 AM	0.0	-	36.50	-	-
	5/27/2026	1:06 PM	0.0	-	25.64	-	-
	5/28/2026	8:45 AM	0.0	-	24.92	-	-
	5/28/2026	10:50 AM	0.0	-	27.20	-	-
	6/2/2026	10:01 AM	0.0	-	28.01	-	-
	6/2/2026	12:03 PM	0.0	-	33.15	-	-
	6/2/2026	2:10 PM	0.0	-	28.40	-	-
	6/2/2026	3:40 PM	0.0	-	26.32	-	-
	6/3/2026	9:12 AM	0.0	-	30.85	-	-
	6/3/2026	11:03 AM	0.0	-	35.05	-	-
	6/3/2026	1:04 PM	0.0	-	27.17	-	Bailer Check Clear



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:30 AM	0.0	-	27.05	-	-
	4/16/2025	12:07 PM	0.0	-	27.10	-	-
	4/17/2025	9:15 AM	0.0	-	27.90	-	-
	4/17/2025	11:11 AM	0.0	-	28.28	-	-
	4/17/2025	12:45 PM	0.0	-	28.22	-	-
	4/17/2025	2:40 PM	0.0	-	28.60	-	-
	4/20/2026	9:40 AM	0.0	-	27.81	-	-
	4/20/2026	11:09 AM	0.0	-	27.78	-	-
	4/20/2026	1:12 PM	0.0	-	29.42	-	-
	4/22/2026	12:34 PM	0.6	-	29.94	-	-
	4/22/2026	2:21 PM	0.2	-	28.91	-	-
	4/23/2026	9:21 AM	0.4	-	28.62	-	-
	4/23/2026	12:40 PM	0.0	-	31.41	-	-
	4/23/2026	2:48 PM	0.5	-	32.62	-	-
	4/24/2026	9:10 AM	0.0	-	29.23	-	-
	4/24/2026	1:01 PM	0.3	-	32.08	-	-
	4/24/2026	3:20 PM	0.3	-	31.90	-	-
	4/27/2026	11:08 AM	0.0	-	28.91	-	-
	4/28/2026	9:24 AM	0.5	-	28.65	-	-
	4/28/2026	11:13 AM	0.0	-	28.70	-	-
	4/28/2026	1:12 PM	0.0	-	28.39	-	-
	4/29/2026	10:38 AM	0.1	-	28.54	-	-
	4/29/2026	12:25 PM	0.0	-	28.98	-	-
	4/29/2026	2:06 PM	0.0	-	29.24	-	-
	4/30/2026	10:45 AM	0.0	-	28.45	-	-
	4/30/2026	1:07 PM	0.0	-	28.48	-	-
	4/30/2026	3:15 PM	0.0	-	28.37	-	-
	5/1/2026	2:02 PM	0.2	-	28.92	-	-
	5/4/2026	9:25 AM	0.4	-	30.12	-	-
	5/4/2026	11:12 AM	1.1	-	29.55	-	-
	5/4/2026	1:18 PM	0.0	-	31.67	-	-
	5/5/2026	9:23 AM	0.0	-	29.75	-	-
	5/5/2026	12:13 PM	0.1	-	32.21	-	-
	5/6/2026	9:23 AM	0.7	-	29.40	-	-
	5/6/2026	11:25 AM	0.0	-	29.60	-	-
	5/6/2026	1:20 PM	0.0	-	30.19	-	-
	5/7/2026	8:28 AM	0.0	-	29.34	-	-
	5/7/2026	12:01 PM	0.0	-	29.68	-	-
	5/12/2026	10:20 AM	0.0	-	29.67	-	-
	5/12/2026	12:05 PM	0.0	-	29.87	-	-
	5/12/2026	2:05 PM	0.0	-	30.29	-	-
	5/12/2026	4:15 PM	26.7	-	32.15	-	Bailer check clear
	5/13/2026	9:30 AM	17.5	-	30.12	-	Bailer check clear
	5/13/2026	11:20 AM	6.0	-	32.50	-	-
	5/13/2026	12:55 PM	54.5	-	32.40	-	-
	5/14/2026	9:30 AM	127.7	-	29.96	-	Bailer check clear
	5/14/2026	12:15 PM	13.4	-	29.80	-	Bailer check clear
	5/14/2026	1:20 PM	11.6	-	30.20	-	Bailer check clear
	5/15/2026	9:40 AM	0.9	-	29.58	-	-
	5/15/2026	11:20 AM	0.9	-	30.05	-	-
	5/18/2026	10:30 AM	0.0	-	30.19	-	-
	5/18/2026	11:40 AM	0.1	-	30.40	-	-
	5/18/2026	1:30 PM	0.2	-	30.49	-	-
	5/19/2026	9:30 AM	0.0	-	30.48	-	-
	5/19/2026	11:00 AM	0.1	-	29.82	-	-
	5/19/2026	12:00 PM	0.0	-	29.68	-	-
	5/19/2026	1:10 PM	0.1	-	29.78	-	-
	5/19/2026	1:55 PM	0.0	-	30.02	-	-
	5/19/2026	3:10 PM	0.1	-	30.18	-	-
	5/26/2026	9:27 AM	0.0	-	28.69	-	-
	5/27/2026	9:08 AM	0.0	-	28.21	-	-
	5/27/2026	11:11 AM	0.0	-	28.59	-	-
	5/27/2026	1:15 PM	0.0	-	28.70	-	-
	5/28/2026	9:01 AM	0.0	-	28.12	-	-
	5/28/2026	11:04 AM	0.0	-	28.08	-	-
	6/2/2026	9:56 AM	0.0	-	29.14	-	-
	6/2/2026	11:58 AM	0.0	-	29.76	-	-
	6/2/2026	2:06 PM	0.0	-	29.48	-	-
	6/2/2026	3:37 PM	0.0	-	29.15	-	-
	6/3/2026	9:17 AM	0.0	-	28.72	-	-
	6/3/2026	11:16 AM	0.0	-	28.75	-	-
	6/3/2026	2:25 PM	0.0	-	28.53	-	Bailer check clear



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:38 AM	0.0	-	28.65	-	-
	4/16/2025	12:35 PM	0.0	-	28.52	-	-
	4/17/2025	9:19 AM	0.0	-	29.20	-	-
	4/17/2025	11:15 AM	0.0	-	31.70	-	-
	4/17/2025	12:50 PM	0.0	-	29.95	-	-
	4/17/2025	2:46 PM	0.0	-	29.70	-	-
	4/20/2026	9:43 AM	0.0	-	28.98	-	-
	4/20/2026	11:12 AM	0.0	-	29.13	-	-
	4/20/2026	1:16 PM	0.0	-	27.60	-	-
	4/22/2026	12:38 PM	0.0	-	29.75	-	-
	4/22/2026	2:25 PM	0.0	-	29.72	-	-
	4/23/2026	9:24 AM	0.0	-	29.69	-	-
	4/23/2026	12:43 PM	0.0	-	30.42	-	-
	4/23/2026	2:51 PM	0.0	-	31.41	-	-
	4/24/2026	9:13 AM	0.0	-	30.39	-	-
	4/24/2026	1:04 PM	0.0	-	31.14	-	-
	4/24/2026	3:25 PM	0.0	-	31.62	-	-
	4/27/2026	11:55 AM	0.0	-	29.74	-	-
	4/28/2026	9:29 AM	0.0	-	29.89	-	-
	4/28/2026	11:15 AM	0.0	-	29.80	-	-
	4/28/2026	1:16 PM	0.0	-	29.67	-	-
	4/29/2026	10:25 AM	0.0	-	29.62	-	-
	4/29/2026	12:22 PM	0.0	-	29.86	-	-
	4/29/2026	2:10 PM	0.0	-	29.97	-	-
	4/30/2026	10:55 AM	0.0	-	29.69	-	-
	4/30/2026	1:13 PM	0.0	-	29.73	-	-
	4/30/2026	3:20 PM	0.0	-	29.62	-	-
	5/1/2026	2:10 PM	0.0	-	30.07	-	-
	5/4/2026	9:30 AM	0.0	-	30.02	-	-
	5/4/2026	11:15 AM	0.0	-	31.19	-	-
	5/4/2026	1:20 PM	0.0	-	33.70	-	-
	5/5/2026	9:27 AM	0.0	-	31.72	-	-
	5/5/2026	12:20 PM	0.2	-	34.82	-	-
	5/6/2026	9:29 AM	0.0	-	30.63	-	-
	5/6/2026	11:29 AM	0.0	-	30.61	-	-
	5/6/2026	1:23 PM	0.0	-	30.63	-	-
	5/7/2026	8:31 AM	0.0	-	30.40	-	-
	5/7/2026	12:04 PM	0.0	-	30.75	-	-
	6/2/2026	9:52 AM	0.0	-	30.32	-	-
	6/2/2026	11:51 AM	0.0	-	30.40	-	-
	6/2/2026	2:02 PM	0.0	-	30.48	-	-
	6/2/2026	3:35 PM	0.0	-	30.32	-	-
	6/3/2026	9:03 AM	0.0	-	30.10	-	-
	6/3/2026	11:21 AM	0.0	-	30.81	-	-
	6/3/2026	2:31 PM	0.0	-	35.23	-	Bailer check clear



Liquid-Level Gauging Data Summary
During Well Installation on Glenwood Drive and Walker Road

Well Location	Date	Time of Day	Well Head Screening (ppm)	Depth to LNAPL (ft.)	Depth to Water (ft.)	LNAPL Thickness (ft.)	Comments
	4/16/2025	10:48 AM	122.9	-	26.70	-	See also Daily Gauging Table
	4/16/2025	12:28 PM	36.3	-	26.63	-	-
	4/17/2025	9:24 AM	29.1	-	27.25	-	-
	4/17/2025	11:25 AM	48.8	-	27.32	-	-
	4/17/2025	12:55 PM	81.6	-	27.74	-	-
	4/17/2025	2:53 PM	51.1	-	27.75	-	-
	4/20/2026	10:06 AM	89.2	-	28.98	-	-
	4/20/2026	11:16 AM	36.1	-	29.13	-	-
	4/20/2026	1:19 PM	40.2	-	27.60	-	-
	4/22/2026	12:42 PM	13.6	-	27.77	-	-
	4/22/2026	2:30 PM	40.7	-	28.78	-	-
	4/23/2026	9:28 AM	46.3	-	27.65	-	-
	4/23/2026	12:46 PM	57.6	-	28.23	-	-
	4/23/2026	2:56 PM	51.9	-	28.15	-	-
	4/24/2026	9:20 AM	46.1	-	28.37	-	-
	4/24/2026	1:08 PM	54.6	-	28.81	-	-
	4/24/2026	3:30 PM	54.9	-	29.50	-	-
	4/27/2026	10:40 AM	374.3	-	28.34	-	Bailer check clear
	4/28/2026	9:33 AM	45.5	-	27.97	-	-
	4/28/2026	11:18 AM	40.7	-	27.90	-	-
	4/28/2026	1:20 PM	40.8	-	28.75	-	-
	4/29/2026	10:15 AM	75.3	-	27.63	-	Bailer check clear
	4/29/2026	12:18 PM	66.7	-	27.96	-	-
	4/29/2026	2:14 PM	40.2	-	28.00	-	-
	4/30/2026	11:05 AM	80.8	-	27.82	-	Bailer check clear
	4/30/2026	1:18 PM	47.1	-	27.80	-	-
	4/30/2026	3:25 PM	63.8	-	27.71	-	-
	5/1/2026	2:15 PM	97.7	-	28.12	-	Bailer check clear
	5/4/2026	9:36 AM	357.2	-	28.00	-	Bailer check clear
	5/4/2026	11:19 AM	199.0	-	28.88	-	-
	5/4/2026	1:27 PM	237.6	-	30.96	-	-
	5/5/2026	9:35 AM	32.1	-	29.80	-	-
	5/5/2026	12:25 PM	83.9	-	31.85	-	-
	5/6/2026	9:35 AM	1,740	-	28.75	-	-
	5/6/2026	11:34 AM	43.6	-	28.72	-	-
	5/6/2026	1:27 PM	45.0	-	28.77	-	-
	5/7/2026	8:35 AM	55.4	-	28.60	-	-
	5/7/2026	12:07 PM	81.3	-	28.86	-	-

Notes:
ft. = feet
LNAPL = Light Non-Aqueous Phase Liquid
NA = Not Applicable
Well head screening is completed with a photoionization detector (PID).

Attachment 1



Standard Operating Procedure

SOP #:	FM-8.1 Rev. 004
Review Date:	06/03/2023
Origin Date:	03/01/2016

Title: Liquid Level Gauging

1. Purpose/Scope

This SOP describes procedures for collecting groundwater and Light and Dense Non-Aqueous Phase Liquid (LNAPL and DNAPL) level measurements in wells. Down-hole liquid level readings can be collected by using an oil/water interface probe, such as Solinst or Heron.

2. References

Solinst Model 122 Interface Meter Operating Instructions.

3. Equipment/Materials

The following equipment and materials are needed to comply with this SOP:

- Oil/water interface probe (e.g., Solinst) with the ability to detect light and dense non-aqueous phase liquids, LNAPL and DNAPL, respectively, and a minimum precision of +/-0.01 foot
- Clear bailer
- Field book, field form, or other approved method of water level documentation
- Records of previous water level readings and analytical data for site, if available
- Modified Level D personal protective Equipment (PPE) or as directed in task Job Loss Analysis (JLA)
- Decontamination materials

Refer to equipment manuals for general maintenance and/or troubleshooting.

4. Preparation

- Obtain a copy of previous water levels from the project manager and the appropriate field data collection form, as applicable, from the field work directive (FWD).
- Check the electronics and battery condition by pushing the 'Start' button. A brief tone and/or light indicate the meter is functional. Follow the equipment manual guidance for brand-specific tone and light indications.
- Inspect probe, probe connection to measuring tape, and optical tip.
- Transport the probe in manufacturer's bag or other suitable transport device to protect the equipment and to keep it clean.

Standard Operating Procedure

SOP #: FM-8.1 Rev. 004

Review Date: 06/03/2023

Origin Date: 03/01/2016

5. Procedure

5.1 Water-Level Measurement Procedure

Liquid level measurements should follow a logical order from the least known or suspected level of contamination to the greatest. This will minimize the potential for cross-contamination between wells/monitoring locations.

1. Don the appropriate PPE per the JLA.
2. Confirm the well location on the Site Map.
3. Turn on the interface meter (e.g., pushing the "START" button) and make sure it indicates it is on through a light or tone.
4. Open the well cap.
5. If there is a potentially hazardous atmosphere, measure the breathing space above the well casing with a photoionization detector (PID) or other applicable meter to ensure safe conditions.
6. Inspect well casing for a measurement reference point (see Reference Point guidance below).
7. If being used in a potentially explosive environment, connect the grounding clip on the meter to the metal well casing or other suitable grounding point.
8. Insert the probe into the well casing.
9. Slowly lower the probe until the meter makes a steady beep with a flashing or solid indicator light. Slowly retrieve the probe until the unit stops beeping and the indicator light stops.
10. Slowly lower the probe again and immediately stop when the meter maintains a steady beep. When using an interface probe, a solid tone and light indicates product (LNAPL or DNAPL) and an alternating beep and blinking light indicates water.

Note: For floating product (LNAPL), take the air/product interface measurement on the way into the liquid, and the water/product interface on the way up. For sinking product (DNAPL), take the water/product interface on the way down.

11. Read the tape measurement and document the readings in a field book and/or on the designated field form.
12. If depth to bottom readings are needed, continue to slowly lower the probe until the tape slackens, indicating it has reached the bottom. Slowly lift the probe up and down until the depth of impact with the bottom of the well can be determined. Record the depth in field book or on the designated form.
13. Retract the probe and decontaminate the probe (see Equipment Decontamination section below). Decontaminate the equipment after each measurement is complete.
14. Replace the well cap and lock it.
15. Repeat steps 1 through 14 at the remaining monitoring locations.
16. If NAPL is detected where it was not previously, or other unexpected or unusual findings are detected, lower a clear bailer into the well (do not fully submerge), remove the bailer, and conduct a visual inspection of the bailer and liquids for confirmation.



Standard Operating Procedure

SOP #: FM-8.1 Rev. 004

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Origin Date: 03/01/2016

17. Call the Project Manager to report/discuss any unexpected findings.

5.2 Reference Point Determination

Use the reference point as imprinted on the top of the well casing as the measuring reference point. If a reference point is not present, the north side of the well casing will be used as the reference point and marked on the well casing in a manner that can be referred to during future monitoring events (e.g., notch piping with file or write with permanent marker). This will be the Point of Measure (POM) to be used when obtaining water-level measurements. Any deviation from this measuring point must be documented in the field notes and reported to the project lead.

5.3 Equipment decontamination

The water level indicator must be decontaminated after each measurement in accordance to the Work Plan requirements and manufacturers guidance. In general, wash the probe and any part of the measuring tape that came in contact with groundwater using warm water and a non-abrasive mild detergent. Rinse the probe with distilled water and wipe dry. Refer to FM SOP-14.1 for additional decontamination guidance.

After cleaning the probe, it should be placed back into the travel bag or transported to the next location in a way that will eliminate cross contamination.

WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN

Upper Makefield Response

Washington Crossing, PA

Status	Name	Signature	Title	Date
Prepared By:	James McCormack		Sr. Principal	2/26/2025
Approved By:	Stacy Boultinghouse	<i>SBoultinghouse</i>	Sr. Mgr.	3/4/2025
Approved By:				
Approved By:				
Approved By:				

February 26, 2025

Waste Management Plan Change Log

Name	Signature	Change Comments	Date
Stacy Boultinghouse	<i>SBoultinghouse</i>	Update Appendices	7/1/2025
Stacy Boultinghouse	<i>SBoultinghouse</i>	Update Waste Stream (4.1) & Waste Management (6.1) Tables	7/18/2025
Stacy Boultinghouse	<i>SBoultinghouse</i>	Update Waste Management Table (6.1)	7/24/2025

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List of Acronyms and Abbreviations

BMP	Best Management Practices
COC	Chemical of Concern
CoC	Chain-of-Custody
CFR	Code of Federal Regulations
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
ERG	Emergency Response Guide
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HM	Hazardous Material
HW	Hazardous Waste
IC	Incident Commander
LDR	Land Disposal Restrictions
LEPC	Local Emergency Planning Committee
NRC	National Response Center
NHW	Non-Hazardous Waste
OSHA	Occupational Safety and Health Administration
PDEP	Pennsylvania Department of Environmental Protection
PHMSA	Pipeline Hazardous Materials Safety Administration
POC	Point of Contact
POL	Petroleum, Oil, and Lubricant
PPE	Personal Protective Equipment
ppm	Parts Per Million
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
SDS	Safety Data Sheet
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasure
SW	Solid Waste
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TSDF	Treatment, Storage, and Disposal Facility
TSS	Total Suspended Solids
UHC	Underlying Hazardous Constituent
WSD	Waste Stream Determination

Definitions

Accumulation Start Date – The date that hazardous waste (HW) is first placed in a container.

Best Management Practices – Control measures and decisions based on the most current professional and technical standards for the protection, enhancement, and rehabilitation of natural resources. BMPs include schedules of activities, prohibited practices, maintenance procedures, treatment requirements, operating procedures, control practices, and other management practices to prevent or reduce pollution.

Characteristic Waste – A waste that exhibits any one or more of the following characteristic properties: ignitability, corrosivity, reactivity or toxicity. Each is assigned the hazard code indicated (40 CFR 261.30).

Characterization – The process of identifying waste constituents, their concentrations, and the work process generating the waste. Characterization determines how waste may be handled, treated, and disposed. Characterization is required to identify the EPA waste codes, the underlying hazardous constituents (UHCs), and the DOT proper shipping name.

Closure – The act of securing HW management in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements.

Combustible Liquid – A combustible liquid is defined at 49 CFR 173.120(b)(1) as any liquid that does not meet the definition of any other hazard class and has a flash point of $>60^{\circ}\text{C}$ ($>140^{\circ}\text{F}$) and $<93^{\circ}\text{C}$ ($<200^{\circ}\text{F}$).

Container – As defined in 40 CFR 260.10, any portable device, in which a material is stored, transported, treated, disposed, or otherwise handled.

Contaminant – Any chemical that when present causes the waste to be regulated.

Corrosive HW – A solid waste exhibits the characteristics of corrosivity if a representative sample of the waste has either of the following properties as defined in 49 CFR 261.22: (1) is aqueous and has a pH less than or equal to 2, or greater than or equal to 12.5, as determined by a pH meter using Method 9040C in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” or (2) is a liquid and corrodes steel (Society of Automotive Engineers [SAE] 1020) at a rate greater than 6.35 mm (0.25 inch) per year at a test temperature of 55°C (130°F) as determined by Method 110A (“Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”).

Debris – Any solid material with a diameter of 2.4 inches or larger that is intended for disposal, including manufactured objects, plant or animal matter, or natural geologic material such as brushes, rags, personnel protective equipment (PPE), large and small equipment, etc.

Dilution – The deliberate mixing of HW with another material with the purpose of changing either the characteristic(s) or the concentration of a constituent in the waste. Dilution of a HW constitutes “Treatment” and is prohibited without a permit.

Disposal – The process of treating a HW to render it non-hazardous or to place the HW into a permitted end facility such as a HW landfill or other permitted TSDF. Disposing of any waste into a wastewater treatment system, storm drain, surface water, or upon land is prohibited.

Empty Container – As defined in 40 CFR 261.7, a container or an inner liner removed from a container from which all material/waste (except compressed gas or an identified acute HW) has been removed that can be removed after pouring, puncturing, pumping, or aspirating until no more than 1 inch of residue

remains on the bottom, or no more than 3 percent by weight of the total capacity of the container remains if it is less than or equal to 119 gallons in size.

Emergency Planning and Community Right-to-Know Act – 40 CFR Parts 350 to 372 intend to: (1) identify the quantities of chemicals present on, or released from, facilities; (2) understand the potential problems that hazardous materials (HMs) pose to surrounding communities and environment; and (3) provide information to the public and local emergency planning and response organizations. The four major provisions of EPCRA are emergency planning (sections 301-303), emergency release notification (section 304), hazardous chemical storage reporting (sections 311-312), and toxic chemical release inventory (section 313).

U.S. Environmental Protection Agency Hazardous Waste Codes – The specific alphanumeric sequence assigned by EPA to specify type and characteristic of a HW.

Flammable Liquid – A flammable liquid is defined at 49 CFR 173.120(a) as a liquid with a flash point of $\leq 60^{\circ}\text{C}$ ($\leq 140^{\circ}\text{F}$), or any liquid in bulk packaging with a flashpoint of $\geq 37.8^{\circ}\text{C}$ ($\geq 100^{\circ}\text{F}$) that is intentionally heated and transported above its flashpoint (some exceptions).

Generator of Record – The owner/operator recognized by EPA as the generator of a HW and holder of the EPA Generator ID number of a contiguous facility.

Hazardous Material – Any material designated by U.S. Department of Transportation (DOT) as posing a potential threat while being transported. HMs are listed in 49 CFR Part 172.

Hazardous Substance – A material included in the specific list of chemicals designated by EPA in 40 CFR Part 302 that may pose a substantial threat to human health or the environment when discharged into the environment because of its quantity, concentration, or physical, chemical, or infectious characteristics. HS is regulated only when released in a quantity equal to or exceeding the reportable quantity (RQ) listed in 40 CFR Part 302.

Hazardous Waste – Any discarded SW as defined in 40 CFR 261.3 (liquid, semi-solid, solid, or gaseous) that meets the definition of a HW. An SW is a listed HW if it is specifically listed in 40 CFR 261.31 (F-list), 261.32 (K-list), or 261.33 (P- or U-list), and/or is a characteristic HW if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity per the Toxicity Characteristic Leaching Procedure (TCLP).

Hazardous Waste Generator – Any person, by site, whose act or process produces HW or whose act first causes a HW to become subject to regulation.

Head Space – The unused volume inside a filled container that allows for expansion (also known as “ullage” in a container of liquid or a tank).

Ignitable HW – Liquids with flash points below 140 degrees Fahrenheit (60° Celsius), non-liquids that cause fire through specific conditions, and ignitable compressed gases and oxidizers as defined in 49 CFR 261.21.

Leachate – The liquid, including any suspended components in the liquid; that has percolated through or drained from a waste.

Manifest – EPA Form 8700-22 (and EPA Form 8700-22A, if necessary) shipping document, originated and signed by the generator, which accompanies and is used for tracking the transportation of HW.

Manifest Tracking Number – The alphanumeric identification number (unique three-letter suffix preceded by nine numerical digits) that is preprinted in Item 4 of the manifest by a registered source.

Oil –oil of any kind or in any form. This includes petroleum, fuel oil, sludge, oil refuse, oil mixed with wastes other than dredged spoil, fats, oils or greases of animal, fish, or marine mammal origin, vegetable oils, including oil from seeds, nuts, fruits, or kernels, and other oils and greases, including synthetic oils and mineral oils. The definition of oil also includes non-petroleum oils, such as silicone fluids, tung oils, and wood-derivative oils such as resin/rosin oils.

Other Regulated Materials – A material such as a consumer commodity that, although otherwise subject to Subpart D of 49 CFR Part 173, presents a limited hazard during transportation due to its form, quantity, and packaging. It must be a material for which exceptions are provided, as shown in the table in 49 CFR 172.101.

pH – An artificial scale used by chemists to measure the relative acidity and alkalinity of weak acids and bases. The usual range of the scale is from 1-13, where pure water is 7. A pH below 7 indicates an acid, and a pH above 7 indicates a base. It is important to note that each number of the scale is ten times the previous number. For instance, an acid of pH 1 is 100,000 times more acidic than one with a pH of 6.

Point of Generation – Identifies the place a material first becomes subject to HW regulations at the department, unit, or work center with the intention of disposal.

Profile Number – A unique alphanumeric identification number used to designate a specific waste stream.

Profile Sheet – Forms used to document specific disposal information for each waste stream sent to the disposal facility.

Reactive HW – A SW exhibits the characteristics of reactivity if a representative sample of the waste has any of the following properties as defined in 49 CFR 261.23: (1) It is normally unstable and readily undergoes violent change without detonating; (2) It reacts violently with water; (3) It forms potentially explosive mixtures with water; (4) When mixed with water, it generates toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment; (5) It is a cyanide or sulfide-bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment; (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement; (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure; or (8) It is a forbidden explosive as defined in 49 CFR 173.51, a Class A explosive as defined in 49 CFR 173.53, or a Class B explosive as defined in 49 CFR 173.88.

Reclaimed – Any material that is processed to recover a usable product or to regenerate a material (40 CFR 261.1).

Recycled – Any material that is converted into a reusable material.

Reportable Quantity – Identifies the amount of material (pounds or gallons) that triggers a reporting requirement to regulatory agencies when spilled or released to the environment. RQ amounts are specific to each material.

Representative Sample – A sample of a universe or whole (e.g., waste pile, groundwater) that can be expected to exhibit the average properties of the universe or whole.

Reused – A material that is employed as an ingredient in an industrial process to make a product or employed in a function or application as an effective substitute for a commercial product without reclaiming.

Safety Data Sheet – The document issued by the product manufacturer that communicates the hazards found in the product.

Sludge – Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

Solid Waste – Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility. An SW is also other discarded material including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and/or community activities.

Sorbent – Material used to soak up free liquids by either adsorption, absorption, or both.

Spill/Release – Intentional or accidental loss including any leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of an HS into the environment.

Transporter – Person engaged in offsite transportation of HW by air, rail, highway, or water.

Treatment – Any method, technique, or process (including neutralization) designed to change the physical, chemical, or biological character or composition of any HW to neutralize such waste, recover energy or material resources from the waste, or render such waste non-hazardous or less hazardous; safer to transport, store, or dispose of; amenable for recovery or storage; or reduced in volume. The facility is not permitted to treat HW under any conditions.

Treatment, Storage, and Disposal Facility – A permitted HW management facility, HW storage facility (HWSF), or Part-B facility that receives HW for treatment, storage, or disposal.

Toxic Characteristic Leachate Procedure – A sample extraction method for chemical analysis which is designed to simulate leaching in a landfill of organic and inorganic analytes present in liquid, solid, and multiphase wastes.

Toxic HW – (a) An SW exhibits the characteristic of toxicity if, using the TCLP, test Method 1311 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in §260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section. (b) An SW that exhibits the characteristic of toxicity has the EPA HW Number specified in Table 1 which corresponds to the toxic contaminant causing it to be hazardous as defined in 40 CFR 261.24.

Ullage – The unused volume inside a filled container that allows for expansion.

Underlying Hazardous Constituent – Any constituent listed in 40 CFR 268.48 that can reasonably be expected to be present at the point of generation of the HW at a concentration above the constituent-specific universal treatment standards.

United Nations/North American Designations – DOT identification numbers assigned to HM are preceded by either a UN or NA designation and are indexed by response instructions found in the Emergency Response Guide (ERG) for use in the event of an accident. Those preceded by UN are associated with descriptions considered appropriate for international shipments as well as domestic shipments. The NA designation is limited to use in the United States and Canada only.

Used Oil – Oil that has been refined from crude oil and used as a lubricating, hydraulic, or heat-transfer fluid and contaminated through that use. Used oil has the potential for reuse or recycling.

Waste Characterization – The process of identifying waste components and their chemical concentrations as well as the work process used to generate the waste. Waste characterization is required to ensure the correct identification of the waste and use of EPA waste numbers/codes necessary for the safe and proper handling, treatment, and disposal of HW.

Waste Stream Determination – RCRA regulations at 40 CFR 262.11 require that any person who produces or generates a waste must determine if that waste is hazardous. In doing so, 40 CFR 262.11 presents the steps in the HW identification process: 1) Is the waste a "solid waste"? 2) Is the waste specifically excluded from the RCRA regulations? 3) Is the waste a "listed" hazardous waste? 4) Does the waste exhibit a characteristic of hazardous waste?

Waste Profiling – A method to identify and classify waste streams based on analytical testing or user knowledge of the specific process.

Wastewater – Water that contains less than 1% by weight total organic carbon (TOC) and less than 1% by weight total suspended solids (TSS).

1.0 Introduction

This Waste Management Plan (WMP) was prepared by the Environmental Team supporting Pipeline Operations to provide a plan for the management of waste during the Upper Makefield Response, Washington Crossing, PA (UM Response). In January 2025 a release involving refined product including jet fuel from the 14-inch Twin Oaks – Newark Sement operated by Sunoco Pipeline L.P., a subsidiary of Energy Transfer LP (Company), was confirmed. The GPS coordinates for the release site (hereinafter referred to as Site) are: 40.271184, -74.875953. A map of the incident location is provided in **Attachment A**.

This WMP establishes and describes procedures and protocols to be followed by responders for all spill response materials, recovered and generated. The plan provides for the management, transportation, interim storage and final disposal of the anticipated waste streams and categories that may be generated. This WMP is designed to only cover waste generated from this release. This document is available upon request to regulators, site personal and contractors working on the response that accumulate, generate, transport, treat, store, or dispose of HW for compliance.

The collection, storage, transportation, treatment and disposal of waste will be conducted in a manner that is both safe and environmentally sound.

This WMP must be reviewed and updated whenever site conditions or operations change that would affect waste accumulation, generation, transportation, treatment, storage, or disposal.

1.1 Applicability

This WMP provides requirements and guidance for the proper management of all waste generated at the UM Response. All personnel, including contractors working at the UM Response retain liability for and must abide by this WMP. Failure to abide by this WMP may result in revocation of access to the site. Any fines, violations, or penalties may be delegated to the offending entity (e.g., contractor). Pipeline Operations grants access to contractors working at the site; therefore, any contractor improperly managing HW or failing to comply with this instruction may be denied access to the site.

This WMP will be reviewed periodically and updated whenever site conditions or operations change that would affect waste accumulation, generation, transportation, treatment or disposal.

1.2 Health and Safety

Pipeline Operations maintains copies of this plan and makes it available to all personnel and contractors that accumulate, generate, transport, store, or dispose of waste.

Health and safety of the associates, workers, community, and the environment will be of the utmost priority while implementing this plan. All personnel will be required to review and adhere to site-specific safety plans as well as company/contractor-specific Health and Safety Plans (HASP), and 29 CFR 1910.120 HAZWOPER requirements, as applicable. Pre-job tailgate safety briefings will be conducted prior to going into the field where samples of waste and other materials will be collected and prepared.

Specific field activities will only be conducted under weather or other environmental conditions that do not create unsafe working conditions, and the appropriate personal protective equipment (PPE) will be utilized for each task. Any incident will be promptly reported in accordance with the site-specific site safety plan and Pipeline Operations' directives.

2.0 Regulatory Framework

The Resource Conservation and Recovery Act (RCRA) authorized the U.S. Environmental Protection Agency (EPA) to implement regulations for the management of HW from the point of generation through final disposal (“cradle to grave”). EPA granted the State of Pennsylvania Department of Environment Protection (PDEP) authority to implement and enforce regulations for identification (ID), packaging, labeling, storing, and transporting HW and NHW, as well as treatment standards for proper disposal of regulated waste.

2.1 Federal and State Regulations

The following regulations mandate the procedures and requirements set forth in this instruction and are therefore not discretionary.

- 40 Code of Federal Regulations (CFR) Parts 260 through 266, and Part 268 - Regulations for the management of HW
- 25 Pa. Code § 260a. - Hazardous Waste Management System: General
- 25 Pa. Code § 261a - Identification and Listing of Hazardous Waste
- 25 Pa. Code § 262a - Notification Requirements and Standards Applicable to Generators of Hazardous Wastes
- 40 CFR Part 273 - Standards for Universal Waste Management
- 40 CFR Part 279 -.11, Management of used oil and used oil filters
- 49 CFR Parts 171-180 - U.S. Department of Transportation (DOT) regulations for transportation of HW on public roads
- 49 CFR Parts 390 - 397 - U.S. DOT regulations for driver qualifications, the equipment in the vehicle, and routing of some HW shipments
- 40 CFR Parts 116-117 - The regulations of reporting the release or chemical spill
- 40 CFR Part 503 – Establishes the standards for the use or disposal of sewage sludge
- 40 CFR 112 - Oil Pollution Prevention regulations

3.0 Waste Management Best Practices

The following best practices must be followed in the management of wastes generated in a spill response effort:

- a. Dispose or manage wastes and recoverable materials in permitted or otherwise authorized locations. Unauthorized disposal or management will not be tolerated.
- b. Obtain Safety Data Sheets (SDSs) for all known products involved in waste management.
- c. Reduce waste generation whenever practical. This is known as waste minimization or pollution prevention.
- d. Reuse or recycled materials whenever practical. This not only lowers a consumption of raw materials, it also eliminates the need for waste disposal. Recycling in reuse of recovered oil and oil and water is the preferred option.
- e. Avoid co-mingling wastes of different classifications. For example, never place non-hazardous wastes in the same container as hazardous waste. In addition, keep recyclable material separate from nonrecyclable waste. It may be difficult or impossible to separate wastes after their co-mingled.
- f. Maintain good housekeeping practices. Employees and contractors should maintain neat, clean-up work areas to reduce the need for additional cleanup and the associated waste.
- g. Properly store wastes, especially hazardous waste, to avoid releases to soil, water, or air, and to avoid consumption by wildlife until they can be appropriately managed.
- h. Clearly identify waste containers. Use a label or other means to clearly identify the contents of containers of hazardous, non-hazardous, and inert wastes.
- i. Document quantities and disposition of all hazardous and NHW as instructed in this plan. Waste tracking is required for all wastes. This information will be included in the final report delivered at the conclusion of response activities.
- j. Recovered liquids should be collected and stored in as large a container as possible (UN approved drum, tote tank, tanker truck, etc.) to maximize dewatering potential, facilitate uninterrupted recovery, and to minimize equipment decontamination requirements.
- k. Communicate your ideas to your supervisor for waste minimization and waste management.
- l. Maintain security at all sites where waste is held.
- m. The site manager is responsible for determining if any regulatory permits (e.g., NPDES) or plans (SWP3 or SPCC Plan) are required for areas where waste is stored.

4.0 Waste Characterization

All waste generated on site will need to be characterized following the procedures detailed below.

4.1 Potential Waste Streams

The potential waste streams will include, but are not limited to, the materials in **Table 4-1**.

Currently the estimated volumes of each waste stream and released materials are unknown due to the nature of the incident. All exempt and NHW classifications of materials associated directly with the response (other than for general trash) will be validated through the application of generator knowledge and sampling and analysis as necessary, per the procedure outlined below and in accordance with EPA SW-846.

Table 4-1: Potential Waste Streams

Waste Stream	Sources	Material Generated
Oil/Oily water (mix)	Mechanically recovered using aqua-bailers (or equivalent), product skimmers, vacuum truck	Free product & water
Soil	Excavation / recovery activities; Site assessment and characterization activities including drilling and development of recovery and monitoring wells	Unimpacted and Impacted soil; vegetation; soil cuttings from approved Site Characterization and Assessment activities
Solids/Debris/Sorbent Materials	Recovery activities	Saturated sorbent socks
Personal Protective Equipment (PPE)	Worker garments used in the cleanup	Tyvek, Gloves, Boots, etc.
Municipal / General Trash	Daily work activities	Food and beverage debris and containers
Investigative Derived Waste (IDW)	Site assessment and characterization activities including drilling and development of recovery and monitoring wells; purge water from sampling of wells	Soil/rock cuttings & Groundwater
Decontamination Waste	Decontamination of equipment used in site assessment and characterization activities; sampling	Non-phosphate detergent & water
Biological Waste	Portable toilets	Raw Sewage

Note: This list of potential waste streams is to be updated when new waste streams are identified throughout the recovery activities.

4.2 Waste Stream Determination

40 CFR 262.11 requires that any person who produces or generates a waste must determine if that waste is hazardous.

4.3 Completing the Determination

The following four questions must be answered to make a WSD:

1. Is the waste a SW as defined in 40 CFR 261.2?

The first step in determining if a material is a HW is to determine whether it is classified as a SW. The rules specify that a material cannot be a HW unless it is first determined to be a SW.

2. Is the waste specifically excluded from RCRA regulations?

The next step is to determine if the waste qualifies for an exemption or exclusion from RCRA regulations.

3. Is the waste a "listed" HW?

RCRA regulations include four lists of wastes, designated with the letters F, K, P, and U.

4. Does the waste exhibit a characteristic of HW?

A characteristic HW is an SW that exhibits one or more of the following HW characteristics:

- Ignitability (D001)
- Corrosivity (D002)
- Reactivity (D003)
- Toxicity (D004-D043)

The site conducts WSDs at the point of generation for each waste generated at the site. User knowledge, HW analysis, or a combination of the two methods are used to complete the WSD process.

WSD documentation for HW and NHW are maintained by the local Environmental Specialist, along with supporting documentation that is readily available.

5.0 Sampling

This plan addresses sampling of only those materials generated during the incident response activities for purposes of waste classification and disposal. Sampling for any site investigation or final remediation/corrective action purposes after the incident response activities are completed will be addressed in greater detail during the remediation phase. Emergency response activities generate waste materials from multiple locations (i.e., product clean-up, decontamination area, incident area, released materials collection, etc.) and the waste materials collected are brought to designated storage areas within Company-maintained staging areas at the Bucks Pump Station and Ft. Mifflin. Safety considerations for the emergency responders and samplers will be the top priority when conducting any sampling for waste classification purposes.

Waste characterization sampling will be conducted from onsite soil stockpiles prior to loading into roll-off boxes for transportation offsite for final disposition. Other waste characterization sampling will occur, as necessary, from various storage containers (i.e., drums, frac tanks, vac trucks, etc...) located in the designated storage areas.

Representative samples will be collected within a reasonable timeframe from arrival at the designated storage area. Sampling of contaminated and phase-separated aqueous liquids (oil and water) will occur directly from the storage containers containing the released liquid materials.

5.1 Sample and Data Collection

Labels will be affixed to each sample container prior to or during sampling. At a minimum, the labels will include the 'Sample ID', the date and time the sample was collected, initials of the sample collector, and the specific analysis the container is for (including any preservatives used).

Chain-of-Custody (CoC) forms will track all samples sent to the offsite laboratory for analyses and testing. The CoC will identify the waste stream sampled using the 'Sample ID', the date and time the sample was collected, number and type of containers filled, any sample preservatives used, the name of the person who collected the sample, and the specific analyses required.

5.2 Sampling Methods

Personnel will collect representative samples from the selected waste streams identified in **Table 5-1** for laboratory analysis. The methods and equipment used for sampling will be based on the physical form and consistency of the waste being sampled. Personnel will select the most appropriate representative sampling methods, techniques, devices, and containers based on guidance published in EPA document SW-846 Chapter 9 "Field Sampling Methods". Sample volumes, container types, and preservation requirements for the required analyses are based on the waste streams and test methods.

Clean coliwassas, tubes, drum thieves, corers, hand trawls/scoops or other compatible collection device will be used to collect representative samples of waste containers. Samples will be taken both vertically and horizontally throughout the waste. If there are multiple containers of the same waste stream, samples will be collected from the individual containers and composited to ensure a true representative sample. Any excess waste material collected will be returned to its original waste container.

For liquids, the sample collector will insert a coliwasa or equivalent into the container from the top, pushing slowly until the bottom of the container is reached. The contents of the sampling device will be transferred to the appropriate sample container.

For solids, a representative sample may be difficult to obtain. In these cases, the sample collector will attempt to obtain a sample that is as representative as possible by collecting multiple samples that reflect the waste type and quantities within the container.

All samples requiring chemical preservation will be placed into sample bottles pre-filled by the laboratory with the correct amount and type of preservative required for that specific test method. All samples requiring preservation by cooling to $\leq 6^{\circ}$ will be placed into a cooler containing ice immediately following sampling collection. All samples collected will be delivered to the lab by the next business day.

5.3 Sample Analysis

This section outlines the analytical parameters and test methods that will be used for waste samples collected during field activities. Samples will be sent to a State accredited laboratory.

5.4 Analytical Parameters

The following analytical parameters may be utilized for the waste samples collected during field activities.

Table 5-1: Analytical Sampling Parameters and Test Methods

Parameter	Description	Test Method
Flashpoint (Ignitability)	This parameter indicates the fire-producing potential of the liquid waste and determines whether the waste is considered a D001 RCRA Ignitable waste.	An offsite laboratory will analyze this parameter using EPA Test Method 1020.
pH (Corrosivity)	This parameter determines whether the liquid waste is considered a D002 RCRA corrosive waste.	An offsite laboratory will analyze this parameter using EPA Test Method 9045.
TCLP Volatile Organic Compounds (VOCs)	This parameter determines if the waste is potentially a characteristic hazardous waste (D018-D022, D028-D029, D035, D039-D040, & D043) and if any VOC exceeds the limits in 40 CFR 261.24.	An offsite laboratory will analyze this parameter using EPA Test Methods 1311/8260.
Reactivity	This parameter determines whether the liquid waste is considered a D003 RCRA reactive waste.	An offsite laboratory will analyze this parameter using EPA Test Method SW-846, Ch. 7.
RCRA Metals	This parameter determines if the waste is potentially a characteristic hazardous waste (D004-D011) and if any Metals exceed the limits in 40 CFR 261.24.	An offsite laboratory will analyze this parameter using EPA Test Method 1311/6010

5.5 Quality Assurance and Quality Control

Upon receipt of the analytical results, personnel will review the results of the laboratory's Quality Assurance/Quality Control documentation for anomalies.

5.6 Field Sampling Equipment Decontamination Procedures

Decontamination procedures refer to the steps undertaken to minimize the potential for offsite contamination and cross-contamination between individual sampling locations. Disposable equipment, where possible, will be used to deter potential cross contamination. Prior to collecting any sample for this investigation, the following decontamination procedures will be undertaken non-disposable sampling equipment which come into contact with sampling media will be decontaminated using a bristled brush and a solution comprised of a laboratory grade, non-phosphate detergent (e.g., Alconox or Liquinox) and deionized water. Depending on ancillary activities being conducted for the response to this release, the decontamination of sampling equipment will be conducted over poly sheeting at the sample location or in a nearby designated area. The sampling equipment to be decontaminated will first be placed in a

bucket containing the detergent solution and thoroughly washed using a bristled brush. The items will then be transferred to the second 5-gallon bucket containing deionized water for rinsing. Following the initial rinsing, the item will be held over the same bucket while distilled water is again carefully decanted over each item. Nitrile gloves will be worn by sampling personnel and changed between activities at each discrete sample collection location. Previously worn nitrile gloves will be discarded in appropriate waste receptacles with other PPE. All waste generated by decontamination activities will be handled, stored, classified, and disposed of in accordance with this WMP.

6.0 Waste Management Table

Disposal, reclamation, and recycling facilities will vary based on the final classification and characterization of the recovered materials/wastes. The facilities mentioned in **Table 6-1** include those facilities that could potentially accept reclaimed, reused, or recyclable released materials.

Table 6-1: Waste Disposal

Waste Description	Waste Category	Method of Removal	Temporary Disposal	Ultimate Disposal
Oil/oily water (mix)	Non-hazardous by Waste Determination	55-gal drum (stored in poly overpack)	Waste Staging Area at Bucks Pump Station	- Energy Transfer Marketing Terminals (ETMT) Eagle Point Terminal [EPA ID No. NJD990753162] / Oil Recycling Facility - Miller Environmental Woodstown [EPA ID No. NJD011881174] / Bulk Processing Facility
Soil	Non-hazardous by Waste Determination	Excavation/ Poly-lined Roll-off box	Waste Staging Area at Bucks Pump Station &/or at Ft. Mifflin	Republic Conestoga Landfill EPA PADEP [SWP No. 101509 / ID No. PA0000015867] / Non-Hazardous Landfill
Solids/Debris/Sorbent Materials	Non-hazardous by Waste Determination	55-gal drum / Poly Lined Roll-off box	Waste Staging Area at Bucks Pump Station	Republic Conestoga Landfill EPA PADEP [SWP No. 101509 / ID No. PA0000015867] / Non-Hazardous Landfill
Personal Protective Equipment (PPE)	Non-hazardous by Waste Determination &/or Process Knowledge	55-gal drum / Poly Lined Roll-off box	Waste Staging Area at Bucks Pump Station	TBD / Non-Hazardous Landfill
Municipal / General Trash	Non-hazardous Waste	Dumpster / Poly Lined Roll-off box	Waste Staging Area at Bucks Pump Station	TBD / Non-Hazardous Landfill
Investigative Derived Waste (IDW)	Non-hazardous by Waste Determination	55-gal drum	Waste Staging Area at Bucks Pump Station &/or at Ft. Mifflin	Republic Conestoga Landfill EPA PADEP [SWP No. 101509 / ID No. PA0000015867] / Non-Hazardous Landfill
Decontamination Waste	Non-hazardous by Waste Determination &/or Process Knowledge	55-gal drum	Waste Staging Area at Bucks Pump Station	TBD / Non-Hazardous Landfill

Table 6-1: Waste Disposal

Waste Description	Waste Category	Method of Removal	Temporary Disposal	Ultimate Disposal
Biological Sludge	Non-hazardous Waste	Vacuum truck	N/A	Non-Hazardous Landfill / Wastewater Treatment Facility

6.1 Waste Disposal Sampling

A waste sample collection may be required for the ultimate disposal facility acceptance of the waste. If any waste stream can be changed to a different waste classification, supported by the waste determination process, additional sampling may be required to maintain this classification.

6.2 Waste Storage Areas

A temporary waste storage area has been established for solid and liquid materials that have been identified.

- Solid waste will be containerized at the staging areas in poly-lined roll off boxes or stockpiled on a poly-lined and bermed staging area. Solid waste will be separated according to contents.
- Liquid wastes will be containerized in steel drums and/or pumped into vac trucks which may further be temporarily stored in frac tanks (as applicable).
- Waste containers will be clearly identified. Each container is to be visibly labeled on opposite sides indicating the contents (e.g., impacted soil, ditch frac water, PPE, etc.) and the date the container began collecting waste.
- A staging area log for tracking on site accumulation is provided in **Appendix A.3**.

6.1.1 Container Management

All containers must be labeled with a label indicating what the waste is (i.e., refined product/ water, contaminated soil, etc.) as well as the date that the waste was placed in the container until waste stream determination is completed. Labels must meet D.O.T. (49 CFR part 172) requirements for labeling substance containers for wastes.

Hazardous and NHW labels will be placed on containers following the waste determination process. Waste must be segregated by type of waste. **Appendix A.4** contains waste label examples.

6.1.2 Inspections

In accordance with 40 CFR 265.170-174 waste storage areas that are presumed or determined to be hazardous wastes will be inspected daily &/or weekly using the Waste Inspection Form (**Appendix A.5**). The daily &/or weekly inspections will ensure that all waste containers are in good condition, roll-off boxes are not leaking and are properly lined and free of liquids. Any totes, drums, pails, or other containers will also be inspected, and discrepancies will be reported to the Company Environmental Specialist.

The inspection record forms must be retained for a minimum of 3 years.

7.0 Transportation

The following sections detail the procedures for the transportation of waste off site.

7.1 Transportation On Site

All waste transportation to the staging area is overseen by the Company Environmental Specialist and shall be performed by the authorized and trained personnel.

Bulk Liquids will be collected using vacuum trucks where feasible or pumped directly and transferred to onsite frac tanks or transported for disposal. The vacuum trucks will be visually and continuously monitored by the operator as recovered material is pumped into the tank.

7.2 Manifesting for Transportation Off Site

All shipments of HW or NHW that are generated at the site and offered for transportation over public highways must be accompanied by a uniform HW or NHW manifest.

7.2.1 U.S. Department of Transportation

Prior to transporting HW or offering HW for transportation offsite, each shipment must be labeled in accordance with applicable DOT regulations (49 CFR Part 172, Subpart E) as follows:

- “HAZARDOUS WASTE—Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or EPA”
- DOT proper shipping name
- UN or NA number (49 CFR 172.101)
- Generator’s name and address
- Generator’s EPA ID number
- EPA HW Code(s)
- ASD
- Manifest tracking number

Additionally, each HW shipment must be labeled in accordance with 49 CFR Part 172, Subpart D, as follows:

- Weight
- Sequence (e.g., 1 of 3)
- DOT shipping label

Each package of HW for shipment must be labeled in accordance with 49 CFR Table 172.101 to the DOT hazard classification for that HW, as follows:

- HW that meets the definition of more than one DOT hazard classification must be labeled in accordance with all DOT hazard classifications.
- When two or more HWs with different DOT hazard classifications are packaged within the same packaging or outer enclosure, the outside of the package or outer enclosure must be labeled with all DOT hazard classifications.

7.2.2 Land Disposal Restrictions

When applicable, LDR Notification Forms in accordance with 40 CFR Part 268, must accompany the uniform HW manifest as part of the shipping papers.

LDR Notification Forms are signed by personnel designated each time an applicable waste is shipped offsite.

7.2.3 HW and NHW Manifesting

Offsite shipments of HW and NHW will incorporate the procedures described below.

7.2.3.1 HW Manifesting

Each offsite HW shipment will be accompanied by a Uniform Manifest (EPA Form 8700-22) and must incorporate the following procedures:

- Only properly trained personnel may sign the HW manifest and associated paperwork.
- The manifest must be complete and accurate.
- All copies of the manifest must be legible.
- “Generator’s Initial Copy” of the manifest must be retained pending receipt of the “Designated Facility to Generator” copy of the manifest. This copy must indicate the HW Report Management Method Codes in Items 19 and 36. It must be hand-signed in Item 20 by the owner or operator of the designated TSDF that received the HW.

7.2.3.2 NHW Manifesting

Each offsite shipment of soil and debris will be accompanied by a NHW Manifest and must incorporate the following procedure:

- The manifest must be complete and accurate.
- All copies of the manifest must be legible.
- “Generator’s/Shipper’s Initial Copy” of the manifest must be retained and provided to the Environmental Manager for recordkeeping and filing.

7.3 Recordkeeping

The “Generator’s Initial Copy” of the HW manifest must be retained while awaiting receipt of the “Designated Facility to Generator” copy of the manifest. This copy must indicate the HW Report Management Method Codes in Items 19 and 36. It must be hand-signed in Item 20 by the owner or operator of the designated TSDF that received the waste as follows:

- If the hand-signed manifest is not received within 30 days of shipment, the Company Environmental Specialist shall contact the designated facility, and/or the transporter to determine the status of the waste.
- If the signed manifest is not received within 45 days, the Company Environmental Specialist shall file an Exception Report with the EPA Region 3 Regional Administrator including:
 - o A cover letter explaining efforts to locate the shipment of waste and results of those efforts.
 - o A legible copy of the manifest.

All records, including manifests, must be kept for a minimum of 3 years.

Appendix A.1

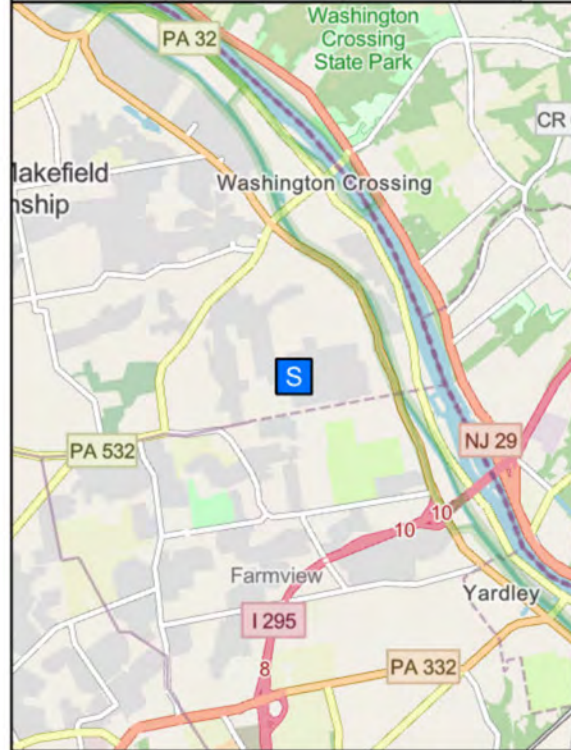


Upper Makefield Response

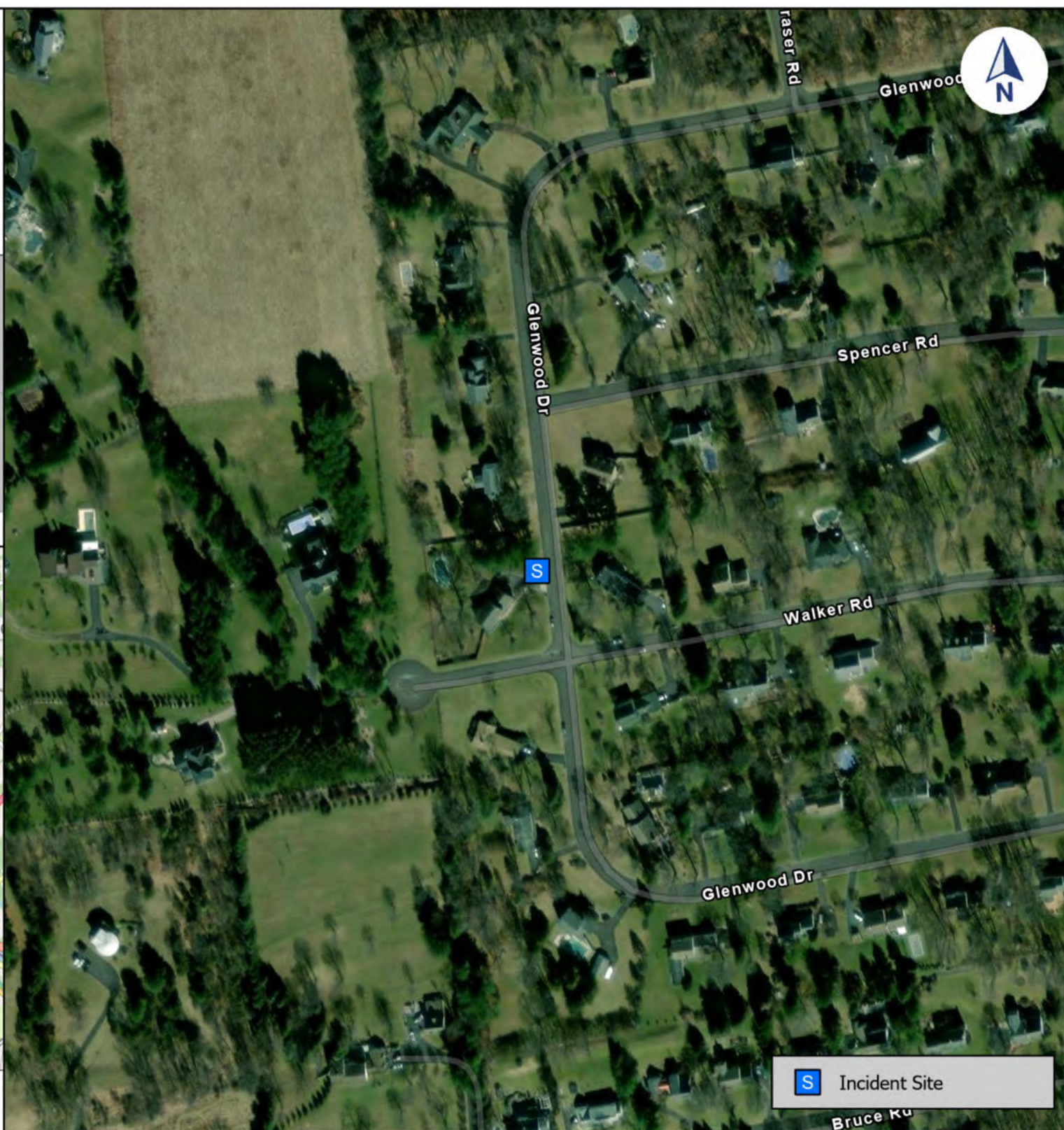
Incident Location

Washington Crossing, PA | Bucks County

PROJ-051861



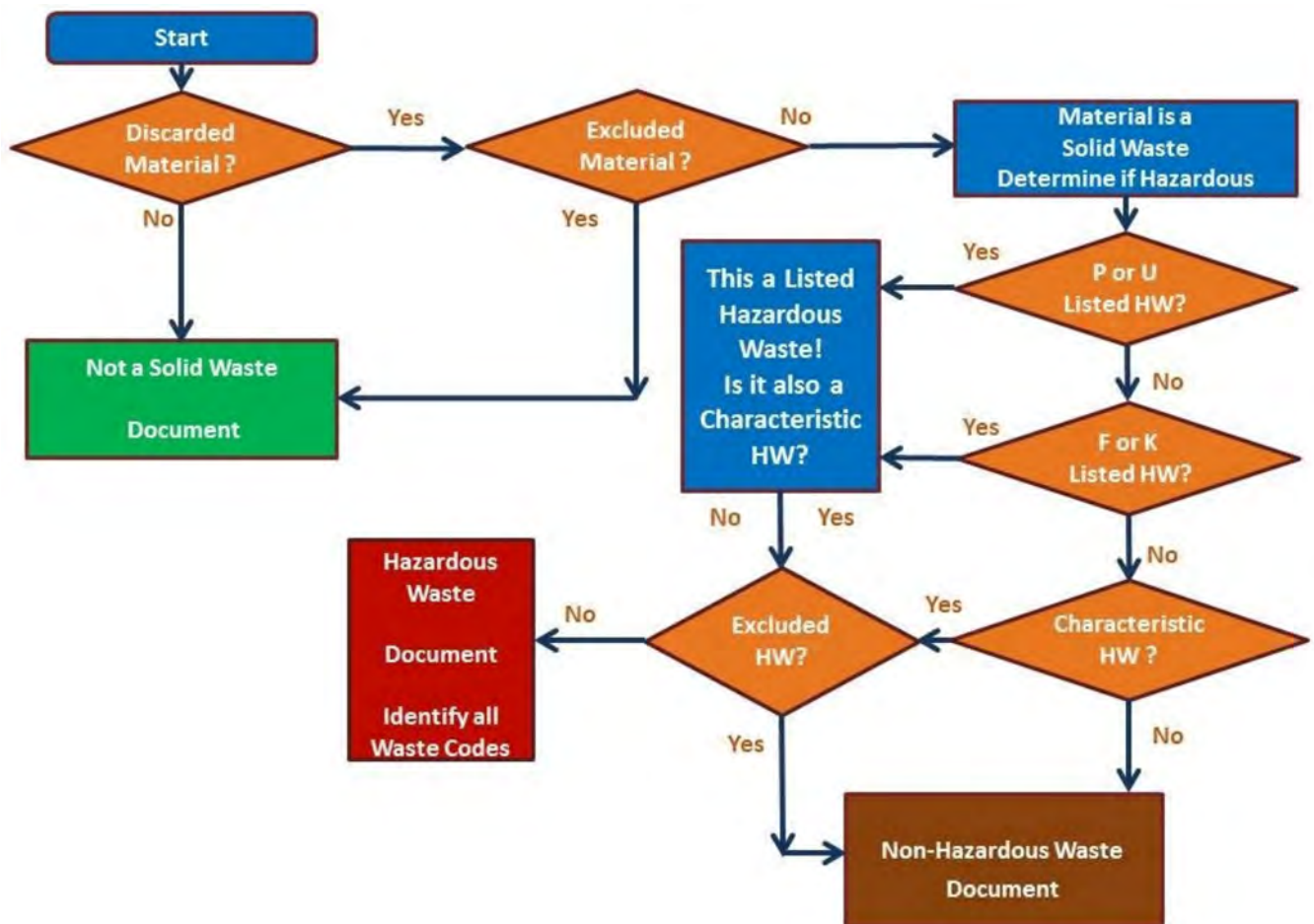
Updated At: 2/15/2025 4:18 PM
Projection: NAD 1983 2011 StatePlane Pennsylvania South
FIPS 3702 Ft US



 Incident Site

Appendix A.2

Hazardous Waste Determination Flow Chart



Appendix A.3

Waste Storage Log

[illegible]

Appendix A.4

NON- HAZARDOUS Waste

OPTIONAL INFORMATION

SHIPPER _____

ADDRESS _____

CITY, STATE, ZIP _____

CONTENTS _____

NON-HAZARDOUS WASTE

 **BRADY®** BRADYID.COM

HAZARDOUS WASTE

STATE AND FEDERAL LAWS PROHIBIT IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCE CONTROL

GENERATOR'S INFORMATION

NAME _____
ADDRESS _____ PHONE _____
CITY _____ STATE _____ ZIP _____
EPA ID NO. _____ MANIFEST TRACKING NO. _____
EPA WASTE NO. _____ CA WASTE NO. _____ ACCUMULATION START DATE _____

CONTENTS, COMPOSITION: _____

PHYSICAL STATE:

☐ SOLID ☐ LIQUID

HAZARDOUS PROPERTIES:

☐ FLAMMABLE ☐ TOXIC
☐ CORROSIVE ☐ REACTIVE ☐ OTHER _____

[_____]
[_____]
[_____]

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

**THIS CONTAINER
ON HOLD
PENDING ANALYSIS**



CONTENTS _____

ORIGIN OF MATERIALS _____

ADDRESS _____

CONTACT _____

**DO NOT TAMPER WITH CONTAINER
AUTHORIZED PERSONNEL ONLY**

Appendix A.5

Waste Storage Area Inspection Form

Date:	Time:	Location: Waste Staging Area	
Inspector's Name:			
Inspector's Signature:		S/U	Comments
1. WASTE ACCUMULATION AREAS			
a. Container lids and bungs are securely closed unless adding or removing waste.			
b. Containers are in good condition and free of leaks, heavy rust, dents, and creases.			
c. All containers have appropriate "Hazardous," "Non-Hazardous," or "Pending Analysis" labels.			
d. All containers are clearly identified as to their purpose and/or contents with accumulation start dates.			
e. Incompatible wastes are stored separately.			
f. Containers are clean and free of spillage/residue.			
g. Frac tank connections are capped or blank-flanged			
h. Frac tank secondary containment is not damaged or stained.			
i. Frac tank drainage valve is closed or locked.			
j. Adequate aisle space is maintained for container inspection and evacuation.			
k. Emergency spill kit and equipment are stocked and readily available.			
l. "Empty" containers are marked and stored properly.			
m. Drum control logs are actively being maintained.			
n. Security - Fencing, gates, or lighting is functional.			
*Unsatisfactory Responses (U) Indicate Deficiencies That Must Be Addressed Immediately			
Inventory/ # steel drums:			
Inventory/ # poly drums/overpacks:			
Comments/Corrective Action & Date:			
Code: S: Satisfactory U: Unsatisfactory			