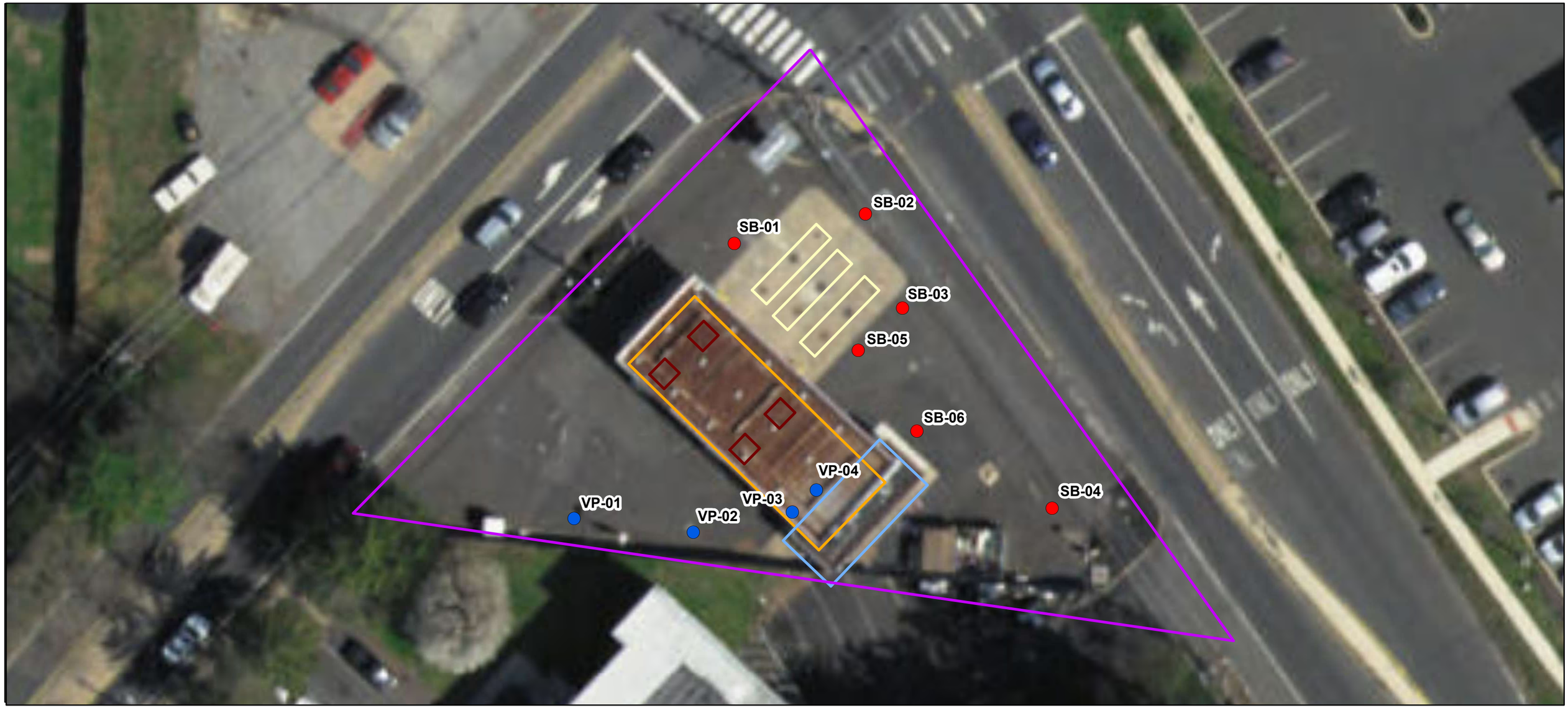
Soil Boring Location Figure



Legend

- Vapor Point/Soil Boring Locations
- Soil Boring Locations
- Site Boundary
- USTs
- Dispensers
- Tank Field
- Convenience Store
- Dispenser Area

N

0 35 70 140 Feet

Figure: Site Map with Soil Boring Locations

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 09/29/2023

Project Manager: Martin Ebel

Prepared By: Christopher Trilleras

Soil Boring Logs

GEO-ENVIRO CONSULTING & REMEDIATION LLC 371 Hoes Lane, Piscataway, NJ 08854	**SOIL BORING LOGS** Project Number: P-242 Address: 7040 Mill Creek Road, Levittown, PA 19057 Driller: Hawk Drilling	Date Advanced: 5/1/2023 Inspector: Martin Ebel

Boring ID: **VP-02**

Type of Drilling Air Kife/ Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			0.0	
			0.0	5.0'-6.0' Grey w/ Brown Medium Fine Sand
			0.0	
			0.0	
6			0.0	6.0'-7.5' Grey w/ Brown Medium Fine Sand w/ Black
			0.0	Staining
			0.0	
			0.0	
7	V		0.0	
			0.0	
			0.0	7.5'-10.0' Brown Medium Fine Sand w/ Small Pebbles
			0.0	Grading Medium Coarse Sand w/ Large Pebbles
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0 '
			0.0	Time: 11:05
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

Boring ID: **VP-03**

Type of Drilling Air Kinfe /Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			50.0	
			0.0	5.0'-8.0' Saturated Grey w/ Brown Fine Sand w/ Trace
			250.0	Coarse Sand
			0.0	
6			5,000.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	
			0.0	
			0.0	
			0.0	
8			0.0	8.0'-10.0' Grey Medium Sand
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0'
			0.0	Time: 10:50
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

NOTES:

DTW - Depth to Water NA - Not Applicable PID - Photo-Ionization Detector bgs - below ground surface

in. - inches ppm - parts per million REC - Recovery

GEO-ENVIRO CONSULTING & REMEDIATION LLC	SOIL BORING LOGS	
	Project Number: P-242	Date Advanced: 5/1/2023
	Address: 7040 Mill Creek Road, Levittown, PA 19057	Inspector: Martin Ebel
371 Hoes Lane, Piscataway, NJ 08854	Driller: Hawk Drilling	

Boring ID: **SB-01**

Type of Drilling Air Kife/ Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			150.0	
			0.0	5.0'-7.0' Asphalt/Conrete
			0.0	
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	7.0'-10.0'Brown Fine Sand w/ Trace Coarse Saturated
			0.0	
			0.0	
			0.0	
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0 '
			0.0	Time: 12:30
10			0.0	Analysis:PADEP Unleaded Gasoline & Total Solids

Boring ID: **SB-02**

Type of Drilling Air Kinfe /Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			25.0	5.0' Soil is compact and begins at 5.0'- Fine Grained Sand
			0.0	5.0'-10.0' Brown Fine Sand w/ Trace Coarse Sand
			0.0	
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	
			0.0	
			0.0	
			0.0	
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0'
			0.0	Time: 13:00
10			0.0	Analysis:PADEP Unleaded Gasoline & Total Solids

NOTES:

DTW - Depth to Water NA - Not Applicable PID - Photo-Ionization Detector bgs - below ground surface

in. - inches ppm - parts per million REC - Recovery

GEO-ENVIRO CONSULTING & REMEDIATION LLC	SOIL BORING LOGS	
371 Hoes Lane, Piscataway, NJ 08854	Project Number: P-242 Address: 7040 Mill Creek Road, Levittown, PA 19057 Driller: Hawk Drilling	Date Advanced: 5/1/2023 Inspector: Martin Ebel

Boring ID: **SB-03**

Type of Drilling Air Kife/ Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			2.9	
			0.0	5.0'-7.0' Fine Medium Grained Sand
			0.0	
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	7.0'-10.0' Brown Fine Sand w/ Trace Coarse Saturated
			0.0	
			0.0	
			0.0	
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0 '
			0.0	Time: 13:45
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

Boring ID: **SB-04**

Type of Drilling Air Kinfe /Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-7.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5				
			0.0	
			0.0	
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	Soil begins at 7.0'
7	V		0.0	7.0'-10.0' Medium Grained Sand w/ Saturation
			0.0	
			0.0	
			0.0	
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 7.0'
			0.0	Time: 14:00
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

NOTES:

DTW - Depth to Water NA - Not Applicable PID - Photo-Ionization Detector bgs - below ground surface

in. - inches ppm - parts per million REC - Recovery

GEO-ENVIRO CONSULTING & REMEDIATION LLC	SOIL BORING LOGS	
	Project Number: P-242	Date Advanced: 5/1/2023
	Address: 7040 Mill Creek Road, Levittown, PA 19057	Inspector: Martin Ebel
371 Hoes Lane, Piscataway, NJ 08854	Driller: Hawk Drilling	

Boring ID: **SB-05**

Type of Drilling Air Kife/ Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			15.0	
			0.0	5.0'-7.0' Fine Grained Medium Brown Sand
			0.0	
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	7.0'-10.0' Odors detected at 7.0'
			0.0	Pebbles and Medium Sand w/ Coarse Gravel Rounded
			0.0	
			0.0	
8			0.0	
			0.0	Additional sample (SB-05A) collected at 9.0' due to
			0.0	indiciations of potential contamination
			0.0	
9			130.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0' & 9.0'
			0.0	Time: 14:20 for SB-05 & 14:30 for SB-05A
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

Boring ID: **SB-06**

Type of Drilling Air Kinfe /Geo-Probe/ Direct Push

Depth (feet)	DTW	REC (%)	PID (ppm)	Description of Soils
0			0.0	0.0'-0.5' Concrete
			0.0	
			0.0	0.5'-5.0' Air Knife conducted, no recovery
1			0.0	
			0.0	
			0.0	
			0.0	
2			0.0	
			0.0	
			0.0	
			0.0	
3			0.0	
			0.0	
			0.0	
			0.0	
4			0.0	
			0.0	
			0.0	
			0.0	
5			0.0	
			0.0	5.0'-7.0' Medium Fine w/ Trace of Coarse Brown and
			0.0	Grey Sand with Pebbles
			0.0	
6			0.0	
			0.0	
			0.0	
			0.0	
7	V		0.0	7.0'-10.0' Brown Medium Grained Sand w/ Saturation
			0.0	
			0.0	
			0.0	
8			0.0	
			0.0	
			0.0	
			0.0	
9			0.0	
			0.0	End of Boring @ 10.0'
			0.0	Sample Depth: 5.0'
			0.0	Time: 14:40
10			0.0	Analysis: PADEP Unleaded Gasoline & Total Solids

NOTES:

DTW - Depth to Water NA - Not Applicable PID - Photo-Ionization Detector bgs - below ground surface

in. - inches ppm - parts per million REC - Recovery

Soil Sampling Results Table

TABLE
SOIL SAMPLE ANALYTICAL RESULTS
SUNOCO
7040 MILLCREEK
LEVITTOWN PA

GECR PROJECT NUMBE	P-242													
SAMPLE ID:						VP-03	VP-02	SB-01	SB-02	SB-03	SB-04	SB-05	SB-05A	SB-06
SAMPLE DATE:						5/1/2023	5/2/2023	5/1/2023	5/1/2023	5/1/2023	5/1/2023	5/1/2023	5/1/2023	5/1/2023
SAMPLE DEPTH:						5	5	5	5	5	7	5	9	5
SAMPLE MATRIX:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		SWHS-UASR	SWHS-UANR	SWHS-NAR	SWHS-NANR									
ANALYTE:	CASRN	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	CONC	CONC	CONC	CONC	CONC	CONC	CONC	CONC	CONC
VOLITILE ORGANICS														
Benzene	71-43-2	0.5	0.5	50	50	0.0017	ND	0.0072	0.0616	0.00097	ND	0.008	0.0578	ND
Toulene	108-88-3	100	100	10000	10000	ND	ND	0.0653	0.0815	0.0012	ND	0.0035	ND	ND
Ethyl-Benzene	100-41-4	70	70	7000	7000	ND	ND	0.0138	ND	ND	ND	ND	0.83	ND
MTBE	1634-04-4	2	2	20	20	ND	ND	0.154	ND	ND	ND	0.00055	0.103	ND
Total-Xylenes	1330-20-7	1000	1000	10000	10000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Napthalene	91-20-3	10	10	1000	1000	ND	ND	0.0049	0.279	ND	ND	ND	1.18	ND
Cumene	98-82-8	84	350	5000	5000	0.0055	ND	ND	ND	ND	ND	ND	6.73	ND
1,2,4 TMB	95-63-6	13	53	1300	5300	0.0335	ND	0.0335	0.0468	ND	ND	ND	0.376	ND
1,3,5 TMB	108-67-8	13	53	13	53	ND	ND	0.0124	ND	ND	ND	ND	0.135	ND

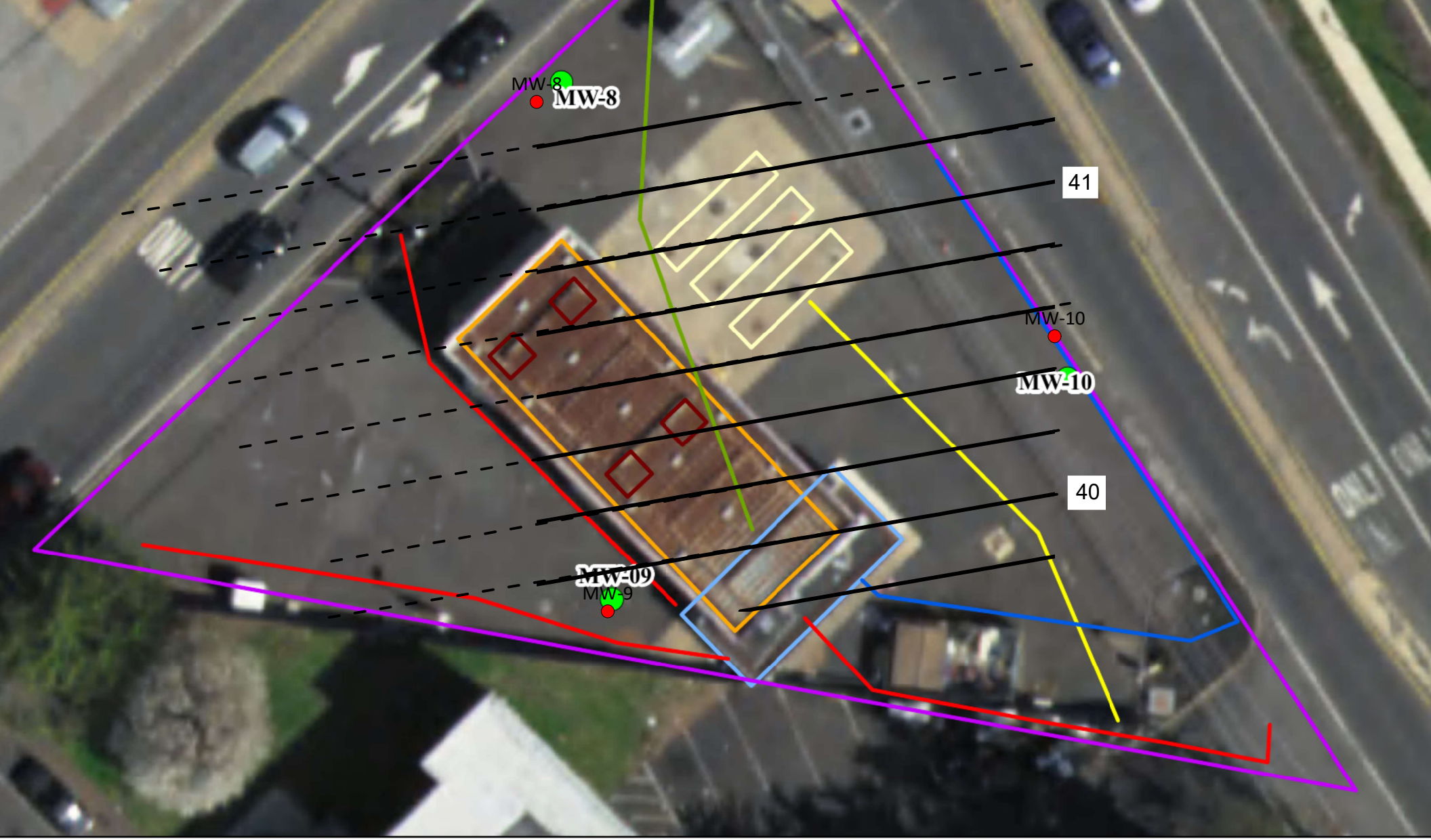
NOTES:

ND- NOT DETECTED or detected below the reporting limit.
NA-NOT AVAILABLE
NS-NO STANDARD
RL - REPORTING LIMIT
J- ESTIMATED VALUE
NJ- PERSUMPTIVE EVIDENCE OF COMPOUND

DATA HIGHLIGHTED IN BLUE REPRESENTS REPORTING LIMIT EXCEEDS NJDEP STANDARD
DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED
DATA HIGHLIGHTED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS NJDEP STANDARD

SWHS-UAR: Used Aquifer, Residential
SWHS-UANR: Used Aquifer, Non-Residential
SWHS-NAR: Non-use Aquifer, Residential
SWHS-NANR: Non-use Aquifer, Non-Residential

Groundwater Contour Figure



Petroleum Lines
Underground Electric
Site Boundary
USTs

Dispensers
Tank Field
Convenience Store
Dispenser Area

N

Figure 1: Scaled Site Map with Proposed Monitor

GEO-ENVIRO CONSULTING & REMEDIATION, LLC

Mill Creek Sunoco
7040 Mill Creek Roa

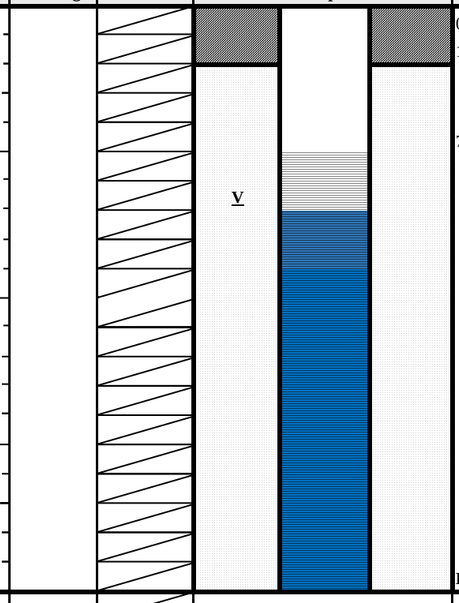
Groundwater Monitoring Well Construction Logs

Well Construction Log

Project:	Sunoco	**Boring No.:**	MW-8
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	1 of 3
Purpose:	Monitoring Well Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	13'
Drilling Contractor:	Hawk Drilling	**Date Started:**	7/20/2023
Driller:	Nelson	**Date Finished:**	7/20/2023
Well Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Hollow Stem Auger
		Elevation TOC:	47.354

Boring/Well Specifications

	Type	*Diameter*
Well	Monitoring Well	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
5				0'-1' Asphalt base/ Stone 1'-7' Brown Sand, Trace Coarse 7'-13' Brown Sand	Surface Completion 0.5-2' Grout 2'-13' Sand Pack 3'-13' Slotted Well Screen
10					Hollow Stem Auger from 0-13 ft. bsg.
15					Groundwater encountered at approx. 7.48' on 07/20/2021
20				**End of boring 13'**	
25					
30					

Well Construction Log

Project:	Sunoco	**Boring No.:**	MW-9
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	2 of 3
Purpose:	Monitoring Well Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	13'
Drilling Contractor:	Hawk Drilling	**Date Started:**	7/20/2023
Driller:	Nelson	**Date Finished:**	7/20/2023
Well Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Hollow Stem Auger
		Elevation TOC:	48.095

Boring/Well Specifications

	Type	*Diameter*
Well	Monitoring Well	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

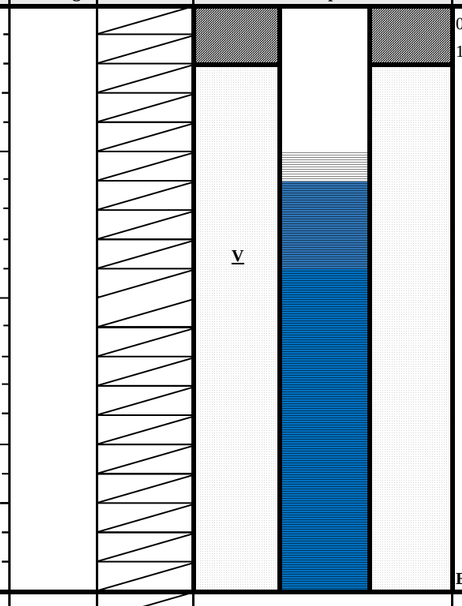
Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
5			V	0'-1' Asphalt base/ Stone 1'-8' Grey with Brown Fine Sand with Trace Coarse Sand 8'-13' Grey Medium Sand	Surface Completion 0.5-2' Grout 2'-13' Sand Pack 3'-13' Slotted Well Screen Hollow Stem Auger from 0-13 ft. bsg. Groundwater encountered at approx. 6.55' on 07/20/2021
10					
15					
20				**End of boring 13'**	
25					
30					

Well Construction Log

Project:	Sunoco	**Boring No.:**	MW-10
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	3 of 3
Purpose:	Monitoring Well Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	13'
Drilling Contractor:	Hawk Drilling	**Date Started:**	7/20/2023
Driller:	Nelson	**Date Finished:**	7/20/2023
Well Location:	See Figure	**Method:**	Hollow Stem Auger
Time Log:	N/A	**Elevation TOC:**	46.435

Boring/Well Specifications

	Type	*Diameter*
Well	Monitoring Well	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
5 10 15 20				0'-1' Asphalt base/ Stone 1'-13' Fine Medium Grain Sand with Coarse and Pebbles **End of boring 13'**	Surface Completion 0.5-2' Grout 2'-13' Sand Pack 3'-13' Slotted Well Screen Hollow Stem Auger from 0-13 ft. bsg. Groundwater encountered at approx. 5.93' on 07/20/2021
25 30					Well Construction Details: 2" id pvc riser pipe from 0'-5' 2" id pvc well screen from 5'-20' sand/gravel pack from 2'-20' Bentonite Seal from 0.5'-2' 1"x1' Sakrete Pad 0'-1'

Groundwater Sampling Results

Table
Groundwater Sample Analytical Results
7040 Millcreek Road
Levittown PA, 19057
PI# 09-43609

PROJECT NUMBER:	P-242													
SAMPLE ID:						MW-8			MW-9			MW-10		
LAB ID:						JD70536-1			JD70536-2			JD70536-3		
SAMPLE DATE:						8/3/2023			8/3/2023			8/3/2023		
SAMPLE MATRIX:						GW			GW			GW		
		MSCUAR	MSCUANR	MSCNAR	MSCNANR									
ANALYTE	CASN	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	CONC	Q	RL	CONC	Q	RL	CONC	Q	RL
PADEP Shortlist														
Benzene	71-43-2	5	5	500	500	1.4		0.5	**19.7**		0.5	**4820**		50
Toluene	108-88-3	1000	1000	100000	100000	1.8		1	2.4		1	**7300**		100
Ethylbenzene	100-41-4	700	700	70000	70000	2.8		1	15.2		1	**1020**		20
Xylenes (Total)	1330-20-7	10000	10000	180000	180000	14.1		1	2.3		1	5320		20
MTBE	1634-04-4	20	20	200	200	ND		1	ND		1	18.9	J	20
Naphthalene	91-20-3	100	100	10000	10000	**103**		5	**509**		25	**113**		100
Isopropylbenzene	98-82-8	840	3500	50000	50000	26.3		1	129		1	46.6		20
1,2,4 Trimethylbenzene	95-63-6	130	530	13000	53000	ND		2	ND		2	**653**		40
1,3,5 Trimethylbenzene	108-67-8	130	530	130	530	1	J	2	1.7	J	2	**168**		40

NOTES:
ND- NOT DETECTED or detected below the reporting limit.
NA-NOT AVAILABLE
NS-NO STANDARD
RL - REPORTING LIMIT
J- ESTIMATED VALUE
NJ-PRESUMPTIVE EVIDENCE OF COMPOUND
E -CONCENTRATION OF ANALYTE EXCEEDS THE RANGE OF THE CALIBARTION CURVE AND/OR LINEAR RANGEOF THE INSTRUMENT
DATA HIGHLIGHTED IN BLUE REPRESENTS REPORTING LIMIT EXCEEDS PADEP STANDARD
DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED
DATA HIGHLIGHTED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS PADEP STANDARD
MSCUAR: Medium-Specific Concentrations for Used Aquifers, Residential
MSCUANR: Medium-Specific Concentrations for Used Aquifers,non- Residential
MSCNAR: Medium-Specific Concentrations for nonuse Aquifers, Residential
MSCNANR: Medium-Specific Concentrations for nonuse Aquifers, non-Residential

Groundwater Gauging Table

Table
Groundwater Gauging Data Table
SUNOCO
7040 Mill Creek Road, Levittown, PA 19057

MW-ID	X	Y	DATE	Top of the Casing	Depth To Water	GroundWater Elevation
MW-8	2780197.178	307960.472	8/3/2023	47.354	6.55	40.804
MW-9	2780208.1	307882.141	8/3/2023	48.095	7.48	40.62
MW-10	2780276.802	307924.444	8/3/2023	46.435	5.93	40.51

Soil Vapor Point Location Figure

Legend

- Vapor Point Locations
- Site Boundary
- USTs
- Dispensers
- Tank Field
- Convenience Store
- Dispenser Area

N

0 35 70 140 Feet

Figure: Site Map with Vapor Point Locations

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 10/2/2023

Project Manager: Martin Ebel

Prepared By: Christopher Trilleras

Utilities Location Figure

Legend

- Storm Sewer
- Sewer Lines
- Water Lines
- Petroleum Lines
- Underground Electric
- Site Boundary
- USTs
- Dispensers
- Tank Field
- Convenience Store
- Dispenser Area

N

0 35 70 140 Feet

Figure: Site Map with Underground Utilities

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 09/29/2023

Project Manager: Martin Ebel

Prepared By: Christopher Trilleras

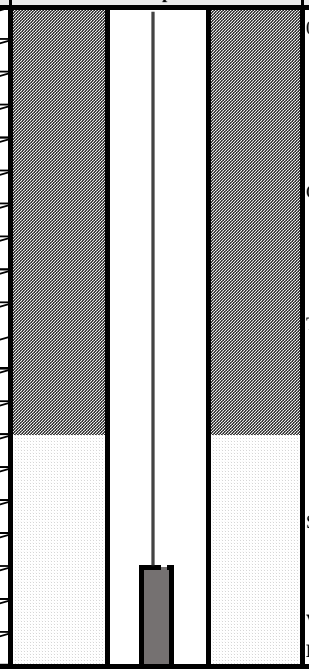
Vapor Point Construction Logs

Vapor Point Construction Log

Project:	Sunoco	**Vapor Point No.:**	VP-01
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	1 of 4
Purpose:	Vapor Point Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	4'
Drilling Contractor:	Hawk Drilling	**Date Started:**	5/2/2023
Driller:	Gravin	**Date Finished:**	5/2/2023
Vapor Point Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Direct Push

Boring/Vapor Point Specifications

	Type	*Diameter*
Well	Vapor Point	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

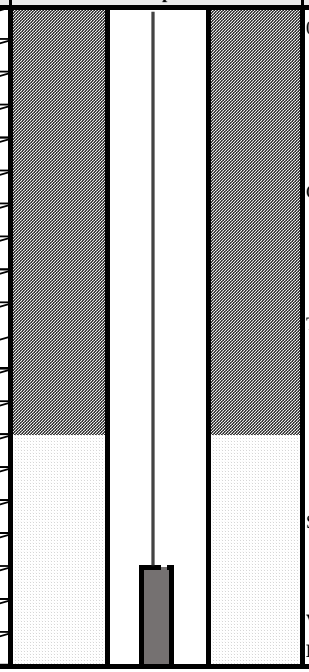
Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
1				0.5'-1' Surface Completion Grout	Boring was completed as a temporary monitoring well Temorary monitoring well was then converted to Vapor Point Bore Hole was 4' bsg.deep,gravel was pack was used to isolate vapor tubing
2				Tubing	Direct Push from 0-1' bsg.
3				Sand Pack	Groundwater encountered at approx. 5' bsg in VP-01 location on 05/2/2023 Grouted 1' to 2' bsg.
4				**Vapor Point** **End of Vapor Point 4'**	

Vapor Point Construction Log

Project:	Sunoco	**Vapor Point No.:**	VP-02
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	2 of 4
Purpose:	Vapor Point Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	4'
Drilling Contractor:	Hawk Drilling	**Date Started:**	5/2/2023
Driller:	Gravin	**Date Finished:**	5/2/2023
Vapor Point Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Direct Push

Boring/Vapor Point Specifications

	Type	*Diameter*
Well	Vapor Point	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
1				0.5'-1' Surface Completion Grout Tubing Sand Pack **Vapor Point** **End of Vapor Point 4'**	Boring was completed as a temporary monitoring well Temorary monitoring well was then converted to Vapor Point Bore Hole was 4' bsg.deep,gravel was pack was used to isolate vapor tubing Direct Push from 0-1' bsg. Groundwater encountered at approx. 5' bsg in VP-02 location on 05/2/2023 Grouted 1' to 2' bsg.
2					
3					
4					

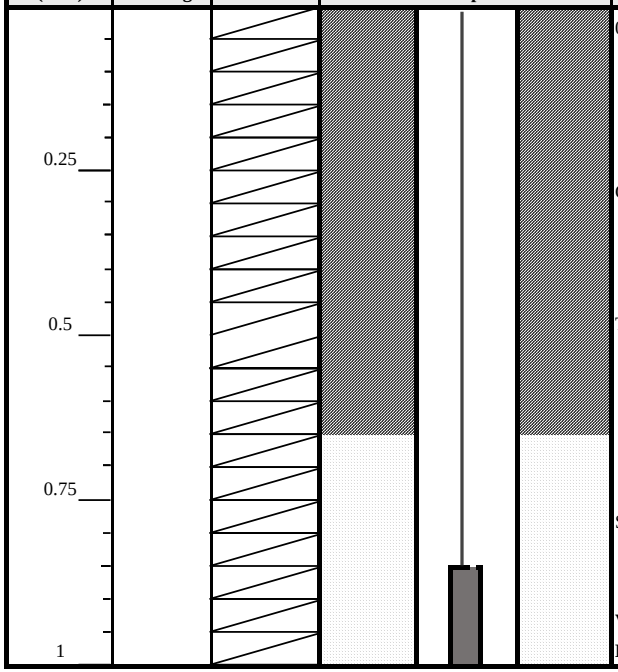
Vapor Point Construction Log

Project:	Sunoco	**Vapor Point No.:**	VP-03
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	3 of 4
Purpose:	Vapor Point Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	1'
Drilling Contractor:	Hawk Drilling	**Date Started:**	5/2/2023
Driller:	Gravin	**Date Finished:**	5/2/2023
Vapor Point Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Direct Push

Boring/Vapor Point Specifications

	Type	*Diameter*
Well	Vapor Point	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
0.25				0.5'-1' Surface Completion Grout	Boring was completed as a temporary monitoring well Temorary monitoring well was then converted to Vapor Point Bore Hole was 1' bsg.deep,gravel was pack was used to isolate vapor tubing
0.5				Tubing	Direct Push from 0-1' bsg.
0.75				Sand Pack	Groundwater encountered at approx. 2' bsg in VP-03 location on 05/2/2023 Grouted 1' to 2' bsg.
1				**Vapor Point** **End of Vapor Point 1'**	



Vapor Point Construction Log

Project:	Sunoco	**Vapor Point No.:**	VP-04
Client:	Geo-Enviro Consulting & Remediation LLC	**Sheet:**	4 of 4
Purpose:	Vapor Point Construction Log	**Project:**	P-242
Geologist/Engineer:	Martin Ebel	**Total Depth:**	1'
Drilling Contractor:	Hawk Drilling	**Date Started:**	5/2/2023
Driller:	Gravin	**Date Finished:**	5/2/2023
Vapor Point Location:	See Figure	**Address:**	7040 Mill Creek Road
Time Log:	N/A	**PARID:**	05-042-056-4259
		Method:	Direct Push

Boring/Vapor Point Specifications

	Type	*Diameter*
Well	Vapor Point	2"
Casing	PVC	2"
Core	----	----
Sampler	----	----
Hammer Weight		

Depth (Feet)	PID Readings	Blow Count	Visual Log Description	Lithologic Description	Notes
0.25				0.5'-1' Surface Completion Grout	Boring was completed as a temporary monitoring well Temorary monitoring well was then converted to Vapor Point Bore Hole was 1' bsg, gravel was pack was used to isolate vapor tubing
0.5				Tubing	Direct Push from 0-1' bsg.
0.75				Sand Pack	Groundwater encountered at approx. 2' in VP-04 location on 05/2/2023 Grouted 1' to 2' bsg
1				**Vapor Point** **End of Vapor Point 1'**	

Vapor Point Sampling Results

TABLE
SUB-SLAB VAPOR SAMPLE ANALYTICAL RESULTS
7040 MILLCREEK ROAD
LEVITTOWN PA ,19057
PI# 09-43609

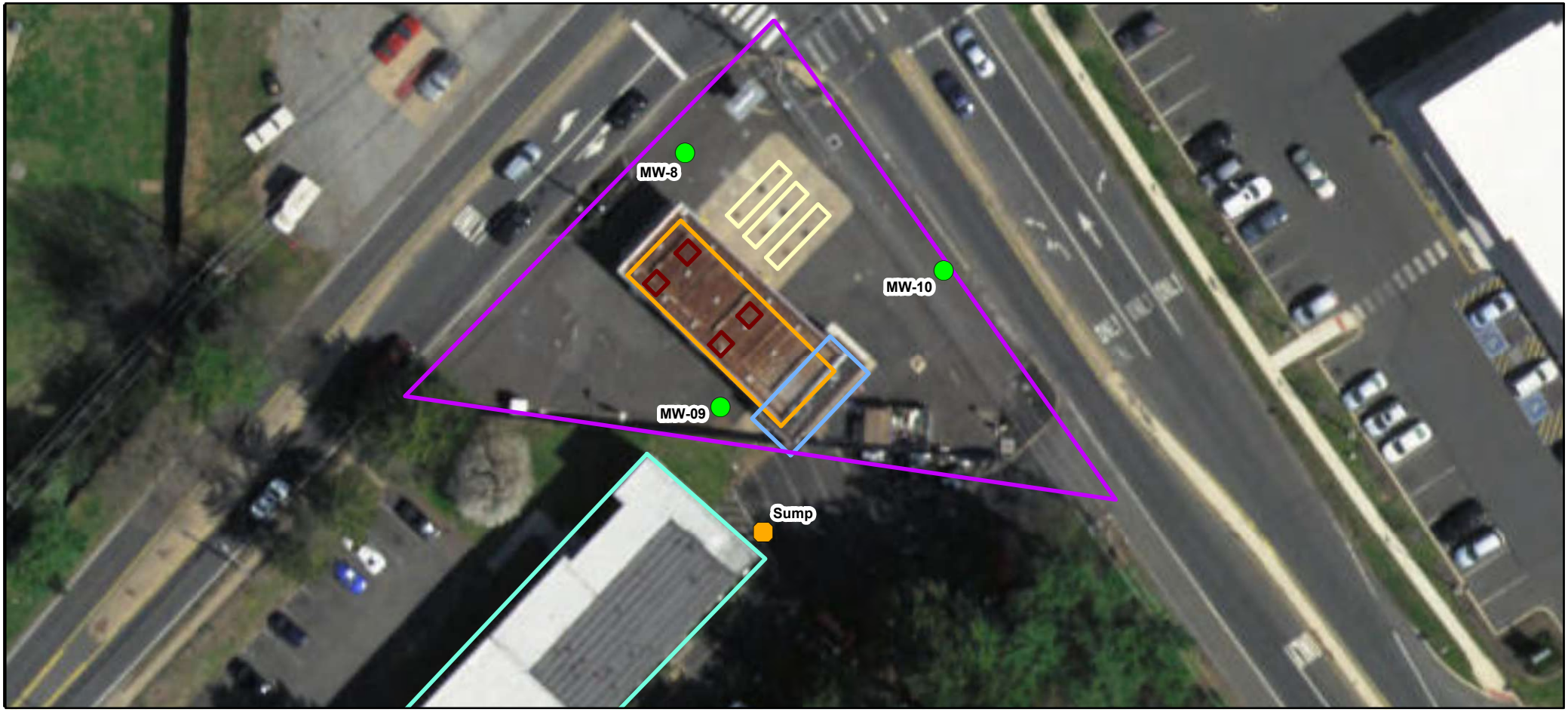
PROJECT NUMBER:	P-242							
SAMPLE ID:					VP-01	VP-02	VP-03	VP-04
SAMPLE DATE:					5/12/2023	5/12/2023	5/12/2023	5/12/2023
SAMPLE MATRIX:					VAPOR	VAPOR	VAPOR	VAPOR
		SVNSR	SVNSNR	SVNSCR				
ANALYTE	CASRN	(mg/m3)	(mg/m3)	(mg/m3)	CONC	CONC	CONC	CONC
PADEP VAPOR SHORTLIST								
BENZENE	71-43-2	120	2,000	610	0	6.4	7.7	**1490**
TOLUENE	108-88-3	200,000	2,800,000	840,000	0	9.4	9	739
ETHYLBENZENE	100-41-4	370	6,300	1,900	0	2.7	2.6	ND
XYLENES (TOTAL)	1330-20-7	4,000	56,000	17,000	0	16	15	1310
MTBE	1634-04-4	3,600	61,000	18,000	0	ND	ND	ND
NAPHTHALENE	91-20-3	28	460	140	0	ND	ND	ND
CUMENE	98-82-8	16,000	220,000	67,000	0	ND	5.5	ND
TRIMETHYLBENZENE 1,2,4	95-63-6	2,400	34,000	10,000	0	11	8.8	ND
TRIMETHYLBENZENE 1,3,5	108-67-8	2,400	34,000	10,000	0	2.7	2	ND

NOTES:
ND- NOT DETECTED or detected below the reporting limit.
NA-NOT AVAILABLE
NS-NO STANDARD
RL - REPORTING LIMIT
J- ESTIMATED VALUE
NJ- PERSUMPTIVE EVIDENCE OF COMPOUND

DATA HIGHLIGHTED IN BLUE REPRESENTS REPORTING LIMIT EXCEEDS PADEP STANDARD
DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED
DATA HIGHLIGHTED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS PADEP STANDARD

SVNSR: Statewide health standard vapor intrusion screening values, Residential
SVNSNR: Statewide health standard vapor intrusion screening values, Non-Residential
SVNCR: Statewide health standard vapor intrusion screening values, Converted Residential

Surrounding Properties and Building Sump Figure



Legend

- Sump
- Monitoring Well Locations
- Site Boundary
- Adjacent Building
- USTs
- Dispensers
- Tank Field
- Convenience Store
- Dispenser Area

N

0 45 90 180 Feet

Figure: Site Map with Adjacent Property

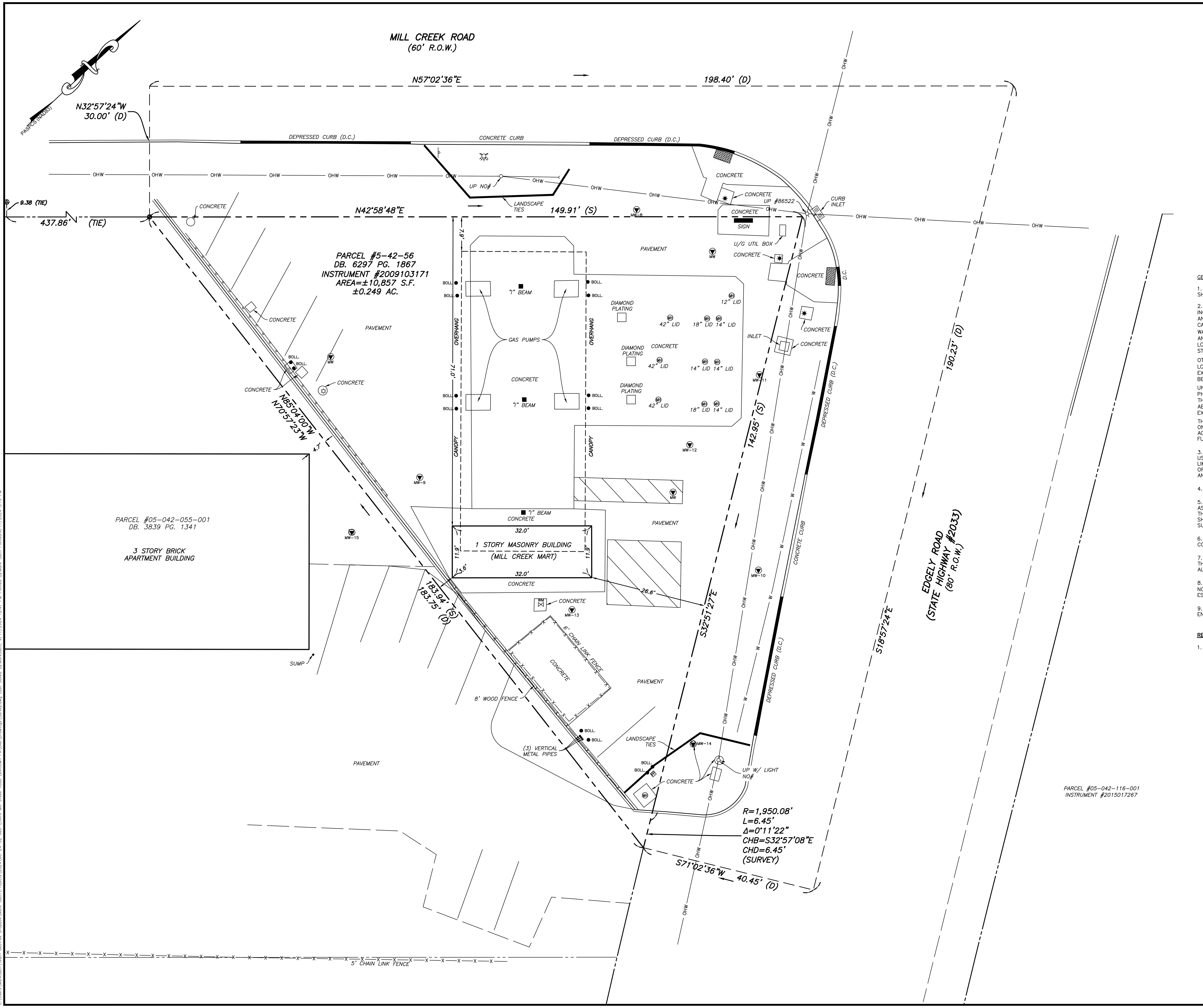
GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

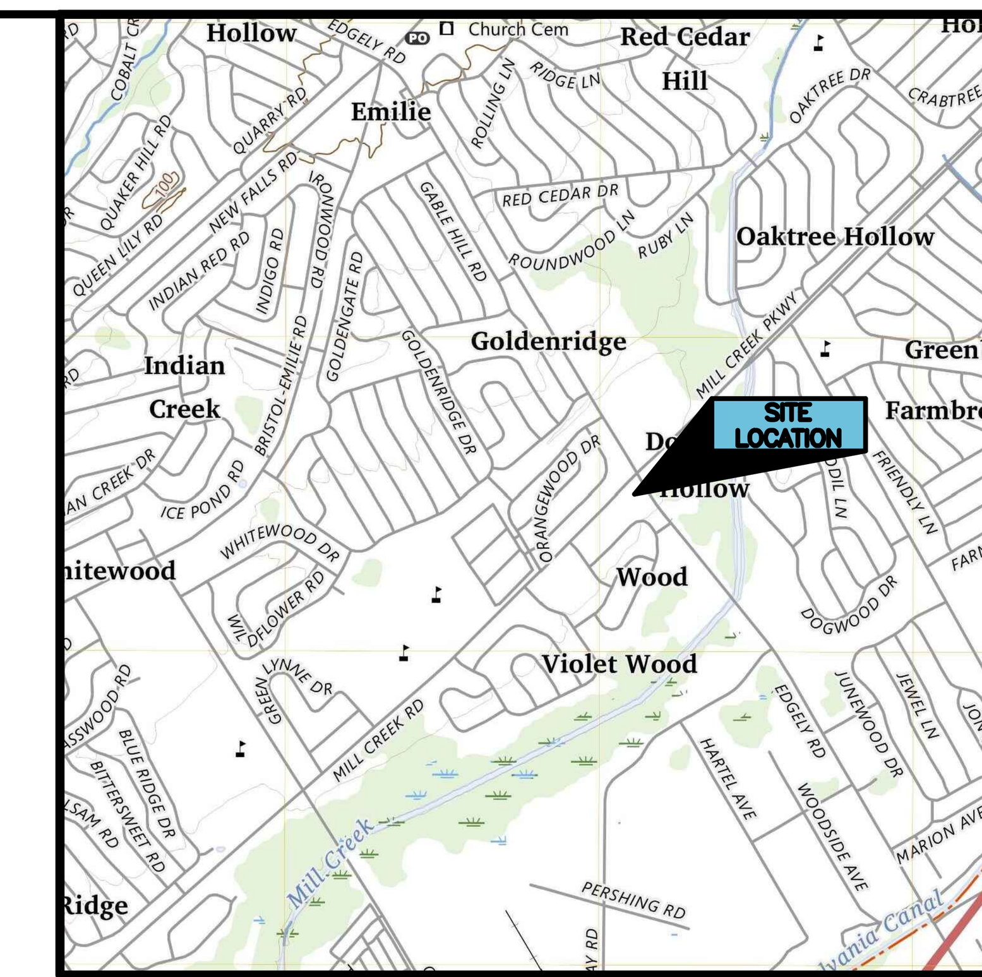
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 09/29/2023

Project Manager: Martin Ebel

Prepared By: Christopher Trilleras





U.S.G.S QUAD MAPS
TRENTON WEST, NJ, PA – 2023
SCALE 1" = 2000'

GENERAL NOTES:

1. PHYSICAL FEATURES OUTSIDE OF THE SITE HAVE NOT BEEN COMPLETELY SHOWN.

2. UNLESS SPECIFICALLY NOTED HEREIN, UTILITIES SHOWN ON THIS PLAN INCLUDING PIPE INVERTS, PIPE MATERIALS, AND PIPE SIZES WERE OBSERVED AND MEASURED AT READILY VISIBLE AND ACCESSIBLE STRUCTURES. CONDITIONS CAN VARY FROM STRUCTURE TO STRUCTURE. THE SURVEYOR DOES NOT WARRANT THAT THE PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE AND OR CONDUIT RUNS ARE THE SAME AS OBSERVED AT THE STRUCTURE LOCATIONS, OR THAT THE PIPE IS A STRAIGHT RUN BETWEEN THE LOCATED STRUCTURES.

OTHER UTILITY (WATER, GAS, ELECTRIC, ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS COMPLETED BY OTHERS, THE LOCATIONS OF EXISTING SURFACE STRUCTURES, AND ANY EXISTING DRAWINGS THAT MAY HAVE BEEN MADE AVAILABLE TO US.

UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. ANY UTILITIES SHOWN ON THE PLAN HAVE NO GUARANTEES THAT THEY ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE. UNLESS EXCAVATIONS ARE NOTED THE EXACT LOCATION AND CONFIGURATION CAN NOT BE DETERMINED.

THE UTILITIES SHOWN ON THIS MAP MAY NOT DISCLOSE ALL UTILITIES PRESENT ON THE SITE. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION, POSSIBLE LOCATION OF FURTHER UNDERGROUND UTILITIES AND DETAILED LOCATIONS OF THE UTILITIES.

3. NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY THE SURVEYOR FOR THE USE OF THIS DOCUMENT FOR ANY OTHER PURPOSES INCLUDING, BUT NOT LIMITED TO THE USE OF THE SURVEY FOR A SURVEY AFFIDAVIT, FUTURE RESALE OF PROPERTY, CONSTRUCTION OF FENCES OR OTHER MATERIAL ITEMS, OR TO ANY OTHER PERSON NOT LISTED DIRECTLY OR INDIRECTLY.

4. UNDERGROUND ENCROACHMENTS, IF ANY HAVE NOT BEEN SHOWN.

5. NO STATEMENT IS BEING MADE OR IMPLIED HEREON, NOR SHOULD IT BE ASSUMED OR CONSTRUED THAT ANY STATEMENT IS BEING MADE BY THE FACT THAT NO EVIDENCE OF TOXIC WASTE IS PORTRAYED HEREON. THE CLIENT SHOULD PURSUE THESE MATTERS AS ITEMS SEPARATE AND APART FROM THIS SURVEY.

6. OFFSETS SHOWN HEREON ARE NOT TO BE USED AS A BASIS FOR CONSTRUCTION OF FENCES OR OTHER PERMANENT CONSTRUCTION.

7. IF THIS DOCUMENT DOES NOT CONTAIN THE RAISED IMPRESSION SEAL OF THE PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL AND MAY HAVE BEEN ALTERED.

8. HORIZONTAL DATUM IS THE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983, (P.A.S.P.C.S., NAD 83). DATUMS WERE ESTABLISHED ON SITE USING GPS OBSERVATIONS.

9. THE FIELD SURVEY WAS CONDUCTED ON APRIL 5, 2024 BY GEOTREK ENVIRONMENTAL & SURVEYING, LLC.

REFERENCE NOTES:

1. A PLANSET ENTITLED "COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF TRANSPORTATION, DRAWINGS FOR CONSTRUCTION OF STATE ROUTE 2033, SECTION M00, IN BUCKS COUNTY, FROM STATION 18+10 TO STATION 241+50", SIGNED MAY 21, 1990, PREPARED BY CONCEPTUAL PLANNERS &ENGINEERS, INC.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R.O.W. LINE
- EDGE OF PAVEMENT LINE
- FENCE LINE
- WATER LINE
- GUIDE RAIL
- REBAR FOUND
- CAPPED PIN FOUND
- GUY WIRE
- UTILITY POLE
- UTILITY POLE W/LIGHT
- FIRE HYDRANT
- WATER METER
- SINGLE POLE SIGN
- DOUBLE POLE SIGN
- BOLLARD — BOLL.
- LIGHT
- TRAFFIC LIGHT
- MANHOLE
- MONITORING WELL
- PAY PHONE
- SURVEY — (S)
- DEED — (D)

HORIZONTAL SCALE IN FEET
1"= 10'

NO.	DATE	REVISION	DRAWN	CHK	REL

MICHAEL J. MCGUIRE
PROFESSIONAL LAND SURVEYOR PA LIC. NO. SU049389E

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL LAND SURVEYOR
MICHAEL J. MCGUIRE
No. 049389

GeoTrek ENVIRONMENTAL AND SURVEYING LLC
ADDRESS:
304 W. ASHLAND STREET
DOYLESTOWN, PA 18901
TELE: (267) 300-1536
CERTIFICATE OF AUTHORIZATION:24GA28306500

SURVEY PLAN
PREPARED FOR
GEO-ENVIRO CONSULTING AND REMEDIATION, LLC
PARCEL #5-42-56
SITUATED IN
BRISTOL TOWNSHIP BUCKS COUNTY PENNSYLVANIA

DATE:	4/12/24
PROJECT NO.:	60-24-02
CADD FILE:	SURVEY
DRAWN BY:	MAS
CHECKED BY:	MJM
SCALE:	1"=10'
SHEET:	1 OF 1

July 31, 2023 Well Survey Results				
Point #	Northing	Easting	Elevation	Description
1001	307891.476	2780223.712	48.445	VP-4 LID
1002	307891.372	2780224.629	48.491	CONC
1003	307892.187	2780223.642	48.498	CONC
1004	307891.521	2780222.722	48.493	CONC
1005	307890.519	2780223.799	48.503	CONC
1006	307891.423	2780223.726	48.42	VP-4 CASING
1007	307885.368	2780218.828	48.573	VP-3 LID
1008	307884.492	2780219.043	48.587	VP-3 PAV
1009	307885.659	2780220.067	48.587	VP-3 PAV
1010	307886.78	2780218.825	48.57	VP-3 PAV
1011	307885.412	2780217.559	48.546	VP-3 PAV
1012	307885.387	2780218.802	48.503	VP-3 CASING
1013	307883.018	2780190.584	48.391	VP-2 LID
1014	307882.403	2780190.236	48.383	VP-2 PAV
1015	307882.467	2780191.25	48.377	VP-2 PAV
1016	307883.912	2780191.362	48.364	VP-2 PAV
1017	307883.89	2780190.217	48.392	VP-2 PAV
1018	307883.039	2780190.619	48.311	VP-2 CASING
1019	307885.939	2780173.905	48.29	VP-1 LID
1020	307886.865	2780173.19	48.282	VP-1 PAV
1021	307886.876	2780174.483	48.279	VP-1 PAV
1022	307885.012	2780174.892	48.292	VP-1 PAV
1023	307884.867	2780173.427	48.305	VP-1 PAV
1024	307886.01	2780173.961	47.906	VP-1 1/4" PVC PIPE
1025	307883.483	2780208.603	48.501	MW-9 PAV
1026	307881.721	2780209.771	48.534	MW-9 PAV
1027	307880.522	2780207.904	48.511	MW-9 PAV
1028	307882.672	2780206.89	48.526	MW-9 PAV
1029	307882.083	2780208.07	48.612	MW-9 LID
1030	307882.141	2780208.1	48.095	MW-9 2" PVC PIPE
1031	307960.441	2780198.042	47.777	MW-8 CONC
1032	307961.317	2780197.203	47.748	MW-8 CONC
1033	307960.479	2780196.341	47.776	MW-8 CONC
1034	307959.44	2780197.218	47.785	MW-8 CONC
1035	307960.472	2780197.178	47.354	MW-8 2" PVC
1036	307960.396	2780197.116	47.784	MW-8 LID
1037	307924.344	2780276.765	47.086	MW-10 LID
1038	307923.282	2780277.517	47.021	MW-10 PAV
1039	307925.505	2780277.346	47.029	MW-10 PAV
1040	307925.233	2780275.836	47.066	MW-10 PAV
1041	307923.282	2780276.131	47.083	MW-10 PAV
1042	307924.444	2780276.802	46.435	MW-10 2" PVC

April 5, 2024 Well Survey Results				
Point #	Northing	Easting	Elevation	Description
100	307886.819	2780295.037	46.996	CONC COR
101	307885.79	2780294.957	47.044	CONC COR
102	307885.7	2780296.011	47.1	CONC COR
103	307886.741	2780296.101	47.086	CONC COR
258	307886.256	2780295.558	46.892	MW 14 TOP 2" PVC
287	307886.108	2780254.095	48.427	GS
288	307886.671	2780253.449	48.41	GS
289	307886.848	2780254.705	48.401	GS
290	307887.329	2780253.859	48.503	GS
291	307886.929	2780254.04	48.086	MW 13 TOP 2" PVC
355	307954.598	2780244.533	47.345	GS
356	307954.532	2780243.426	47.359	GS
357	307955.642	2780243.413	47.342	GS
358	307955.438	2780244.374	47.365	GS
359	307955.176	2780243.933	47.034	MW 11 TOP 2" PVC
360	307932.529	2780244.725	47.355	MW 12 TOP 2" PVC
361	307932.757	2780245.277	47.741	GS
362	307931.858	2780245.292	47.733	GS
363	307931.934	2780244.333	47.791	GS
364	307932.89	2780244.355	47.733	GS
415	307861.24	2780206.485	48.009	CONC COR
416	307862.026	2780207.215	48.096	CONC COR
417	307861.936	2780205.665	48.019	CONC COR
418	307862.758	2780206.43	48.092	CONC COR
419	307862.043	2780206.556	47.808	MW 15 TOP 2" PVC
524	307836.377	2780221.08	48.473	SUMP
1000	307861.998	2780206.595	48.05	MW 15 LID
1001	307886.841	2780254.073	48.45	MW 13 LID
1002	307886.2	2780295.604	47.05	MW 14 LID
1003	307932.469	2780244.796	47.75	MW 12 LID
1004	307955.119	2780243.985	47.35	MW 11 LID

BCDH#		MUN		YEAR		SERIAL		
	W	05		23	1	6	3	

Official use only
Owner ☐ Township ☐ Well driller ☐

Bucks County Department of Health

7321 New Falls Road, Levittown, PA 19055 – Phone: 267-580-3510 – Fax: 215-949-5819
1282 Almshouse Road, Doylestown PA 18901 – Phone: 215-345-3336 – Fax 215-340-8456
261 California Road, Quakertown, PA 18951 - Phone: 215-529-7000 – Fax: 215-529-7032

BUCKS COUNTY DEPT. OF HEALTH
JUN 26 2023
LEVITTOWN

APPLICATION TO CONSTRUCT/MODIFY ALL WELLS

Well Owner: 7040 Millcreek of PA, LLC

Site Address: 7040 Mill Creek Road
Street

Mailing Address: Levittown PA 19057

Levittown PA 19057
Post Office State Zip

Subdivision Name Lot #

Telephone #: 412-889-2258

Bristol Township
Municipality

Email address: mebel@geoenviroconsulting.com

Tax Parcel # 05-042-056-4259

Application Fee Required $ 250
*(See current fee schedule)

Date Received _____

Well Driller Company: Hawk Drilling

Send copy/response to consultant/driller? Yes ☐ No ☑

License # 4554

Type of Well Construction	Geothermal Wells	Method of Sewage Disposal
☑ New Well	☐ Open Loop	☑ Public ☐ On-Site
☐ Deepen Existing Well	☐ Closed Loop	If on-site Sewage Permit #
☐ Hydrofracturing	# of Holes	Date Issued
☐ Abandoned	☑ Monitoring Wells	Date Finalized
☐ Other (specify)	# of Holes	

Plot Plan

Note: 4 copies of plot plan must accompany this application and be to a scale of 1" = 50' (minimum) on 8 ½" x 11" paper (minimum size).

Note: For new or modified drinking water well construction a RESIDENTIAL WELL WORKSHEET SA-131 must be filed and approved by Bucks County Department of Health BEFORE the water can be used for consumption.

Directions to Drilling Site:
left on Edgely Road from New Falls Road, Sunoco at intersection of Edgely Road and Mill Creek Road

Owner Declaration: I certify that the location herein proposed is accessible and meets all isolation distances presented in BCDH Rules and Regulations Governing all Wells and their Construction Specifications.

Owner(s) Name: Jai Patheja **Owner's Signature:** _____ **Date** _____

Original Signature Required / No Faxed Copies Will Be Accepted

For Department Use Only

Approval to Construct/Modify

BCDH Signature: _____ **Date:** 6/29/23

Approval to use

Date: _____

By: _____

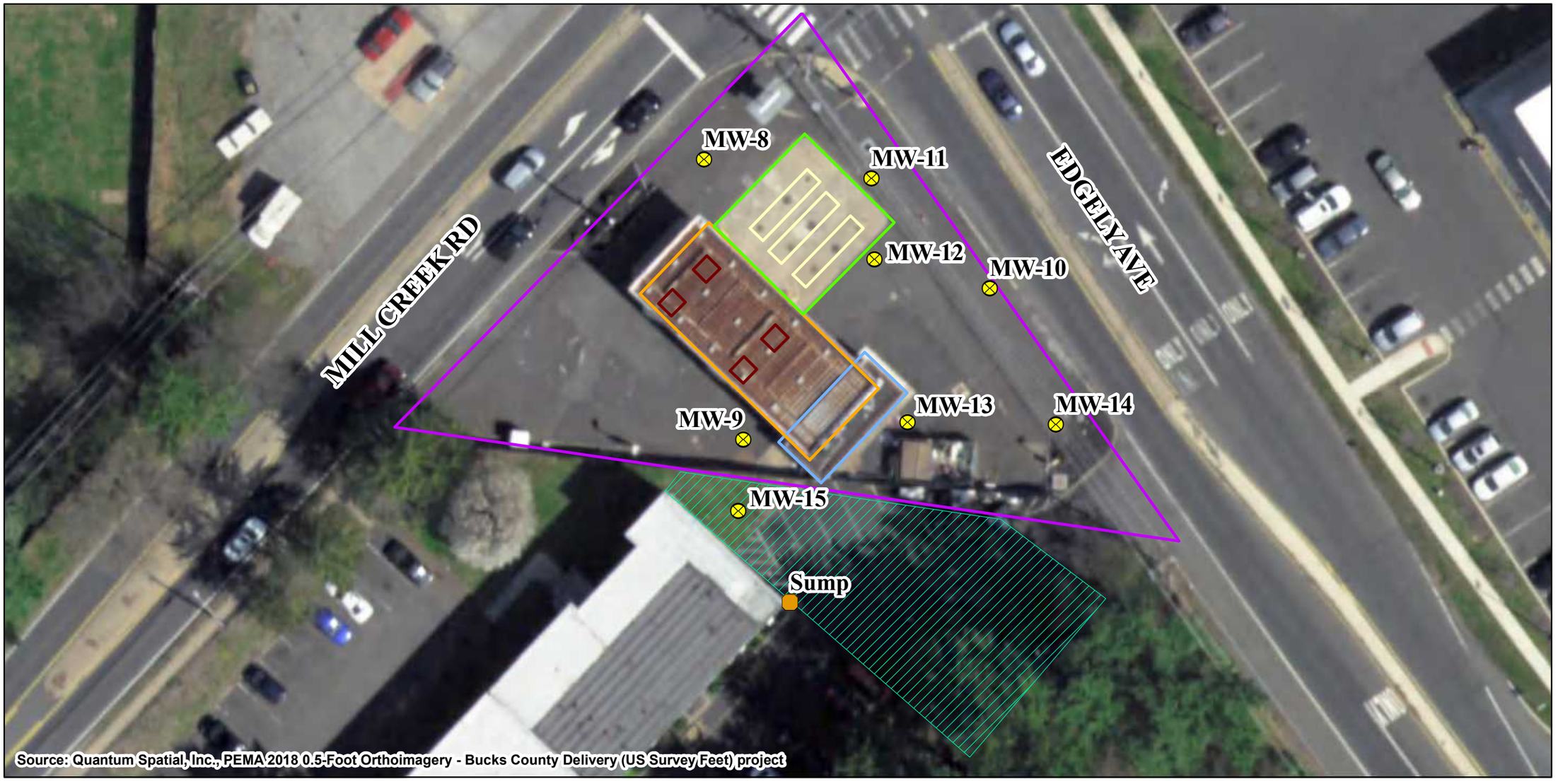
SA-130 (Rev. 12/2019)

Geo-Enviro Consulting & Remediation conducted a geophysical investigation to determine whether underground utilities or other obstructions to drilling are in the area of the monitoring well to be installed in the adjacent property. The area investigated was the southwest corner of 7030 Mill Creek Road, Levittown Pennsylvania including the lawn beside the apartment building and the western portion of the parking lot. The area investigated is shown on the attached figure.

A Sensors and Software Smart Cart Noggin ground penetrating radar (GPR) system and an RD7200 Radio Detection pipe and cable locater were used at the site. The Smart Cart Noggin operates a 500-megahertz radar transmitter and receiver. The digital video logger is the user interface and controls the transmitter and receiver, displays the radar reflections and saves the data. The RD7200 detects radio waves retransmitted by linear conductors.

The GPR was operated by running transects both parallel and perpendicular to the building. The radar reflections are displayed on the digital video logger and interpreted as the data are collected. The radar reflections were analyzed for the characteristic pattern for underground utilities and for indications of an excavation which can be an indication of a subsurface obstruction. The RD7200 was used to determine whether any metallic utilities pass through the area such as metal pipes, conduits or electrical or communication wires.

No indications of subsurface utilities or other obstructions were detected in the area investigated at 7030 Mill Creek Road.



Legend

- Monitoring Wells
- Sump
- Site Boundary
- Tank Field
- Dispenser Area
- Convenience Store
- Dispensers
- USTs
- GPR: No Annomolies Detected

N

1 inch = 30 feet

0 15 30 60 Feet

Geophysical Investigation of Property with MW-15

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 07/10/2024

Project Manager: Martin Ebel

Prepared By: Ashley Peoples

Mill Creek Sunoco
7040 Mill Creek Road,
Levittown, PA 19057
PADEP Facility ID No. 09-11351

On the morning of March 5, 2024, a geophysical survey was completed using radio detection and ground penetrating radar. No anomalies consistent with the subsurface utility or other features were detected in the area surveyed.

On March 5, 2024, five wells labeled MW-11 to MW-15 were installed around the site. One boring was completed on the adjacent property in the location of what is now MW-15. No PID hits were returned, and one soil sample above the depth of groundwater was collected. All tested parameters of the sample were returned by the laboratory as non-detect. The data is provided in Table 4 alongside the state health standard MSCs for organic regulated substances in soil, soil to groundwater numeric values.

As of April 23, 2024, the surveyor has provided GECR with the survey data of the monitoring wells and well pads alongside a survey map of the data. The surveyor found one property corner during the 4/4/2024 property survey and will be going back out to the site during the week of 4/22 – 4/26/2024 to set the missing property corners. After this is completed, the surveyor will be sending to GECR a CAD file alongside the revised survey map. During the 4/4/2024 survey, the top of the sump was also surveyed. We have requested for the top of the sump's float and the bottom of the sump to be surveyed when the surveyor returns to the site to set the missing property corners.

Groundwater elevation data and 4/2/2024 analytical results are displayed in table 1 and table 2 respectively.

Previously, GECR has conducted hand bailing of the tank vault observation well. During sampling on 4/2/2024, a sorbent sock was installed at MW-12 upon the discovery of product in the well.GECR will be planning a future vac-out extraction at the site.

TABLE 1
HISTORIC GROUNDWATER ELEVATION DATA
7040 Millcreek Road
Levittown PA, 19057
PI# 09-43609

Monitoring Well ID	Date	Top of Casing Elevation (feet above sea level)	Depth to Water (feet btoc)	Depth to LNAPL (feet btoc)	LNAPL Thickness (feet)	Groundwater Elevation (feet above sea level)
MW-8	8/3/2023	47.35	6.55	-	-	40.80
	12/15/2023		6.13	-	-	41.22
	4/2/2024		4.62	-	-	42.73
MW-9	8/3/2023	48.10	7.48	-	-	40.62
	12/15/2023		7.00	-	-	41.10
	4/2/2024		5.46	-	-	42.64
MW-10	8/3/2023	46.44	5.93	-	-	40.51
	12/15/2023		5.53	-	-	40.91
	4/2/2024		4.25	-	-	42.19
MW-11	4/2/2024	47.03	2.73	-	-	44.30
MW-12	4/2/2024	47.36	4.80	4.74	0.06	42.60
MW-13	4/2/2024	48.09	5.52	-	-	42.57
MW-14	4/2/2024	46.89	4.20	-	-	42.69
MW-15	4/2/2024	47.81	5.12	-	-	42.69

Calculation for Groundwater Elevation = (TOC - DTW- (SG * PT))
TOC - Top of Casing Elevation
DTW - Depth to Water
SG - Specific gravity, 0.72 for Unleaded Gasoline
PT- LNAPL Product Thickness

TABLE 2
GROUNDWATER ANALYTICAL RESULTS
7040 Millcreek Road
Levittown PA, 19057
PI# 09-43609

Project Number:		**P-242**								
Sample ID:				**MW-8**	**MW-9**	**MW-10**	**MW-11**	**MW-13**	**MW-14**	**MW-15**
Lab ID:				**JD85755-7**	**JD85755-1**	**JD85755-3**	**JD85755-5**	**JD85755-6**	**JD85755-4**	**JD85755-2**
Sample Date:				**4/2/2024**	**4/2/2024**	**4/2/2024**	**4/2/2024**	**4/2/2024**	**4/2/2024**	**4/2/2024**
Dilution Factor:				**1**	**1**	**5**	**100**	**1**	**1**	**1**
Sample Matrix:				**GW**	**GW**	**GW**	**GW**	**GW**	**GW**	**GW**
Analyte	**CAS#**	**MSCUAR**	**MSCUANR**	**CONC**	**CONC**	**CONC**	**CONC**	**CONC**	**CONC**	**CONC**
Volatile Organics										
Benzene	71-43-2	5	5	**6.7**	**5.7**	**661**	**1200**	1.3	ND (0.50)	ND (0.50)
Toluene	108-88-3	1000	1000	81.7	0.80 J	7.4	**15800**	1.5	0.96 J	ND (1.0)
Ethylbenzene	100-41-4	700	700	14.4	7.2	147	**2480**	0.76 J	ND (1.0)	ND (1.0)
Total Xylenes	1330-20-7	10000	10000	67.4	1.3	545	**15500**	4.6	2.9	ND (1.0)
MTBE	1634-04-4	20	20	ND (1.0)	ND (1.0)	ND (5.0)	ND (100)	ND (1.0)	ND (1.0)	ND (1.0)
Naphthalene	91-20-3	100	100	50.5	**130**	46.9	ND (500)	ND (5.0)	ND (5.0)	ND (5.0)
Cumene	98-82-8	840	3500	42.8	81.8	32.9	99.5 J	ND (1.0)	ND (1.0)	ND (1.0)
1,2,4-TMB	95-63-6	130	530	5.1	ND (2.0)	118	**1750**	1.2 J	ND (2.0)	ND (2.0)
1,3,5-TMB	108-67-8	130	530	1.3 J	ND (2.0)	33.8	**424**	ND (2.0)	ND (2.0)	ND (2.0)

NOTES:

ND- Not Detected Or Detected Below The Reporting Limit.

J- Indicates an Estimated Value

TMB - Trimethylbenzene; MTBE - Methyl Tert Butyl Ether; Cumene - Isopropylbenzene

Number in Parentheses Represents Reporting Limit (RL)

All Results Reported in Micrograms per Liter (µg/l)

DATA HIGHLIGHTED IN BLUE REPRESENTS REPORTING LIMIT THAT EXCEEDS PADEP STANDARD

DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED

DATA HIGHLIGHTED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS PADEP STANDARD

MSCUAR: Medium-Specific Concentrations for Used Aquifers, Residential

MSCUANR: Medium-Specific Concentrations for Used Aquifers,non- Residential

TABLE 3
SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS
7040 Mill Creek Road
Levittown PA, 19057
PI# 09-43609

Sample ID				SS-1A	SS-2
SAMPLE DATE:				3/5/2024	3/5/2024
SAMPLE MATRIX:		Residential SV_{SS}	Non-Residential SV_{SS}	Soil Gas	Soil Gas
ANALYTE	CAS	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
VOLATILE ORGANICS					
Benzene	71-43-2	120	2000	ND (2.6)	2.7
Toluene	108-88-3	200,000	2,800,000	ND (3.0)	18
Ethylbenzene	100-41-4	370	6,300	ND (3.5)	2.7 J
Xylenes (Total)	1330-20-7	4,000	56,000	ND (3.5)	62
MTBE	1634-04-4	3600	61000	ND (2.9)	ND (2.9)
Naphthalene	91-20-3	28	460	ND (4.2)	ND (4.2)
Cumene	98-82-8	16,000	220,000	ND (3.9)	ND (3.9)
1,2,4-TMB	95-63-6	2,400	34,000	ND (3.9)	5.9
1,3,5-TMB	108-67-8	2,400	34,000	ND (3.9)	5.4

NOTES:

All results compared with the PADEP's guidance document#261-0300-101,September 29, 2022 for Near Source Vapor Intrusion Screening Values.

SV_{SS} -Subslab soil gas Statewide health standard vapor intrusion screening values

MTBE -Methyl Tert-Butyl Ether

TMB -Trimethylbenzene

ND -Not Detected

J -Estimated Value

DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED

DATA HIGHLIGHED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS PADEP STANDARD

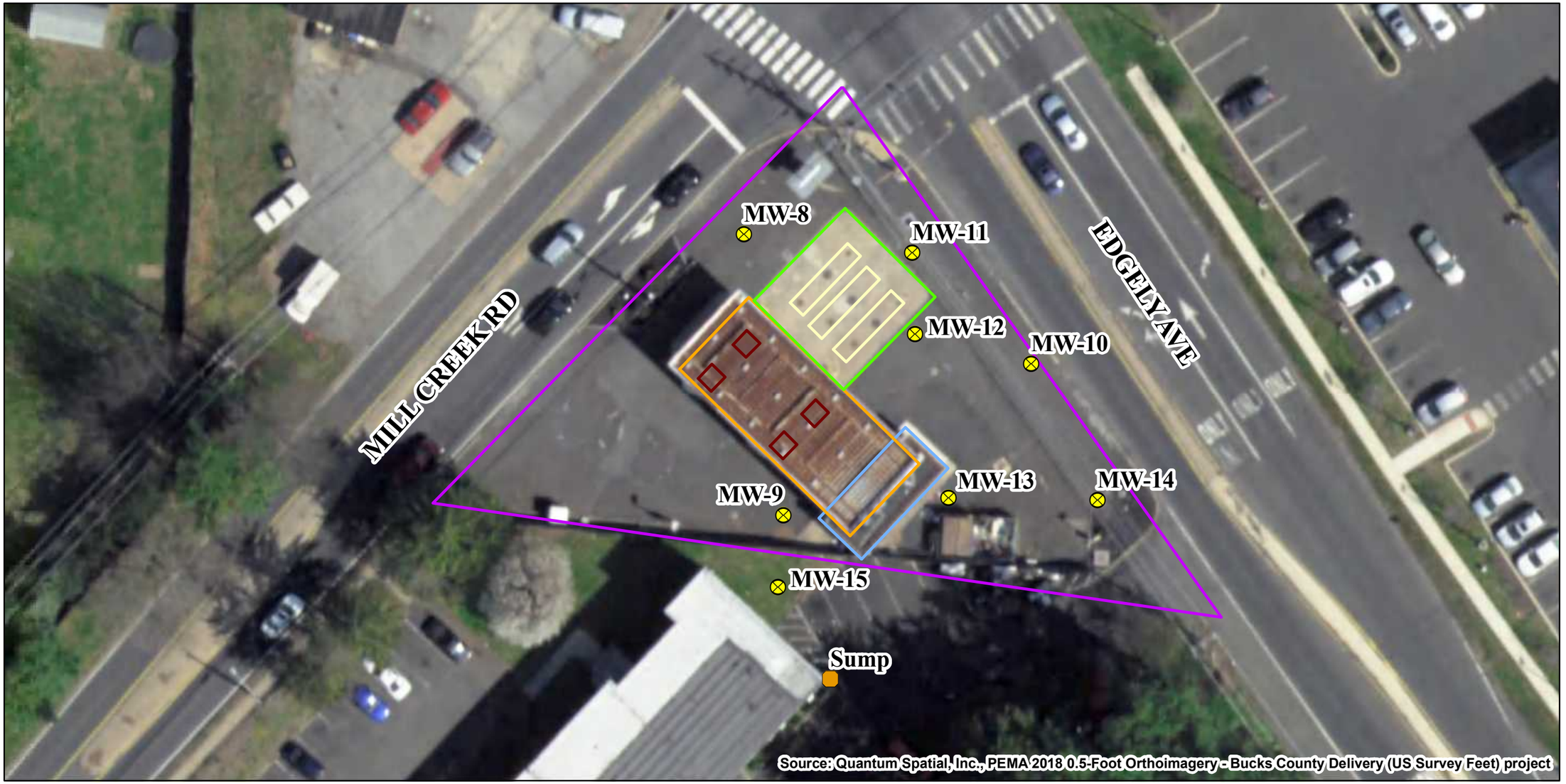
TABLE 4
SOIL SAMPLE ANALYTICAL RESULTS
SUNOCO
7040 MILLCREEK
LEVITTOWN PA

GECR Project Number:	**P-242**			
Sample ID:		**Soil SHS MSCs Residential**	**Soil SHS MSCs NonResidential**	**SB-07**
Sample Date:				**3/5/2024**
Sample Depth:				**10.5' - 11'**
Matrix:	**CAS#**			**Soil**
Volatile Organics				
Benzene	71-43-2	0.13	0.13	ND (0.00048)
Toluene	108-88-3	44	44	ND (0.00095)
Ethylbenzene	100-41-4	46	46	ND (0.00095)
Total Xylenes	1330-20-7	990	990	ND (0.00095)
MTBE	1634-04-4	0.28	0.28	ND (0.00095)
Naphthalene	91-20-3	25	25	ND (0.0048)
Cumene	98-82-8	600	2500	ND (0.0019)
1,2,4-TMB	95-63-6	73	300	ND (0.0019)
1,3,5-TMB	108-67-8	23	93	ND (0.0019)
General Chemistry				
Solids, Percent				87.30%

NOTES:
ND- NOT DETECTED or detected below the reporting limit.
MTBE - Methyl Tert Butyl Ether
Cumene - Isopropylbenzene
TMB - Trimethylbenzene
Number in Parentheses represents the Reporting Limit (RL)
All Results Reported in mg/kg

DATA HIGHLIGHTED IN GREY REPRESENTS VALUE DETECTED
DATA HIGHLIGHTED IN YELLOW REPRESENTS ANALYTICAL RESULT EXCEEDS PADEP STANDARD

Statewide Health Standards, Medium-Specific Concentrations (Mscs) For Organic Regulated Substances In Soil, Soil to Groundwater Numeric Values



Legend

- Monitoring Wells
- Sump
- Site Boundary
- Tank Field
- Dispenser Area
- Convenience Store
- Dispensers
- USTs

N

1 inch = 30 feet

0 15 30 60 Feet

Site Map of Pertinent features with Surveyed Sump and Monitoring Well Locations

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

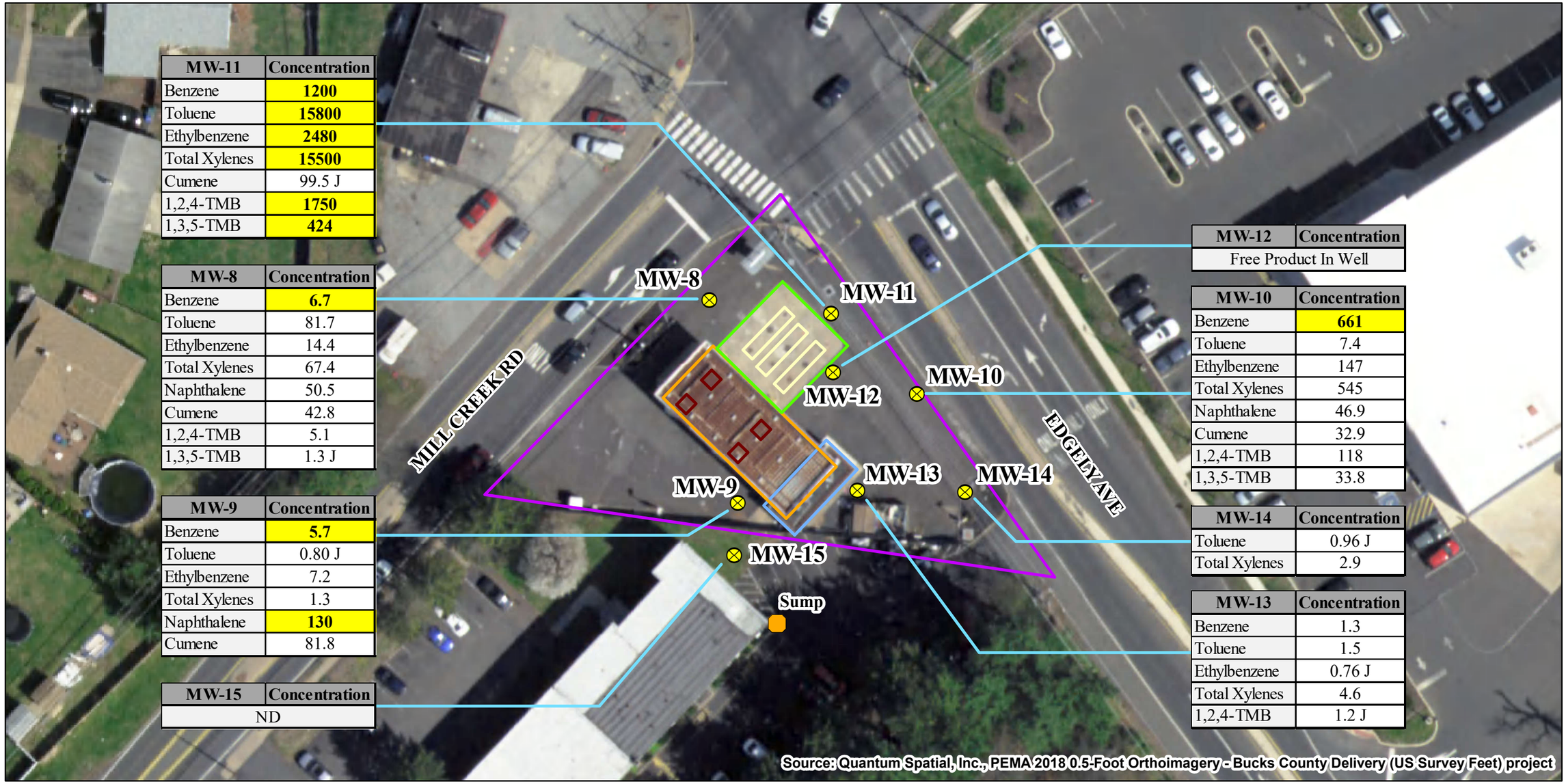
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/23/2024

GECR Project #: P-242

Project Manager: Martin Ebel

Prepared By: Ashley Peoples



MW-11	Concentration
Benzene	**1200**
Toluene	**15800**
Ethylbenzene	**2480**
Total Xylenes	**15500**
Cumene	99.5 J
1,2,4-TMB	**1750**
1,3,5-TMB	**424**

MW-8	Concentration
Benzene	**6.7**
Toluene	81.7
Ethylbenzene	14.4
Total Xylenes	67.4
Naphthalene	50.5
Cumene	42.8
1,2,4-TMB	5.1
1,3,5-TMB	1.3 J

MW-9	Concentration
Benzene	**5.7**
Toluene	0.80 J
Ethylbenzene	7.2
Total Xylenes	1.3
Naphthalene	**130**
Cumene	81.8

MW-15	Concentration
ND	

MW-12	Concentration
Free Product In Well	

MW-10	Concentration
Benzene	**661**
Toluene	7.4
Ethylbenzene	147
Total Xylenes	545
Naphthalene	46.9
Cumene	32.9
1,2,4-TMB	118
1,3,5-TMB	33.8

MW-14	Concentration
Toluene	0.96 J
Total Xylenes	2.9

MW-13	Concentration
Benzene	1.3
Toluene	1.5
Ethylbenzene	0.76 J
Total Xylenes	4.6
1,2,4-TMB	1.2 J

Source: Quantum Spatial, Inc., PEMA 2018 0.5-Foot Orthoimagery - Bucks County Delivery (US Survey Feet) project

Legend

- Monitoring Wells
- Sump
- Site Boundary
- Tank Field
- Dispenser Area
- Convenience Store
- Dispensers
- USTs

Results Reported in (µg/l)
J Indicates Estimated Value
Highlights indicate values which exceed PADEP Standards

N

1 inch = 40 feet

0 20 40 80 Feet

Figure: Compound Distribution Map for April 2024 Groundwater Sampling Event

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

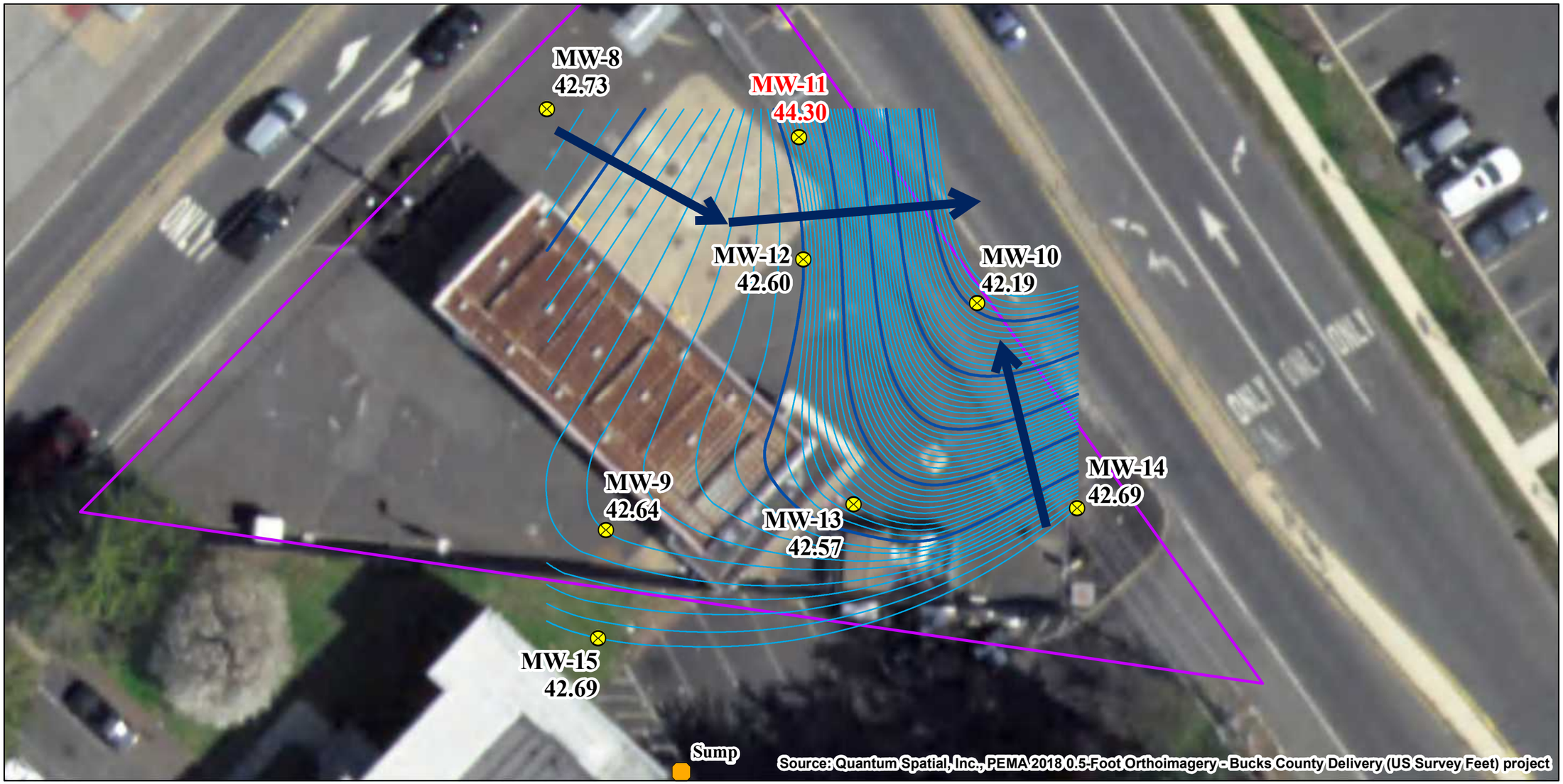
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/16/2024

GECR Project #: P-242

Project Manager: Martin Ebel

Prepared By: Ashley Peoples



Legend

- Sump
- Monitoring Wells
- Site Boundary

Contour Interval

- 0.01 ft
- 0.1 ft

Flow Direction

N

MW-11 Excluded from groundwater contours due to rapid increase in groundwater elevation

1 inch = 20 feet

0 10 20 40 Feet

Groundwater Contour Map for April 2024 Groundwater Sampling Event

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

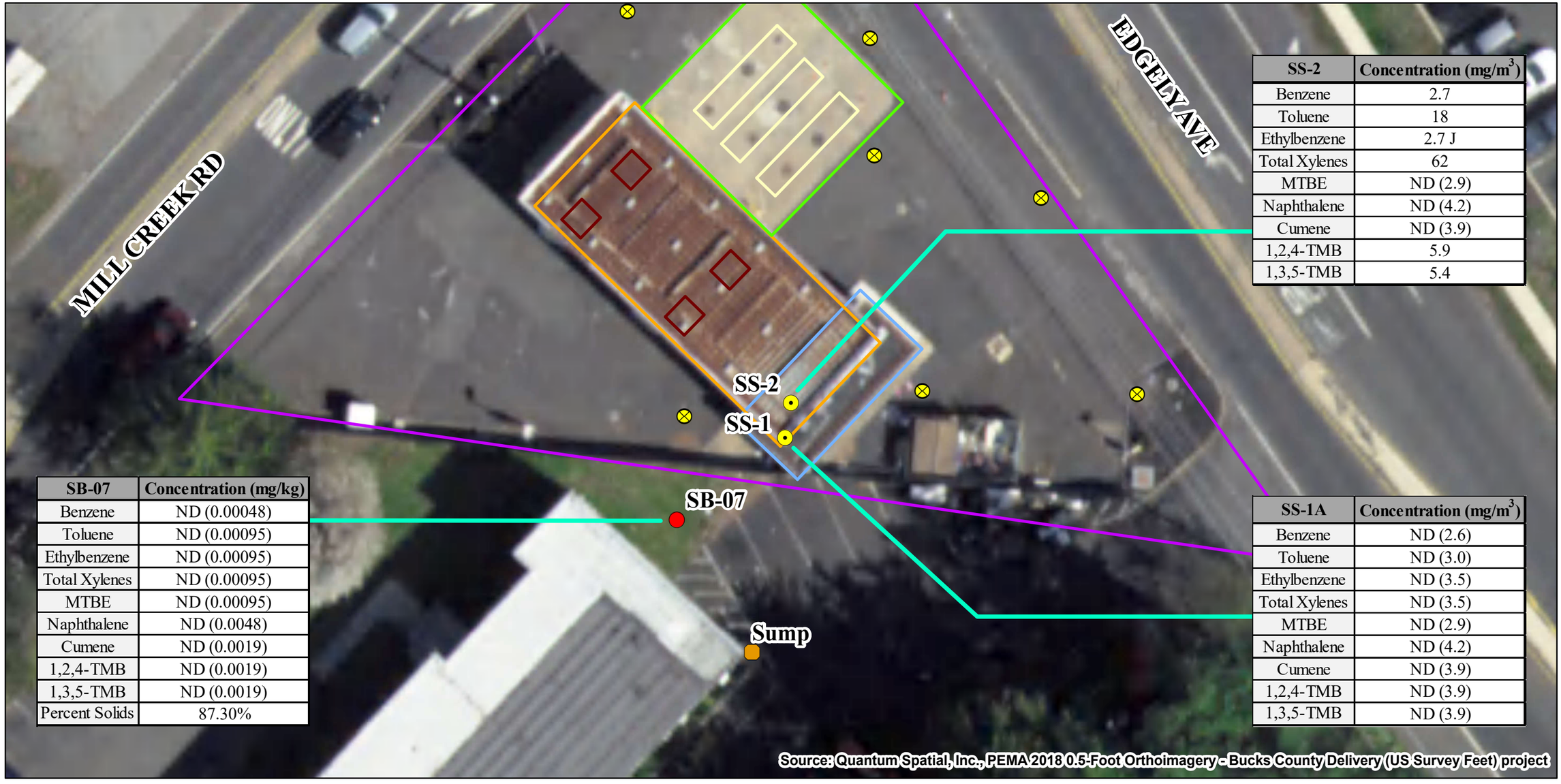
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/22/2024

GECR Project #: P-242

Project Manager: Martin Ebel

Prepared By: Ashley Peoples



SS-2	Concentration (mg/m^3)
Benzene	2.7
Toluene	18
Ethylbenzene	2.7 J
Total Xylenes	62
MTBE	ND (2.9)
Naphthalene	ND (4.2)
Cumene	ND (3.9)
1,2,4-TMB	5.9
1,3,5-TMB	5.4

SB-07	Concentration (mg/kg)
Benzene	ND (0.00048)
Toluene	ND (0.00095)
Ethylbenzene	ND (0.00095)
Total Xylenes	ND (0.00095)
MTBE	ND (0.00095)
Naphthalene	ND (0.0048)
Cumene	ND (0.0019)
1,2,4-TMB	ND (0.0019)
1,3,5-TMB	ND (0.0019)
Percent Solids	87.30%

SS-1A	Concentration (mg/m^3)
Benzene	ND (2.6)
Toluene	ND (3.0)
Ethylbenzene	ND (3.5)
Total Xylenes	ND (3.5)
MTBE	ND (2.9)
Naphthalene	ND (4.2)
Cumene	ND (3.9)
1,2,4-TMB	ND (3.9)
1,3,5-TMB	ND (3.9)

Legend

- Monitoring Wells
- Sump
- **Sample Type**
  - Soil Boring
  - SubSlab Vapor Point
- Site Boundary
- Tank Field
- Dispenser Area
- Convenience Store
- Dispensers
- USTs

N

1 inch = 20 feet

0 10 20 40 60 Feet

Compound Distribution Map for March 2024 Soil and Subslab Vapor Sampling Event

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

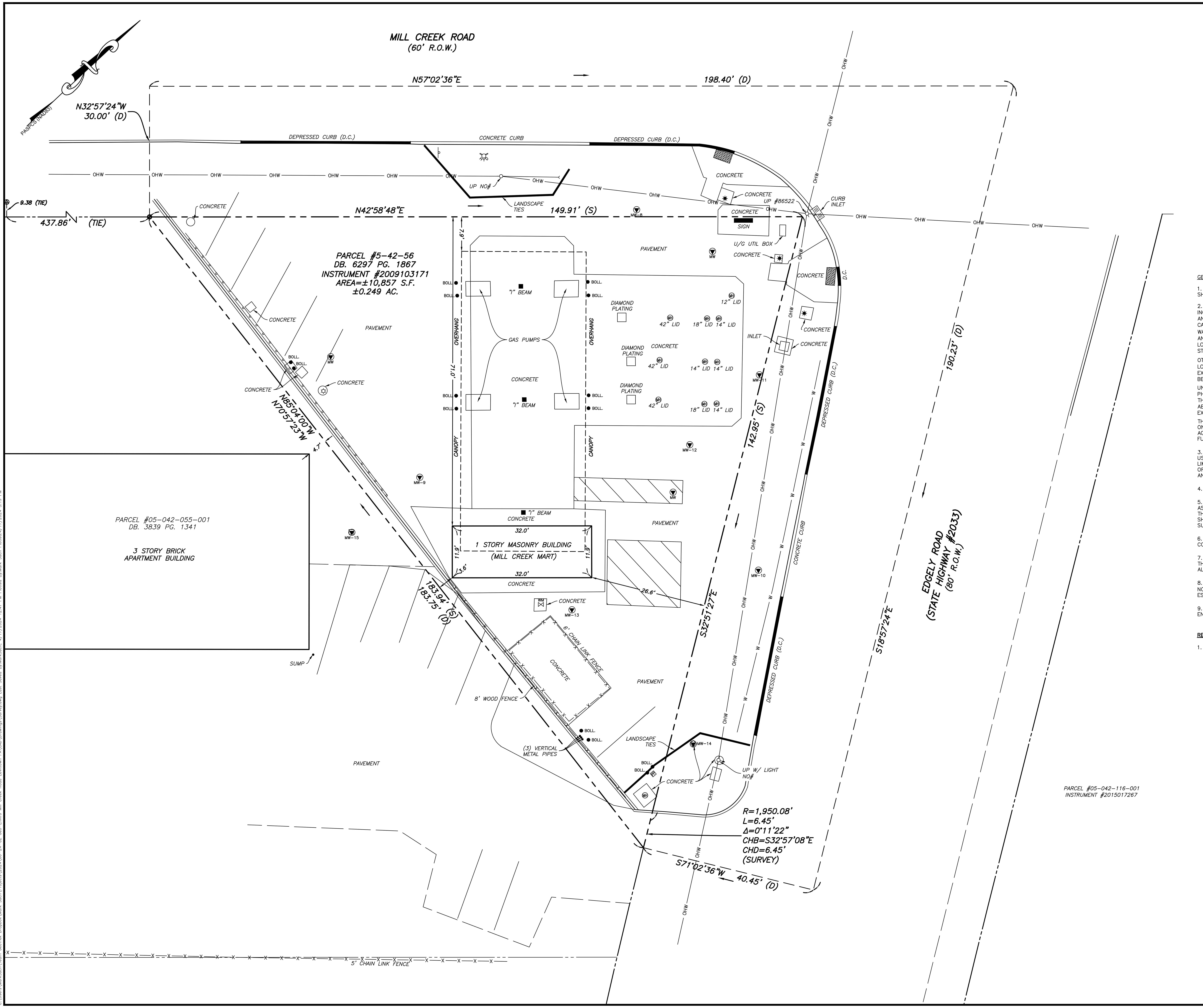
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

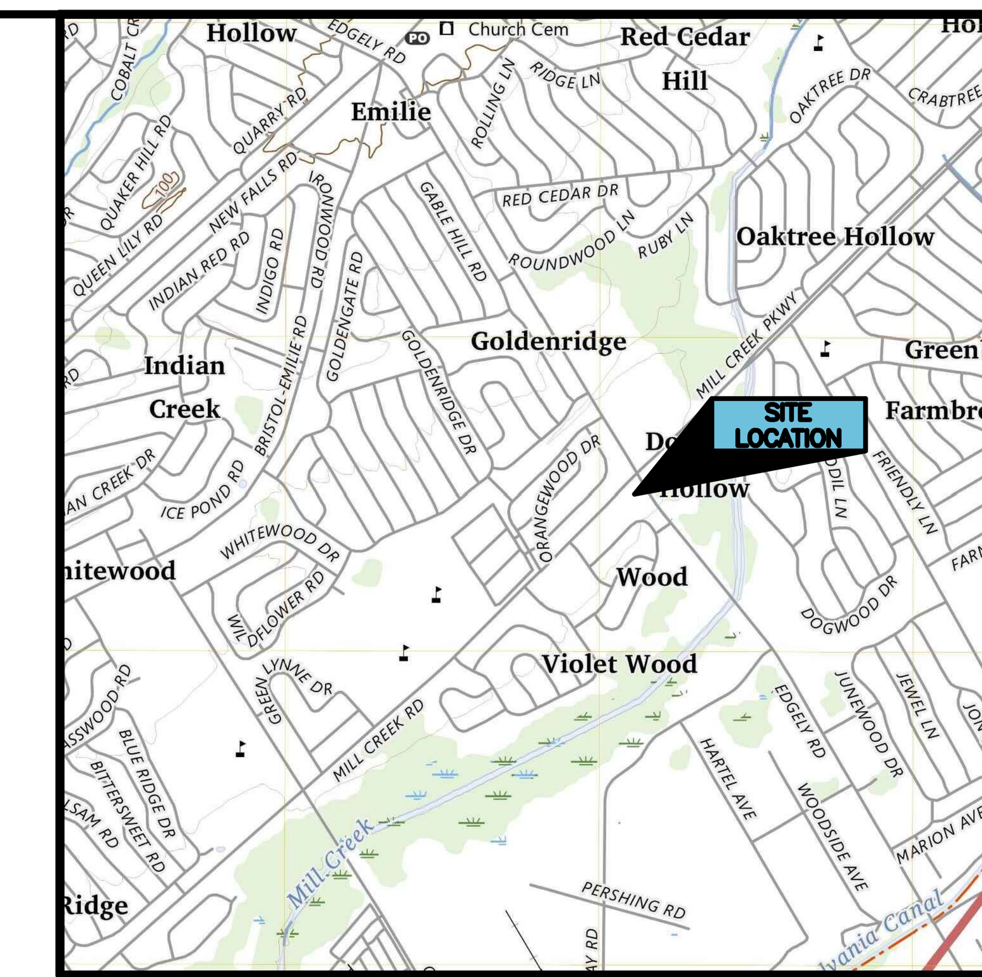
Date: 04/19/2024

GECR Project #: P-242

Project Manager: Martin Ebel

Prepared By: Ashley Peoples





U.S.G.S QUAD MAPS
TRENTON WEST, NJ, PA – 2023
SCALE 1" = 2000'

GENERAL NOTES:

1. PHYSICAL FEATURES OUTSIDE OF THE SITE HAVE NOT BEEN COMPLETELY SHOWN.

2. UNLESS SPECIFICALLY NOTED HEREIN, UTILITIES SHOWN ON THIS PLAN INCLUDING PIPE INVERTS, PIPE MATERIALS, AND PIPE SIZES WERE OBSERVED AND MEASURED AT READILY VISIBLE AND ACCESSIBLE STRUCTURES. CONDITIONS CAN VARY FROM STRUCTURE TO STRUCTURE. THE SURVEYOR DOES NOT WARRANT THAT THE PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE AND OR CONDUIT RUNS ARE THE SAME AS OBSERVED AT THE STRUCTURE LOCATIONS, OR THAT THE PIPE IS A STRAIGHT RUN BETWEEN THE LOCATED STRUCTURES.

OTHER UTILITY (WATER, GAS, ELECTRIC, ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS COMPLETED BY OTHERS, THE LOCATIONS OF EXISTING SURFACE STRUCTURES, AND ANY EXISTING DRAWINGS THAT MAY HAVE BEEN MADE AVAILABLE TO US.

UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. ANY UTILITIES SHOWN ON THE PLAN HAVE NO GUARANTEES THAT THEY ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE. UNLESS EXCAVATIONS ARE NOTED THE EXACT LOCATION AND CONFIGURATION CAN NOT BE DETERMINED.

THE UTILITIES SHOWN ON THIS MAP MAY NOT DISCLOSE ALL UTILITIES PRESENT ON THE SITE. PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION, POSSIBLE LOCATION OF FURTHER UNDERGROUND UTILITIES AND DETAILED LOCATIONS OF THE UTILITIES.

3. NO RESPONSIBILITY OR LIABILITY IS ASSUMED BY THE SURVEYOR FOR THE USE OF THIS DOCUMENT FOR ANY OTHER PURPOSES INCLUDING, BUT NOT LIMITED TO THE USE OF THE SURVEY FOR A SURVEY AFFIDAVIT, FUTURE RESALE OF PROPERTY, CONSTRUCTION OF FENCES OR OTHER MATERIAL ITEMS, OR TO ANY OTHER PERSON NOT LISTED DIRECTLY OR INDIRECTLY.

4. UNDERGROUND ENCROACHMENTS, IF ANY HAVE NOT BEEN SHOWN.

5. NO STATEMENT IS BEING MADE OR IMPLIED HEREON, NOR SHOULD IT BE ASSUMED OR CONSTRUED THAT ANY STATEMENT IS BEING MADE BY THE FACT THAT NO EVIDENCE OF TOXIC WASTE IS PORTRAYED HEREON. THE CLIENT SHOULD PURSUE THESE MATTERS AS ITEMS SEPARATE AND APART FROM THIS SURVEY.

6. OFFSETS SHOWN HEREON ARE NOT TO BE USED AS A BASIS FOR CONSTRUCTION OF FENCES OR OTHER PERMANENT CONSTRUCTION.

7. IF THIS DOCUMENT DOES NOT CONTAIN THE RAISED IMPRESSION SEAL OF THE PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL AND MAY HAVE BEEN ALTERED.

8. HORIZONTAL DATUM IS THE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983, (P.A.S.P.C.S., NAD 83). DATUMS WERE ESTABLISHED ON SITE USING GPS OBSERVATIONS.

9. THE FIELD SURVEY WAS CONDUCTED ON APRIL 5, 2024 BY GEOTREK ENVIRONMENTAL & SURVEYING, LLC.

REFERENCE NOTES:

1. A PLANSET ENTITLED "COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF TRANSPORTATION, DRAWINGS FOR CONSTRUCTION OF STATE ROUTE 2033, SECTION M00, IN BUCKS COUNTY, FROM STATION 18+10 TO STATION 241+50", SIGNED MAY 21, 1990, PREPARED BY CONCEPTUAL PLANNERS &ENGINEERS, INC.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- R.O.W. LINE
- EDGE OF PAVEMENT LINE
- FENCE LINE
- WATER LINE
- GUIDE RAIL
- REBAR FOUND
- CAPPED PIN FOUND
- GUY WIRE
- UTILITY POLE
- UTILITY POLE W/LIGHT
- FIRE HYDRANT
- WATER METER
- SINGLE POLE SIGN
- DOUBLE POLE SIGN
- BOLLARD — BOLL.
- LIGHT
- TRAFFIC LIGHT
- MANHOLE
- MONITORING WELL
- PAY PHONE
- SURVEY — (S)
- DEED — (D)

10 0 10 20
HORIZONTAL SCALE IN FEET
1"= 10'

NO.	DATE	REVISION	DRAWN	CHK	REL

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL LAND SURVEYOR — MICHAEL J. McGUIRE — No. 049389
MICHAEL J. MCGUIRE
PROFESSIONAL LAND SURVEYOR PA LIC. NO. SU049389E

GeoTrek ENVIRONMENTAL AND SURVEYING LLC
ADDRESS:
304 W. ASHLAND STREET
DOYLESTOWN, PA 18901
TELE: (267) 300-1536
CERTIFICATE OF AUTHORIZATION:24GA28306500

SURVEY PLAN
PREPARED FOR
GEO-ENVIRO CONSULTING AND REMEDIATION, LLC
PARCEL #5-42-56
SITUATED IN
BRISTOL TOWNSHIP BUCKS COUNTY PENNSYLVANIA

DATE:	4/12/24
PROJECT NO.:	60-24-02
CADD FILE:	SURVEY
DRAWN BY:	MAS
CHECKED BY:	MJM
SCALE:	1"=10'
SHEET:	1 OF 1

REQUIRED COVER SHEET FOR THE WORK PLAN

WORK PLAN SUBMISSION

Preliminary Document – Submitted at the Request of USTIF for Project Planning Purposes

Date: April 28, 2023

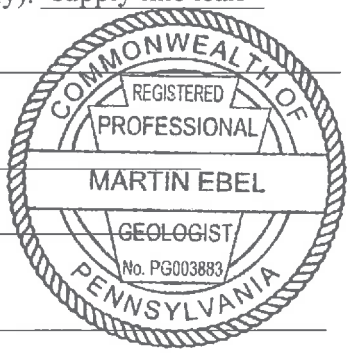
USTIF Claim Number: 20230041

Claimant Name: 740 Millcreek of Pa LLC

Date of Release: March 22, 2023

Regulated Substance Released
- Unleaded gasoline
- Diesel
- Fuel Oil
- Other (Please specify)

Cause/Location of Release (if not known, please specify): supply line leak near dispenser 7/8



DEP Project Officer: Adam Pelak

DEP Reference Number: 58718

Submitted and Sealed By (P.G.): Martin Ebel

Claimant's name and email: Jai Patheja sunocostations@gmail.com

Consultant's email: mebel@geoenviroconsulting.com

WORK PLAN

740 Millcreek of PA LLC
7040 Mill Creek Rd
Levittown, Bucks County, PA, 19057
Facility ID # 09-43609
Incident # 58-718

WORK PLAN

PREPARED FOR:

Mr. Jai Patheja
Mill Creek Sunoco

7040 Mill Creek Road.
Levittown, PA 19057

PREPARED BY:

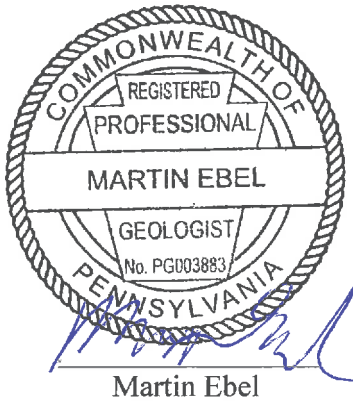
Geo-Enviro Consulting & Remediation, LLC.
371 Hoes Lane, (Suite 200) Piscataway, NJ 08854
Phone NO: (732) 377-2028; FAX: (866) 604-2364

April 2023

Prepared By:

Steven Rhein
(Environmental Scientist)

Reviewed By



Martin Ebel
(Professional Geologist)

Table of Content

TABLES

Table: Well Search

FIGURES

Figure 1: Site Plan with pertinent features

Figure 2: USGS 7.5-minute Quadrangle Map

Figure 3A: Geological Map of the site

Figure 3B: Zoomed in Geological Map of the Site

Figure 4: Map showing sensitive populations withing 1000ft.

Figure 5: Proposed Site Action Locations

APPENDICES

Appendix A: Site Reconnaissance Summary

Appendix B: Site Restrictions

Appendix C: Cost Estimate

Appendix D: February 2002 RACR

Appendix E: UST Documentation

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

Date:	April 1st, 2023
USTIF Claim Number:	
Claimant Name:	740 Millcreek of PA LLC 7040 Mill Creek Road Levittown, Bucks County, PA 19057
DEP Facility ID:	09-43609
Regulated Substance Released:	Unleaded Gasoline
Cause of Release:	Piping between Dispenser and UST leaked, unknown to what extent.
Submitted & Sealed by	Geo-Environmental Consulting and Remediation LLC (GECR)
Claimant's Name & Email:	Jai Patheja; sunocostations@gmail.com
Consultant's email:	srhein@geoenviroconsulting.com

INTRODUCTION

On behalf of Mr. Jai Patheja, owner of the Mill Creek Sunoco, GECR is pleased to submit this Work Plan to USTIF. The subject site is located at 7040 Mill Creek Road, Levittown, PA 19057, Bucks County in Pennsylvania.

SECTION 1-SUBJECT PROPERTY HISTORY

The site history is based upon the information provided by the PADEP. The property owner, Mr. Jai Patheja bought the property in April, 2020. The property lies within the southern portion of Bucks County in Bristol Township, Pennsylvania. The site is currently a retail gasoline service station (09-43609) and convenience store.

The site encompasses approximately 0.285 acres and is located at Latitude 40.142 and Longitude -74.846 as shown in United States Geological Survey (USGS) 7.5-minute West Trenton Quadrangle Map attached as **Figure 1.**

The site contains one UST area, two fuel pump islands with two dispensers each, and a single-story convenience store. Most of the site is covered by asphalt and concrete with a few landscaped areas.

Petroleum products are stored at the site in three USTs. The USTs on-site are all constructed of fiberglass with flex connectors, over fill alarms, and mechanical leak detectors. There is one facility number associated with the site.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

Facility ID 09-43609 – MILL CREEK SUNOCO

740 Millcreek of PA LLC operates the business as a convenience store and gasoline service station under Facility ID 09-43609.

AOC-1 – Installed 02/01/1990.

1. Tank #004 - 10,000 gallons – Regular Unleaded Gasoline, Single Walled Fiberglass, Pressurized, with Leak Detector and Overfill Alarm
2. Tank #005 - 10,000 gallons – Regular Unleaded Gasoline, Single Walled Fiberglass, Pressurized, with Leak Detector and Overfill Alarm
3. Tank #006 - 12,000 gallons – Super Unleaded Gasoline, Single Walled Fiberglass, Pressurized, with Leak Detector and Overfill Alarm

These are the only currently active tanks.

The site has had several previous USTs on-site:

- Tank 611570-001 – 16,000-gallon – Unleaded Gasoline – Closed
- Tank 611571-002 – 8,0000-gallon – Unleaded Gasoline – Closed
- Tank 611572-003 – 16,000-gallon – Unleaded Gasoline – Closed
- Tank 611576-007 – 6,000-gallon – Unknown Substance Code – Closed
- Tank 611577-008 – 6,000-gallon – Unknown Substance Code – Closed

The reasons for the closure of these tanks is unknown at this time.

The site is connected to the following utilities:

- The electricity is provided by PECO Energy Company and is overhead.
- Water is provided by Lower Bucks County Municipal Authority
- Cable and telephone are provided by Comcast and is overhead.
- Onsite Sewer discharges to a sewer in Mill Creek Road

Generally, the surrounding area is a mixture of commercial and residential properties in all directions around the site.

The elevation of the property is approximately 46 feet above mean sea level. Topography exhibits a gentle slope towards the southeast. The nearest wetland is a freshwater forest or a shrub wetland, approximately 400 feet east of the property boundary. The nearest waterbody is Mill Creek, 900 feet east of the property boundary. The Site Reconnaissance Summary is included in **Appendix A**.

A figure showing the pertinent site features is attached as **Figure 2** and The Site Reconnaissance Summary is attached in **Appendix A.** A map showing the mapped bedrock geological formations in the area of the site is provided in **Figure 3A** and **Figure 3B** of this report. A sensitive population map along with the nearest water body is attached as **Figure 4,** the well search table is attached as a **Table** and the relevant ordinance documents are included in **Appendix B**.

In **February 2002**, a RACR was filed with the PADEP for releases from liability under Site-Specific Standards at the site. This report is included as **Appendix D**. In summary, the onsite source of contamination to the subsurface had been removed from the site, there are no risk exposure pathways for soil or groundwater, there is no inhalation risk, the contamination present in the groundwater was attributed to an upgradient source, natural attenuation is predicted to reach levels below standards. No further action was necessary at that time.

UST System Testing and Results

August 2020

A minor modification of the USTs occurred on September 2, 2020. The modifications were done in accordance with manufacture's specifications and current industry standards as well as compliance with Fire Safety Requirements.

The modifications made in accordance with PADEP regulations were the removal and replacement of the dispensers for USTs 4, 5, and 6 (listed as 1, 2, 3 above). The UST Modification report is included in **Appendix E**.

October 2021

On October 29, 2021, a UST Automatic Line Leak Detector Functionality Test was performed by Bristol Environmental (Company Cert # 1052) to check if there were any issues with the line leak detectors. All lines leak detectors are mechanical and they all passed the test. This report is included in **Appendix E**.

January 2022

On January 3, 2022, minor modifications of the USTs were made in accordance with manufacturer's specification and current industry standards. Fire Safety Requirements were not applicable for this modification. For tanks 4, 5, and 6 overfill prevention installation was done through the adding of overfill alarms to each tank. This report is included in **Appendix E**.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

March 2023

During a line test on March 22, 2023, one of the unleaded gasoline lines failed the test so a helium test was also done. The test indicated a problem near dispensers 7/8 on the #7 side relating to Tank #006. Free product was found within the nearby observation well.

A claim was called in with USTIF and GECR went to the site to draw out product from the observation well.

SECTION 2- NATURE OF THE RELEASE

Based upon the information available to GECR at the time of this work plan, the location of the leak was determined to be near dispenser 7/8 on the #7 side. for Tank #006 (12,000-gallon unleaded regular gasoline UST) which had failed the line test. The UST is located in the tank field as shown in **Figure 2**. The line that leaked was removed from usage and subsequently repaired. The data gathered indicates a chronic release; however, the estimated volume of released unleaded gasoline is unknown. The total time of the leak is unknown, and can be between 1 and 11 months, from the last line test to the most recent test done when it seemed that the tank took on water. Bristol Environmental Services was contracted to examine the leak location and provide repairs over several days in late March and early April.

SECTION 3- HYDROGEOLOGY

The subject site is at 7040 Mill Creek Road, Levittown, Bucks County, Pennsylvania, 19057 and is in Bristol Township. The property covers approximately 0.285 acres and is located at latitude 40.142 and longitude -74.846 as shown in USGS 7.5-minute Trenton West Quadrangle Map attached as **Figure 1.**

The site is at an elevation of approximately 46 feet above mean sea level and shows natural gentle slope towards the east. Well logs and soil boring logs from previous investigations to the site are available, showing that the water table is around five feet deep. The exact direction of groundwater flow is unknown but based on the topography of the region, it most likely flows southeast from the site.

Surface water bodies within one mile include Mill Creek (900 feet east, 35 feet above sea level (asl)), the Delaware Canal (5,250 feet southeast, 25 feet asl), two unnamed streams (950 ft northwest, 55 feet asl; 4,500 feet east, 30 feet asl), and wetlands (400 feet east and 1,900 feet south, both at 35 feet asl).

SECTION 4: GEOLOGY

Based on the USGS online search and EMap PA online databased, the bedrock geology below the site is the Wissahickon Formation and Mafic Gneiss, which is lower Paleozoic and characterized by oligoclase-mica schist, hornblende gneiss, general gneiss, and mafic gneiss.

Based on the well logs and soil boring logs, from 0-5 feet is 0-3" blacktop, angular fill with fine brown sand and black organic matter. From 5-13 feet there is brown-gray sand with trace of silt. From 13-25 feet there is brownish-gray sand with miscellaneous pebbles. A map showing the mapped bedrock geological formations in the area of the site is provided in **Figure 3A** and **Figure 3B** of this report.

SECTION 5: DEEP WELL SPECIAL CASE:

Not Applicable.

SECTION 6: RECEPTOR EVALUATION:

Sensitive Receptors, and Nearest Waterbodies

- The nearest school is Ralph Waldo Emerson Elementary School located approximately 2,300 feet southwest of the site,
- Nearest childcare is Child Guidance Center Daycare located approximately 600 feet southwest of the site,
- Nearest elderly care is Mercy Compassionate Home Care located approximately one mile north of the site.
- Nearest Hospital is Lower Bucks Hospital located 2.75 miles southwest of the site, and
- There are no domestic water supply wells located within a 1,000-foot radius of the site boundary.
- Outside of the property to the northwest around to the southeast of the site are all residential properties, except for some commercial sites to the north and west.

These are considered potential receptors to the Site.

The nearest wetland is a freshwater, forested, or shrub wetland located approximately 400 feet east of the property boundary.

GECR will conduct a Pennsylvania Natural Diversity Inventory (PNDI) search within a ½-mile radius of the site and perform a well search during the site characterization process and will notify ICF/PADEP if additional investigation is warranted for any identified receptors.

A map showing the wetlands is provided as **Figure 4,** and the well search is attached as a **Table**.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

SECTION 7: PROPOSED WELLS AND BORINGS:

GECR recommends the following activities for the release that occurred on 03/22/2023:

1. Continue Intermedial Remedial Action for the current release.

2. Conduct a geophysical investigation at the site to confirm the presence of any underground pipelines, utilities, or any other anomalies.

3. Conduct a soil investigation around the tank field area in all directions, the sampling area may extend beyond the UST field depending on PID readings and field observations to determine the extent of soil impact from the release.

4. Soil samples will be collected from both saturated and unsaturated zones based on field observations. Soil cuttings will be drummed up and disposal will be necessary.

5. Since LNAPL has been detected, a groundwater investigation will be necessary and proper procedures pursuant to the PADEP standards will be taken.

6. Depending upon the results of groundwater samples, additional monitoring wells might be necessary. If so, the locations of monitoring wells for groundwater investigation at the site will be evaluated.

7. Any monitoring wells will be developed by the well drillers upon well completion. Monitoring well development will be conducted in accordance with standard industry practices and the PADEP Land Recycling Technical Guidance Manual (TGM).

8. After installation, wells will be surveyed for position in order to verify their location.

9. The monitoring wells will be sampled twice, the initial sampling round will be collected at least 14 days after monitoring well development and the groundwater sampling rounds will be separated by at least 60 to 90 days to comply with Section II(B)(3)(c)(i) of the PADEP Land Recycling TGM. During each round of sampling, the monitoring wells will be purged in accordance with the PADEP Land Recycling TGM.

10. Pending analytical results, the monitoring wells will be gauged, purged, and sampled on a quarterly basis after the second round of sampling and will be conducted in accordance with the applicable methodologies as per the PADEP Land Recycling TGM. The purged water will be treated with a granular activated carbon (GAC) filter and discharged to the ground surface.

11. Prior to the commencement of groundwater sampling, all wells will be gauged for the presence of free product and groundwater levels will be measured using an interface probe. If LPH is

encountered, bailing will be performed to recover the free product. Based upon synoptic groundwater gauging with an electronic depth-to-water meter, the groundwater flow direction for the site will be calculated.

12. If LPH is discovered, monthly gauging of the monitoring wells will be conducted to monitor the presence of LPH/free product in any of the monitoring wells.

13. If LPH is discovered, GECR will conduct interim remedial measures, such as bailing the product or applying sorbent materials or socks, as necessary, in any affected monitoring or recovery well. If this does not suffice, GECR may choose to implement vacuum extraction, as a more aggressive method for the removal of any LNAPL, as necessary.

14. GECR may also conduct a near-source and/or sub-slab vapor intrusion investigations by buildings, the nearest receptor of concern or other underground potential receptors of concern to determine if vapor intrusion has occurred above acceptable health-based risk levels as a result of any release to soil and/or groundwater.

15. Well canvassing within a 1,000 ft radius of the site boundary will be conducted to determine if any domestic, irrigation or any private wells are present. If identified, those wells will be sampled, and the results will be provided to the PADEP and well owner.

16. If the private wells detect contamination associated with site-related constituents, further plan of action will be evaluated.

17. As necessary, GECR shall conduct additional receptor evaluations at the site inclusive of residence and subsurface evaluations, and vapor intrusion investigations of nearby manways, vaults and/or stormwater catch basins at, and immediately surrounding, the Site.

18. As analytical data is gathered and evaluated during the course of the above-referenced investigations, GECR may change or modify the steps and/or actions involved in the remedial activities applied at the subject site.

PROPOSED INTERIM REMEDIAL ACTION

In order to begin dealing with contamination caused by the leak, GECR proposes several interim remedial actions to be taken in order to limit the spread of the contamination as well as begin delineation:

- Continual and regular monitoring of the on-site observation as well as bailing out of free product when necessary.
- The installation of two vapor points on the border of the property with the neighboring apartment building. This is shown in **Figure 5**.
- Fluid recovery events

- If more aggressive action is needed prior to complete delineation, actions will be taken in order to keep the situation under control.

PROPOSED SOIL BORINGS, MONITORING WELLS, AND VAPOR POINTS

As part of site characterization, GECR proposes the following soil investigation of the tank field area to determine the nature and extent of the suspected soil contamination:

- If contamination exists based on visual, olfactory, or analytical observations (e.g. PID) in the soil, further characterization will be conducted to delineate impacted soil by collecting additional soil samples.
- During the soil sampling, if the groundwater is encountered or if the soil sampling results exceed PADEP applicable soil standards, a groundwater investigation will be conducted.
- If the soil or groundwater sampling results exceed the PADEP applicable vapor intrusion standards, vapor intrusion sampling will be conducted.

The cost estimate to perform this site characterization is included in **Appendix C**.

Direct-Push Soil Boring Investigation

To investigate the reported release on 03/22/2023, GECR proposes to conduct soil borings advanced into the overburden using direct push sampling methodology. This shall be completed to characterize/delineate the soil at the site both horizontally and vertically. The locations of the soil borings shall be performed around the unleaded gasoline UST tank field area and the approximate location of the leak (Area #1).

Initial Soil Sampling

In order to investigate the impact of the release on the overburden soil, GECR is proposing:

- Conduct soil sampling at approximately eight initial soil borings locations around Area #1 (SB-1 through SB-8) around all accessible directions approximately 20 ft – 30 feet apart.
- The soil borings will be advanced to the depth of approximately 10 feet, bedrock refusal or groundwater, whichever is encountered first. The soil samples retrieved from the sampling liners will be screened with a calibrated photo-ionization detector (PID) instrument and soil samples with the highest meter readings shall be collected for laboratory analyses.
- The samples will be sent to the PADEP certified laboratory, in an ice-filled cooler maintained at a temperature from 4 degree Celsius for analyses for the PADEP's shortlist unleaded gasoline parameters.
- Soil boring logs shall also be interpreted by a GECR environmental scientist and confirmed for accuracy by a PA licensed Professional Geologist (PG).

- Vacuum cleaning or soft digging is also recommended, prior to advancement of the soil boring into the subsurface, to approximately 5 feet below the ground surface (bgs) at each location to prevent the damage/breakage of product piping, vapor recovery lines, or subsurface utilities during the drilling activities.

The actual locations and the total number of soil borings will be determined/confirmed based upon geophysical survey/soft dig activities. The proposed soil sample locations are shown in **Figure 5.**

Delineation Soil Sampling

If the soil sampling results detect contamination that needs further characterized, additional delineation soil sampling will be conducted, as necessary. If appropriate, GECR will recommend additional soil borings to determine the extent of soil impacts associated with the release.

- At the time of initial soil sampling, if high PID readings are measured in the soil sample, delineation borings will be conducted 5-10 ft away from the initial soil borings in all accessible directions.
- The soil borings will advance to a depth of approximately 15-20-ft, bedrock refusal or groundwater, whichever is encountered first. Each liner retrieved shall be screened with a calibrated PID instrument and soil samples with the highest PID readings shall be collected for laboratory analyses.
- These delineation soil samples will be kept on hold, if the related initial soil samples detect exceedances of PADEP's applicable soil standards, then the delineation soil samples will be analyzed for PADEP's shortlist unleaded gasoline constituents.
- At this time the exact number of delineation soil borings cannot be determined.
- Soil boring logs shall also be interpreted by a GECR environmental scientist during the investigation and confirmed for accuracy by a PADEP licensed PG.
- Vac-clearing or soft digging is also recommended to approximately 5 feet bgs at each soil boring location to prevent the breakage of product piping, vapor recovery lines, or subsurface utilities during the boring advancement activities.

Reporting

The findings of the analytical data collected for soil quality, as proposed above, shall be documented in a Site Characterization/Remedial Action Plan (SCR/RAP) that will be submitted to the PADEP for review and approval.

Proposed Groundwater Monitoring Well Installations

To investigate the reported release of 03/22/2023, GECR proposes the following if groundwater or bedrock is encountered before the extent of clean soil are determined to be vertically delineated in the subsurface:

- Installation of temporary well points at the soil boring locations with the highest PID readings.

- Grab groundwater samples will be collected and analyzed for the PADEP's shortlist unleaded gasoline parameters to confirm if the monitoring well installations are necessary.
- Based on the analytical results of the proposed soil boring and/or temporary well point investigations, permanent monitoring and/or recovery wells will be installed to assess groundwater quality conditions at the site, as necessary.
- GECR understands the temporary well sampling results may not be sufficient in the evaluation of the groundwater quality at the site but will be evaluated to support the placement of permanent monitoring wells that may be required at the site.

At this point, the extent of contamination, the depth to groundwater or bedrock at the site are unknown. Determination will be done based on site observations and site analytical's (e.g. PID readings).Therefore, GECR is proposing the following scope of work, pending sampling results indicate contamination beneath the site:

- Three monitoring wells advanced to a depth of 10-15 feet, constructed of 4-inch diameter PVC depending upon the groundwater conditions encountered during drilling activities. 4-inch diameter wells will allow for both sampling and vacuuming out of material if need be.
- The wells will be flush-mounted, screen intervals from approximately 3 feet to 13 feet deep. Ultimately, the well screen interval will be selected to intercept the water table, as directed by a PA licensed PG, based on the depth of the saturated zone at the time of the investigation.
- All the groundwater samples shall be analyzed for water quality analyses for PADEP's shortlist of unleaded gasoline parameters for two rounds (60 to 90 days apart) and thereafter scheduled for quarterly sampling, pending results.
- All proposed soil boring and monitoring well locations will be surveyed by a PA licensed surveyor.

The proposed monitoring wells locations are presented in **Figure 5.**

Reporting

The findings of the analytical data collected for soil and groundwater quality as proposed above shall be documented in the SCR/RAP for the service station.

Vapor Intrusion

To investigate the indoor air quality at the nearest receptor and the nearest residence, the office area of the current convenience store, GECR may recommend vapor intrusion investigations pending soil and/or groundwater results. This investigation is subjected to change pending the soil and groundwater sampling analytical results above their respective vapor screening levels. Currently, GECR initially and tentatively proposes the following:

- Two sub-slab vapor intrusion points at locations in front of the site-building (convenience store).
- Two vapor points along the boundary toward the townhouse.

- The vapor intrusion points shall be installed one foot above the water table in the overburden to determine if a pathway exists from the release that may adversely affect indoor air quality above acceptable risk limits. These vapor points are proposed to be drilled and installed by a contracted drilling company during the above-referenced investigations.
- Following installation, two rounds of soil gas samples from the vapor points will be collected with airtight connections to vacuum collection Summa canisters. The second round will be approximately three months after the first round.
- The soil gas samples shall be analyzed via analytical method TO-15 for the PADEP's shortlist of unleaded gasoline compounds, including 1,2,4-TMB and 1,3,5-TMB. The results of these samples shall be compared to the PADEP's current sub-surface and near-source screening lists for each of the unleaded gasoline compounds.

This will confirm whether a pathway exists and whether the pathway may adversely affect the indoor air quality of the on-site office area above acceptable indoor air quality criteria. The proposed locations for the proposed on-site, sub-slab and near-source vapor intrusion points are presented in **Figure 5.** Please note that additional VI activities or investigations may also become necessary based on the findings of the initial VI investigation and/or based on the proximity and extent of impact from the current release relative to the locations of other subsurface utilities and access ways at or near the site or other potential offsite receptors, as deemed necessary.

Reporting

The findings of the analytical data collected for vapor quality as proposed above shall be documented in the SCR/RAP for the service station.

Contingency:

If the soil or groundwater sampling results do not exceed the PADEP applicable vapor intrusion standards, the vapor intrusion sampling will not be conducted.

SECTION 8: ADDITIONAL TOPICS

Additional Receptor Evaluations

Additional receptor evaluations that shall be conducted for the site and documented in the forthcoming SCR/RAP include the following:

- The wetlands search in the vicinity of the site shall be conducted to determine whether any mapped wetlands may be at risk near the site.

- An updated receptor search shall be conducted to determine if there are any neighboring medical facilities and/or childcare facilities that are at risk of exposure, within a 1,000-foot radius of the site.

- An investigation of the air quality within adjacent stormwater and/or surface water catch basins via the use of a calibrated PID shall be conducted to assess if any potential adverse exposure pathways exist within these structures.

All the above sensitive receptor searches shall be included and documented in the SCR/RAP for the site. A map showing sensitive properties within a 1,000-foot buffer zone is provided in **Figure 4,** the well search is attached as a **Table** and the relevant ordinance documents are included in **Appendix B**.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

9.0 DISCLAIMER

This Work Plan was prepared for the sole use of GECR. The conclusions provided by GECR throughout this investigation are based solely on the information reported in this document. Future investigative site information not available to GECR at the time of this report preparation may result in a modification of the conclusions stated above. The conclusions presented are based solely on the current regulations and may require revision if future regulatory changes occur. All field activities will be performed in accordance with the generally accepted hydrogeologic practices and under the guidelines set forth by the PADEP Technical Document - Closure of Underground Storage Tanks and Pennsylvania's Land Recycling Program. No other warranty, expressed or implied, is made.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

TABLES

PA Well ID	Well Record	Mapped	County	Municipality	Quadrangle	Latitude (DD)	Longitude (DD)	X	Y	Location Method	Well Address	Well Zip Code	Original Owner	Site Type	Topography	Elevation (ft)	Elevation Method	Elevation Accuracy (ft)	Water Use	Well Use	Data Source	Depth-Data Source	Data Reliability	Permit Number	Local Well ID	Remarks
68921	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/68921	Yes	BUCKS	BRISTOL	TRENTON EAST	40.12722	-74.835	359814.075	4714321.031				DIEGIDIO J	WELL	VALLEY FLAT				INDUSTRIAL	WITHDRAWAL	PAGS WWI PAPER		LOCATION MAY NOT BE ACCURATE (WWI paper)		58249i	
4727	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4727	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12778	-74.82722	400630.233	471627.914				BRISTOL BOROUGH	WELL	VALLEY FLAT	15	INTERPOLATED FROM TOPOGRAPHIC MAP		5 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		BK 1277	
4728	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4728	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12778	-74.8275	400551.941	4716228.202				BRISTOL BOROUGH	WELL	FLAT SURFACE	20	INTERPOLATED FROM TOPOGRAPHIC MAP		10 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		FIELD CHECKED BY REPORTING AGENCY (PaDAq pest. survey)		BK 563	
4729	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4729	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12778	-74.82778	400473.65	4716128.491				BRISTOL BOROUGH	WELL	VALLEY FLAT	20	INTERPOLATED FROM TOPOGRAPHIC MAP		10 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		FIELD CHECKED BY REPORTING AGENCY (PaDAq pest. survey)		BK 562	
69053	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/69053	Yes	BUCKS	BRISTOL	TRENTON WEST	40.13444	-74.83778	397686.738	4740464.923				LEVITTOWN HDWR	WELL					DOMESTIC	WITHDRAWAL	PAGS WWI PAPER		LOCATION MAY NOT BE ACCURATE (WWI paper)		X 3940	
297012	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/297012	Yes	BUCKS	BRISTOL	TRENTON WEST	40.13292	-74.83716	397857.981	4739110.591	Digital Quadrangle Map	2040 EDGELY ROAD, LEVITTOWN		JOE INGRASSIA	WELL					DOMESTIC	WITHDRAWAL	PAGS WWI PAPER		MINIMAL DATA			UPDATED BY AR 2-28-19
646269	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/646269	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12799	-74.82809	400387.252	4717705.305	Commercial Street Atlas Program	7680 North Radcliffe Street		19007 Aqua PA	WELL					PUBLIC SUPPLY	WITHDRAWAL	PAGS WWI ELECTRONIC					
646270	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/646270	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12785	-74.82728	400613.55	4716513.474	Commercial Street Atlas Program	7680 North Radcliffe Street		19007 Aqua PA	WELL					PUBLIC SUPPLY	WITHDRAWAL	PAGS WWI ELECTRONIC					
687948	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/687948	Yes	BUCKS	BRISTOL	TRENTON WEST	40.14	-74.865	390084.731	4761220.292	Commercial Street Atlas Program	3710 Reedman Ave		19057 Oh Jonathan	WELL					DOMESTIC	WITHDRAWAL	PAGS WWI ELECTRONIC					
4731	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4731	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12806	-74.82667	400784.395	4717729.341				BRISTOL BOROUGH	WELL	VALLEY FLAT	10	INTERPOLATED FROM TOPOGRAPHIC MAP		5 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		BK 1278	
4765	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4765	Yes	BUCKS	BRISTOL	TRENTON WEST	40.13194	-74.82889	400168.885	4731144.954				L D DAVIS CO	WELL	VALLEY FLAT	20	INTERPOLATED FROM TOPOGRAPHIC MAP		10 INDUSTRIAL	WITHDRAWAL	USGS - GWSI		FIELD CHECKED BY REPORTING AGENCY (PaDAq pest. survey)		BK 560	
4767	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4767	Yes	BUCKS	BRISTOL	TRENTON WEST	40.13222	-74.82917	400090.976	473247.236				L D DAVIS CO	WELL	VALLEY FLAT	20	INTERPOLATED FROM TOPOGRAPHIC MAP		10 INDUSTRIAL	WITHDRAWAL	USGS - GWSI		FIELD CHECKED BY REPORTING AGENCY (PaDAq pest. survey)		BK 561	
658466	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/658466	Yes	BUCKS	BRISTOL	TRENTON WEST	40.15467	-74.85055	392468.479	4814454.399	Commercial Street Atlas Program	4216 Woodbourne Road		19057 Five Points Retail Properties	WELL						WITHDRAWAL	PAGS WWI ELECTRONIC				05-18-018	
4769	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4769	Yes	BUCKS	BRISTOL	TRENTON WEST	40.1325	-74.82889	400169.64	4733148.939				L D DAVIS CO	WELL	UNKNOWN	20	INTERPOLATED FROM TOPOGRAPHIC MAP		10 INDUSTRIAL	WITHDRAWAL	USGS - GWSI		FIELD CHECKED BY REPORTING AGENCY (PaDAq pest. survey)		BK 559	
4730	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4730	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12806	-74.82611	400940.977	4717128.766				BRISTOL BOROUGH	WELL	VALLEY FLAT	10	INTERPOLATED FROM TOPOGRAPHIC MAP		5 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		BK 1279	
4732	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/4732	Yes	BUCKS	BRISTOL	TRENTON WEST	40.12806	-74.82806	400395.734	4717730.772				BRISTOL BOROUGH	WELL	VALLEY FLAT	20	INTERPOLATED FROM TOPOGRAPHIC MAP		5 PUBLIC SUPPLY	WITHDRAWAL	USGS - GWSI		NOT FLD CHECKED, RPRTING AGENCY CONSIDERS IT OK (DEP WSM, WWI web)		BK 1276	
68990	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/68990	Yes	BUCKS	BRISTOL	TRENTON WEST	40.13194	-74.83528	398382.358	4731151.628				MAGGIO MRS C	WELL	HILLSIDE				DOMESTIC	WITHDRAWAL	PAGS WWI PAPER		LOCATION MAY NOT BE ACCURATE (WWI paper)		X 0180	
296948	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/296948	Yes	BUCKS	BRISTOL	TRENTON WEST	40.132	-74.83163	399402.874	4731169.656	Unknown	7601 BIRSTOL PIKE		19057 FUEL SERV INC	WELL		0			DOMESTIC	WITHDRAWAL	PAGS WWI PAPER		UNKNOWN			UPDATED BY AR 8-18-17
511934	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/511934	Yes	BUCKS	BRISTOL		40.14008	-74.8324	399108.592	4761118.675	GPS - Global Positioning System	220 Haines Rd.		19055 James Buchanan Elementary School	WELL					GEOTHERMAL	GEOTHERMAL - CLOSED LOOP	PAGS WWI ELECTRONIC				W0513233	
511962	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/511962	Yes	BUCKS	BRISTOL		40.13957	-74.85391	393184.461	475951.121	GPS - Global Positioning System	6501 Mill Creek Rd.		19057 Ralph Waldo Emerson Elementary School	WELL					GEOTHERMAL	GEOTHERMAL - CLOSED LOOP	PAGS WWI ELECTRONIC				W0513232	
480856	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/480856	Yes	BUCKS	FALLS		40.1564	-74.8484	394748.898	4820275.534	Commercial Street Atlas Program	297 Cedar Lane, Fairless Hills, PA		Johnathon Way, LLC	WELL					OTHER	WITHDRAWAL	PAGS WWI ELECTRONIC					
485336	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/485336	Yes	BUCKS	BRISTOL		40.14997	-74.83967	397179.942	479723.891	GPS - Global Positioning System	26 Oval Turn Lane		19055 Jeffrey Bartron	WELL						WITHDRAWAL	PAGS WWI ELECTRONIC				05-11-089	
646195	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/646195	Yes	BUCKS	BRISTOL		40.12778	-74.82669	400778.427	4716272.369	GPS - Global Positioning System	7680 North Radcliffe Street		19007 Aqua PA	WELL					PUBLIC SUPPLY	WITHDRAWAL	PAGS WWI ELECTRONIC					
485334	https://www.pagwisdrillerdcnr.pa.gov/PAGEOD/PaGeodSearch/WellInformation/485334	Yes	BUCKS	BRISTOL		40.14997	-74.83967	397179.942	4797231.891	GPS - Global Positioning System	26 Oval Turn Lane		19055 Jeffrey Bartron	WELL					GEOTHERMAL	GEOTHERMAL	PAGS WWI ELECTRONIC				05-11-089	

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

FIGURES

Legend

- Storm Sewer
- Sewer Lines
- Water Lines
- Gas Lines
- Underground Electric
- Site Boundary
- USTs
- Dispensers
- Tank Field
- Convenience Store
- Dispenser Area

N

0 30 60 120 Feet

Figure 1: Site Map with Pertinent Features

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

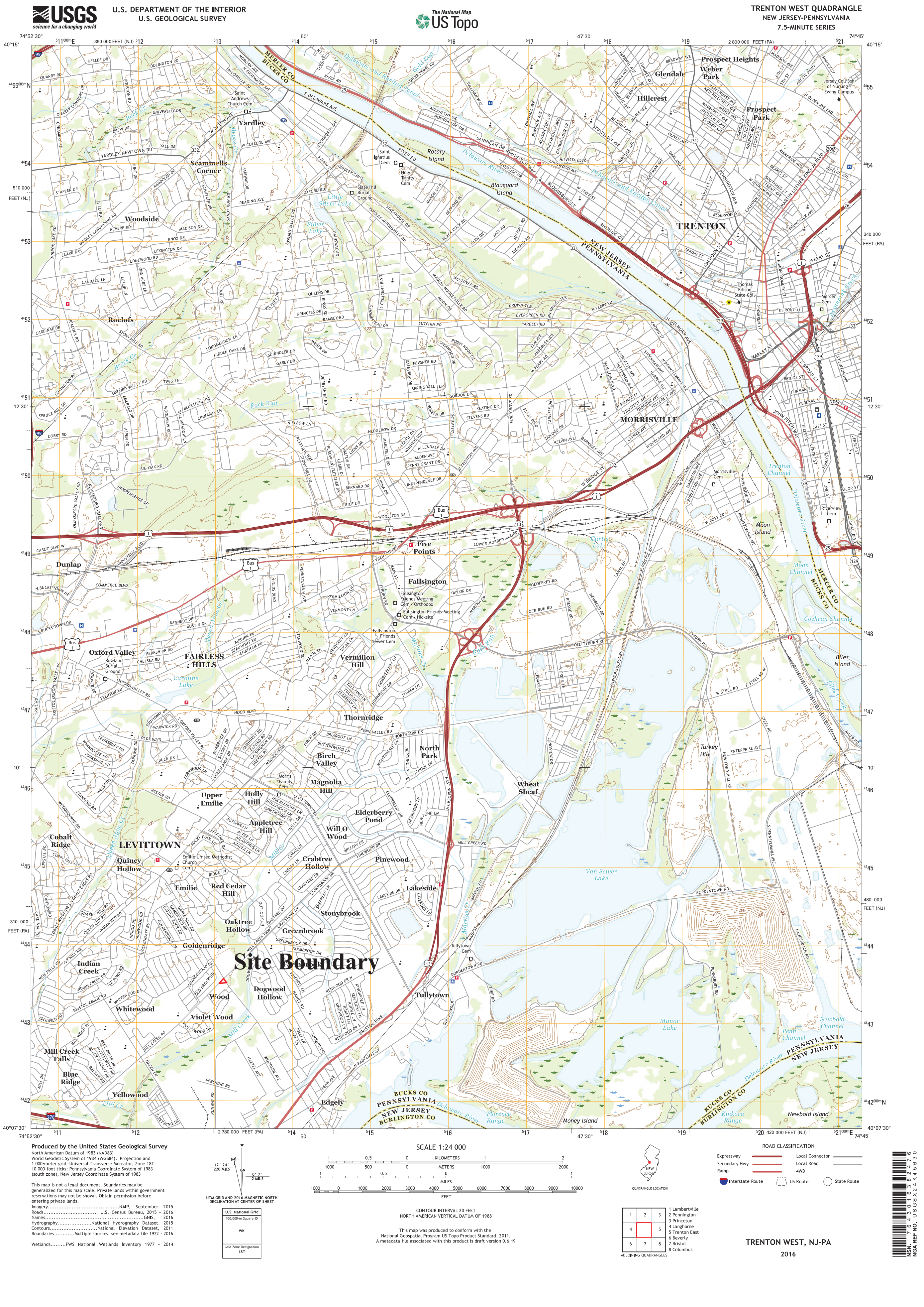
Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/19/2023

Project Manager: Martin Ebel

Prepared By: Steven Rhein

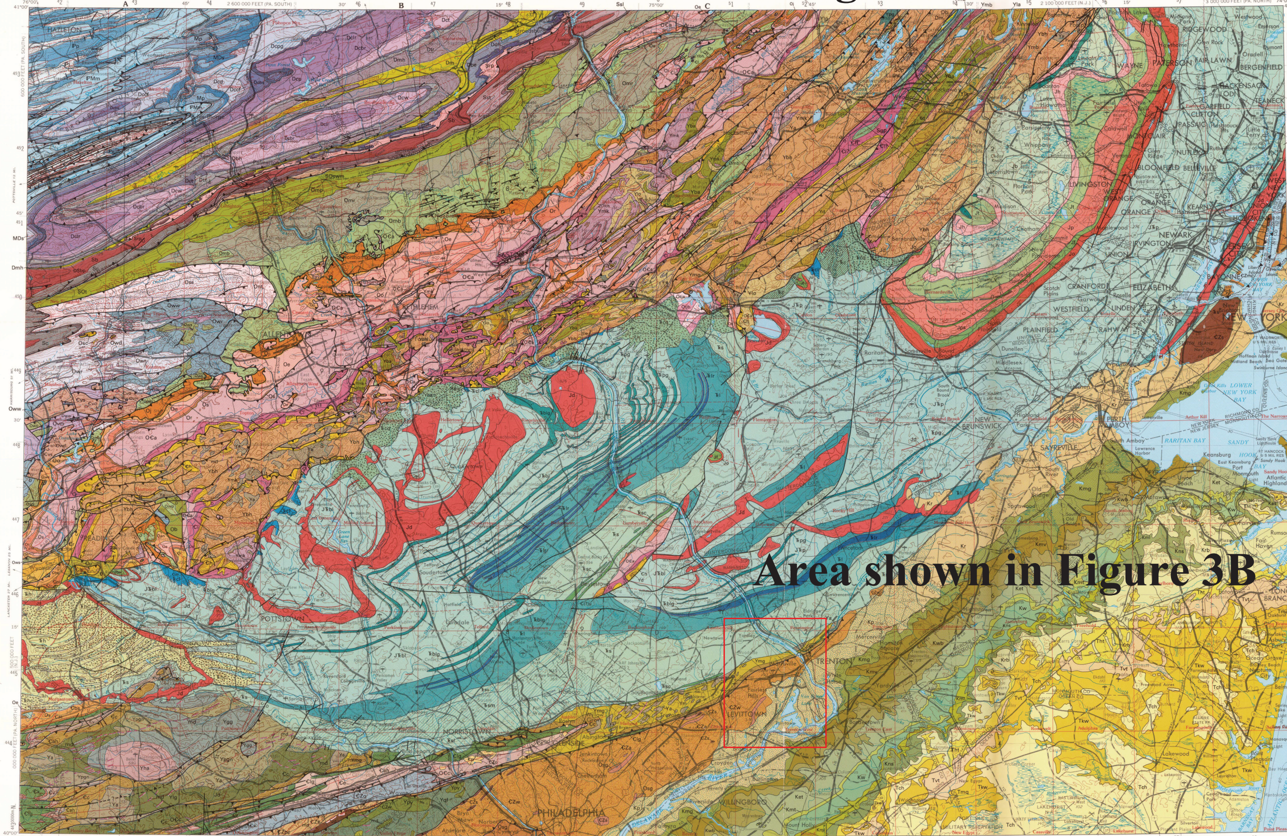
Figure 2


U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
The National Map
US Topo
TRENTON WEST QUADRANGLE
NEW JERSEY-PENNSYLVANIA
7.5-MINUTE SERIES
Site Boundary
TRENTON
MORRISVILLE
LEVITTOWN
FAIRLESS HILLS
Yardley
Tullytown
Delaware River
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
ROAD CLASSIFICATION
TRENTON WEST, NJ-PA
2016

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Figure 3A

MISCELLANEOUS INVESTIGATIONS SERIES
I-1715 (SHEET 1 OF 2)

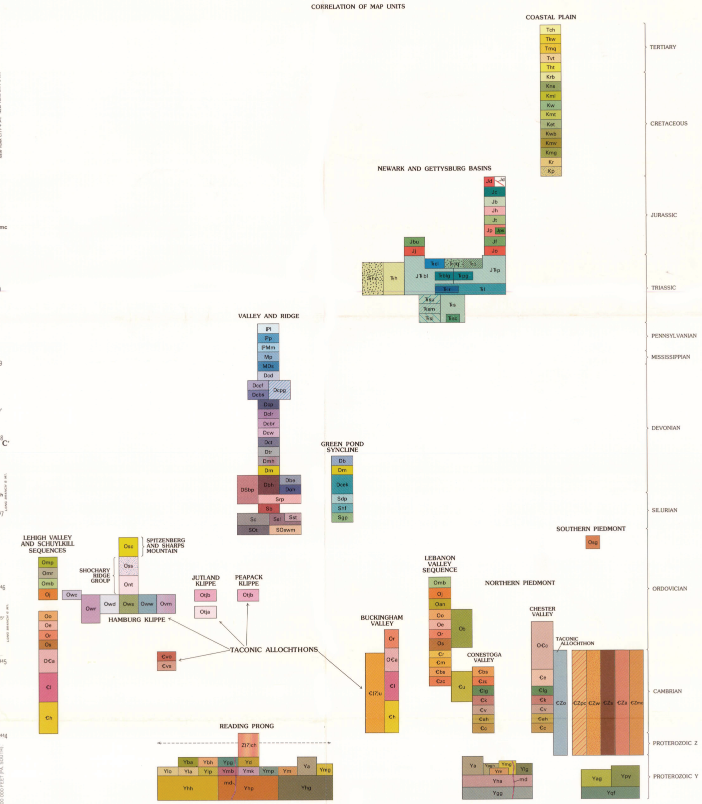


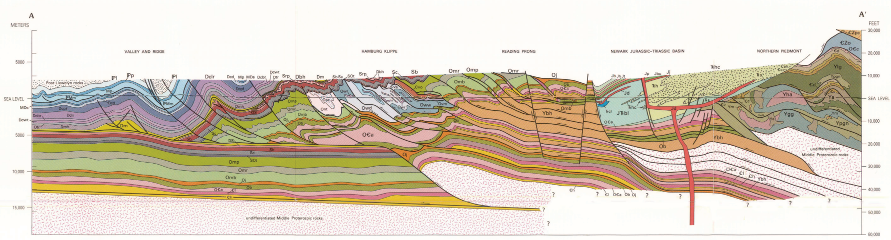
Base from U.S. Geological Survey, 1944
Photorevision as of 1969
10,000-meter Universal Transverse Mercator grid ticks, zone 18, shown in black

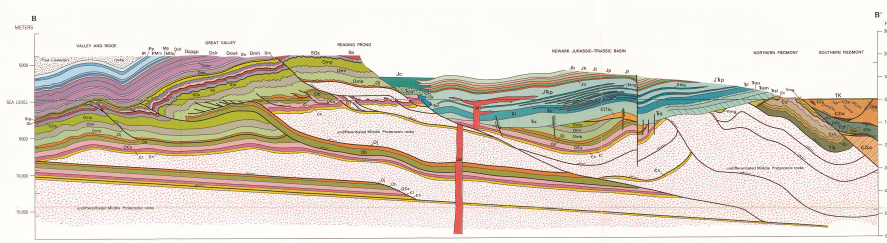
Geology compiled in 1982–85

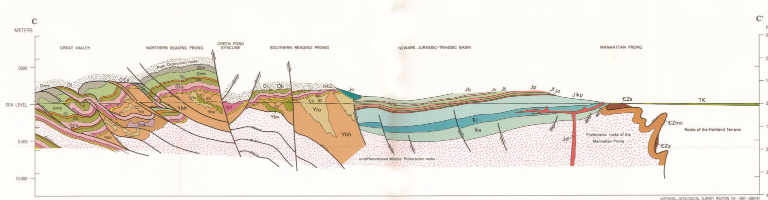
SCALE 1:250 000

CONTOUR INTERVAL 100 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929









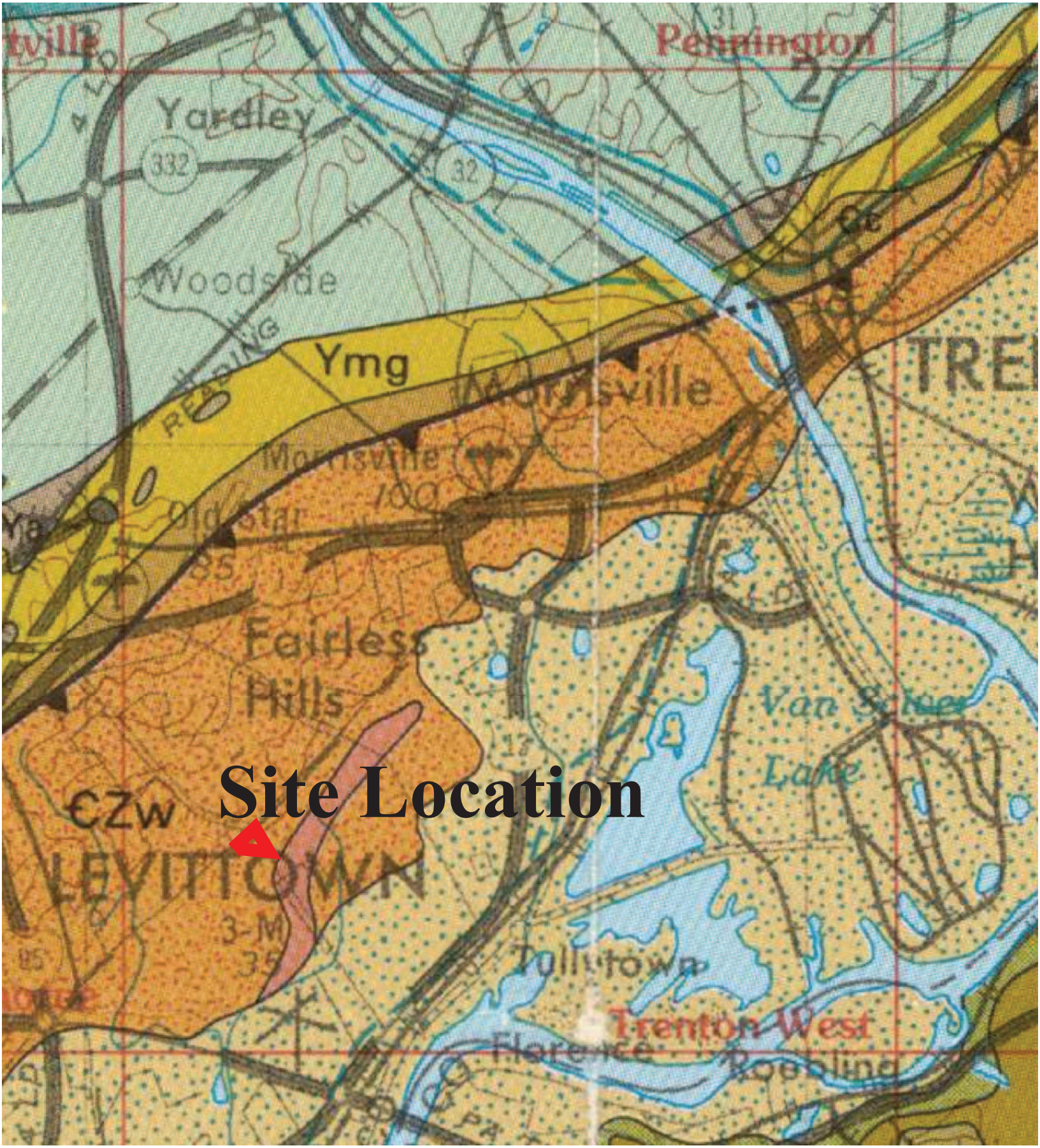
GEOLOGIC MAP OF THE NEWARK 1° x 2° QUADRANGLE, NEW JERSEY, PENNSYLVANIA, AND NEW YORK

By

Peter T. Lyttle and Jack B. Epstein

1987

For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225


Pennington
Yardley
332
Woodside
Ymg
Morrisville
Fairless Hills
Site Location
CZw
LEVITTOWN
Van Sciver Lake
Tullytown
Trenton West
Florence
Roebling

Legend

- Schools in 1000ft
- Streams
- Site Boundary
- Other Zones
- Commercial Zones
- Residential Zones
- Waterbodies
- 1000 ft Buffer
- Wetlands

N

There are no Deed Notice Areas, CEAs/WRAs, or Historic Fills within 1000ft of the site

0 485 970 1,940 Feet

Figure 4: 1000ft Area Map

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/04/2023

Project Manager: Brody Steele

Prepared By: Steven Rhein

Legend

- Proposed Vapor Points
- Proposed Monitoring Wells
- Proposed Soil Borings
- Approximate 2023 Leak Location
- Hydraulic Gradient
- Site Boundary
- Tank Field
- Convenience Store
- Dispenser Area

N

0 30 60 120 Feet

Figure 5: Proposed Monitoring Well, Soil Boring, and Vapor Point Locations

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/05/2023

Project Manager: Martin Ebel

Prepared By: Steven Rhein

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

APPENDIX A
SITE RECONNAISANCE SUMMARY

Site Reconnaissance Summary

The site is at 7040 Mill Creek Road, Levittown, Bucks County, Pennsylvania 19057 located in Bristol Township, and encompasses a triangular area of approximately 0.285 acres. The site contains one Underground Storage Tank (UST) area, two fuel pump islands with two double sided dispensers each, and a single-story convenience store. Most of the site is covered by asphalt and concrete with a few small, landscaped areas. Petroleum products are stored at the site in three USTs. The USTs-are ~~all~~ constructed of fiberglass with flex connectors, over fill alarms, and mechanical leak detectors. Only one facility number is associated with this site. The site is at an elevation of approximately 46 ft above mean sea level showing a natural gentle slope towards the east. The soil and bedrock makeup on the site is predominantly a mix of mafic gneiss and unconsolidated sand, gravel, and clay. Surrounding the site is a predominantly residential area to the south and west, with commercial and farming to the north and east of the property.

The USTs are near the surface, approximately five feet deep with piping branching off from the tanks. A single active observation well is on site, while three abandoned monitoring wells exist on-site. A sewer cleanout is located near to the tank field and dispenser islands, as well as near the location where the leak occurred in the piping. The leak was caused by a small opening in the pipe on an elbow of the piping system near the northern most dispenser.

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

APPENDIX B
SITE RESTRICTIONS

PaGWIS Map Search

You must be zoomed to the level where municipality names appear to search.

○ Multiple Criteria ◉ Map

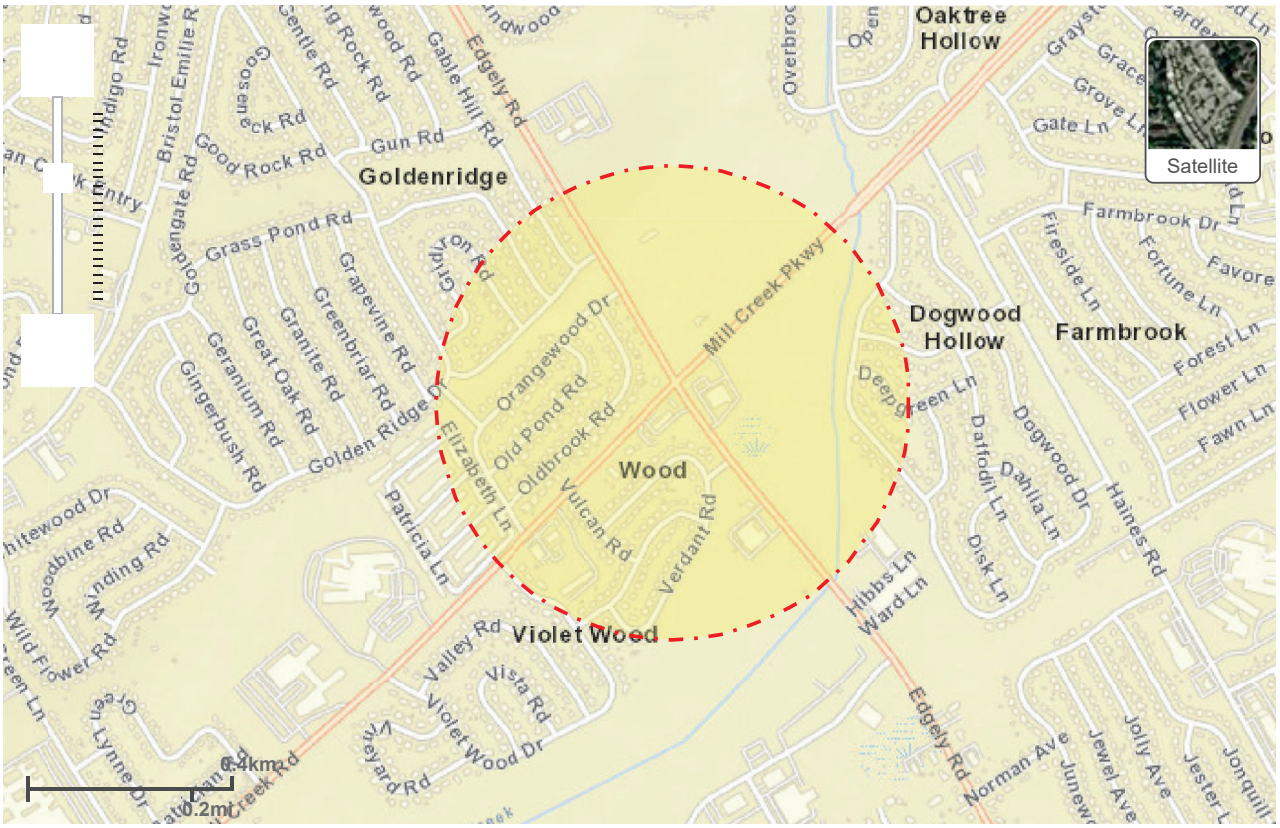
◉ Wells ○ Springs

Data Packages: ◉ General Info ○ Site Info ○ Well Construction ○ Hydrogeologic ○ Geologic

7040 Mill Creek Road, Levittown Go 40 -79 Jump to Point

40.149, -74.841

☐ Include unlocated wells within intersected municipalities Explain



Download Data Package | Clear Selections | Contact Us

'Download Data Package' creates a data package-specific CSV file that you may open or download. If you choose to open the file, it may open in Excel (if you have Microsoft Office installed). Because of the relational nature of the database, there may be more than 1 line per well in the downloaded data. For data on public water supply wells, or water quality data, please see instructions.

Instructions

Total Records To Download : 3 Records

View Items Below

'View Items Below' creates a general list (not data package-specific) that contains links to individual well information. It is based on the search criteria entered. Not all of the records displayed below will necessarily have data corresponding to the data package you have selected.

For correct record counts after changing any search criteria or data package, you must click again on the "View Items Below" button.

Total Records Returned : 3 Records **Click on the column headers to sort the Search Results.**

PA Well ID	Driller	Driller Ref	Date Drilled	Owner	County	Municipality	Image
498872	C S GARBER & SONS INC	MW11077	4/11/2012	DILLON	BUCKS	BRISTOL TWP.	
623875	EICHELBERGERS INC.	DS07032-MW2	5/31/2007	CITGO	BUCKS	BRISTOL TWP.	
623876	EICHELBERGERS INC.	DS07032-MW1	5/31/2007	CITGO	BUCKS	BRISTOL TWP.	

DEPARTMENT OF CONSERVATION & NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
WATER WELL PROGRAM
3240 Schoolhouse Rd
Middletown, PA 17057
717-702-2017

WATER WELL INFORMATION REPORT

PA Well ID: **498872** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**BUDDY & ELIZABETH DILLON**	Original Paper Record Image Available:	**No**
Address of Well:	**115 VIOLETWOOD DRIVE**		
County:	**BUCKS**		
Municipality:	**BRISTOL TWP.**		
Latitude:	**40.13835**	Coordinate Method:	**GPS - Global Positioning System**
Longitude:	**-74.84858**	Data Reliability:	
Description of Well Location and Other Notes:	**MONITORING WELL #P-5 - MANHOLE REMOVED**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**C S GARBER & SONS INC**	License:	**0188**	Driller Well ID:	**MW11077**
Original Well By:	**UNKNOWN**				
Type of Activity:	**Well Abandonment**	Date Drilled:	**4/11/2012**	Drilling Method:	**OTHER/UNKNOWN**
Well Depth (ft):	**10**	Well Finish:			

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**10**	**2**

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):		Yield Measurement Method:	
Water Level when not pumped: (ft below land surface)	**8**	Water Level after yield test: (ft below land surface)	
Length of Yield Test (minutes):		Saltwater Zone (ft):	
Use of Well:	**ABANDONED**	Use of Water:	

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**10**	**CEMENT GROUT W/5% POWDERED BENTONITE**

Depth to Bedrock (ft): Was Well Drilled Into Bedrock? **Yes**

Date Printed: **4/20/2023**

DEPARTMENT OF CONSERVATION & NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
WATER WELL PROGRAM
3240 Schoolhouse Rd
Middletown, PA 17057
717-702-2017

WATER WELL INFORMATION REPORT

PA Well ID: **623875** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**CITGO**	Original Paper Record Image Available:	**No**
Address of Well:	**7039 MILL CREEK RD. 19057**		
County:	**BUCKS**		
Municipality:	**BRISTOL TWP.**		
Latitude:	**40.14167**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-74.84639**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**EICHELBERGERS INC.**	License:	**0198**	Driller Well ID:	**DS07032-MW2**
Type of Activity:	**New Well**	Date Drilled:	**5/31/2007**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**15**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**15**	**10**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**0**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**15**	**4**	**SCREEN**	**PLASTIC**	**10**	**SAND - SCREENED**

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):		Yield Measurement Method:	
Water Level when not pumped: (ft below land surface)		Water Level after yield test: (ft below land surface)	
Length of Yield Test (minutes):		Saltwater Zone (ft):	
Use of Well:	**OBSERVATION**	Use of Water:	**UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**8**	**GRAVEL/SOIL**
8	**15**	**SILT SAND CLAY**

Depth to Bedrock (ft): Was Well Drilled Into Bedrock? **No**

Date Printed: **4/20/2023**

DEPARTMENT OF CONSERVATION & NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
WATER WELL PROGRAM
3240 Schoolhouse Rd
Middletown, PA 17057
717-702-2017

WATER WELL INFORMATION REPORT

PA Well ID: **623876** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**CITGO**	Original Paper Record Image Available:	**No**
Address of Well:	**7039 MILL CREEK RD. 19057**		
County:	**BUCKS**		
Municipality:	**BRISTOL TWP.**		
Latitude:	**40.14167**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-74.84639**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**EICHELBERGERS INC.**	License:	**0198**	Driller Well ID:	**DS07032-MW1**
Type of Activity:	**New Well**	Date Drilled:	**5/31/2007**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**20**	**10**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**0**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**20**	**4**	**SCREEN**	**PLASTIC**	**10**	**SAND - SCREENED**

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):		Yield Measurement Method:	
Water Level when not pumped: (ft below land surface)		Water Level after yield test: (ft below land surface)	
Length of Yield Test (minutes):		Saltwater Zone (ft):	
Use of Well:	**OBSERVATION**	Use of Water:	**UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**14**	**SAND SOIL**
14	**17**	**GRAVEL AND SILT**
17	**20**	**SILT, CLAY, AND SAND**

Depth to Bedrock (ft): Was Well Drilled Into Bedrock? **Yes**

Date Printed: **4/20/2023**

Chapter 201

WATER

[HISTORY: Adopted by the Board of Commissioners (now Township Council) of the Township of Bristol as indicated in article histories. Amendments noted where applicable.]

GENERAL REFERENCES

Uniform construction codes — See Ch. 84. **Sewers and sewage disposal — See Ch. 160.**

ARTICLE I
Public Water System
[Adopted 9-27-1973 by Ord. No. 831]

§ 201-1. Definitions.

Unless the context specifically indicates otherwise, the meaning of the terms used in this article shall be as follows:

AUTHORITY — Bristol Borough Water and Sewer Authority.

OCCUPIED BUILDING — Each single dwelling unit, household unit, flat or apartment unit, store, shop, office, business, commercial or industrial unit or family unit contained within any structure, erected and intended for continuous or periodic habitation, occupancy or use by human beings.

OWNER — Any person vested with ownership, legal or equitable, sole or partial, of any property situated in the Township.

PERSON — Any individual, partnership, company, association, society, corporation or group.

PRIVATE WATER SUPPLY — Any supply of water in the Township, including wells and other similar sources, other than the public water system operated by the Authority.

SERVICE CONNECTION — That part of the water system extending from a water distribution main to the curbline or, if there shall be no curbline, to the edge of the street abutting property affected and including the curb stop, or if no such service connection shall be provided, then "service connection" shall mean that portion of or place in a water main which is provided for the connection of any service line.

SERVICE LINE — A water transmission line extending from an occupied building to its connection with the service connection.

TOWNSHIP — The Township of Bristol, Bucks County, Pennsylvania.

TOWNSHIP ENGINEER — An engineer employed by the Township or an authorized member of his staff.

WATER MAIN — The water distribution lines which are part of the water system.

WATER SYSTEM — Water mains, service connections, service lines, pumping stations, water treatment facilities and all appurtenant facilities operated by the Borough of Bristol or the Authority in furnishing water to the Township.

§ 201-2. Connection to public system required; water meters; private water supplies.

A. Each owner of any occupied building situate on property abutting on any street, alley or right-of-way in which there has been constructed a water main and where any part of such building is within 150 feet of said main shall, at his own expense, install a service line and connect such line with the service connection in accordance with the provisions of this chapter within 60 days after the date of official notice to do so, given in the manner provided by law. In the event any such owner shall refuse or neglect to so connect within said sixty-day period, he shall be deemed to be in violation of this chapter, and the Township Council or its agents may enter upon such property and construct such connection. In such case, the Township Council shall forthwith, upon completion of the work, send an itemized bill of the cost of the construction of such connection to such owner, which bill shall be payable forthwith. In case of neglect or refusal by such owner to pay said bill within 30 days thereafter, it shall be the duty of the Township Council to file a municipal lien. **[Amended 10-20-1992 by Ord. No. 92-17]**

B. Each connection made pursuant to this chapter shall be made in compliance with Chapter 84, Construction Codes, Uniform, including payment of inspection fees which may be required by said chapter. A water meter furnished by the Authority shall be installed for each such connection at such place on the service line as the Authority shall determine.

C. Private water supplies.

(1) No private water supply shall be connected, directly or indirectly, with the water system at any time or be used on any property subject to Subsection A above for human consumption. A private water supply may be used for nonhuman

consumption at properties subject to Subsection A above, but only after written consent by the Township specifying the purposes for which such water may be used.

(2) Each such private water supply shall be abandoned upon the making of connection to the water system (unless its use for nonhuman consumption has been approved by the Township) and, at the request of the Township, shall be filled under its direction and supervision; and any such facility not so abandoned and, if required by the Township, filled, shall constitute a nuisance and such nuisance shall be abated as provided by law at the expense of the owner of such property.

§ 201-3. Connection requirements and permits.

A. No person shall uncover, connect with, make any opening into or use, alter or disturb in any manner any part of the water system without first making application for and obtaining a permit, in writing, from the Township and the Authority.

B. Application to the Township and the Authority for a permit required under this section shall be made by the owner of the property to be served, in such form as may be prescribed by the Township. The application shall be accompanied by any required connection charge and tapping fee imposed by the Authority and any inspection fee imposed by the Township.

C. No person other than the Township or its agents shall make or cause to be made the connection of any property with a service connection until such person shall have fulfilled each of the following conditions:

(1) Such person shall have notified the Township of the desire and intention to connect to a service connection.

(2) Such person shall apply for and obtain a permit as required by this chapter.

(3) Such person shall have given the Township at least 24 hours' notice of the time when such service line is to be connected and such connection made so that the Township may inspect the service line, the work of connection and perform necessary testing.

D. All costs and expenses of construction of a service line and all costs and expenses of connecting such service line to a service connection shall be borne by the owner of the property to be connected; and such owner shall indemnify and save harmless the Township and the Authority from all loss or damage that may be occasioned, directly or indirectly, as a result of the construction of a service line or the connection of a service line to a service connection.

E. Whenever the surface of any public street, sidewalk or cartway is disturbed by the construction of a service line, it shall be the responsibility of the applicant for a connection to obtain street opening permits from the Township or highway occupancy permits from the Pennsylvania Department of Transportation. Unless otherwise required, all surfacing materials must be restored in kind, thickness and construction to the

satisfaction of the Township or of the Pennsylvania Department of Transportation, as the case may be.

§ 201-4. Power of Engineer to enter upon premises.

The Township Engineer and other duly authorized representatives or employees of the Township and the Authority, bearing proper credentials and identification, shall be permitted at all reasonable times to enter upon any premises connected or about to be connected or required to be connected to the water system for the purpose of inspection, observation, measurement, sampling and testing in accordance with the provisions of this article.

§ 201-5. Damage of system prohibited.

No person shall maliciously, willfully or negligently damage, destroy, deface, block or otherwise tamper with any water main, service connection or service line or any other structure or equipment which is part of the water system, or discharge or insert any substance into the water system.

§ 201-6. Violations and penalties; notice.

A. Notice of violation.

(1) Any person who shall violate any provision of this article other than §§ 201-4 and 201-5 shall be served by the Township with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The notice provided for in § 201-2A above shall be deemed to be notice of a violation for this purpose in respect to violations of such section.

(2) The offender shall, within the period of time (if any, otherwise forthwith) stated in such notice, permanently cease all violations.

B. Any person who shall continue any violation beyond the time limit fixed as provided for in Subsection A shall be subject to a fine in an amount not exceeding $600 for each violation. A new and separate violation shall be deemed to have been committed for each day any violation continues beyond such time limit. **[Amended 10-20-1992 by Ord. No. 92-17]**

C. Any person who shall violate any provision of §§ 201-4 and 201-5 shall, upon summary conviction, be subject to a fine not to exceed $600 for each violation, together with costs of prosecution in each case. **[Amended 10-20-1992 by Ord. No. 92-17]**

D. All fines and penalties imposed for violation of any provision of this article shall be paid to the Treasurer of the Township for the use of the Township. Default in payment of the fine and costs shall make the defendant liable for imprisonment for a term not to exceed 30 days.

E. Any person violating any of the provisions of this article, in addition to becoming liable for a fine and penalty, shall become liable to the Township for nay expense, loss or damage occasioned by the Township by reason of such violation.

ARTICLE II
Water Conservation Performance Standards
[Adopted 3-17-1992 by Ord. No. 92-6]

§ 201-7. Conformance required; applicability.

No water shall be provided for internal or external use to any residential, commercial, industrial, agricultural, recreational, governmental or public building or structure of any kind which is constructed or remodeled and in which plumbing, water piping or water fixtures are to be installed, extended or altered in any way and for which construction a permit is required to be obtained from Bristol Township (or would be required but for an exemption from a permit requirement for public or governmental agencies) unless the new, extended or altered plumbing, water piping and other water using fixtures therein conform to the requirements and standards of § 201-8 of this article. The provisions of this article shall apply to any such building or structure for which such a building permit is issued or would otherwise be required to be issued but for such an exemption, on or after the date of adoption of this article.

§ 201-8. Plumbing fixtures and fittings.

A. Water closets and associated flushing mechanisms. The water consumption of water closets shall not exceed an average of 1.6 gallons per flush cycle over a range of test pressures from 20 pounds per square inch to 80 pounds per square inch. The fixture shall perform in accordance with the test requirements of the ANSI A112.19.2M and ANSI A112.19.6M.

B. Urinals and associated flushing mechanisms. Urinal water consumption shall not exceed an average of 1.5 gallons per flush cycle over a range of test pressures from 20 pounds per square inch to 80 pounds per square inch. The fixtures shall perform in accordance with the test requirements of ANSI A112.19.2M and ANSI A112.19.6M.

C. Showerheads. Showerhead discharge rates shall not exceed 3.0 gallons of water per minute over a range of test pressures from 20 pounds per square inch to 80 pounds per square inch. The fixture shall perform in accordance with the test requirements of ANSI A112.18.1M.

D. Faucets. Sink and lavatory faucet discharge rates shall not exceed 3.0 gallons of water per minute over a range of test pressures from 20 pounds per square inch to 80 pounds per square inch. The fixture shall perform in accordance with the test requirements of ANSI A112.18.1M.

§ 201-9. Special provisions.

A. Special purpose equipment. The performance standards of § 201-8 shall not apply to fixtures and fittings, such as emergency showers, aspirator faucets and blowout fixtures, that, in order to perform a specialized function, cannot meet the specified standards.

B. Exemptions. Any person(s) may apply to the Township of Bristol for an exemption to the terms of this article, which may be granted by the Board of Supervisors, upon proof that some other device, system or procedure will save as much or more water as those set forth herein or that those set forth herein cannot be complied with without undue hardship.

§ 201-10. Modifications of standards.

The Board of Supervisors may, from time to time, modify, add to or remove from the standards and restrictions herein.

ARTICLE III
Water Rates
[Adopted 10-11-1994 by Ord. No. 94-12]

§ 201-11. Rate increases authorized. [Amended 10-15-1996 by Ord. No. 96-13; 4-21-1998 by Ord. No. 98-8]

A. The appropriate Township officials and departments shall increase the current per-gallon water rates charged by the Township by 14%, with said increase being retroactive to January 1, 1998.

B. Beginning January 1, 1998, the per-gallon water rates charged by Bristol Township shall be increased on a yearly basis by an amount equal to the consumer price index increase for that year as reported in the Wall Street Journal or other comparable publication, but in no event shall the yearly increase exceed 3%.

C. The total increase defined in Subsections A and B will be 14% and 1.7%, or a total of 15.7%, for the 1998 calendar year.

§ 201-12. Late charge.

The current late charge is hereby amended to be a fee equal to 41/2% of all past-due amounts and shall be billed on a quarterly basis.

Legend

N

Quarter Mile Wells

0.25 Mile Buffer

Site Boundary

0 625 1,250 2,500 Feet

Appendix B: Well Search Map

GEO-ENVIRO CONSULTING & REMEDIATION, LLC
371 Hoes Lane (Suite 200)
Piscataway, NJ 08854
Phone: (732) 377-2028

Mill Creek Sunoco
7040 Mill Creek Road
Levittown, PA 19057
Facility ID #09-43609

Date: 04/21/2023

Project Manager: Martin Ebel

Prepared By: Steven Rhein

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

APPENDIX C
COST ESTIMATE

Geo Enviro Consulting & Remediation LLC (GECR)

371 Hoes Lane(Suite 200)
Piscataway, NJ 08854
+1 7323772028
accounting@geoenviroconsulting.com
www.gecr.org

Estimate

ADDRESS
P-242 (7040 Mill Creek Road, Levittown, PA 19057)

ESTIMATE 242-041823
DATE 04/18/2023

DATE	ACTIVITY	QTY	RATE	AMOUNT
	P-242 (7040 Mill Creek Road, Levittown, PA 19057)			
	Task 1: Drilling- installation of Soil borings, Monitoring Wells and Vapor points			
	Drilling Cost Estimated (Vac Clearing fess are included as a part of drilling cost)			10,000.00
	PG- Drilling Oversight and soil sample collection (includes office and field time)	30	105.00	3,150.00
	Envt. Scientist	30	85.00	2,550.00
	Field Vehicle	3	110.00	330.00
	PID	3	98.00	294.00
	Interface meter	3	98.00	294.00
	Analytical - Soil Samples	10	65.00	650.00
	Encores for soil samples	10	10.00	100.00
	Soil Data Tabulation and soil sampling locations figure prepration	2	98.00	196.00
	Groundater from Temporary well Points	3	98.00	294.00
	Preparation Monitoring Well Location for Buck County	1	98.00	98.00
	Monitoring Well Permit Fees by Buck County		275.00	275.00

$250 plus 10% surcharge			
		Subtotal:	18,231.00
Task 2: First Round of Sampling of three monitoring wells			
PG	1	105.00	105.00
Sampling Technician (office and field time)	10	75.00	750.00
PID	1	98.00	98.00
Interface meter	1	98.00	98.00
Sampling Equipment and supplies (pump, tubing and bailers)	1	150.00	150.00
Analytical	3	75.00	225.00
Data Tabulation (GW)	1	98.00	98.00
Figure Prepration	1	98.00	98.00
PG- PADEP update	1	100.00	100.00
		Subtotal:	1,722.00
Task 3 :Survey of Monitoring Wells			
Scheduling of survey	1	105.00	105.00
Surveyor Cost	1	900.00	900.00
GECR Staff member for the oversight of Survey	8	98.00	784.00
Field Vehicle	1	110.00	110.00
GW flow calculation-PG	1	100.00	100.00
		Subtotal:	1,999.00
Task 4: Second round of GW sampling			
PG	1	100.00	100.00
Sampling Technician (office and field time)	10	75.00	750.00
PID	1	98.00	98.00
Interface meter	1	98.00	98.00
Sampling Equipment and supplies (pump, tubing and bailers)	1	150.00	150.00
Analytical	3	75.00	225.00
Data Tabulation (GW)	1	98.00	98.00
Figure Prepration	1	98.00	98.00
PG- PADEP update	1	100.00	100.00

		Subtotal:	1,717.00
Task 5 : First round of Vapor Intrusion (VI) Sampling			
PG	1	100.00	100.00
Sampling Technician (office and field time)	10	98.00	980.00
PID	1	98.00	98.00
Analytical	5	250.00	1,250.00
Data Tabulation (VI)	2	98.00	196.00
Figure Prepration	2	98.00	196.00
PG- PADEP update	2	105.00	210.00
		Subtotal:	3,030.00
Task 6: Second round of VI sampling			
PG	1	100.00	100.00
Sampling Technician (office and field time)	10	98.00	980.00
PID	1	98.00	98.00
Data Tabulation (VI)	5	250.00	1,250.00
PG- PADEP update	2	105.00	210.00
		Subtotal:	2,638.00
Task 7 : Summary Report (if required)			
PG	10	100.00	1,000.00
Envt. Scientist	4	98.00	392.00
This task will only be performed if requeste by PADEP			
		Subtotal:	1,392.00
Task 8 : Drum Disposals			
Estimated			1,500.00
		Subtotal:	1,500.00
Task 9: PADEP Laison (PADEP is requiring weekly updates due to presence of Light Non-Aqueous Phase Liquid and Vapor Intrusion Concerns). The purpose of this task is to keep PADEP informed on weekly basis)			
PADEP	10	105.00	1,050.00

Principal	10	105.00	1,050.00
		Subtotal:	2,100.00

TOTAL **$34,329.00**

Accepted By

Accepted Date

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

APPENDIX D
FEBRUARY 2002 RACR

1 5 2 2 9 9

Start Sheet Scanning

Box No.: 7040 MILL CREEK RD LEVITTOWN PA 19057

Agency: DEP

Bureau: ENV CLEANUP & BROWNFIELDS ECB

Document Type: REPORTS

File Breakdowns: STORAGE TANKS

Tags:

Confidential: PUBLIC

Records Retention Code: STORAGE TANK CASE FILE(907)

Region: SOUTHEAST REGIONAL OFFICE

County: BUCKS

Municipality: BRISTOL TOWNSHIP

Permit / Project #: 09-43609

Case Name: MILL CREEK SUNOCO - RACR 2/6/02

Year: 2002

eFacts Facility ID: 583285

Created on 5/5/2022 9:21 AM by RYAN SEPSY

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Pennsylvania Department of Environmental Protection

Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

February 12, 2002

Southeast Regional Office

610-832-5950
Fax 610-832-6143

Mr. Charlie Kominas
Exxon Mobil Refining & Supply
Global Remediation
P.O. Box 288
Fort Washington, PA 19034

Re: Storage Tank Program
Mobil Station No. 15-DAC
Facility ID No. 09-43609
7040 Mill Creek Road
Falls Township
Bucks County

Dear Mr. Kominas:

On February 8, 2002 we received your report entitled "Act 2 Closure Request", dated February 6, 2002, for the storage tank facility referenced above. We consider this submittal to be the Remedial Action Completion Report required by the Corrective Action Process regulations, 25 Pa. Code Section 245.313.

You have identified your selected cleanup standard as the Department's Site Specific Standard and Statewide Health Standard. As such, the Department will attempt to review this report within 90 days of its receipt and send a review letter to the facility owner.

If you have any questions concerning the requirements of the Corrective Action Process Regulations, please contact me at 610-832-5968.

Sincerely,

Stephan B. Sinding
Chief, Storage Tank Section
Environmental Cleanup

cc: Bucks County Health Department
Falls Township
Mr. Bedle, B & B
McClennen
Ms. Mapleton
Re 30 (RW02ECP) 043.20

B & B
DIVERSIFIED ENTERPRISES, INC.

Tel (215) 699-5191
Fax (215) 699-5147
PO Box 3282
Maple Glen, PA 19002
cbastian@bbde.com

February 6, 2002

Ms. Lauren Mapleton
Pennsylvania Department of Environmental Protection
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

RE: ECP STORAGE TANK PROGRAM
Act 2 Closure Request — Remedial Action Completion Report
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC, Facility ID No. 09-43609
Levittown, Pennsylvania
Bristol Township, Bucks County

Dear Ms. Mapleton:

B&B Diversified Enterprises, Inc. is pleased to submit the enclosed revised Act 2 Closure Request, dated February 6, 2002, for the Exxon Mobil Corporation – Former Mobil Station No. 15-DAC located in Levittown, Pennsylvania. Per our recent conversations, B&B has revised the air model section (Appendix E) and the report Section 6.1 – Evaluation of Inhalation Pathways to reflect the revision in the air model run. Please note that the new result obtained from the air model run has not changed the conclusions of this Act 2 Closure Report.

If you have any questions or comments on this report, please contact us at your convenience.

Sincerely,
B&B DIVERSIFIED ENTERPRISES, INC.

Carl Bastian

Carl P. Bastian, P.G.
President

Mark D Bedle

Mark D. Bedle
Senior Project Manager

cc: Mr. Charlie Kominas – Exxon Mobil Refining and Supply
Mr. Steve Quattro – Tosco Marketing Company

02/053 LTM

B & B

DIVERSIFIED ENTERPRISES, INC.

ACT 2 CLOSURE REQUEST
FOR
EXXON MOBIL CORPORATION
FORMER MOBIL STATION NO. 15-DAC
7040 MILL CREEK ROAD
LEVITTOWN, PENNSYLVANIA

Prepared for:

Mr. Charlie Kominas
ExxonMobil Refining and Supply - Global Remediation
PO Box 288
Fort Washington, Pennsylvania 19034

Prepared by:

B&B DIVERSIFIED ENTERPRISES, INC.
P.O. Box 3282
Maple Glen, Pennsylvania 19002
(215) 699-5191

February 7, 2002
Revision 2.1

TABLE OF CONTENTS

ATTACHMENTS

TABLES

FIGURES

APPENDICES

1.0 SUMMARY

This report represents a formal request to the Pennsylvania Department of Environmental Protection (PADEP) for releases from liability under Site-Specific Standards, as stipulated under Pennsylvania's Land Recycling and Environmental Remediation Standards Act (Act 2) at the ExxonMobil Corporation (ExxonMobil) Former Mobil Service Station No. 15-DAC (Site). The Site is located at the intersection of Mill Creek and Edgely Roads in Levittown, Pennsylvania. Closure is being requested for the following:

- ***Act 2 Release from Liability for soils under Statewide Health Standards for benzene, toluene, ethylbenzene, and xylenes.***
- ***Act 2 Release from Liability for groundwater under a Statewide Health Standard for xylenes.***
- ***Act 2 Release from Liability for groundwater under Site-Specific Standards for benzene, toluene, ethylbenzene, methyl tertiary butyl ether, naphthalene, and isopropylbenzene.***

The report is a comprehensive compilation of all pertinent information that justifies the closure request using both Statewide Health and Site-Specific Standards. Many factors bearing on the closure request have been examined:

- Types and uses of surrounding properties
- Water usage in the area
- Potential sensitive receptors
- Risk exposure pathways
- Historical concentrations/trends
- Predictive modeling to evaluate future conditions

All of these factors have been thoroughly evaluated to ensure that the final closure of the Site under the Statewide Health and Site-Specific Standards is protective of human health and the environment.

The objective of the site-specific standard is to develop and evaluate detailed Site information using a rigorous scientific evaluation of a remedy to provide a protective cleanup standard unique to that Site. The site-specific standard is a risk management approach. All risk exposure pathways are evaluated and the past, current, and future use of the land is considered.[1]

Any person selecting the site-specific standard established by Section 304 of Act 2 should submit a risk assessment report to the PADEP unless no present or future pathways exist as demonstrated by a fate and transport analysis.[2] If no complete present or future pathways exist, a risk assessment report and cleanup plan are not required and no remedy is required to be proposed or completed [Act 2, Section 304(l)(1)(v)]. *When no complete pathways exist, a person only needs to follow the streamlined reporting requirements in Section II.C.8 of the Act 2 Technical Guidance Manual.*[3] Considering that no complete risk exposure pathways exist for this Site, the format of this report will follow the streamlined reporting requirements outlined on Pages II-78-81 of the December 1997 Act 2 Technical Guidance Manual.

1 Page II-53 of December 1997 Act 2 Technical Guidance Manual
2 Page II-60 of December 1997 Act 2 Technical Guidance Manual
3 Page II-59 of December 1997 Act 2 Technical Guidance Manual

2.0 SITE DESCRIPTION

The Site is located on the United States Geological Survey Trenton West, Pennsylvania/New Jersey 7.5 minute topographic quadrangle at approximately 40° 08' 30" north latitude and 74° 50' 45" west longitude (Figure 1). The Site is located on the southern junction of the intersection of Mill Creek Road, which runs roughly northeast-southwest, and Edgely Road, which runs roughly northwest-southeast. Currently, the Site is an active gasoline service station. A Site Map is provided as Figure 2. There are underground storage tanks (USTs), dispensers, and associated piping located at the Site. Land use in the area is mixed, consisting primarily of residential with some commercial along Mill Creek Road. The Site and surrounding area receives potable water from the Lower Bucks Joint Municipal Authority (LBJMA).

2.1 SURROUNDING PROPERTIES

Surrounding properties, depicted on Figure 3, consist of the following:

Surrounding Property Description	Property's Direction from Site
Mill Creek Road and Car Care Auto Repair (Former Citgo Gasoline Station - upgradient contaminant source) and Residential (Goldenridge Development).	North
Mill Creek Road, Car Care Auto Repair and Residential (Goldenridge Development).	Northwest
Mill Creek Road and Residential (Goldenridge Development)	West
Apartment Complex, Commercial Properties, and Residential (Violet Woods Development).	Southwest
Undeveloped woodland and Residential (Woods Development).	South
Edgely Road and Undeveloped woods (possible wetlands noted on the USGS Topographic Map).	Southeast
Edgely Road and Undeveloped woods.	East
Intersection Of Mill Creek & Edgely Roads and PECO Energy Substation.	Northeast

2.2 SENSITIVE RECEPTOR SURVEY / WATER USAGE IN THE VICINITY

An InfoMap Technologies Incorporated (InfoMap) Environmental FirstSearch Report™ was obtained for an approximate one-mile radius from the site by B&B Diversified Enterprises, Inc. (B&B) on September 26, 2000 to search available environmental records for groundwater withdrawal wells in the vicinity of the Site. Two key items are contained within this survey:

1. A map with the annotated locations (relative to the subject property) of wells located within the search radius contained in the Federal, State, and Public Supply databases.

2. Summary sheets for all wells located with the specific radius of the search.

An additional well search was also conducted using the Pennsylvania Groundwater Information Systems (PaGWIS) (Version 3.0, dated 1999). The PaGWIS search was conducted for approximately

2,500 feet in each cardinal direction (N, S, E, W) from the project site. The well searches are summarized in Table 1 (summary table limited to a 1,000-foot radius). Appendix B contains the raw data collected from both the InfoMap and PaGWIS searches. The surveys indicate that there are no public or domestic supply wells located within a 1,000-foot radius of the Site. The closest supply well noted in the report is located approximately 3,600 feet southeast of the Site and is reported as being used for domestic purposes. Sensitive Receptors (i.e., potable wells, basements and sewer lines, etc.) are discussed in detail in Section 5.2.3.

A surrounding property canvass was conducted at the Site to determine surrounding property status (undeveloped, abandoned, residential, commercial). The LBJMA supplies potable water to the surrounding businesses and residences. B&B contacted the LBJMA to verify water usage by the properties located within a 1,000-foot radius of the Site (Appendix A). All of the properties listed in the above table (including the surrounding three developments) and within an approximately 1,000-foot radius of the Site, receive their potable water from the LBJMA. The closest body of water in the area is Mill Creek located approximately 1,500 feet south of the Site.

3.0 SITE CHARACTERIZATION

3.1 SITE HISTORY

In November 1989, IT Corporation (IT) conducted a Phase I Investigation at the Site. The Phase I included the installation of 4 monitoring wells (MW-1 through MW-4). Soil samples were not obtained during the well installation. The results of the Phase I Investigation indicated impact to groundwater at the Site.

In February 1990, IT was contracted to perform closure activities for five underground storage tanks (USTs) including (4) – 8,000 gallon gasoline USTs and (1) – 6,000 gallon UST. Post excavation soil samples indicated total petroleum hydrocarbon concentrations ranging from 93 mg/kg to 490 mg/kg. A copy of the UST closure report is provided in Appendix C.

In August 1991, Pollution Enterprises, Inc. (PEI) was contracted to perform closure activities for two USTs at the Site. Upon uncovering the USTs, it was discovered that the tanks had previously been filled with concrete. After correspondence with the PADER (now PADEP), permission was granted to leave the USTs in place and backfill over them. Two soil samples collected from beneath the USTs were analyzed for BTEX and TPH. The laboratory results of the analyses indicated BTEX concentrations of 149 mg/kg and 257 mg/kg and TPH concentrations of 630 mg/kg and 640 mg/kg.

On April 17, 1991, the former Mobil Oil Corporation (Mobil – its successor is ExxonMobil) contracted PEI to perform a Phase II Investigation and to install and operate a pump and treat groundwater remediation system at the Site. The Phase II Investigation confirmed on-site impact and identified contamination in an off-site, hydraulically upgradient monitoring well adjacent to an abandoned gasoline service station (Former Citgo Petroleum Corporation (Citgo) gasoline station) now operating as a Car Care Auto Repair.

On September 4 and 9, 1991, PEI supervised the installation of two offsite (upgradient) monitoring wells (MW-6 and MW-7) and an onsite recovery well (RW-5 - currently MW-5). The installation of these wells included the collection of soil samples and groundwater monitoring and sampling.

On October 4, 1991, PEI conducted a pre-pump test on RW-5 at the Site. The results of this test were used to determine the parameters (pumping rate & length) at which to run the pump test. A 7-hour pump test was conducted at the Site on October 8, 1991. The results of the pump test indicated a hydraulic conductivity value of approximately 1.50 feet/day.

The final NPDES permit was received on April 2, 1992 and remediation system operations commenced on April 20, 1992. The remediation system consisted of a groundwater pump and treat system that recovered groundwater from RW-5. The recovered groundwater was then processed through an air-stripper before being pumped through granular activated carbon (GAC) units and discharged to the NPDES outfall point (storm sewer). The remediation system was deactivated in 1993 due to decreasing concentrations and the threat of pulling off-site impacted groundwater onto the Site.

On January 6, 1993, PADEP issued a letter to Citgo regarding the former Citgo gasoline station located upgradient of the Site. The letter directed the former owner of the USTs located at the Citgo gasoline station (Cities Service Oil Company and its successor Oxy USA) to investigate, document, and develop a remedial action plan for the contamination located at the subject property. A copy of the January 6, 1993 PADEP directive is provided in Appendix C.

In October 1995, two free-phase petroleum hydrocarbons (free product) samples were collected from monitoring wells MW-1 (onsite) and MW-6 (offsite-upgradient). These samples were submitted to a laboratory for free product characterization. The results of this characterization suggested that the MW-1 and MW-6 products were not from the same source and were different ages.

Free product (at thicknesses >0.01 feet) has not been detected at the Site in the onsite wells (MW-1 through MW-5) since January 1996 (MW-1 – 0.01 feet). Free product was detected in the upgradient off-site monitoring well MW-6 at a thickness of 0.13 feet during the December 29, 1999 groundwater monitoring and sampling event.

In December 1998, Groundwater Environmental Services (GES) conducted a subsurface investigation at the upgradient former Citgo gasoline station. Ten soil borings (SB-1 through SB-10) were conducted at the site using the Geoprobe direct push method. Samples were collected from the borings for laboratory analyses of BTEX, MTBE, naphthalene and isopropylbenzene using EPA Method 8260B. Five groundwater samples were collected from the borings SB-1, SB-3, SB-5, SB-7 and SB-8 and analyzed for BTEX, MTBE, naphthalene and isopropylbenzene by 8260B. The results of the investigation are provided in Appendix C (selected sections of the GES investigation report).

In 1998, B&B Diversified Enterprises, Inc. submitted to the PADEP an Amended Remedial Action Plan (RAP) for the Site indicating ExxonMobil's intentions of closing the Site under the Pennsylvania's Act 2 regulations.

In November 1991, ExxonMobil began a groundwater monitoring and sampling program that included 24 sampling events conducted from November 1991 through December 1999. The results of this work are described in various groundwater monitoring and sampling reports prepared by ExxonMobil's consultants. A summary of the historical groundwater monitoring and quality data is provided in Table 3.

On April 16, 2001, B&B Diversified Enterprises, Inc. submitted to the PADEP an Act 2 Closure Request report (dated March 1, 2001) including a comprehensive Site history, summary of soil and groundwater data, a sensitive receptor survey, fate and transport model/analysis, risk assessment, and a proposed combination of Background, Statewide Health, and Site-Specific Standards for soils and groundwater.

Based on PADEP's review of the March 1, 2001 Act 2 Closure Request report and discussions between PADEP and B&B, it was determined that Site-Specific Standards were more appropriate and applicable for closure under Act 2 for those media and regulated constituents for which Background Standards had been previously developed. Development and proposal of the applicable Site-Specific Standards are provided in Section 7.0 - Site-Specific Remediation Cleanup Standards.

3.2 LOCAL HYDROGEOLOGY

The Site is located in the Piedmont Physiographic Province, Upland Section of Pennsylvania. According to the Geologic Map of Pennsylvania published by the Pennsylvania Geologic Survey (Socolow, 1978), the bedrock underlying the Site is comprised of mafic gneiss, pyroxene-bearing of lower Paleozoic age. These rocks are characterized as dark and medium grained; includes rock of probable sedimentary origin.

Based on a review of the topographic map, the elevation of the Site is estimated at 45 feet above mean sea level. The topography of the Site and surrounding area has a low relief with a general slope to the east. Based on a review of the MW-1 through MW-7 soil boring logs, approximately 25 feet of orange, brown, and gray sandy silt underlie the Site. The sediments were poorly sorted. Competent bedrock was not encountered during the drilling activities. Groundwater was present in the unconsolidated materials at approximately 6 feet below grade (fbg). Soil boring logs and monitoring well construction diagrams are provided in Appendix D.

Based on site-specific liquid level data, groundwater flows to the south across the property at a gradient of approximately 0.0068 foot per foot. Groundwater depths typically range from 4 to 8 fbg.

In order to ascertain subsurface hydrogeologic characteristics for a given site, pump tests or slug tests are typically conducted to determine hydraulic conductivity (K), transmissivity, and storativity values. With these hydrogeologic values available, rates of contaminant movement can be projected and models can be developed which predict contaminant levels at property boundaries and beyond if necessary.

Hydrogeologic testing was conducted at the Site in October 1991 by PEI. The testing consisted of a 7-hour pump test conducted on RW-5. The results of the testing indicated a hydraulic conductivity value of 1.50 feet per day. This calculated hydraulic conductivity value is used as a baseline estimate in the Predictive Modeling section of this report to predict downgradient contaminant levels over time.

Predictive model input values for hydraulic conductivity used in Section 8.0 – Fate & Transport Modeling / Analysis may be obtained from literature available for the subject Site vicinity. Three factors justify the use of hydraulic conductivity values other than site-specific derived values:

1. Formation Alteration Around the Borehole: This could be particularly true with slug test data, which may not be representative of actual aquifer conditions due to the well drilling or well development process. Fine-grained particles congregating around the borehole or smear zones due to the drilling process can skew the data values obtained in field tests.

2. Published literature offer a range of hydraulic conductivity values for different subsurface media. Two key hydrogeologic reference texts ("Groundwater", by Freeze & Cheery, Table 2.2, p.29; and "Groundwater and Wells", by Driscoll, Figure 5.14, p.75) offer a range of hydraulic conductivity values for particular subsurface media.

3. Local Heterogeniety of the Formation On-Site: Variations in local stratigraphy across the site could cause a range of site-specific derived hydraulic conductivity values at different points on the Site.

Therefore, when predictive model calibration is not achievable with the actual site-specific hydraulic conductivity values, the published text values may justifiably be used as alternate input values.

4.0 REMEDIATION

Since the Phase I Site Assessment was performed in February 1989, impact to groundwater has been closely monitored on a periodic basis. In April 1992, a groundwater pump and treat recovery system was activated at the Site. The recovery system recovered groundwater from one recovery well (RW-5) via a submersible pump. The recovered groundwater then passed through an air-stripper before it was pumped through a GAC unit and discharged at the NPDES outfall location. The remediation system was deactivated in 1993 due to the threat of drawing off-site impacted groundwater onto the Site (free-product and dissolved hydrocarbons present in the upgradient well MW-6).

Adequate soil and groundwater data exist to assess potential impact to these media. Based upon observed historic petroleum compound concentrations in these media (both onsite and upgradient of the Site), the volume of data available to assess hydrogeologic conditions, the locations of exceedances and their magnitude, and the absence of complete risk pathways, further active remediation at this Site was not necessary.

5.0 CONCEPTUAL MODEL

The development of a site conceptual model is an important step in identifying additional data needs in site characterization and in defining both existing and potential exposure. A conceptual model identifies all potential or suspected sources of contamination (both onsite and offsite), types and concentrations of contaminants detected at the site or from an offsite source, potentially contaminated media, potential exposure pathways, and receptors. The conceptual model provides a systematic way to identify and summarize information to ensure that potential exposures at the site are accounted for accurately[4].

The conceptual models for this Site are based on the fact that the source of observed impact to the subsurface was related primarily to an upgradient offsite contamination source and secondarily to a past onsite small volume underground storage tank release or overfill. Therefore, there are two conceptual models for the Site.

5.1 UPGRADIENT OFFSITE SOURCE CONCEPTUAL MODEL

The first conceptual model addresses the upgradient offsite contamination source of benzene, toluene, ethylbenzene, xylenes, naphthalene and isopropylbenzene. This conceptual model assumes that the source of observed impact to the Site's groundwater was related to a past underground storage tank/line release or surface spill at the upgradient former Citgo gasoline station. Petroleum compounds, specifically benzene, toluene, ethylbenzene, xylenes, naphthalene and isopropylbenzene constitute the sources of impact to subsurface soil and groundwater media. These petroleum compounds initially impacted soil (as demonstrated by laboratory analyses of soil samples collected from MW-6). The soil sampling results from upgradient well MW-6 indicate concentrations of benzene above the PADEP MSC. Over time, through vertical and horizontal migration, the petroleum compounds impacted groundwater at the upgradient site (as demonstrated by laboratory analyses of groundwater samples collected from upgradient MW-6). Groundwater samples collected from MW-6 have indicated free-product (at various times) and concentrations of BTEX, naphthalene, and isopropylbenzene above the PADEP MSCs. Over time, these dissolved compounds have migrated downgradient beneath the former Mobil Station No. 15-DAC. This conceptual model assumes that the only viable potential exposure pathway is groundwater ingestion, so evaluation efforts in obtaining the Site-Specific Standard for benzene, toluene, ethylbenzene, xylenes, naphthalene and isopropylbenzene are focused on assessing whether or not this pathway is complete. Consequently, a thorough evaluation of potential downgradient groundwater receptors is conducted as part of this closure request.

Because the Citgo station ceased to operate (June 1984) prior to Citgo's use of MTBE as a gasoline additive (third quarter of 1986 - per Citgo's correspondence dated August 25, 1993 – provided in Appendix C), a conceptual model related to the MTBE impact to groundwater is provided in the following section.

4 Page II-57 of December 1997 Act 2 Technical Guidance Manual

5.2 ONSITE SECONDARY SOURCE CONCEPTUAL MODEL

The second conceptual model for this Site assumes that the source of observed MTBE impact to the subsurface was related to a past small volume underground storage tank release or overfill. The petroleum compound MTBE constitutes the source of impact to the subsurface groundwater media. MTBE initially impacted groundwater present within the UST hold, which in turn migrated out of the tank hold downgradient towards MW-4. Soil impact did not occur since the release was within the tank hold. This conceptual model also assumes that the only viable potential exposure pathway is groundwater ingestion, so evaluation efforts in obtaining the Site-Specific Standard for MTBE are focused on assessing whether or not this pathway is complete. Consequently, a thorough evaluation of potential downgradient groundwater receptors is conducted as part of this closure request.

6.0 RISK ASSESSMENT AND POTENTIAL RECEPTORS

Current and future exposure pathways should be identified based on the Site-Specific Standard Conceptual Models. A potentially complete exposure pathway generally consists of four elements:[5]

1. A source and mechanism of chemical release
2. A retention or transport medium
3. A point of potential receptor contact with the contaminated medium (the exposure point)
4. An exposure route (e.g. ingestion) at the exposure point

Risk exposure pathways for the Site were evaluated with respect to impacted soil and groundwater media. Ingestion, inhalation, and dermal contact of chemical compounds typically pose the greatest risk to human health and ecological organisms. Complete pathways from source to receptor must exist to realize any adverse impacts.

6.1 EVALUATION OF INHALATION PATHWAYS

The inhalation pathway poses an unlikely risk to human health. The Site is capped with blacktop/concrete, thereby precluding the soil inhalation pathway. The Site is zoned commercial and will be used for commercial purposes in the future. With commercial use, the Site will likely remain covered in blacktop and or structures. The only viable pathway for inhalation would be volatilization of constituents from groundwater. The only realistic way to complete this pathway would be for groundwater to infiltrate into a leaky sewer line and or basement. An occupant or worker would then be potentially exposed to the concentration of the compound in air that volatilized from the groundwater. For this Site, such potential scenarios are presented in Appendix E. Air modeling for a leaky sewer scenario indicates that allowable benzene groundwater concentrations can be as high as 335.55 milligrams per liter (mg/l) without risk to human health via the inhalation pathway from groundwater volatilization. Air modeling for a leaky basement scenario indicates that allowable benzene groundwater concentrations can be as high as 1.2690 mg/l without risk to human health via the inhalation pathway from groundwater volatilization. Current downgradient groundwater concentrations are below the leaky sewer and basement thresholds. In addition, the benzene detected in the groundwater at the Site is attributable to the upgradient source (Citgo gasoline station). Concentrations of benzene in the groundwater decrease to below the State-wide Health Based Standard across the Site from upgradient well MW-3 (300 µg/l – 12/29/99) to downgradient well MW-5 (non detectable – 12/29/99). Furthermore, the area located directly downgradient of the Site is undeveloped woodlands. A small portion of the adjacent apartment building (with sub basement apartments) is located downgradient of the Site.

6.2 EVALUATION OF SOIL PATHWAYS

For the subject Site, there are incomplete exposure pathways with respect to inhalation, dermal contact, and ingestion of soil because the Site is covered with blacktop, stone fill, and concrete, thereby precluding any contact. The Site is zone commercial and will be used for commercial purposes in the future. With commercial use, the Site will remain covered in blacktop/concrete and

5 Section 250.404-"Pathway Identification and Elimination" & Page II-58 of the December 1997 Act 2 Technical Guidance Manual

or structures. Furthermore, the soil samples collected during the installation of MW-5 (RW-5) indicated concentrations of BTEX below the PADEP MSCs. MW-5 is located at the downgradient property line. Soil samples collected during the installation of offsite well MW-6 (located on the upgradient Citgo gasoline station) indicated concentrations of benzene above the PADEP MSC (2.8 mg/kg and 4.3 mg/kg).

6.3 EVALUATION OF GROUNDWATER PATHWAYS

At any site with petroleum compound impact to groundwater; all viable pathways must be assessed. Inhalation of groundwater is not a realistic risk pathway. At the concentrations indicated by the groundwater analytical data, the chemical compounds would not cause a dermal reaction, even if direct contact were possible (e.g. from a potable well). Therefore, both of these pathways are considered incomplete.

The remaining *potentially* complete risk pathway is ingestion of groundwater. Any time that groundwater is impacted; the migration of chemical constituents and potential sensitive receptors must be assessed. Groundwater flow direction, velocity, as well as compound concentration, solubility, dispersion, and natural attenuation must be examined. Potential receptors must also be investigated to determine whether a complete ingestion pathway exists that poses a risk to human health or the environment.

The attainment of the Site-Specific Standard under Act 2 requires the performance of a limited screening for ecological receptors[6]. A site owner obtaining liability protection using the statewide health standards is not required to perform the limited ecological receptor screening for sites impacted with only light petroleum products[7]. As such, attainment of Statewide Health Standards for this Site does not require the ecological receptor screening. However, because liability protection is being requested using Statewide health and site-specific standards (requires screening) at the Site, a limited screening for ecological receptors was performed. More specifically, a determination was made to the potential impact from regulated substances stored at the Site to the following receptors[8]:

- Individuals of threatened or endangered species (as defined under the United States Fish and Wildlife Service under the Endangered Species Act)
- Exceptional value wetlands (as defined in Section 105.17)
- Habitats of concern
- Species of concern

On April 5, 2000, B&B Diversified Enterprises, Inc. conducted a field survey of Mill Creek located approximately 1,500 feet south of the Site. During the field survey, no evidence of stress vegetation or animals was observed in or adjacent to Mill Creek.

6 Page 4217 of the Pennsylvania Bulletin, Section 250.311 - Evaluation of ecological receptors under Act 2 Rules and Regulations.
7 Section 250.311 (b-1) & Page II-29 of the December 1997 Act 2 Guidance Manual.
8 Section 250.311 (1, 2, 3 and 4) - " Evaluation of Ecological Receptors" and Section 250.402 (c) – " Human Health and Environmental Protection Goals".

The ecological screening process described in Section 311 (Evaluation of Ecological Receptors) of Act 2 was followed to evaluate whether surface soils or sediments at the property have the potential to pose substantial impact on potential ecological receptors, requiring further evaluation. In accordance with paragraph (b) of Section 311, no additional evaluation was required because: (1) gasoline is the only constituent detected on Site; (2) the area of contaminated soil is less than 2 acres, and the area of contaminated sediment is less than 1,000 square feet; and (3) the site features eliminate the exposure pathways.

All of the properties lying immediately adjacent to (including the Site) and 1,000 feet downgradient of the Site receive their potable water from the LBJMA (see Appendix A). Therefore, there are incomplete pathways for groundwater ingestion at all properties located within 1,000 feet downgradient of the Site, since groundwater is neither withdrawn nor consumed at these properties.

The sensitive receptor survey summarized the results of a groundwater withdrawal well search for the Site vicinity (Table 1). *Based on a physical site reconnaissance where no downgradient potable wells were found within a 1,000-foot radius of the Site and the closest downgradient water body is located approximately 1,500 feet from the Site, there are no downgradient sensitive receptors within 1,000-feet of the Site.*

In summary, the table below depicts an evaluation of potential exposure pathways for each media of concern.

Potential Exposure Pathway	Soil	Groundwater
Inhalation	Incomplete	Incomplete
Dermal Contact	Incomplete	Incomplete
Ingestion	Incomplete	Incomplete

7.0 SITE-SPECIFIC REMEDIATION CLEANUP STANDARDS

7.1 SOILS

Petroleum hydrocarbons measured in the soil samples collected during the Site investigation include benzene, toluene, ethylbenzene and xylenes. The Medium Specific Concentrations (MSCs) for Organic Substances in Soil (Act 2 Regulations; Appendix A, Table 3B) for Non-Residential, Used Aquifers for these constituents are compared to the available soil analytical data for the Site in Table 2 (soil samples collected during the installation of monitoring wells MW-5 (onsite) and MW-6 through MW-7 (offsite)). As shown in Table 2, benzene is the only compound detected at a concentration above the MSCs. Furthermore, benzene was only detected in the soil sample collected during the installation of upgradient wells MW-6 and MW-7. BTEX was not detected in the soil samples collected during the installation of onsite well MW-5 (all concentrations below method detection limits).

only samples from wells 5, 6, 7

The risk pathway evaluation conducted in Section 6.2 of this report eliminates the soil to groundwater pathway as a complete risk pathway. The Site is covered with blacktop and concrete, thereby precluding contact with potential receptors.

7.2 GROUNDWATER

Dissolved-phase hydrocarbons measured at the Site and upgradient of the Site include benzene, toluene, ethylbenzene, xylenes, methyl tertiary-butyl ether (MTBE), naphthalene, and isopropylbenzene. The MSCs for Organic Substances in Groundwater (Act 2 Regulations; Appendix A, Table 1) under the Used Aquifers, <2,500 TDS, Residential, for these constituents are compared to the latest available analytical data for the Site below:

Current Groundwater Analytical Data versus MSCs

Well	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	MTBE (µg/l)	Naphtha-lene (µg/l)	Isopropyl -benzene (µg/l)
MSC	**5**	**1,000**	**700**	**10,000**	**20**	**100**	**25**
MW-1	<50	<50	1,200	1,300	<50	420	120
MW-2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
MW-3	300	14	11	34	21	82	25
MW-4	78	<5.0	9	80	640	20	21
MW-5	<5.0	<5.0	<5.0	<5.0	94	<5.0	<5.0
MW-6 *	240	1,900	2,600	11,000	<50	970	670
MW-7	<5.0	<5.0	<5.0	<5.0	51	<5.0	<5.0

Explanation:

MSC – Maximum Contaminant Concentration
MTBE – methyl tertiary butyl ether
µg/l – micrograms per liter
< - less than
MW-6 contained 0.13 feet of product during the 12/29/99 sampling event. Data presented is from the 10/13/99 sampling event.

For a basis of comparison, the Site's available historical analytical data is compared to the respective MSCs below to identify MSC exceedances for the compounds of interest. Benzene, toluene, ethylbenzene, and xylenes data (other than total BTEX concentrations) is not available prior to the December 18, 1997 sampling event. However, MTBE data is available from May 1992 through the current data set (December 29, 1999).

Historical Analytical Data versus MSCs

Benzene (MSC = 5 µg/l)	
MW-1	Ranging from 26 to 62 ug/l
MW-2	Never detected above (since December 1997)
MW-3	Ranging from 98 to 744 ug/l
MW-4	Ranging from below MSC to 78 ug/l (<1,000 µg/l in April 1999)
MW-5	Ranging from below to 18 ug/l
MW-6	Ranging from 170 to 360 µg/l & LPH
MW-7	Never detected above (since April 1999)

Toluene (MSC = 1,000 µg/l)	
MW-1, MW-2, MW-3, MW-5, & MW-7	Never detected above (since December 1997)
MW-4	Ranging from below MSC to 2,700 ug/l
MW-6	Ranging from 1,400 to 2,200 µg/l & LPH

Ethylbenzene (MSC = 700 µg/l)	
MW-2, MW-3, MW-4, MW-5, & MW-7	Never detected above (since December 1997)
MW-1	Ranging from below MSC to 1,300 ug/l
MW-6	Ranging from 2,400 to 4,100 µg/l & LPH

Xylenes (MSC = 10,000 µg/l)	
All wells except MW-6	Never detected above MSC (since December 1997)
MW-6	Ranging from 10,000 to 21,000 µg/l & LPH

MTBE (MSC = 20 ug/l)	
MW-1 – Onsite	Below MSC since December 1997
MW-2 – Onsite	Never Detected Above MSC
MW-3 – Onsite	Ranged from below MSC to 1,540 ug/l
MW-4 – Onsite	Ranged from below MSC to 38,000 ug/l (April 1999)
MW-5 – Onsite	Ranging from below MSC to 3,300 ug/l (July 1993)
MW-6 – Offsite	Ranging from below MSC to 2,100 ug/l & LPH

MTBE (MSC = 20 ug/l)	
MW-7 – Offsite	Never Detected Above MSC (since May 1992)

Naphthalene (MSC = 100 µg/l)	
MW-1	Ranging from below to 530 ug/l
MW-2	Never detected above (since December 1997)
MW-3	Ranging from below to 217 ug/l
MW-4	Ranging from below to 130 ug/l
MW-5	Never detected above (since December 1997)
MW-6	Ranging from below to 1,900 ug/l & LPH
MW-7	Never detected above (since April 1999)

Isopropylbenzene (MSC = 25 ug/l)	
MW-2 - MW-3, MW-5, & MW-7	Never detected above (since April 1999)
MW-1	Ranging from 33 to 150 ug/l
MW-4	Ranging from below to 37 µg/l
MW-6	Ranging from 230 to 670 ug/l & LPH

The most recent groundwater sampling event (December 29, 1999) indicates that concentrations of one or more of the regulated unleaded gasoline constituents including benzene, ethylbenzene, MTBE, naphthalene, and isopropylbenzene in groundwater were above the Statewide MSCs in MW-1, MW-3, MW-4, MW-5, and MW6 (LPH). Historically, all wells except MW-2 and MW-7 indicated some residual benzene and MTBE concentrations above the MSCs, and toluene, ethylbenzene, xylenes, naphthalene, and isopropylbenzene concentrations in some of the wells exceeded the MSCs. However, as noted in Section 5.0 - Conceptual Model and Section 6.0 – Risk Assessment and Potential Receptors, *no threat to human health exists due to incomplete risk pathways for soil and groundwater.*

7.3 PROPOSED SITE-SPECIFIC REMEDIATION CLEANUP STANDARDS

The following Recommended Site-Specific Standards are set at the highest observed concentrations of BTEX (soil and groundwater) and MTBE, naphthalene, and isopropylbenzene (groundwater only) in onsite wells MW-1 through MW-5. No soil or groundwater concentrations observed in onsite wells MW-1 through MW-5 have exceeded the Site-Specific Standards.

Recommended Site-Specific Standards

site specific std.

Media	Compound	Recommended Background Standard ?
Soils	Benzene	0.5 mg/kg (statewide)
Soils	Toluene	100 mg/kg (statewide)
Soils	Ethylbenzene	70 mg/kg (statewide)
Soils	Xylenes	1,000 mg/kg (statewide)
Groundwater	Benzene	1,000 ug/l
Groundwater	Toluene	2,700 ug/l
Groundwater	Ethylbenzene	1,300 ug/l
Groundwater	Xylenes	10,000 ug/l (statewide)
Groundwater	Methyl tertiary-butyl ether	38,000 µg/l
Groundwater	Naphthalene	530 ug/l
Groundwater	Isopropylbenzene	150 ug/l

Current groundwater concentrations are at or below these recommended Site-Specific Remediation Standards in all wells. Based upon the risk exposure pathways evaluated, these proposed Site-Specific Remediation Standards are protective of human health and the environment.

The historic groundwater data contained in Table 3 meets the attainment requirements for groundwater as per Sections 704 (General Attainment Requirements for Groundwater) and 707 (Statistical Tests) of Act 2. The above referenced Site-Specific Remediation Standards proposed for the Site were set to the maximum concentrations ever observed in onsite wells MW-1 through MW-5 at the Site for those compounds that exceeded Statewide Health Standards. The historic data set meets the attainment criteria for groundwater based upon the 95%UCL of the arithmetic mean analysis as indicated in Appendix F. The groundwater attainment evaluation for this Site also verified the following (as per 250.704d):

- There was adequate spatial sampling of the plume upgradient, which indicated a decreasing concentration trend toward the downgradient property boundary.
- The parameters affecting the fate and transport of regulated substances within the plume were fully evaluated.
- Concentrations of regulated substances in the plume at the point of compliance monitoring wells downgradient were all less than the proposed site-specific cleanup levels. Predictive modeling scenarios for compounds of concern as displayed in Section 9.0 verify that no compounds of concern exceed the proposed site-specific cleanup standards.
- The age and stability of the plume are well documented.

8.0 ATTAINMENT

The point of compliance for demonstration of attainment of Site-Specific Standards is contained in Section 250.407 of the Act 2 regulations. For any standard selected, the attainment demonstration for groundwater media shall be made at the point of compliance as defined in Subchapters B-D (Section 250.707). Site-specific standards must be attained at and beyond the point of compliance, where the plume has migrated beyond the property boundary. For groundwater, the point of compliance is the property boundary that existed at the time the contamination was discovered.[9]

To ensure that contaminant concentration at the point of compliance will not exceed the selected standard in the future, a statistical time trend analysis or knowledge of plume stability must be provided to the PADEP as part of the closure report.[10] Act 2 requires that statistical methods be applied to verify the cleanup of a site (Section 250.707). The selection of a statistical method for use in assessing the attainment of cleanup standards depends on the characteristics of the environmental media. Statistical methods can be divided into two categories: parametric and non-parametric procedures.

The statistical test selected for this data set is the Upper Confidence Limit (UCL). As per Section 250.707c, p. 4228 "Statistical Tests", in order "to demonstrate attainment of the site-specific standard, a person may use a statistical test identified in subsection (b)(1)(ii) and (2)(ii) where the 95% UCL of the arithmetic mean is below the site-specific standard". Figure IV-1 "Flow Chart of Recommended Statistical Methods", Section IV of the Technical Guidance Document provides the basis for the selection of this statistical method. These tests statistically verify attainment with the established Site-Specific Cleanup Levels (Appendix F).

In Appendix F, B&B performed statistical analyses on the actual data set for MTBE in MW-4 between 11/20/91 and 12/29/99 using the 95% Upper Confidence Level (UCL) of the arithmetic mean analysis. If 95% UCL of arithmetic mean is less than the proposed cleanup standard, it can be concluded that the area is "clean". The number resulting from the 95% UCL analysis on the MTBE data set was 7,714 ug/l, which is less than the proposed site-specific standard of 38,000 ug/l for MTBE; therefore, it can be concluded the area is "clean".

9 Page II-65 of the 12/97 Act 2 Technical Guidance Manual
10 Page II-66 of the 12/97 Act 2 Technical Guidance Manual

9.0 FATE & TRANSPORT MODELING / ANALYSIS

There are no downgradient sensitive receptors within 1,000 feet of the Site and therefore no threat to human health exists due to incomplete risk pathways for soil and groundwater. The Site is situated in an urban environment. All downgradient properties located with a 1,000-foot radius are provided with public drinking water. Although the aquifer beneath the Site and 1,000 feet downgradient of the Site is not used for potable water, projected concentrations resulting from the predictive modeling scenarios in this section were compared to the MSCs for Residential Used Aquifers. The overall purpose of the predictive modeling was to demonstrate that dissolved concentrations of regulated unleaded gasoline components in groundwater at the Site would not impact downgradient sensitive receptors, even if they existed.

The fate and transport modeling scenarios contained in Appendix E were performed to demonstrate that the residual concentrations in the groundwater would quickly attenuate a short distance downgradient to levels below each compound's MSC. For each compound of concern, the distance downgradient and the elapsed time until attenuation below the MSC are determined. A predictive fate and transport model known as the Quick Domenico (QD) Model is used to illustrate that those compounds above MSC levels in the Site wells will continue to attenuate naturally and not impact any potential downgradient receptors. The QD Model is a Microsoft® Excel spreadsheet application of "An Analytical Model For Multidimensional Transport of A Decaying Contaminant Species", by P.A. Domenico, Journal of Hydrology, 91 (1987), pp. 49-58.

The QD Model calculates the concentration of contaminants at any point in time downgradient of a source area of known size and magnitude. The types of contaminants for which QD Model is intended are dissolved contaminants whose fate and transport can be described or influenced by first order decay and reaction with organic carbon in the soil. The model allows for first order decay, retardation, and three-dimensional dispersion.

Input data (See Appendix E) to the QD Model includes the following:

- Source Concentration (mg/l)
- Distance to Location of Concern (feet)
- Longitudinal Dispersivity (Ax = X/10 where X is distance a contaminant has traveled by advective transport (i.e. velocity x time))
- Transverse Dispersivity (Ay = Ax/10)
- Vertical Dispersivity (Az = Ax/20 to Ax/100)
- Lambda (days-1 First Order Decay Constant)
- Source Width (feet)
- Source Thickness (feet)
- Hydraulic Conductivity (K in ft/day)
- Hydraulic Gradient (ft/ft)
- Porosity (%)
- Soil Bulk Density (g/cm3)
- KOC (Organic Carbon Partition Coefficient-Chemical Specific)
- Fraction Organic Carbon (decimal fraction)

- "y" feet = y coordinate for which solution is desired
- "z" feet = z coordinate in the vertical axis
- "t" (days) = time in days after a contaminant began moving in the groundwater for which a solution is desired

The QD Model will yield a projected concentration for a specific compound at a given downgradient location (i.e. the potential downgradient receptor or the property boundary) at a given future point in time. The output of the QD Model allows verification that the MSC for a specific compound is not exceeded at the point of compliance.

9.1 SITE-SPECIFIC QUICK DOMENICO MODELING ANALYSIS

Several QD Modeling scenarios were generated of for each compound of concern at the Site. Historical data indicated that benzene, toluene, ethylbenzene, MTBE, naphthalene, and isopropylbenzene have exceeded their respective MSCs in one or more of onsite wells MW-1 through MW-5 in the past. The purpose of performing QD modeling analysis on these compounds is to demonstrate, by predictive modeling, the progress of natural attenuation over time. The QD Model shows the predicted distance downgradient at which the individual compounds fall below their MSC.

9.2 DOMENICO MODEL CALIBRATION

Calibration is the process of adjusting hydraulic parameters, initial conditions, and boundary conditions within reasonable ranges to obtain a match between observed and modeled data. If model output correlates with actual plume concentrations, then the model is appropriately calibrated and residuals (differences between actual and modeled contaminant concentrations) are minimized. A well-calibrated model accurately simulates actual conditions and increases the degree of confidence in the model's output.

For this Site, actual laboratory data was used as the input "source concentration" for MW-3 (benzene), MW-4 (toluene & MTBE), and MW-6 and MW-1 (ethylbenzene, naphthalene, and isopropylbenzene) due to the different wells indicating the highest observed concentrations for their respective source components. The component source concentrations were then projected downgradient and concentrations were compared to the actual concentration in the calibration wells. The use of two separate "source concentration" wells was required due to the existence of both the upgradient offsite source (MW-6) and the onsite residual source (tank hold area) as described in Section 5.0 – Conceptual Model. Finally, input variables were adjusted until the predicted data matched the actual data for each compound of concern (Appendix E).

9.3 PREDICTIVE MODELING SCENARIOS

The objective in running the QD Model was to determine the distance downgradient and the time that a compound would attenuate to below its MSC. The procedure was performed for each of the compounds of concern. The results are summarized on the next page:

Predictive Modeling Results

Compound of Concern	MSC (µg/l)	Peak Concentration (µg/l)	Peak Concentration Location	Time in Years to Attainment of MSC	Distance to Location of Concern (feet)	Predicted Concentration (µg/l)
Benzene	5	744	MW-3	23.7	128	5
Toluene	1,000	2,700	MW-4	1.2	76	0
Ethylbenzene	700	1,300	MW-1	8.2	8	446
Xylenes[1]	10,000	N/A	N/A	N/A	N/A	N/A
MTBE	20	38,000	MW-4	1.5	76	0
Naphthalene	20	530	MW-1	7.7	8	64
Isopropylbenzene	25	150	MW-1	0.5	8	0

Explanation:
MSC – Maximum Contaminant Concentration
MTBE – methyl tertiary butyl ether
µg/l – micrograms per liter
N/A –Not Applicable
[1] Xylenes were never detected above MSC in onsite wells MW-1 through MW-5 and therefore were not modeled.

Input and output QD Model data is contained in Appendix E. The results of the QD Model demonstrate that predicted concentrations for benzene, toluene, ethylbenzene, MTBE, naphthalene, and isopropylbenzene remained below the Site-Specific Cleanup Standards outlined in Section 7.0 of this report. In addition, modeling predicted that each compound of concern attenuated to below its Statewide Health Standard Concentration either onsite or at a relatively short distance downgradient of the Site.

Typically, several predictive modeling runs are also generated that factored in the potential additive impact to groundwater from soils. Any residual petroleum hydrocarbon compounds entrained in the vadose zone soils at the Site could leach from the soil to the groundwater. However, for this Site, concentrations of BTEX were not detected or in the onsite soil boring samples (MW-5 well installation).

10.0 CONCLUSIONS AND RECOMMENDATIONS

ExxonMobil Corporation requests from the Pennsylvania Department of Environmental Protection under Pennsylvania's Land Recycling and Remediation Standards Act (Act 2) the following for Former Mobil Station No. 15-DAC:

- ***Act 2 Release from Liability for soils under Statewide Health Standards for benzene, toluene, ethylbenzene, and xylenes.***
- ***Act 2 Release from Liability for groundwater under a Statewide Health Standard for xylenes.***
- ***Act 2 Release from Liability for groundwater under Site-Specific Standards for benzene, toluene, ethylbenzene, methyl tertiary butyl ether, naphthalene, and isopropylbenzene.***

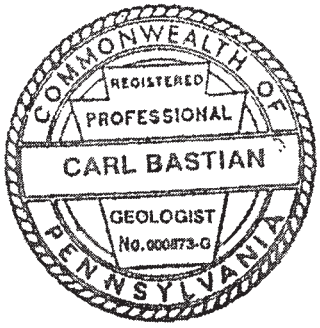
This request is based on the following reasons:

- The onsite source of contamination to the subsurface (i.e. former USTs and associated piping and dispensers) has been removed from the Site.
- There are no risk exposure pathways for soil. The inhalation, dermal, and ingestion pathways are incomplete.
- Air modeling indicates that residual concentrations in the groundwater do not pose an inhalation risk to potential receptors such as sewers and basements. Current downgradient groundwater concentrations are below the leaky sewer and basement threshold values.
- There are no risk exposure pathways for groundwater. The inhalation, dermal, and ingestion pathways are incomplete. No downgradient sensitive receptors exist within 1,500 feet of the Site.
- Benzene, toluene, ethylbenzene, xylenes, naphthalene, and isopropylbenzene are present in the groundwater. However, the source of these concentrations is attributable to an upgradient source (former Citgo gasoline station).
- Xylene values have indicated below MSC (10,000 µg/l) values in all onsite monitoring wells (MW-1 through MW-5) since at least December 1997. So has toluene
- Predictive fate and transport analysis further supports Act 2 closure of the Site. Modeling scenarios demonstrate that benzene, toluene, ethylbenzene, MTBE, naphthalene, and isopropylbenzene remains below the proposed Site-Specific Remediation Cleanup Standard for the Site. UCL statistical tests verify attainment with the proposed cleanup standards.
- Furthermore, predictive modeling indicates that each compound of concern will continue to naturally attenuate to below its MSC either onsite or at a relatively short distance downgradient of the Site. Based on these modeling results, no offsite adverse impact to groundwater is expected in the future, nor do the contaminant concentrations presently existing at the Site pose a risk to human health or the environment.

Based upon the bullet items above, it is recommended that ***no further action*** is necessary at this Site and that an ***Act 2 release from liability for Benzene, Toluene, Ethylbenzene, and Xylenes*** for soils and for ***Benzene, Toluene, Ethylbenzene, Xylenes, Methyl Tertiary Butyl Ether, Naphthalene, and Isopropylbenzene*** for groundwater be granted for this Site.

11.0 SIGNATURES

This closure report has been prepared on behalf of ExxonMobil Refining and Supply – Global Remediation by the following individuals:



Carl Bastian, P.G.
President
B&B DIVERSIFIED ENTERPRISES, INC.

Mark Bedle
Senior Project Manager
B&B DIVERSIFIED ENTERPRISES, INC.

Timothy Pilcher
Project Manager
B&B DIVERSIFIED ENTERPRISES, INC.

12.0 REFERENCES

The following reference materials were used in the compilation of this report:

Pennsylvania's Land Recycling Program Technical Guidance Manual, Final Draft December 1997, by the PADEP.

Pennsylvania Bulletin, Vol. 27, No. 33, August 16, 1997 (Act 2 Regulations).

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

PA Department of Environmental Protection Microsoft® Excel Quick_Domenico.XLS Spreadsheet Application of "An Analytical Model for Multidimensional Transport of a Decaying Contaminant Species" P.A. Domenico (1987) Modified to Include Retardation

InfoMap Technologies Incorporated – Environmental FirstSearch Report™ for Mobil Station No. 15-DAC in Levittown, PA 19057, dated 09/26/00.

"Groundwater", by Freeze & Cheery, Table 2.2, p.29

"Groundwater and Wells", by Driscoll, Figure 5.14, p.75

TABLES

TABLE 1

Summary of Federal, State and Public Potable Supply Well Search
ExxonMobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Well ID Number on Map	Database Type	Database ID Number	Distance from Target Property	Direction from Target Property	Year Constructed	Primary Use of Water	Well Owner	Well Depth (feet)	Casing Length (feet)	Depth to Water Bearing Zone (feet)	Well Yield (gpm)
None Reported Within 1,000 Foot Radius of the Site (InfoMap Report)											

Explanation:
NR - not recorded
gpm - gallons per minute

1. Federal, State and Public Potable Supply Well Search was conducted using an Environmnetal Technologies Inc. InfoMap Database Report. Additional information was also obtained from the PAGWIS Database and interviews with the local public water supplier(s).

TABLE 2

Soils Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Compound of Concern	Appendix A Table 3A MSCs for Organics in Soil Direct Contact Numeric Values	Appendix A Table 3A MSCs for Organics in Soil Direct Contact Numeric Values		Appendix A Table 3B MSCs for Organics in Soil Soil to Groundwater Numeric Values											
	Residential	Non-Residential		Residential			Non-Residential			Residential			Non-Residential		
	Soil	Surface Soil	Subsurface Soil	Used Aquifers TDS<2500			Used Aquifers TDS<2500			Non-Use Aquifers			Non-Use Aquifers		
	(0-15 feet)	(0-2 feet)	(2-15 feet)	100xGW MSC	Generic Value		100xGW MSC	Generic Value		100xGW MSC	Generic Value		100xGW MSC	Generic Value	
Benzene	38 N	200 N	230 N	0.50	0.13	E	0.50	0.13	E	50	13	E	50	13	E
Toluene	7,600 N	10,000 C	10,000 C	100	44	E	100	44	E	10,000	4,400	E	10,000	4,400	E
Ethylbenzene	10,000 C	10,000 C	10,000 C	70	46	E	70	46	E	70,000	4,600	E	70,000	4,600	E
Xylenes (Total)	10,000 C	10,000 C	10,000 C	1,000	850	E	1,000	850	E	10,000	10,000	E	10,000	10,000	E
MTBE	10,000 C	10,000 C	10,000 C	2	0.28	E	2	0.28	E	20	2.8	E	20	2.8	E
Naphthalene	8,800 G	110,000 G	190,000 C	10	5	E	10	5	E	2,000	5,000	E	2,000	5,000	E
Isopropylbenzene	170 N	480 N	550 N	2.5	18	E	5.2	37	E	250	1,800	E	520	3,700	E

Explanation:
G - Ingestion
C - Cap
N - Inhalation
E - Number calculated by the soil to groundwater equation in Section 250.308.

Note:
1. All concentrations are reported in mg/kg.

Selection of Soil MCSs is based on process in Act 2 Technical Guidance Manual - Final Draft 12/1997 (Section II Remediation Standards, pages II 22 - II 24)

Which Is:

Select highest MSC listed in Table 3B "Soil to Groundwater Numeric Values" - Under Used Aquifers with <2,500 TDS - Non-Residential Colu

And Compare To:

MSC listed in Table 3A "Direct Contact Numeric Values" - Under Non-Residential Subsurface Soil 2-15 feet Column

MSC is the lowest of the two numbers selected above

TABLE 2

Soils Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Site Specific Soil Data Compared to Selected MSCs

Compound of Concern			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	Naphthalene (mg/kg)	Isopropylbenzene (mg/kg)
Selected MSC - Non- Residential, Used Aquifers, TDS<2500			0.5	100	70	1,000	2	100	37
Sample Location	Depth (ft)	Date							
MW-5	5-7	4-Sep-91	ND	ND	ND	ND	NA	NA	NA
MW-5	13-15	4-Sep-91	ND	ND	ND	ND	NA	NA	NA
MW-6	5-7	9-Sep-91	**2.8**	34	23	130	NA	NA	NA
MW-6	10-12	9-Sep-91	**4.3**	35	21	120	NA	NA	NA
MW-7	5-7	9-Sep-91	0.61	6.1	3.8	21	NA	NA	NA
MW-7	10-12	9-Sep-91	0.07	0.49	0.3	1.8	NA	NA	NA

Explanation:
ND - Not detected
NA - Not Analyzed
BRL - Below Reporting Limits

Note:
1. All concentrations are reported in milligrams per kilogram (mg/kg)
2. Bolded concentration note exceedances of PADEP MSCs.

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
					Selected MSC	**5**	**1,000**	**700**	**10,000**	**NS**	**20**	**100**	**25**
MW-1	20-Nov-91	99.03	8.15	90.88	NDA	NDA	NDA	NDA	NDA	1,862	NDA	NA	NA
	24-Feb-92	99.03	7.48	91.55	NDA	NDA	NDA	NDA	NDA	1,861	NDA	NA	NA
	29-May-92	99.03	6.69	92.34	NDA	NDA	NDA	NDA	NDA	782	190	NA	NA
	12-Aug-92	99.03	7.64	91.39	NDA	NDA	NDA	NDA	NDA	1,692	120	NA	NA
	13-Nov-92	99.03	7.72	91.31	NDA	NDA	NDA	NDA	NDA	1,230	82	NA	NA
	10-Feb-93	99.03	6.67	92.36	NDA	NDA	NDA	NDA	NDA	1,743	95	NA	NA
	20-May-93	99.03	6.02	93.01	NDA	NDA	NDA	NDA	NDA	685	55	NA	NA
	16-Jul-93	99.03	7.43	91.60	NDA	NDA	NDA	NDA	NDA	740	ND	NA	NA
	20-Oct-93	99.03	6.62	92.41	NDA	NDA	NDA	NDA	NDA	1,040	ND	NA	NA
	31-Jan-94	99.03	5.63	93.40	NDA	NDA	NDA	NDA	NDA	1,080	ND	NA	NA
	08-Apr-94	99.03	5.22	93.81	NDA	NDA	NDA	NDA	NDA	763	64	NA	NA
	14-Jul-94	99.03	7.18	91.85	NDA	NDA	NDA	NDA	NDA	783	72	NA	NA
	03-Oct-94	99.03	6.93	92.10	NDA	NDA	NDA	NDA	NDA	979	ND	NA	NA
	11-Jan-95	99.03	6.95	92.08	NDA	NDA	NDA	NDA	NDA	384	30	NA	NA
	19-Apr-95	99.03	7.29	91.74	NDA	NDA	NDA	NDA	NDA	670	29	NA	NA
	10-Jul-95	99.03	7.34	91.69	NDA	NDA	NDA	NDA	NDA	798	86	NA	NA
	19-Oct-95	99.03	NDA	91.13	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	25-Jan-96	99.03	NDA	93.45	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	12-Dec-96	99.03	5.70	93.33	NDA	NDA	NDA	NDA	NDA	1,339	87	192	NA
	18-Dec-97	99.03	7.53	91.50	ND	<100	12	380	480	872	17	430	NA
	02-Apr-99	99.03	6.63	92.40	Sheen	26	<25	340	420	786	<25	210	33
	22-Jul-99	99.03	8.33	90.70	Sheen	40	<5.0	450	420	910	<5.0	170	53
	13-Oct-99	99.03	6.55	92.48	ND	62	<5.0	1,300	1,400	2,762	<5.0	530	150
	29-Dec-99	**99.03**	**6.57**	**92.46**	**ND**	**<50**	**<50**	**1,200**	**1,300**	**2,500**	**<50**	**420**	**120**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-2	20-Nov-91	98.69	7.59	91.10	ND	NDA	NDA	NDA	NDA	1.3	NDA	NA	NA
	24-Feb-92	98.69	6.91	91.78	ND	NDA	NDA	NDA	NDA	ND	NDA	NA	NA
	29-May-92	98.69	6.02	92.67	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	12-Aug-92	98.69	7.00	91.69	ND	NDA	NDA	NDA	NDA	1.1	ND	NA	NA
	13-Nov-92	98.69	7.18	91.51	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	10-Feb-93	98.69	5.98	92.71	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	20-May-93	98.69	5.23	93.46	ND	NDA	NDA	NDA	NDA	0.6	ND	NA	NA
	16-Jul-93	98.69	6.74	91.95	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	20-Oct-93	98.69	5.94	92.75	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	31-Jan-94	98.69	4.94	93.75	ND	NDA	NDA	NDA	NDA	0.7	ND	NA	NA
	08-Apr-94	98.69	4.42	94.27	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	14-Jul-94	98.69	6.44	92.25	ND	NDA	NDA	NDA	NDA	ND	4.7	NA	NA
	03-Oct-94	98.69	6.18	92.51	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	11-Jan-95	98.69	6.31	92.38	ND	NDA	NDA	NDA	NDA	3.5	3.8	NA	NA
	19-Apr-95	98.69	6.47	92.22	ND	NDA	NDA	NDA	NDA	0.2	ND	NA	NA
	10-Jul-95	98.69	6.61	92.08	ND	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	19-Oct-95	98.69	7.51	91.18	ND	NDA	NDA	NDA	NDA	2.6	ND	NA	NA
	25-Jan-96	98.69	4.81	93.88	ND	NDA	NDA	NDA	NDA	0.6	ND	NA	NA
	12-Dec-96	98.69	4.95	93.74	ND	NDA	NDA	NDA	NDA	NA	NA	NA	NA
	18-Dec-97	98.69	7.23	91.46	ND	<1.0	<1.0	<1.0	<3.0	BDL	<1.0	<5.0	NA
	02-Apr-99	98.69	5.86	92.83	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	22-Jul-99	98.69	7.70	90.99	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	13-Oct-99	98.69	5.98	92.71	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	29-Dec-99	**98.69**	**5.94**	**92.75**	**ND**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**BDL**	**<5.0**	**<5.0**	**<5.0**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-3	20-Nov-91	98.32	7.33	90.99	ND	NDA	NDA	NDA	NDA	1,204	NDA	NA	NA
	24-Feb-92	98.32	6.66	91.66	ND	NDA	NDA	NDA	NDA	1,347	NDA	NA	NA
	29-May-92	98.32	5.85	92.47	ND	NDA	NDA	NDA	NDA	378	27	NA	NA
	12-Aug-92	98.32	6.78	91.54	ND	NDA	NDA	NDA	NDA	1,044	ND	NA	NA
	13-Nov-92	98.32	6.88	91.44	ND	NDA	NDA	NDA	NDA	2,192	80	NA	NA
	10-Feb-93	98.32	5.82	92.50	ND	NDA	NDA	NDA	NDA	1,205	ND	NA	NA
	20-May-93	98.32	5.26	93.06	ND	NDA	NDA	NDA	NDA	1,870	ND	NA	NA
	16-Jul-93	98.32	6.57	91.75	ND	NDA	NDA	NDA	NDA	2,128	150	NA	NA
	20-Oct-93	98.32	5.81	92.51	ND	NDA	NDA	NDA	NDA	1,057	ND	NA	NA
	31-Jan-94	98.32	5.00	93.32	ND	NDA	NDA	NDA	NDA	741	1,100	NA	NA
	08-Apr-94	98.32	4.65	93.67	ND	NDA	NDA	NDA	NDA	466	45	NA	NA
	14-Jul-94	98.32	6.31	92.01	ND	NDA	NDA	NDA	NDA	1,254	97	NA	NA
	03-Oct-94	98.32	6.03	92.29	ND	NDA	NDA	NDA	NDA	1,827	ND	NA	NA
	11-Jan-95	98.32	6.08	92.24	ND	NDA	NDA	NDA	NDA	1,351	116	NA	NA
	19-Apr-95	98.32	6.38	91.94	ND	NDA	NDA	NDA	NDA	1,863	44	NA	NA
	10-Jul-95	98.32	6.57	91.75	ND	NDA	NDA	NDA	NDA	852	154	NA	NA
	19-Oct-95	98.32	7.21	91.11	ND	NDA	NDA	NDA	NDA	357	ND	NA	NA
	25-Jan-96	98.32	4.91	93.41	ND	NDA	NDA	NDA	NDA	89	336	NA	NA
	12-Dec-96	98.32	5.00	93.32	ND	744	35	211	154	1,144	1,540	217	NA
	18-Dec-97	98.32	7.55	90.77	ND	140	14	12	28	194	<50	<100	NA
	02-Apr-99	98.32	5.66	92.66	ND	230	11	22	18	281	47	110	14
	22-Jul-99	98.32	7.47	90.85	ND	98	23	<5.0	28	149	95	66	8.0
	13-Oct-99	98.32	5.75	92.57	ND	260	10	19	16	305	44	93	23
	29-Dec-99	**98.32**	**5.73**	**92.59**	**ND**	**300**	**14**	**11**	**34**	**359**	**21**	**82**	**25**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-4	20-Nov-91	98.50	7.61	90.89	ND	NDA	NDA	NDA	NDA	653	NDA	NA	NA
	24-Feb-92	98.50	6.94	91.56	ND	NDA	NDA	NDA	NDA	ND	NDA	NA	NA
	29-May-92	98.50	6.19	92.31	ND	NDA	NDA	NDA	NDA	19	110	NA	NA
	12-Aug-92	98.50	7.10	91.40	ND	NDA	NDA	NDA	NDA	360	22	NA	NA
	13-Nov-92	98.50	7.12	91.38	ND	NDA	NDA	NDA	NDA	ND	14	NA	NA
	10-Feb-93	98.50	6.19	92.31	ND	NDA	NDA	NDA	NDA	NDA	44	NA	NA
	20-May-93	98.50	5.57	92.93	ND	NDA	NDA	NDA	NDA	307	250	NA	NA
	16-Jul-93	98.50	6.88	91.62	ND	NDA	NDA	NDA	NDA	84	580	NA	NA
	20-Oct-93	98.50	5.57	92.93	ND	NDA	NDA	NDA	NDA	20	73	NA	NA
	31-Jan-94	98.50	5.25	93.25	ND	NDA	NDA	NDA	NDA	103	320	NA	NA
	08-Apr-94	98.50	4.92	93.58	ND	NDA	NDA	NDA	NDA	323	240	NA	NA
	14-Jul-94	98.50	6.63	91.87	ND	NDA	NDA	NDA	NDA	56	147	NA	NA
	03-Oct-94	98.50	6.36	92.14	ND	NDA	NDA	NDA	NDA	19	170	NA	NA
	11-Jan-95	98.50	6.41	92.09	ND	NDA	NDA	NDA	NDA	308	5,660	NA	NA
	19-Apr-95	98.50	7.70	90.80	ND	NDA	NDA	NDA	NDA	107	946	NA	NA
	10-Jul-95	98.50	6.78	91.72	ND	NDA	NDA	NDA	NDA	15	146	NA	NA
	19-Oct-95	98.50	7.49	91.01	ND	NDA	NDA	NDA	NDA	16	2,790	NA	NA
	25-Jan-96	98.50	5.19	93.31	ND	NDA	NDA	NDA	NDA	143	(29,700)	NA	NA
	12-Dec-96	98.50	5.30	93.20	ND	3.5	ND	7.8	3.7	15	7,770	22	NA
	18-Dec-97	98.50	8.25	90.25	ND	<5.0	<1.0	<1.0	<3.0	BDL	1,900	12	NA
	02-Apr-99	98.50	5.97	92.53	ND	<1,000	2,700	<1,000	5,500	8,200	(38,000)	130	37
	22-Jul-99	98.50	7.73	90.77	ND	28	<5.0	15	9.0	52	71	60	21
	13-Oct-99	98.50	6.00	92.50	ND	5.0	<5.0	<5.0	<5.0	5.0	21	<5.0	17
	29-Dec-99	**98.50**	**6.03**	**92.47**	**ND**	**78**	**<5.0**	**9.0**	**80**	**167**	**640**	**20**	**21**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-5	20-Nov-91	97.32	NDA	NM	0.00	NDA	NDA	NDA	NDA	NDA	NDA	NA	NA
	24-Feb-92	97.32	5.89	91.43	ND	NDA	NDA	NDA	NDA	53	NDA	NA	NA
	29-May-92	97.32	9.91	87.41	ND	NDA	NDA	NDA	NDA	NS	NA	NA	NA
	12-Aug-92	97.32	9.26	88.06	ND	NDA	NDA	NDA	NDA	2.0	NA	NA	NA
	13-Nov-92	97.32	6.65	90.67	ND	NDA	NDA	NDA	NDA	41	NA	NA	NA
	10-Feb-93	97.32	6.40	90.92	ND	NDA	NDA	NDA	NDA	7	NA	NA	NA
	20-May-93	97.32	5.64	91.68	ND	NDA	NDA	NDA	NDA	776	59	NA	NA
	16-Jul-93	97.32	6.92	90.40	ND	NDA	NDA	NDA	NDA	63	3,300	NA	NA
	20-Oct-93	97.32	6.13	91.19	ND	NDA	NDA	NDA	NDA	NS	NS	NA	NA
	31-Jan-94	97.32	5.17	92.15	ND	NDA	NDA	NDA	NDA	0.8	230	NA	NA
	08-Apr-94	97.32	4.90	92.42	ND	NDA	NDA	NDA	NDA	78	440	NA	NA
	14-Jul-94	97.32	6.69	90.63	ND	NDA	NDA	NDA	NDA	94	216	NA	NA
	03-Oct-94	97.32	6.39	90.93	ND	NDA	NDA	NDA	NDA	12	275	NA	NA
	11-Jan-95	97.32	6.43	90.89	ND	NDA	NDA	NDA	NDA	1.5	100	NA	NA
	19-Apr-95	97.32	6.78	90.54	ND	NDA	NDA	NDA	NDA	35	2,560	NA	NA
	10-Jul-95	97.32	6.91	90.41	ND	NDA	NDA	NDA	NDA	9.0	455	NA	NA
	19-Oct-95	97.32	7.49	89.83	ND	NDA	NDA	NDA	NDA	2.4	12	NA	NA
	25-Jan-96	97.32	5.16	92.16	ND	NDA	NDA	NDA	NDA	4.5	720	NA	NA
	12-Dec-96	97.32	5.22	92.10	ND	NDA	NDA	NDA	NDA	0.3	498	NA	NA
	18-Dec-97	97.32	7.05	90.27	ND	<1.0	<1.0	<1.0	<3.0	BDL	16	<10	NA
	02-Apr-99	97.32	5.95	91.37	ND	<5.0	<5.0	<5.0	<5.0	BDL	210	<5.0	<5.0
	22-Jul-99	97.32	7.84	89.48	ND	18	<5.0	10	<5.0	28	250	<5.0	<5.0
	13-Oct-99	97.32	5.99	91.33	ND	<5.0	<5.0	<5.0	<5.0	BDL	63	<5.0	<5.0
	29-Dec-99	**97.32**	**6.03**	**91.29**	**ND**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**BDL**	**94**	**<5.0**	**<5.0**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

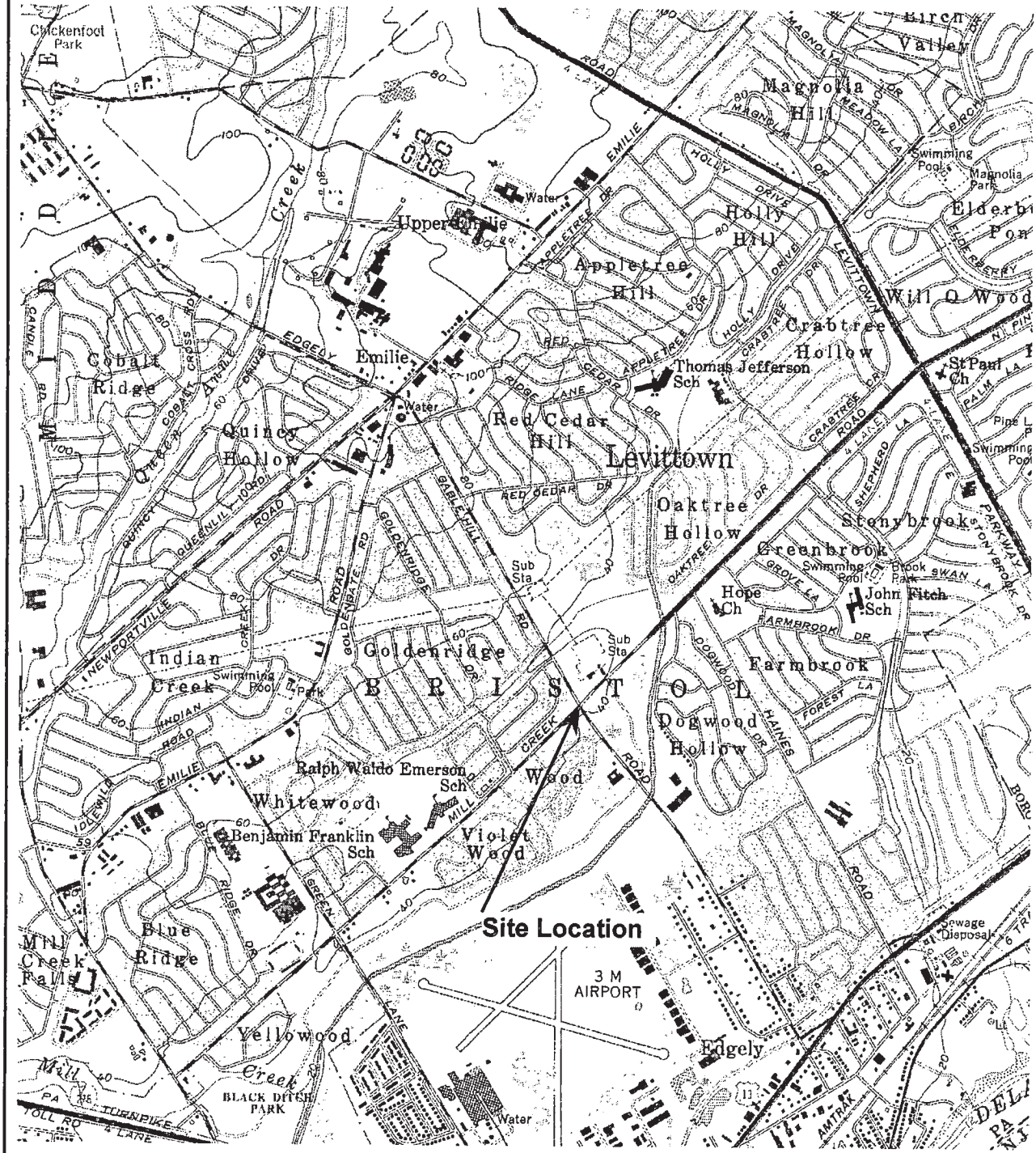
Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-6	20-Nov-91	97.74	6.55	91.19	ND	NDA	NDA	NDA	NDA	34,200	NDA	NA	NA
	24-Feb-92	97.74	5.90	91.84	ND	NDA	NDA	NDA	NDA	34,700	NDA	NA	NA
	29-May-92	97.74	4.98	92.76	ND	NDA	NDA	NDA	NDA	32,300	2,100	NA	NA
	12-Aug-92	97.74	5.95	91.79	ND	NDA	NDA	NDA	NDA	43,000	ND	NA	NA
	13-Nov-92	97.74	6.11	91.63	ND	NDA	NDA	NDA	NDA	36,800	910	NA	NA
	10-Feb-93	97.74	4.93	92.81	ND	NDA	NDA	NDA	NDA	35,900	ND	NA	NA
	20-May-93	97.74	4.26	93.48	ND	NDA	NDA	NDA	NDA	25,600	ND	NA	NA
	16-Jul-93	97.74	5.69	92.05	ND	NDA	NDA	NDA	NDA	26,900	ND	NA	NA
	20-Oct-93	97.74	4.94	92.80	ND	NDA	NDA	NDA	NDA	144	ND	NA	NA
	31-Jan-94	97.74	3.85	93.89	ND	NDA	NDA	NDA	NDA	34,500	ND	NA	NA
	08-Apr-94	97.74	3.23	94.51	ND	NDA	NDA	NDA	NDA	30,400	ND	NA	NA
	14-Jul-94	97.74	5.09	92.65	ND	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	03-Oct-94	97.74	4.88	92.86	ND	NDA	NDA	NDA	NDA	23,890	ND	NA	NA
	11-Jan-95	97.74	NDA	92.31	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	19-Apr-95	97.74	NDA	92.55	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	10-Jul-95	97.74	NDA	92.63	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	19-Oct-95	97.74	NDA	91.56	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	25-Jan-96	97.74	NDA	93.82	NDA	NDA	NDA	NDA	NDA	LPH	LPH	NA	NA
	12-Dec-96	97.74	NM	NM	NS	NS	NS	NS	NS	NS	NS	NA	NA
	18-Dec-97	97.74	5.75	91.99	ND	360	2,200	4,100	21,000	27,660	<500	1,900	NA
	02-Apr-99	97.74	4.45	93.29	Sheen	210	1,800	2,900	14,000	18,910	<50	1,900	230
	22-Jul-99	97.74	6.30	91.44	Sheen	170	1,400	2,400	10,000	13,970	<25	980	400
	13-Oct-99	97.74	4.59	93.15	ND	240	1,900	2,600	11,000	15,740	<50	970	670
	29-Dec-99	**97.74**	**4.65**	**93.19**	**0.13**	**LPH**	**LPH**	**LPH**	**LPH**	**LPH**	**LPH**	**LPH**	**LPH**

TABLE 3
Groundwater Monitoring and Quality Data
Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
Levittown, Pennsylvania

Monitoring Well	Date	Top of Casing Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Benzene (µg/l)	Toluene (µg/l)	Ethylbezene (µg/l)	Total Xylenes (µg/l)	Total BTEX (µg/l)	MTBE (µg/l)	Naphthalene (µg/l)	Isopropyl benzene (µg/l)
MW-7	20-Nov-91	97.99	6.75	91.24	0.00	NDA	NDA	NDA	NDA	9.2	NDA	NA	NA
	24-Feb-92	97.99	6.08	91.91	NDA	NDA	NDA	NDA	NDA	ND	NDA	NA	NA
	29-May-92	97.99	5.10	92.89	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	12-Aug-92	97.99	6.08	91.91	NDA	NDA	NDA	NDA	NDA	ND	6.0	NA	NA
	13-Nov-92	97.99	6.30	91.69	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	10-Feb-93	97.99	5.01	92.98	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	20-May-93	97.99	4.17	93.82	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	16-Jul-93	97.99	5.82	92.17	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	20-Oct-93	97.99	0.00	97.99	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	31-Jan-94	97.99	4.01	93.98	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	08-Apr-94	97.99	NM	NM	NDA	NDA	NDA	NDA	NDA	NS	NS	NA	NA
	14-Jul-94	97.99	5.48	92.51	NDA	NDA	NDA	NDA	NDA	ND	3.2	NA	NA
	03-Oct-94	97.99	5.16	92.83	NDA	NDA	NDA	NDA	NDA	0.3	6.7	NA	NA
	11-Jan-95	97.99	5.42	92.57	NDA	NDA	NDA	NDA	NDA	0.8	2.1	NA	NA
	19-Apr-95	97.99	5.56	92.43	NDA	NDA	NDA	NDA	NDA	0.2	ND	NA	NA
	10-Jul-95	97.99	5.59	92.40	NDA	NDA	NDA	NDA	NDA	ND	ND	NA	NA
	19-Oct-95	97.99	6.62	91.37	NDA	NDA	NDA	NDA	NDA	0.5	ND	NA	NA
	25-Jan-96	97.99	3.83	94.16	NDA	NDA	NDA	NDA	NDA	0.3	ND	NA	NA
	25-Jan-96	97.99	3.88	94.11	NDA	NDA	NDA	NDA	NDA	NS	ND	NA	NA
	12-Dec-96	97.99	NM	NM	ND	NS	NS	NS	NS	NS	NS	NS	NS
	18-Dec-97	97.99	NM	NM	ND	NS	NS	NS	NS	NS	NS	NS	NS
	02-Apr-99	97.99	4.84	93.15	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	22-Jul-99	97.99	6.70	91.29	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	13-Oct-99	97.99	4.99	93.00	ND	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0
	29-Dec-99	**97.99**	**4.91**	**93.08**	**ND**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**BDL**	**<5.0**	**<5.0**	**<5.0**

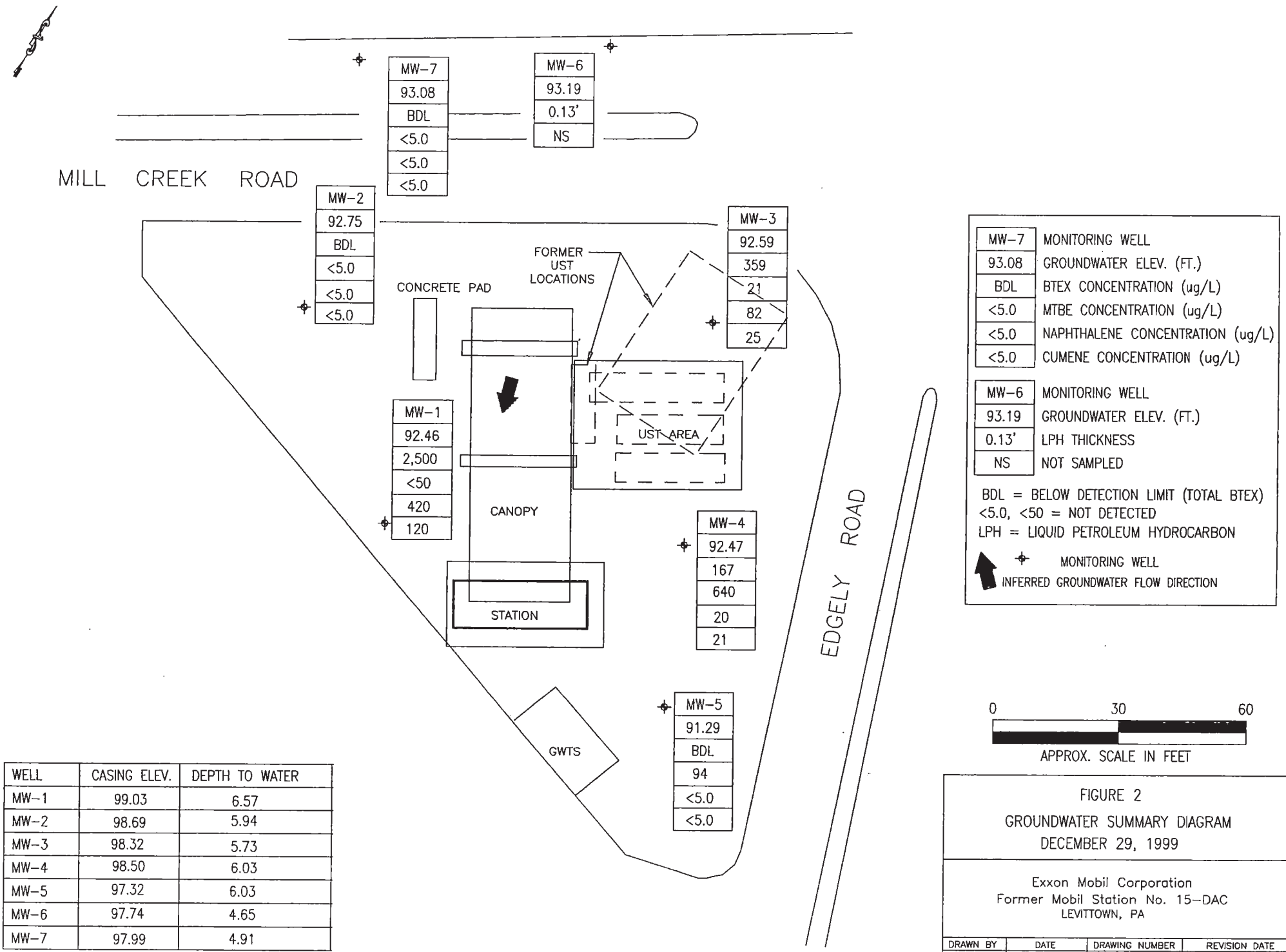
Notes:
NA = Not Analyzed NS = Not Sampled BDL = Below Detection Limits (Total BTEX)
ND = Not Detected NM = Not Measured
NDA = No Data Available LPH: Liquid petroleum hydrocarbon detected in well; not sampled
Well elevations are relative to an assigned datum of 100.00'.
BTEX, MTBE, and Naphthalene results were derived using EPA Method 8021A after January 1, 1997.
BTEX, MTBE, naphthalene, and cumene results were derived using EPA Method 8260B after April 1, 1998 except where noted by *.
The break out of BTEX is provided on the attached table. Some of the data was not retrievable from the site file.

FIGURES



Source: Trenton West, PA-NJ Quadrangle, 1955, PH 1981
Contour Interval: 20 Feet

SITE LOCATION MAP		
Exxon Mobil Corporation Former Mobil Station No. 15-DAC Levittown, Pennsylvania		
B & B	Diversified Enterprises, Inc. PO Box 3282 Maple Glen, PA 19002	
Scale: 1:24,000 Feet	Drawing By: MDB	File: 15-DAC
Date: April 17, 2001	Approved By: MDB	FIGURE 1



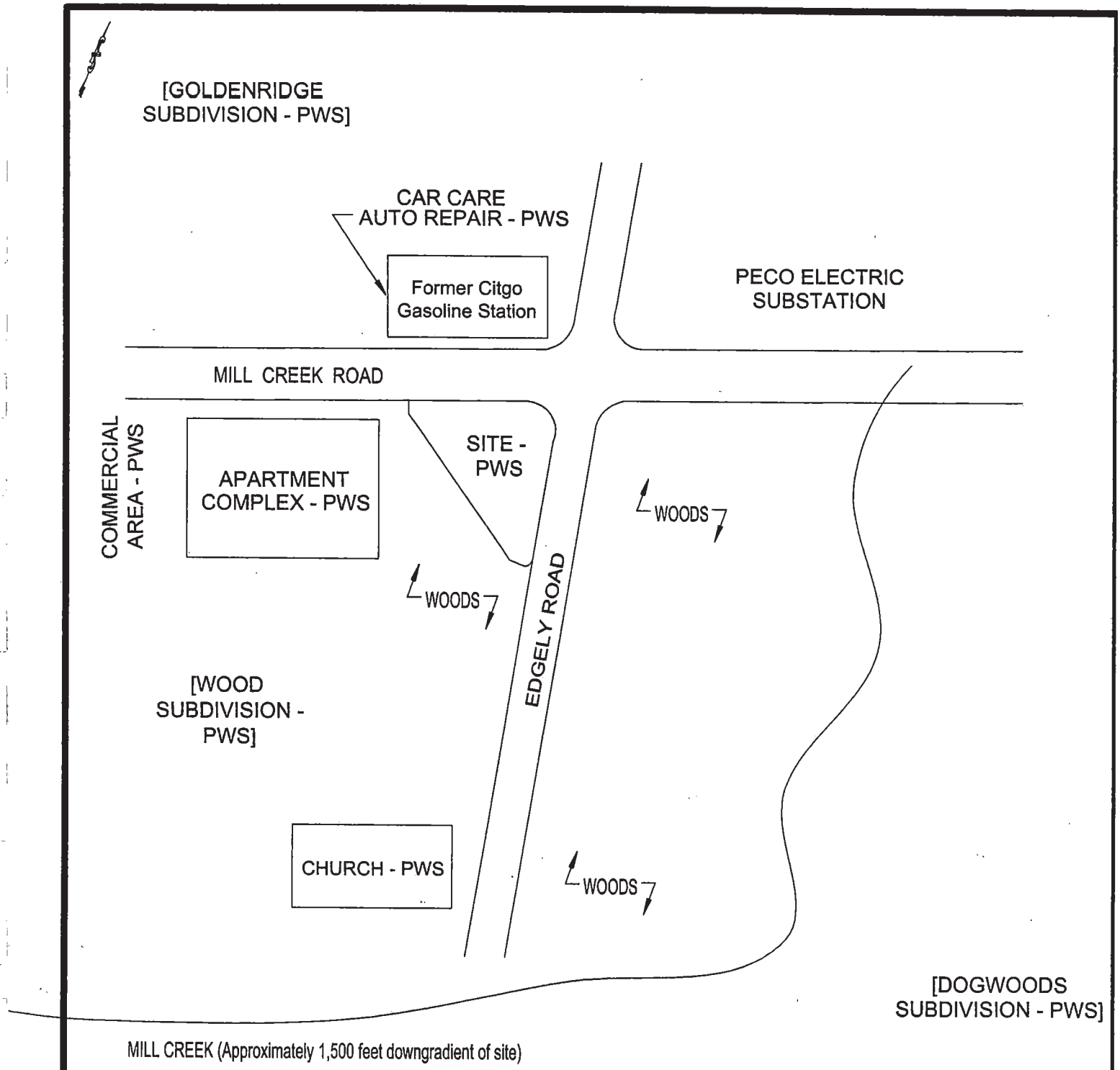
WELL	CASING ELEV.	DEPTH TO WATER
MW-1	99.03	6.57
MW-2	98.69	5.94
MW-3	98.32	5.73
MW-4	98.50	6.03
MW-5	97.32	6.03
MW-6	97.74	4.65
MW-7	97.99	4.91

Original Drawing from Handex of Eastern PA

FIGURE 2
GROUNDWATER SUMMARY DIAGRAM
DECEMBER 29, 1999

Exxon Mobil Corporation
Former Mobil Station No. 15-DAC
LEVITTOWN, PA

DRAWN BY	DATE	DRAWING NUMBER	REVISION DATE
RCE	2/4/98	62178205	1/29/00



PWS - Property of Subdivision services by Public Water Supplier

TITLE	SURROUNDING PROPERTY MAP		
PROJECT	Exxon Mobil Corporation Former Mobil Station No. 15-DAC Levittown, Pennsylvania		
B & B	DIVERSIFIED ENTERPRISES, INC. PO BOX 3282 MAPLE GLEN, PENNSYLVANIA 19002		
SCALE: NTS	DWN. BY: MB	JOB NO.: 15-DAC	
DATE: 12/21/98	APPR. BY: MB	FIG. NO.: 3	

APPENDIX A
(Local Public Water Supplier Interview Summary)

Local Water Supplier Customer Records Search						
Site Name: Mobil 15-DAC			Location: 7040 Mill Creek Road, Levittown, PA			
Local Potable Water Supplier: Lower Bucks Joint Municipal Authority						
Communicated With: Customer Service Representative (Lauren)						
Communication via:	X	Telephone 215-945-7400		Letter		In Person
Recorded By: Mark Bedle			Of: B&B Diversified Enterprises, Inc.			
At: 14:00			On: 04/16/01			

Summary of Customer Record Search:

B & B Diversified Enterprises, Inc. contacted the Lower Bucks Joint Municipal Authority (LBJMA) to obtain information on customers supplied by the LBJMA near the Former Mobil Station No. 15-DAC, located in Levittown, Pennsylvania. According to LBJMA, all properties in the vicinity of the Site are serviced with public water.

Specific Records Searched:

- Site – Serviced with public water
- Adjacent properties (condos, Car Care) – Serviced with public water.
- Area Subdivisions (Violet Woods, Woods, Goldenridge and Dogwoods) - serviced with public water.

Conclusions/Required Action/Follow-up: None

APPENDIX B
(InfoMap Well Search Report & PaGWIS Search Data)

DataMap Technology Corporation

Environmental FirstSearch™ Report

TARGET PROPERTY:

7040 MILL CREEK ROAD

LEVITTOWN PA 19057

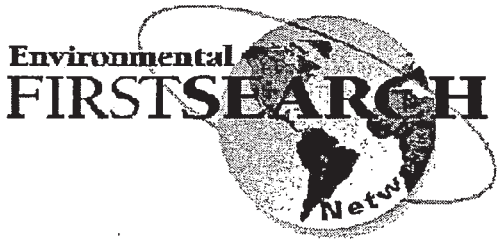
Job Number: MOBIL DAC

PREPARED FOR:

B&B Diversified Enterprises, Inc.

PO Box 16

Barto, PA 19504



Tel: (781) 320-3720 *Fax: (781) 320-3715*

Environmental FirstSearch
Search Summary Report

Target Site: 7040 MILL CREEK ROAD
LEVITTOWN PA 19057

FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2 >	ZIP	TOTALS
NPL	N	07-27-00	1.00	-	-	-	-	-	-	-
CERCLIS	N	08-10-00	1.00	-	-	-	-	-	-	-
RCRA TSD	N	06-24-00	1.00	-	-	-	-	-	-	-
RCRA COR	N	06-24-00	1.00	-	-	-	-	-	-	-
RCRA GEN	N	06-24-00	1.00	-	-	-	-	-	-	-
RCRA NLR	N	10-18-99	1.00	-	-	-	-	-	-	-
ERNS	N	01-06-00	1.00	-	-	-	-	-	-	-
NPDES	N	10-18-99	1.00	-	-	-	-	-	-	-
FINDS	N	09-21-99	1.00	-	-	-	-	-	-	-
TRIS	N	07-16-98	1.00	-	-	-	-	-	-	-
State Sites	N	08-21-00	1.00	-	-	-	-	-	-	-
Spills-1990	N	NA	1.00	-	-	-	-	-	-	-
Spills-1980	N	NA	1.00	-	-	-	-	-	-	-
SWL	N	01-15-00	1.00	-	-	-	-	-	-	-
Permits	N	NA	1.00	-	-	-	-	-	-	-
Other	N	NA	1.00	-	-	-	-	-	-	-
REG UST/AST	N	06-30-00	1.00	-	-	-	-	-	-	-
Leaking UST	N	08-21-00	1.00	-	-	-	-	-	-	-
State Wells	Y	06-01-98	1.00	0	0	0	0	2	0	2
Aquifers	N	NA	1.00	-	-	-	-	-	-	-
ACEC	N	NA	1.00	-	-	-	-	-	-	-
Wetlands	N	12-31-99	1.00	-	-	-	-	-	-	-
Floodplains	N	NA	1.00	-	-	-	-	-	-	-
Receptors	N	01-01-95	1.00	-	-	-	-	-	-	-
Nuclear Permits	N	04-30-99	0.25	-	-	-	-	-	-	-
Historic/Landmark	N	09-01-99	0.25	-	-	-	-	-	-	-
Federal Land Use	N	06-17-98	0.25	-	-	-	-	-	-	-
Federal Wells	N	NA	0.25	-	-	-	-	-	-	-
Releases(Air/Water)	N	NA	0.25	-	-	-	-	-	-	-
- TOTALS -				0	0	0	0	2	0	2

Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to DataMap Technology Corp., certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in DataMap Technology Corp.'s databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the northern and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

Waiver of Liability

Although DataMap Technology Corp. uses its best efforts to research the actual location of each site, DataMap Technology Corp. does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of DataMap Technology Corp.'s services proceeding are signifying an understanding of DataMap Technology Corp.'s searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.

Environmental FirstSearch
Site Information Report

Request Date: 09-26-00
Requestor Name: Mark Bedle
Standard: Well Search

Search Type: COORD
Job Number: MOBIL DAC

Target Address: 7040 MILL CREEK ROAD
LEVITTOWN PA 19057

Demographics

Sites: 2 **Non-Geocoded:** 0 **Population:** NA

Radon: NA

Site Location

	Degrees (Decimal)	Degrees (Min/Sec)		UTMs
Longitude:	-74.845826	-74:50:45	**Easting:**	513133.296
Latitude:	40.141993	40:8:31	**Northing:**	4443318.322
			Zone:	18

Comment

Comment: EXXONMOBIL 15-DAC WELL SEARCH

Additional Requests/Services

Adjacent ZIP Codes: **1.00 Mile(s)**

ZIP Code	City Name	ST	Dist/Dir	Sel
19030	FAIRLESS HILLS	PA	0.98 NW	Y
19055	LEVITTOWN	PA	0.01 NE	Y

Services:

	Requested?	Date
Sanborns	N	
Aerial Photographs	N	
Topo Maps (hardcopy)	N	
City Directories	N	
Title Search	N	
Municipal Reports	N	
Online Topo Map	N	

Environmental FirstSearch
Sites Summary Report

TARGET SITE: 7040 MILL CREEK ROAD
LEVITTOWN PA 19057

JOB: MOBIL DAC
EXXONMOBIL 15-DAC WELL SEARCH

TOTAL: 2 **GEOCODED:** 2 **NON GEOCODED:** 0 **SELECTED:** 0

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
1	PWS	LEVITTOWN HDWR 14588/DOMESTIC	BRISTOL BORO PA	0.68 SE	1
2	PWS	MAGILO MRS C 14525/DOMESTIC	BRISTOL BORO PA	0.90 SE	2

Environmental FirstSearch
Site Detail Report

TARGET SITE: 7040 MILL CREEK ROAD
LEVITTOWN PA 19057

JOB: MOBIL DAC
EXXONMOBIL 15-DAC WELL SEARCH

No sites were selected!

Environmental FirstSearch
Federal Databases and Sources

1. **NPL:** ***National Priority List.*** The EPA's list of confirmed or proposed Superfund sites.

   Updated quarterly.

2. **CERCLIS:** ***Comprehensive Environmental Response Compensation and Liability Information System.*** The EPA's database of current and potential Superfund sites currently or previously under investigation.

   Updated quarterly.

3. **RCRIS:** ***Resource Conservation and Recovery Information System.*** The EPA's database of registered hazardous waste generators and treatment, storage and disposal facilities. Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List).

   Updated quarterly.

4. **ERNS:** ***Emergency Response Notification System.*** The EPA's database of EPA emergency response actions.

   Updated quarterly.

5. **NPDES:** ***National Pollution Discharge Elimination System.*** The EPA's database of all permitted facilities receiving and discharging effluents to and from the environment.

   Updated semi-annually.

6. **FINDS:** ***The Facility Index System.*** The EPA's Index of identification numbers associated with a property or facility which the EPA has investigated or has been made aware of in conjunction with various regulatory programs. Each record indicates the EPA office that may have files on the site or facility.

   Updated quarterly.

Environmental FirstSearch
Pennsylvania Databases and Sources

1. **STATE:** The Pennsylvania Priorities List (SPL) is a priority list of sites which have released or could potentially release hazardous substances into the environment. Under the Hazardous Sites Cleanup Act (HSCA) and CERCLA, the Pennsylvania Department of Environmental Protection is authorized to investigate, assess, and cleanup sites in the Commonwealth regardless of whether or not these sites qualify for cleanup under the Federal Superfund Act.

2. **LUST:** The Pennsylvania List of Confirmed Releases report identifies facilities in the Commonwealth with known releases from above ground or underground storage tanks. In this report, the Pennsylvania Department of Environmental Protection, Bureau of Land Recycling and Waste Management provides pertinent site details such as name and address of the facility, type of substance released, and remediation status.

3. **UST:** The Pennsylvania Department of Environmental Protection, Bureau of Water Quality Management, provides a listing of registered underground storage tanks, known as the Regulated Storage Tank Listing.

4. **SWL:** Solid waste facilities within the Commonwealth are regulated by the Pennsylvania Department of Environmental Protection, Bureau of Waste Management. The lists provided by the DEP and searched in this report include Solid Waste Transfer Stations, Inactive Solid Waste Facilities, and the Solid Waste Inventory Database.

Environmental FirstSearch
Street Name Report for Streets within .25 Mile(s) of Target Property

TARGET SITE: 7040 MILL CREEK ROAD
LEVITTOWN PA 19057

JOB: MOBIL DAC
EXXONMOBIL 15-DAC WELL SEARCH

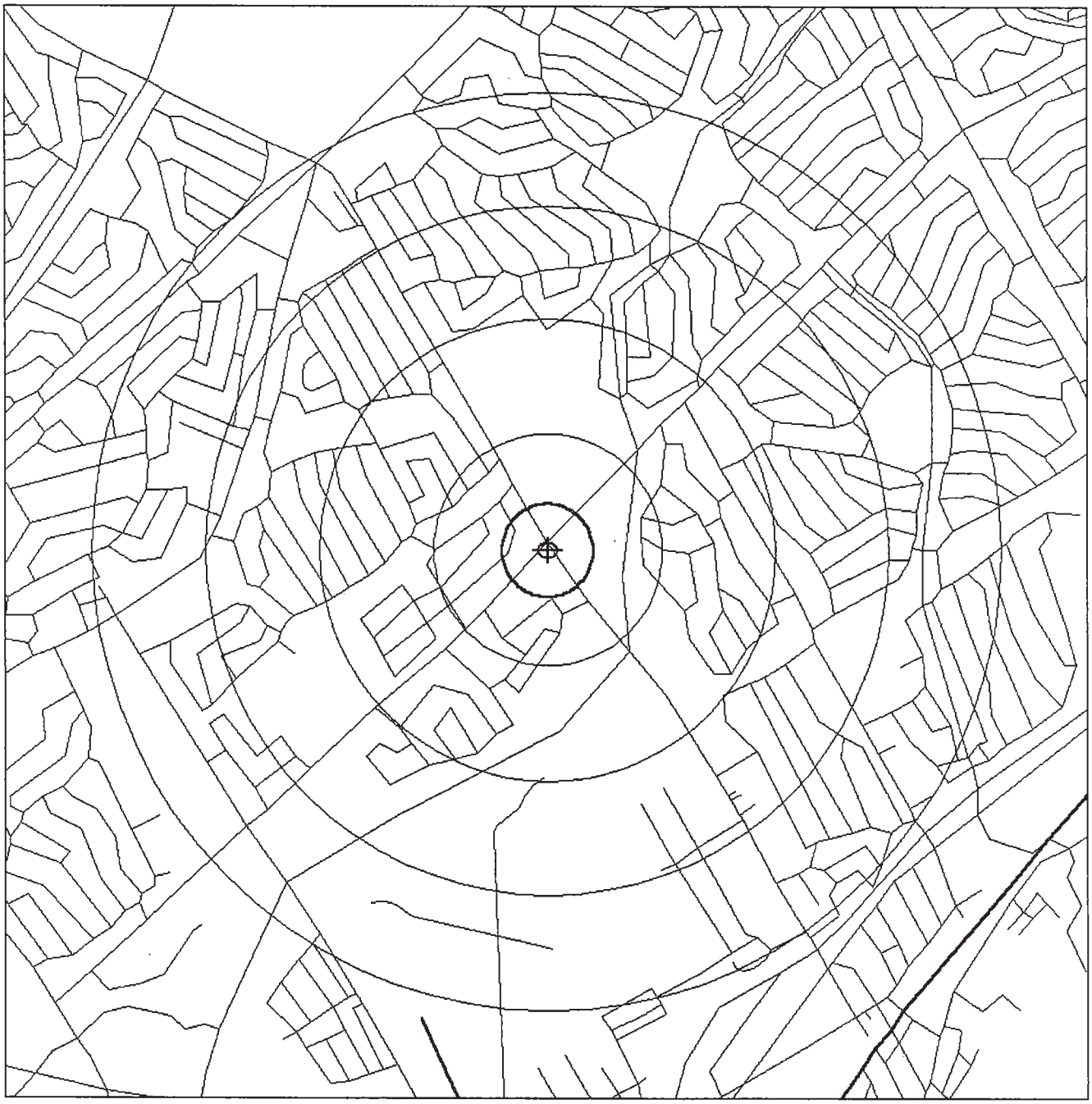
Street Name	Dist/Dir	Street Name	Dist/Dir
Dark Leaf Ln	0.22 NE		
Deepgreen Ln	0.21 NE		
Dogwood Dr	0.21 NE		
Edgely Rd	0.01 NE		
Gable Hill Rd	0.21 NW		
Gatewood Rd	0.21 NW		
Goodturn Rd	0.21 NW		
Gridiron Rd	0.22 NW		
Joseph Pl	0.25 SW		
Michael Pl	0.24 SW		
Mill Creek Pky	0.01 NE		
Mill Creek Rd	0.01 NW		
Oldbrook Rd	0.14 NW		
Oldpond Rd	0.16 NW		
Orange End	0.24 NW		
Orangewood Dr	0.15 NW		
Verdant Rd	0.14 SE		
Violet Rd	0.18 SE		
Violetwood Turn	0.14 SE		
Vulcan Rd	0.19 SW		

Environmental FirstSearch

1 Mile Radius

ASTM Map: NPL, RCRACOR, STATE Sites

7040 MILL CREEK ROAD, LEVITTOWN PA 19057



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 40.141993 Longitude: -74.845826) .....

Identified Site, Multiple Sites, Receptor .....

NPL, Solid Waste Landfill (SWL) or Hazardous Waste .....

Railroads .....

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

Environmental FirstSearch

.5 Mile Radius

ASTM Map: CERCLIS, RCRATSD, SPILLS90, SWL

7040 MILL CREEK ROAD, LEVITTOWN PA 19057

Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 40.141993 Longitude: -74.845826) .....

Identified Site, Multiple Sites, Receptor .....

NPL, Solid Waste Landfill (SWL) or Hazardous Waste .....

Railroads .....

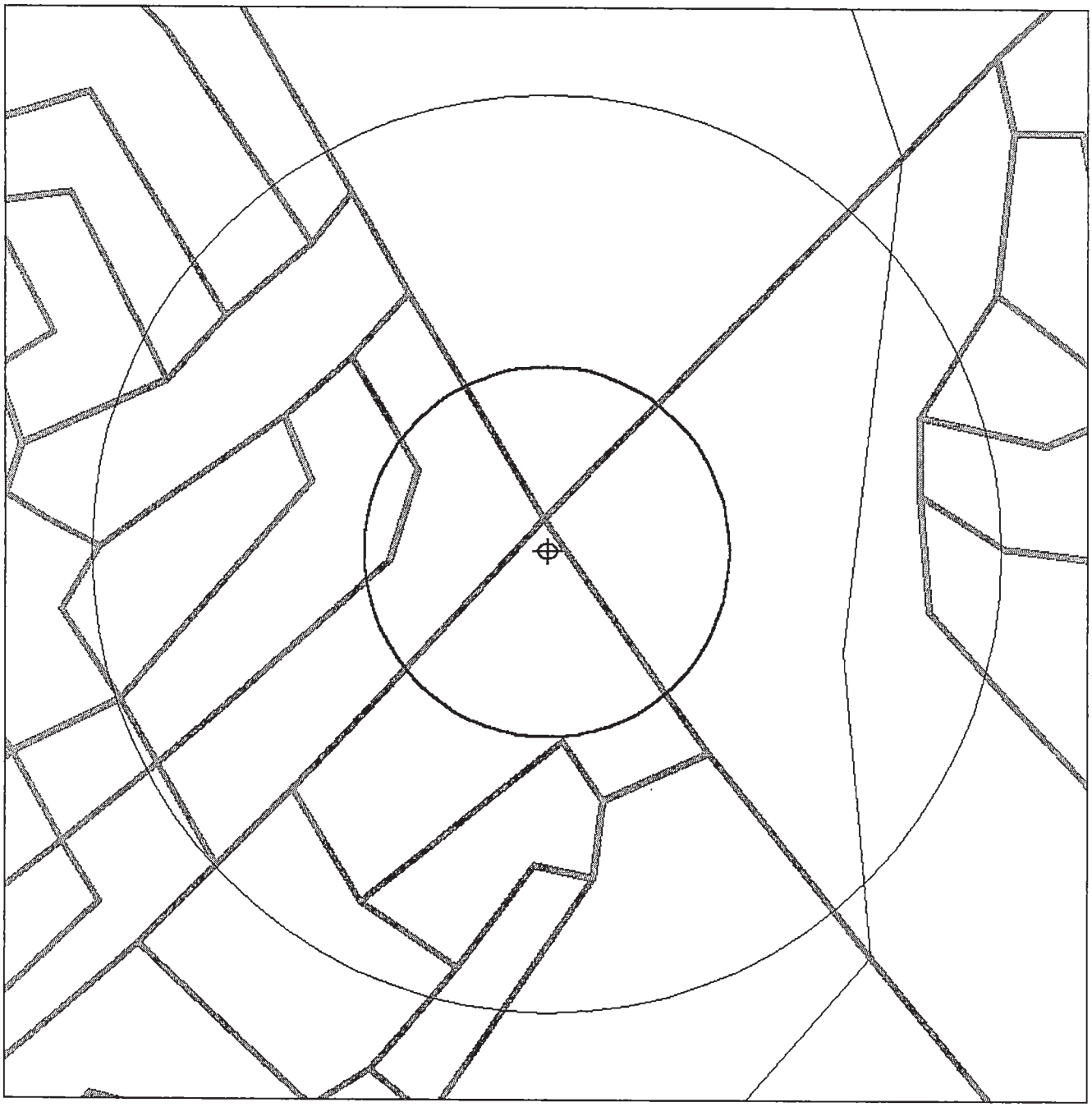
Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

Environmental FirstSearch

.25 Mile Radius

ASTM Map: RCRAGEN, ERNS, UST

7040 MILL CREEK ROAD, LEVITTOWN PA 19057



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 40.141993 Longitude: -74.845826) .....

Identified Site, Multiple Sites, Receptor .....

NPL, Solid Waste Landfill (SWL) or Hazardous Waste .....

Railroads .....

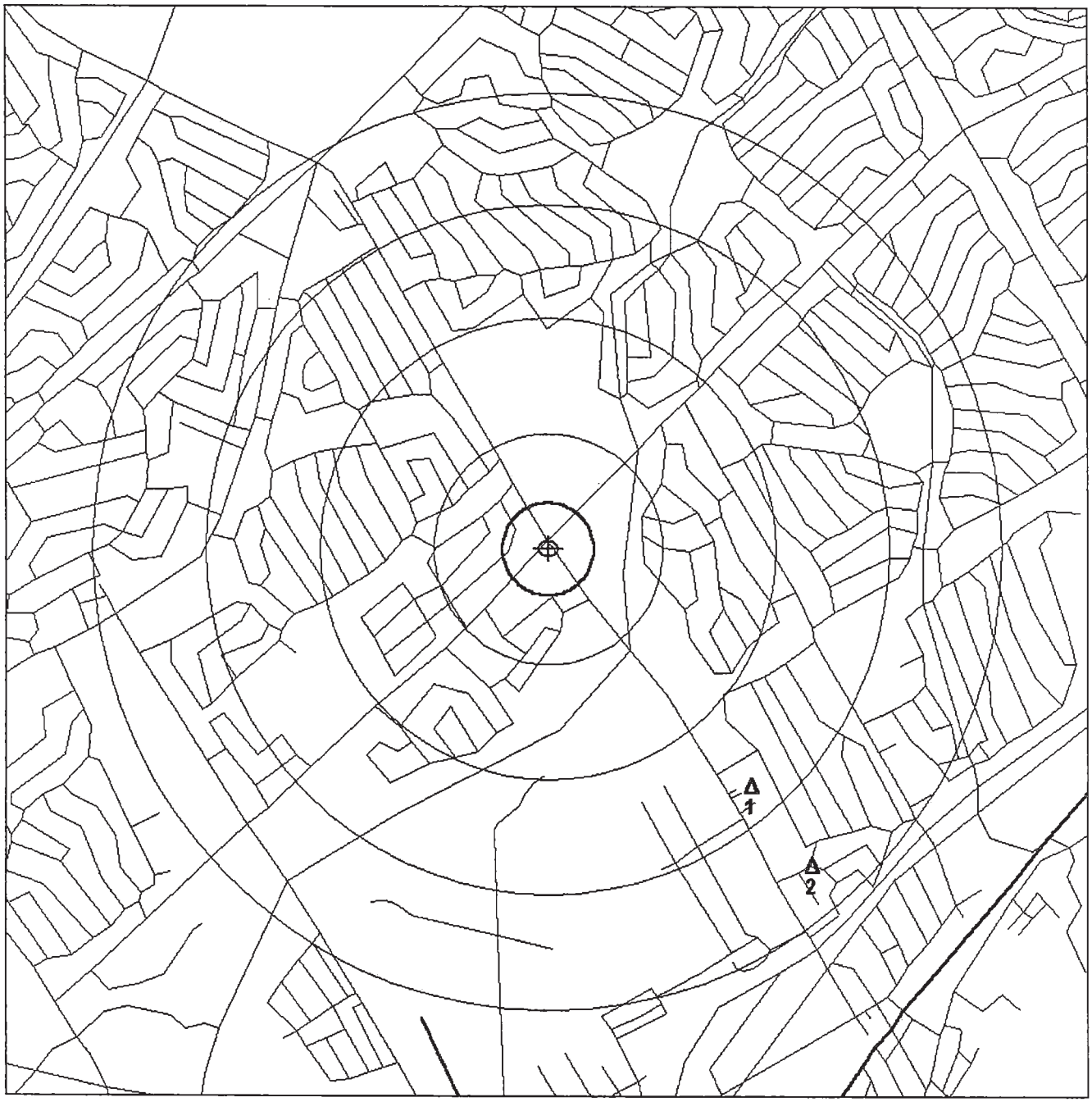
Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

Environmental FirstSearch

1 Mile Radius

State Wells Sites

7040 MILL CREEK ROAD, LEVITTOWN PA 19057



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 40.141993 Longitude: -74.845826) .....

Identified Site, Multiple Sites, Receptor .....

NPL, Solid Waste Landfill (SWL) or Hazardous Waste .....

Railroads .....

Black Rings Represent 1/4 Mile Radii; Red Ring Represents 500 ft. Radius

Public Water Supply, DEP Zone II Boundaries .....

POLLUTION ENTERPRISES, INC. II

151 Keith Valley Road • Horsham, PA 19044 • 215-343-7705

December 11, 1991

12-16-91
RAY CAVALIER-WIN CATION
TOO

Ms. Cynthia Steele
UST Program
PADER
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

RE: Off-site Contaminant Su.
Mobil SS #16-DAC
7040 Mill Creek Road
Levittown, PA
PEI# 5055

Dear Ms. Steele:

On behalf of our client, Mobil Oil Corporation, I contacted Mr. Robert Day-Lewis of the UST Program on November 18, 1991, in reference to free-phase liquid hydrocarbons found in an upgradient, off-site monitor well (Well 06) at the referenced site on November 14, 1991. This product is of particular concern because we had intended to install a pump and treat system at the subject site to address low levels of dissolved-phase hydrocarbons. At the request of Mr. Day-Lewis, I have prepared a brief history of the site and our future remedial plans.

PEI is presently conducting an environmental investigation at the subject site. To date, six monitoring wells have been installed: four on-site and two off-site (Figure 1).

Analytical data from soil samples obtained during drilling indicate that total BTEX concentrations ranged from 180.3 - 189.9 ppm in Well 06, to 2.66 - 31.51 ppm in Well 07 (See the Concentrations of BTEX and TPH in Soil Table).

Analytical data from a recent groundwater sampling event indicate that total dissolved BTEX concentrations are 9.24 ppb in Well 07 and 34,200 ppb in Well 06. (see Concentrations of BTEX and TPH in Groundwater Table). It should also be noted that Well 06 has had a thin film of LHC on the water

APPENDIX C
(PADEP Correspondence / Selected Site Files)

POLLUTION ENTERPRISES, INC.

151 Keith Valley Road • Horsham, PA 19044 • 215-343-7705

September 12, 1991

Mr. Arnie DiFlorio
Mobil Oil Corporation
P. O. Box 839
Valley Forge, PA 19482

RE: Tank Closure Report
Mobil SS #16-DAC
7040 Mill Creek Road
Levittown, PA
PEI #5055

Dear Mr. DiFlorio:

On April 17, 1991, Mobil Oil Corporation contracted Pollution Enterprises, Inc. (PEI) to inert two abandoned USTs (6,000 gallon each) at the referenced site and provide a Tank Closure Report. This contract was subsequent to PEI's proposal dated April 4, 1991.

After receiving the appropriate tank registration numbers from the PADER, work commenced on August 26, 1991. The concrete and fill material overlying the tanks was removed, at which point it was discovered the tanks were already filled with concrete. The PADER was notified of this fact and, during the discussion, PEI obtained permission to backfill and repave the excavation. A copy of the correspondence with the PADER is enclosed for your review.

On the following day, August 27, two soil samples were obtained from between the two tanks at a depth of 9 feet. After samples were obtained, the excavation was backfilled.

Total BTEX levels for the two samples were 149,000 ppb and 257,000 ppb respectively, and TPH levels were 630 and 640, respectively. A copy of the analytical results have been included with this letter.

surface during the last three monitoring visits. See Figure 2 for Dissolved BTEX in Groundwater Map.

No sheens or free-phase films have ever been detected in any of the on-site wells (Wells 01-04). Water elevations indicate that groundwater flows southeasterly across the site under a 0.3% gradient (Figure 3).

Well 06 and 07 are located at the property boundary of an abandoned service station, directly upgradient (approximately 60 ft. - 80 ft.) from the subject site. The owner of this property is unknown.

As mentioned earlier, remedial action at this site included a pump and treat system. However, pumping groundwater from the subject site would induce the migration of contaminated groundwater towards Mobil's property. Mobil would effectively be "pulling" a higher concentration plume onto its site.

Any remedial action plan must take into account the presence of LHC in the off-site, upgradient well, as Mobil will not assume responsibility to remediate contamination caused by other parties. Therefore, it is imperative that the LHC in Well 06 be remediated by the property owner.

PEI will continue to monitor and sample on a regular basis as requested by Mobil. Construction and operation of the pump and treat system will be put on hold until the issue of off-site contaminant sources is addressed.

Should you have any questions or concerns regarding this project, please do not hesitate to call our office. Thank you for your time and co-operation.

Sincerely yours,

Daniel F. Yonker
Project Manager

DFY:kkh
cc: Arnie DiFlorio, Mobil Oil
05055MRR.kh1
Encls.

Concentrations (ppm) of BTEX and TPH in Soil

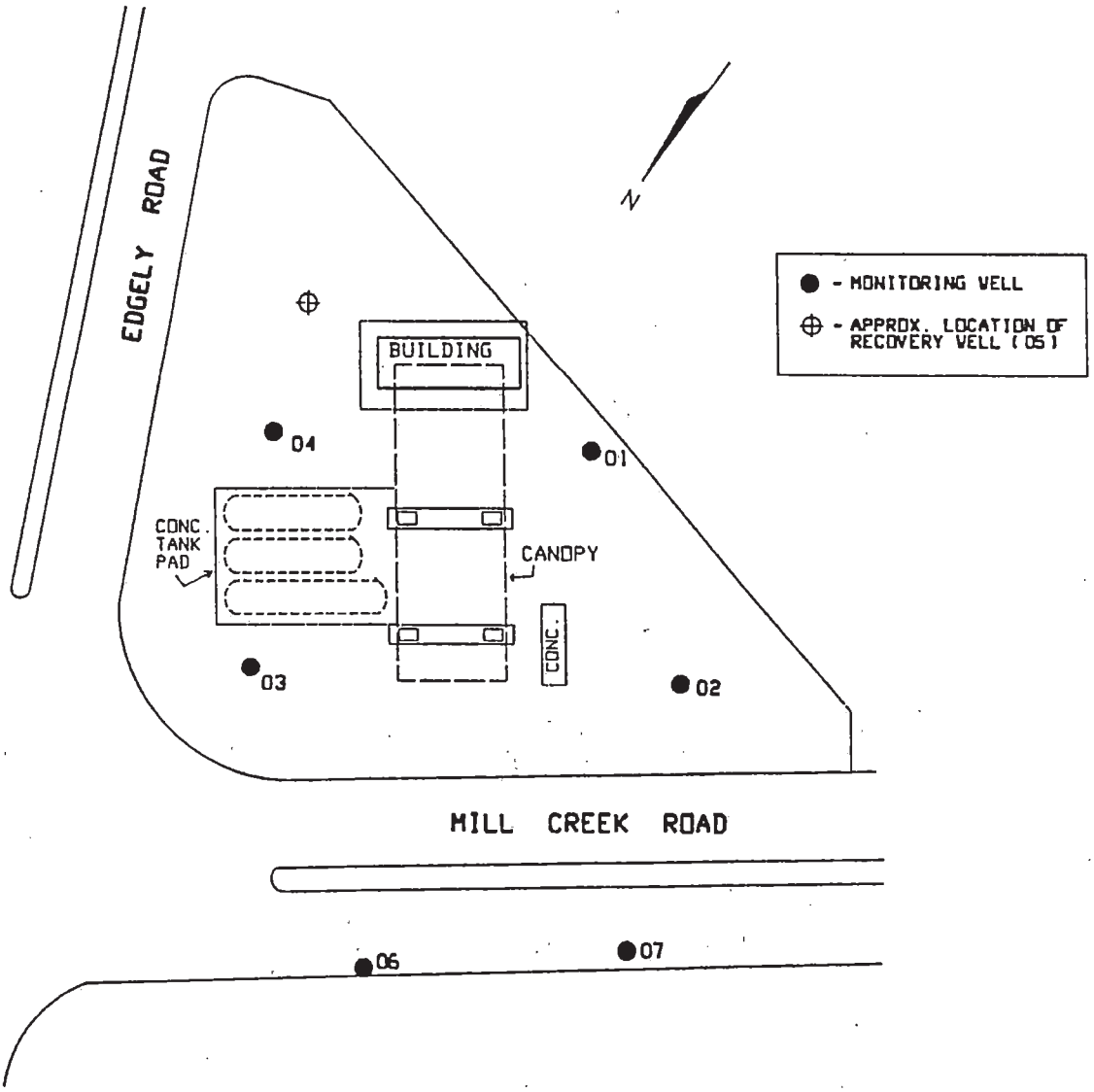
Well	Depth(ft)	Benzene	Toluene	E-Benzene	Xylenes	TPH	Tot BTEX	Date
05(RW)	05-07	0	0	0	0	0	0	09/04/91
05(RW)	13-15	0	0	0	0	0	0	
06	05-07	2.80	34.00	23.00	130.00	640.00	189.80	09/09/91
06	10-12	4.30	35.00	21.00	120.00	380.00	180.30	
07	05-07	0.61	6.10	3.80	21.00	0.00	31.51	
07	10-12	0.07	0.49	0.30	1.80	0.00	2.66	

Concentrations below detection limits are shown as 0.
Refer to lab data for actual values.

Concentrations of BTEX (ppb) and TPH (ppm) in Groundwater

Well	Benzene	Toluene	E-Benzene	Xylenes	TPH	Tot BTEX	Date
01	250	39	900	1600	3.9	2789	08/12/91
02	5.4	0.92	15	18	0	39.32	
03	1200	72	780	310	1.1	2362	
04	230	0	280	15	0.7	525	
01	240	22	670	930	6.3	1862	11/20/91
02	0	0	0	1.3	0	1.3	
03	870	24	190	120	0.71	1204	
04	410	3.3	220	20	1.1	653.3	
06	3500	13000	2700	15000	21	34200	
07	0	2.7	0.84	5.7	0	9.24	

Concentrations below detection limits are shown as 0.
Refer to lab data for actual values.



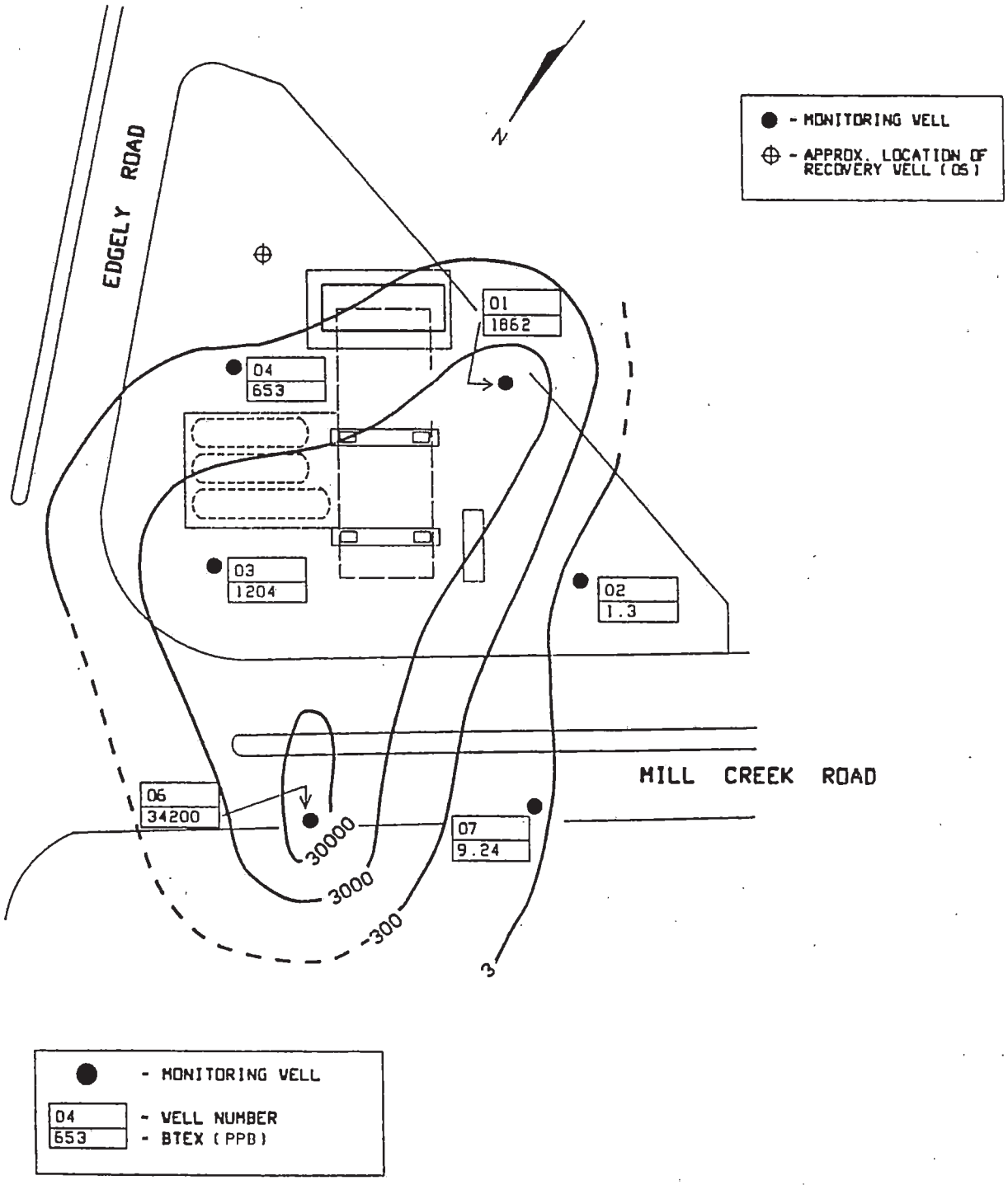
SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC.
151 Keith Valley Road Horsham, PA 19044 215-343-7705

DATE: 12/09/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SP1

Figure 1 - Site Plan Map
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA

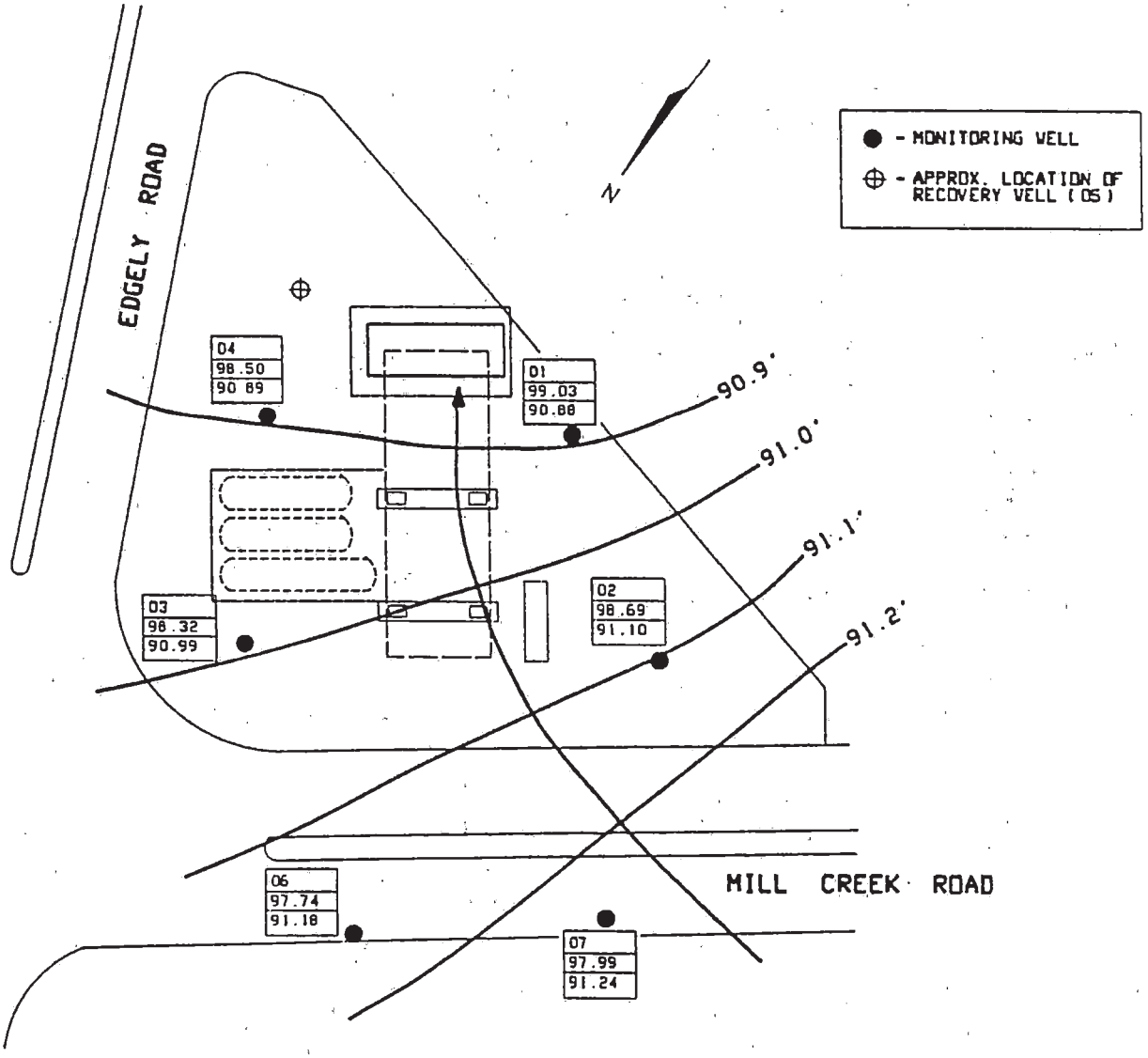


SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC. 151 Keith Valley Road Horsham, PA 19044 215-343-7705	
DATE: 12/11/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SB1

Figure 2 - Total BTEX in Groundwater (11/20/91)
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA



● - MONITORING WELL

04 - WELL NUMBER
98.50 - TOC (FT)
90.89 - WATER ELEVATION (FT)

- GROUNDWATER FLOW DIRECTION

SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC.
151 Keith Valley Road Horsham, PA 19044 215-343-7705

DATE: 12/11/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SRG

Figure 3 - Groundwater Gradient Map (11/20/91)
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA

POLLUTION ENTERPRISES, INC. II

151 Keith Valley Road • Horsham, PA 19044 • 215-343-7705

STATUS REPORT

(Reporting Period: April 17, 1991, to November 30, 1991)

Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, Pennsylvania

PREPARED FOR

Arnie DiFlorio
Mobil Oil Corporation
Valley Forge Engineering Center
P. O. Box 839
Valley Forge, PA 19482

INVESTIGATION CONDUCTED BY:

Daniel F. Yonker
Project Manager

PREPARED BY:

Larry Keffer
Staff Geologist

REVIEWED BY:

James G. Gallagher, PE
Operations Manager

PEI# 5055

December 13, 1991

CONTENTS

1.0 INTRODUCTION

On April 17, 1991, Mobil Oil Corporation contracted Pollution Enterprises, Inc. (PEI). to perform the work as presented in PEI's proposal dated April 4, 1991, at Mobil Station #16-DAC in Levittown, PA (Figure 1). The scope of work included:

* A pump test to determine the hydrogeologic properties of the underlying aquifer.

* The installation of two groundwater monitoring wells (upgradient and off-site) and one eight-in. recovery well.

* The construction and operation of a pump and treat groundwater remediation system.

* Twice monthly monitoring of all monitoring wells, and quarterly groundwater sampling events, analyzing for BTEX (602) and TPH (418.1).

* Generate three Quarterly Reports.

The report which follows summarizes PEI's field procedures, data collection and recovery progress to date for the period beginning April 17, 1991, and ending November 30, 1991.

2.0 SITE DESCRIPTION

The subject facility is located on a site which is approximately 12,100 ft.^{2}, and consists of a one-story building with a small sales area and office. Two pump islands exist on site, both of which are located between the building and Mill Creek Road. Three underground storage tanks (UST's), two 10,000-gal. and one 12,000-gal., are located on the northeast corner of the site (Figure 2).

3.0 RECOVERY OPERATIONS AND PROGRESS

3.1 Monitor Well Installation

On September 4 and 9, 1991, PEI supervised the installation of two off-site monitor wells (Wells 06 and 07) and a recovery well (RW 05). The off-site wells were drilled in the shoulder of Mill Creek Road, approximately 40 ft. northwest (upgradient) of the site. The recovery well (RW 05) was drilled approximately 40 ft. southeast of Well 04. Each

monitor well was constructed with 4-in. ID flush joint threaded (FJT) PVC riser and .02-in. screen, with the exception of the recovery well which was constructed with 8-in. FJT PVC riser and screen. The annular space was packed with sand one to two ft. above the screened PVC, sealed with Bentonite, and secured in place with a cement/grout mixture. All wells were constructed in compliance with PADER and Mobil specifications. For specific construction and lithologic details, refer to the drilling logs in the Appendix.

Split spoon samples were obtained at 5-ft. intervals in each well during drilling operations. Sample collection procedures can be found in the Appendix. Refer to Section 4.3 for soil sample data.

After completion the wells were developed to counteract the effects of drilling. This was accomplished by hand bailing three times the volume of water from each well using a PVC bailer. The bailer was cleaned between each well using standard decontamination procedures.

On September 30, 1991, all the on-site and off-site monitoring wells were surveyed using an optical differential leveling technique. The recovery well will be surveyed when the manhole is installed. The northern corner of the building foundation was used as a benchmark.

3.2 Pump Test

On October 4, 1991, a pre-pump test was conducted on RW 05 at the subject site. The results of this test were used to determine the parameters at which to run the pump test several days later.

The pump test commenced on October 8, 1991, on RW 05 at an average pumping rate of 0.3 gpm, which increased to 0.75 gpm after 4.5 hours. The water was evacuated from the well using a submersible pump, and was discharged into a VAC truck. During the test, water levels were obtained from each well on a timed interval basis to determine aquifer response. At the conclusion of the pump test, a recovery test (which involves measuring the rate of recharge within a well) was performed to aid in determining hydraulic characteristics of the aquifer. The results from the pump test are discussed below in Section 4.4.

3.3 Water/Hydrocarbon Level Monitoring

Monitoring of the six observation wells was conducted eleven times during the reporting period. An interface probe and surface sampler were used during monitoring to determine water levels and the presence of liquid-phase hydrocarbons. PEI's exact QA/QC procedures can be found in the Appendix. Refer to Section 4.1 for monitoring data.

3.4 Groundwater Sampling

Groundwater samples were obtained from monitoring Wells 01 through 04 on August 12, 1991. The wells were sampled again on November 20, 1991, this time including new Wells 06 and 07. See the Appendix for PEI's sampling procedures. Refer to Section 4.2 for groundwater sampling data.

All samples were stored in a cooler and delivered to Enseco Laboratories in Somerset, New Jersey, to be analyzed for BTEX (EPA Method 602) and TPH (EPA Method 418.1).

4.0 DATA SUMMARY

4.1 Water/Liquid Hydrocarbon Level Monitoring Data

Water level data from November 20, 1991, were used to construct a groundwater gradient map, which indicates groundwater flows in an southeasterly direction across the site under a 0.3% gradient (Figure 3). Groundwater monitoring reports indicate that no floating liquid hydrocarbons or sheens were present in any of the wells until the November 13 visit, at which point a sheen was noted in Well 06. On the following visit (November 20) a film was noted in Well 06. Please refer to the Groundwater Monitoring Data Table in the Appendix.

4.2 Groundwater Analysis

Analytical results from samples collected (per Section 3.4) on August 12, 1991, indicate that total dissolved BTEX levels ranged from 39.32 ppb in Well 02 to 2,789 ppb in Well 01. Analytical results from the November 20, 1991 event indicate that total dissolved BTEX levels ranged from 34,200 ppb in Well 06 to 1.3 ppb in Well 02 (see Concentrations of BTEX and TPH in Groundwater Table). Two Total Dissolved BTEX in Groundwater maps has been constructed from this data to help delineate the dissolved BTEX plume (Figure 4 and 5). A copy of the lab data can be found in the Appendix.

With the exception of Well 04, dissolved BTEX concentrations decreased in the on-site wells from the August sampling event to the November sampling event.

4.3 Soil Analysis

Analytical results from soil samples collected during drilling indicate the presence of extensive hydrocarbon contamination in off-site Wells 06 and 07. Well 06 (from 5 ft. -7 ft.) had BTEX and TPH concentrations of 189.8 ppm and 640 ppm, respectively. From 10 ft. -12 ft., concentrations were 180.3 ppm and 380 ppm, respectively. In Well 07, BTEX and TPH concentrations from 5 ft. -7 ft. were 31.51 ppm and 0 ppm, respectively; from 10 ft. -12 ft. concentrations were 2.66 ppm and 0 ppm, respectively. Recovery Well 05 had no detectable BTEX or TPH concentrations from 5 ft. -7 ft. or 13 ft. -15 ft. See the Concentrations of BTEX and TPH in Soil Table in the Appendix.

4.4 Pump Test Data

The pumped well (05) showed a maximum drawdown of 5.16 ft. at the end of a 7 hour period. The pump rate at 7 hours was averaging .75 gpm. Well 04 (40 ft. from the pumping well) had .04 ft. of drawdown, Wells 01 and 03 (70 ft. and 80 ft. from the pumping well, respectively) had .03 ft. of drawdown, and Well 02 (110 ft. from pumping well) had .01 ft. of drawdown. There was no measured response in Wells 06 and 07 which are 140 ft. - 160 ft. from the pumping well. See Figure 6 for a Drawdown map.

At the conclusion of the pump test, a recovery test was performed for 40 minutes. The field data recorded during the 7 hour test and the recovery test are presented in tabular form in the Appendix.

An estimation of hydraulic conductivity was calculated from the recovery data using a computer software program. Specifically, a Recovery Test method designed by Bouwer and Rice was used to obtain a permeability value of approximately .001036 ft/min, which is typical for the poorly sorted stream deposits encountered during drilling operations. A graph of the recovery data can be found in the Appendix.

5.0 CONCLUSIONS

Soil samples from off-site Wells 06 and 07 have excessively high dissolved BTEX and TPH concentrations. Because of their location (upgradient) and the shallow depth to groundwater (6 ft.), it can be concluded that the abandoned gasoline station (upgradient from the subject site) is a contributing factor to on-site hydrocarbon contamination.

This conclusion can be substantiated by noting that Well 06 has a thin LHC film (.01 ft.) and dissolved BTEX levels of 34,200 ppb. In the past,

the highest BTEX concentrations in on-site wells has been 2,789 ppb in Well 01.

Dissolved BTEX concentrations in groundwater indicate that the subsurface hydrocarbon plume has its highest concentrations around Well 06 (Figure 4).

Data from the pump test indicate that the recovery well (05) can yield 0.75-1.0 gpm. This flow rate is adequate for a low volume pump and treat system.

6.0 SCHEDULED ACTIVITIES

The monitor wells are scheduled to be sampled in January, 1991. All wells will continue to be monitored on a twice-monthly schedule.

The PADER has been notified of the LHC found in Well 06. Installation of the pump and treat system has been delayed until the upgradient contaminant source has been addressed.

7.0 LIMITATIONS

The purpose of this investigation is to determine the extent of on-site and off-site contamination through a network of monitoring wells and to determine hydrogeologic conditions for the installation of a remediation system. The report has been based on a limited number of monitoring wells and chemical analyses. The conclusions presented and the remedial actions taken are based only on the observations made during this investigation and data provided by others. The report presents a description of the conditions observed at each monitoring location selected during this and previous investigations, as well as observations made during well installations. The subsurface conditions may vary significantly with time, particularly with respect to groundwater elevations and groundwater quality. Should any additional data become available, this data should be reviewed by Pollution Enterprises, Inc. and the conclusions presented herein modified, as appropriate.

Information provided by others has been utilized in assessing the site conditions. The accuracy of conclusions drawn from this information is inherently based on the accuracy of the information that is provided.

This report was prepared exclusively for the use of the Mobil Oil Corporation. Use of this report or any portion thereof by others, out of its intended context, may invalidate conclusions presented herein. Likewise, the report was prepared for an evaluation of the referenced site and was confined to the scope as issued by the Mobil Oil Corporation. It is accurate only to the degree implied by the investigative methods used. Use of this data for any location other than the referenced site or beyond the scope of the contract may invalidate conclusions based thereon.

This report has been prepared in accordance with Pollution Enterprises, Inc. Standard Terms and Conditions. No other warranty, expressed or implied, is made.

Monitoring wells installed by Pollution Enterprises, Inc. become the property of the client. Maintenance and sealing of these wells is the responsibility of the client. Pennsylvania State Act 610. The Water Well Drillers Licensing Act of 1956 (PL 1840), requires that such wells be properly maintained and eventually sealed when abandoned. According to Act 610, a well is considered abandoned when no activity has occurred at the well after a period of one year.

Particular care should be taken to ensure that such wells are not destroyed, damaged and/or lost during any construction subsequent to their installation.

Wells should be sealed in accordance with the requirements and specifications as outlined in Act 610. Please refer to the Pennsylvania Department of Environmental Resources, Bureau of Topographic and Geologic Survey for guidelines on sealing abandoned wells.

APPENDIX

Tables
Graphs
Figure 1 - Site Location Map
Figure 2 - Site Plan Map
Figure 3 - Groundwater Gradient Map (11/20/91)
Figure 4 - Total BTEX in Groundwater (08/21/91)
Figure 5 - Total BTEX in Groundwater (11/20/91)
Figure 6 - Drawdown @ 7 hrs. Map (10/08/91)
Boring Logs
Laboratory Analyses and Chains of Custody
Standard QA/QC Procedures for Field Data Acquisition

Groundwater Monitoring Data

Well	Depth to LHC(ft)	Depth to Water(ft)	Clear/ Sheen	LHC Thick(ft)	Water Elev(ft)	Adj Wtr Elev(ft)	Date
01		6.75	c		92.28		05/28/91
02		6.10	c		92.59		
03		5.95	c		92.37		
04		6.29	c		92.21		
01		7.14	c		91.89		06/10/91
02		6.45	c		92.24		
03		6.34	c		91.98		
04		6.66	c		91.84		
01		7.13	c		91.90		06/25/91
02		6.59	c		92.10		
03		6.43	c		91.89		
04		6.75	c		91.75		
01		7.35	c		91.68		07/15/91
02		6.74	c		91.95		
03		6.54	c		91.78		
04		6.85	c		91.65		
01		7.52	c		91.51		07/29/91
02		6.92	c		91.77		
03		6.73	c		91.59		
04		7.01	c		91.49		
01		7.47	c		91.56		08/12/91
02		6.92	c		91.77		
03		6.73	c		91.59		
04		7.02	c		91.48		
01		5.85	c		93.18		08/21/91
02		6.11	c		92.58		
03		6.09	c		92.23		
04		6.60	c		91.90		

Groundwater Monitoring Data (cont.)

Well	Depth to LHC(ft)	Depth to Water(ft)	Clear/ Sheen	LHC Thick(ft)	Water Elev(ft)	Adj Wtr Elev(ft)	Date
01		7.79	c		91.24		10/08/91
02		7.21	c		91.48		
03		6.98	c		91.34		
04		7.27	c		91.23		
06		6.17	c		91.57		
07		6.33	c		91.66		
01		5.81	c		93.22		10/28/91
02		6.23	c		92.46		
03		6.11	c		92.21		
04		6.49	c		92.01		
06		6.37	c		91.37		
07		6.53	c		91.46		
01		8.05	c		90.98		11/13/91
02		7.50	c		91.19		
03		7.24	c		91.08		
04		7.56	c		90.94		
06		6.47	s		91.27		
07		6.64	c		91.35		
01		8.15	c		90.88		11/20/91
02		7.59	c		91.10		
03		7.33	c		90.99		
04		7.61	c		90.89		
06	6.55	6.56		0.01	91.18	91.19	
07		6.75	c		91.24		

Concentrations of BTEX (ppb) and TPH (ppm) in Groundwater

Well	Benzene	Toluene	E-Benzene	Xylenes	TPH	Tot BTEX	Date
01	250	39	900	1600	3.9	2789	08/12/91
02	5.4	0.92	15	18	0	39.32	
03	1200	72	780	310	1.1	2362	
04	230	0	280	15	0.7	525	
01	240	22	670	930	6.3	1862	11/20/91
02	0	0	0	1.3	0	1.3	
03	870	24	190	120	0.71	1204	
04	410	3.3	220	20	1.1	653.3	
06	3500	13000	2700	15000	21	34200	
07	0	2.7	0.84	5.7	0	9.24	

Concentrations below detection limits are shown as 0.
Refer to lab data for actual values.

Observation Well Data, 10/08/91

Well	Elapsed Time (min)	Depth to Water (ft)	Drawdown
01	0	7.79	0
	420	7.82	0.03
02	0	7.21	0
	420	7.22	0.01
03	0	6.98	0
	420	7.01	0.03
04	0	7.27	0
	420	7.31	0.04
06	0	6.17	0
	420	6.17	0
07	0	6.33	0
	420	6.33	0

Concentrations (ppm) of BTEX and TPH in Soil

Well	Depth(ft)	Benzene	Toluene	E-Benzene	Xylenes	TPH	Tot BTEX	Date
05(RW)	05-07	0	0	0	0	0	0	09/04/91
05(RW)	13-15	0	0	0	0	0	0	
06	05-07	2.80	34.00	23.00	130.00	640.00	189.80	09/09/91
06	10-12	4.30	35.00	21.00	120.00	380.00	180.30	
07	05-07	0.61	6.10	3.80	21.00	0.00	31.51	
07	10-12	0.07	0.49	0.30	1.80	0.00	2.66	

Concentrations below detection limits are shown as 0.
Refer to lab data for actual values.

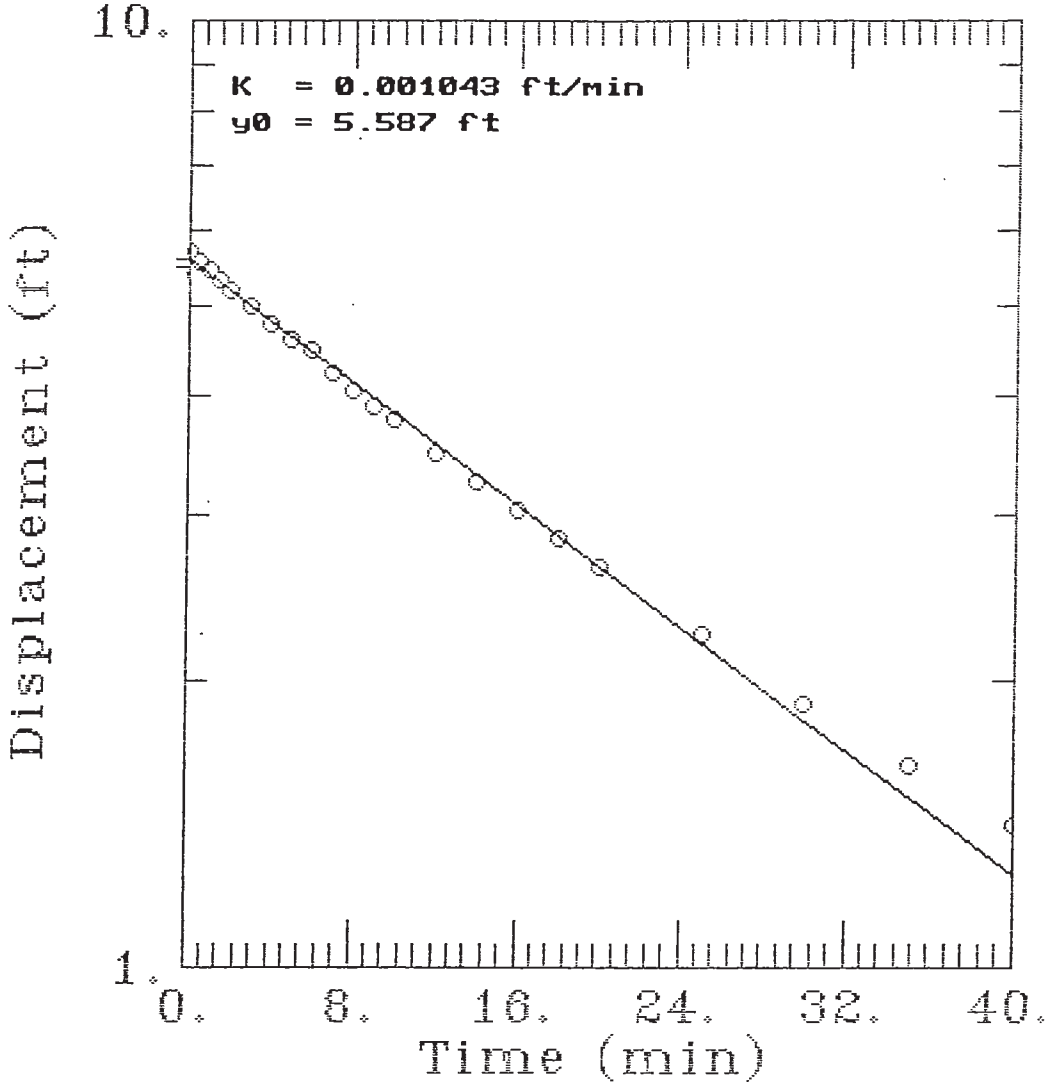
Pumping Well Data, Well 05, 10/08/91

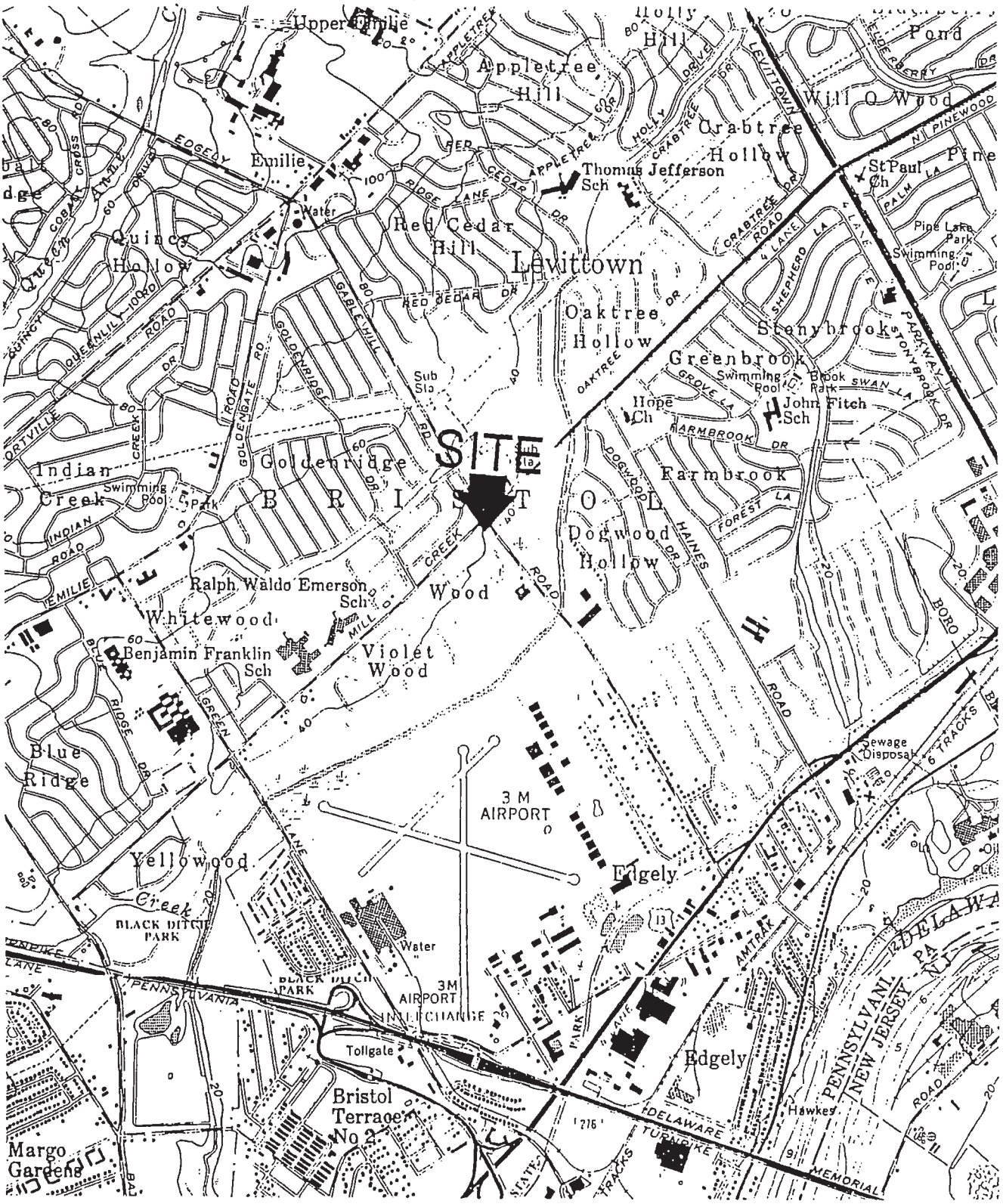
Elapsed Time (min)	Depth to Water (ft)	Drawdown (ft)	GPM
0	6.29		
0.5	6.38	0.09	
1	6.41	0.12	
1.5	6.44	0.15	0.30
2	6.48	0.19	
3	6.56	0.27	
4	6.69	0.40	
5	6.82	0.53	
6	6.91	0.62	
7	6.97	0.68	
8	7.03	0.74	
9	7.08	0.79	
10	7.14	0.85	0.30
12	7.23	0.94	
14	7.28	0.99	
16	7.31	1.02	
18	7.35	1.06	
20	7.39	1.10	
25	7.47	1.18	0.30
30	7.54	1.25	
35	7.59	1.30	
40	7.64	1.35	
45	7.70	1.41	
50	7.73	1.44	
55	7.76	1.47	
60	7.80	1.51	0.30
70	7.88	1.59	
80	7.98	1.69	
90	8.06	1.77	
100	8.11	1.82	
120	8.18	1.89	
140	8.22	1.93	
160	8.25	1.96	0.30
180	8.17	1.88	
210	8.16	1.87	0.30
240	8.06	1.77	0.30
270	10.07	3.78	0.75
300	10.58	4.29	
360	11.13	4.84	0.75
420	11.45	5.16	0.75

Recovery Data, Well 05, 10/08/91

Elapsed Time (min)	Depth to Water (ft)	Drawdown (ft)
0	11.98	5.69
0.5	11.86	5.57
1	11.73	5.44
1.5	11.62	5.33
2	11.49	5.20
3	11.28	4.99
4	11.08	4.79
5	10.88	4.59
6	10.69	4.49
7	10.53	4.24
8	10.37	4.05
9	10.21	3.92
10	10.07	3.78
12	9.79	3.50
14	9.54	3.25
16	9.32	3.03
18	9.12	2.83
20	8.93	2.64
25	8.53	2.24
30	8.19	1.90
35	7.92	1.63
40	7.70	1.41

RECOVERY TEST (RW05) LEVITTOWN, PA





SCALE

0' 2000' 4000'

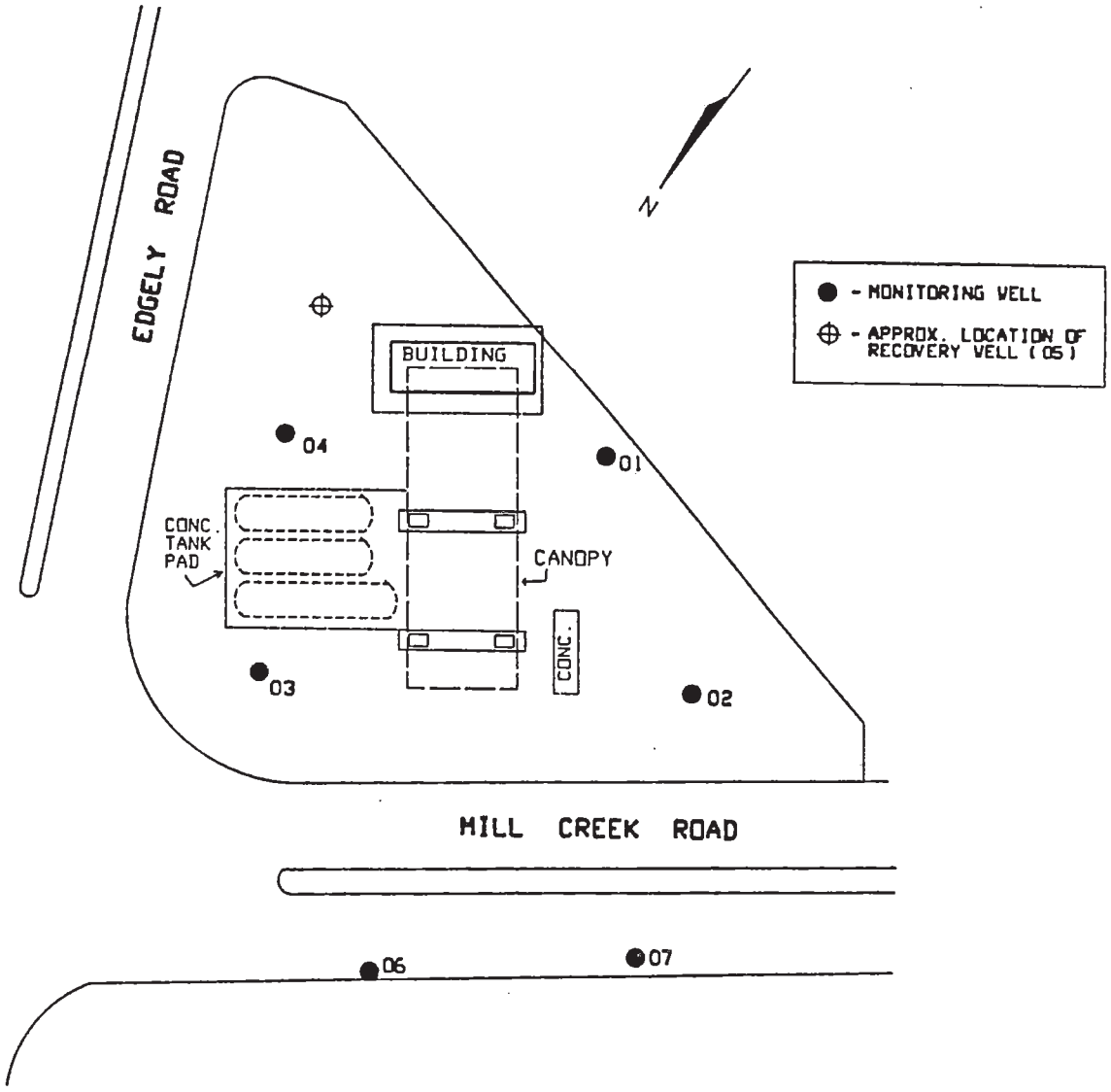
N

USGS 7.5-Minute Series Topographic Map
"Bristol, PA, Quadrangle"
1955, photorevised 1981
"Trenton West, NJ, Quadrangle"
1955, photorevised 1981

POLLUTION ENTERPRISES, INC.
151 Keith Valley Road Horsham, PA 19044 215-343-7705

DATE: 12/12/91	DRAWN BY: See Source
SCALE: See Legend	DRW NO: 5055SLM

Figure 1 - Site Location Map
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA



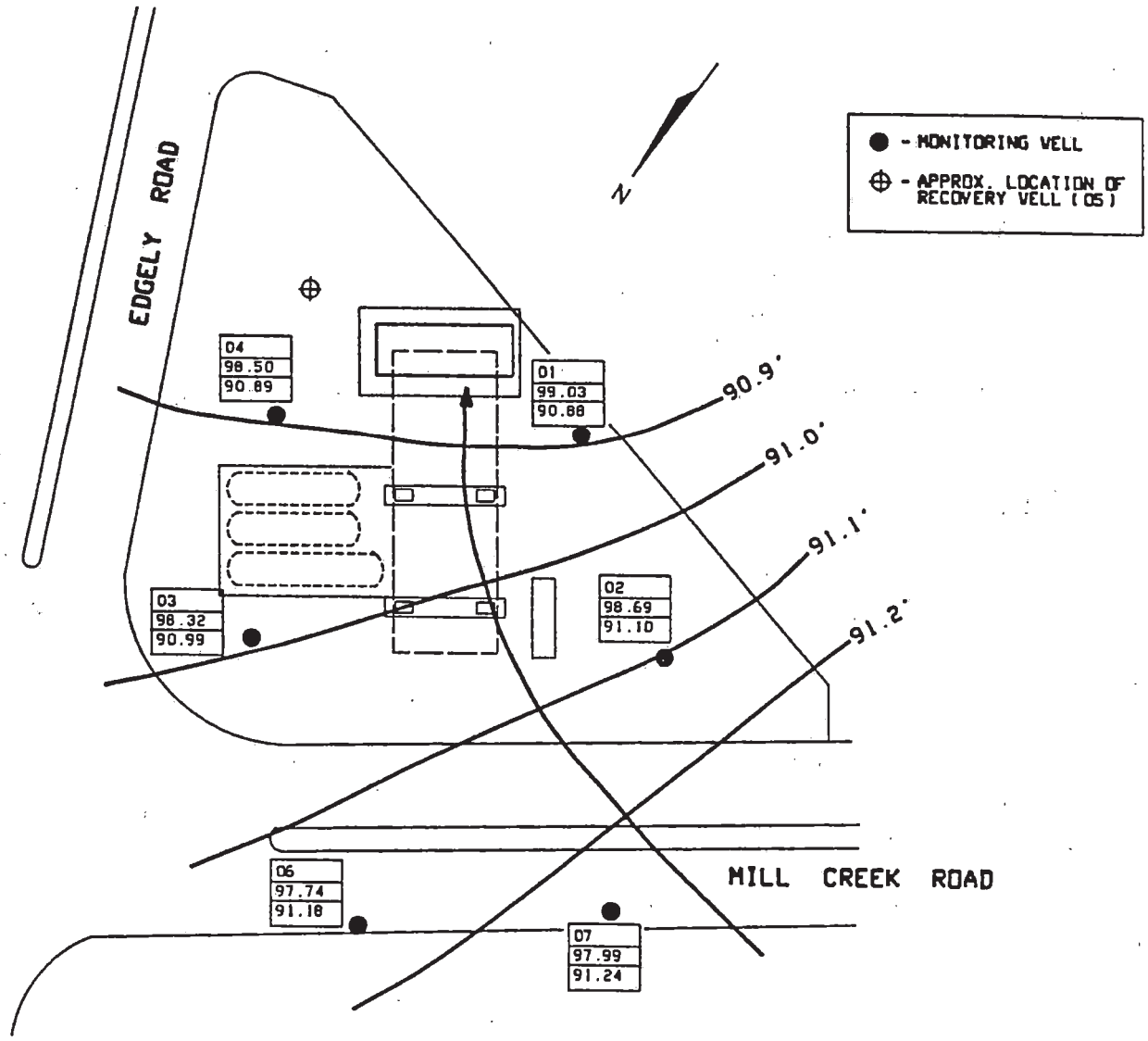
SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC. 151 Keith Valley Road Horsham, PA 19044 215-343-7705	
DATE: 12/09/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SP1

Figure 2 - Site Plan Map

Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA



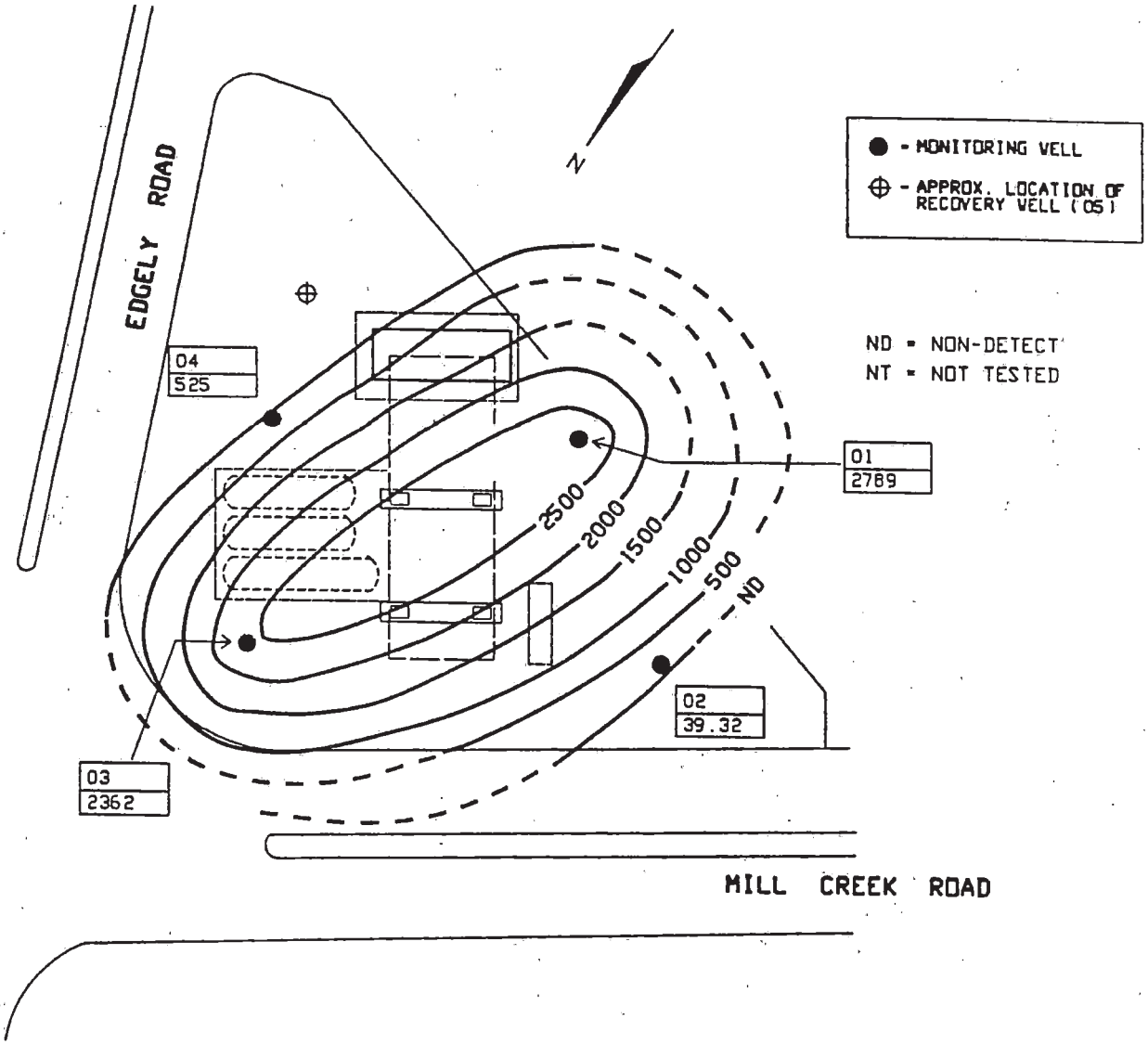
SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC.
151 Keith Valley Road Horsham, PA 19044 215-343-7705

DATE: 12/11/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SRG

Figure 3 - Groundwater Gradient Map (11/20/91)
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA



● - MONITORING WELL

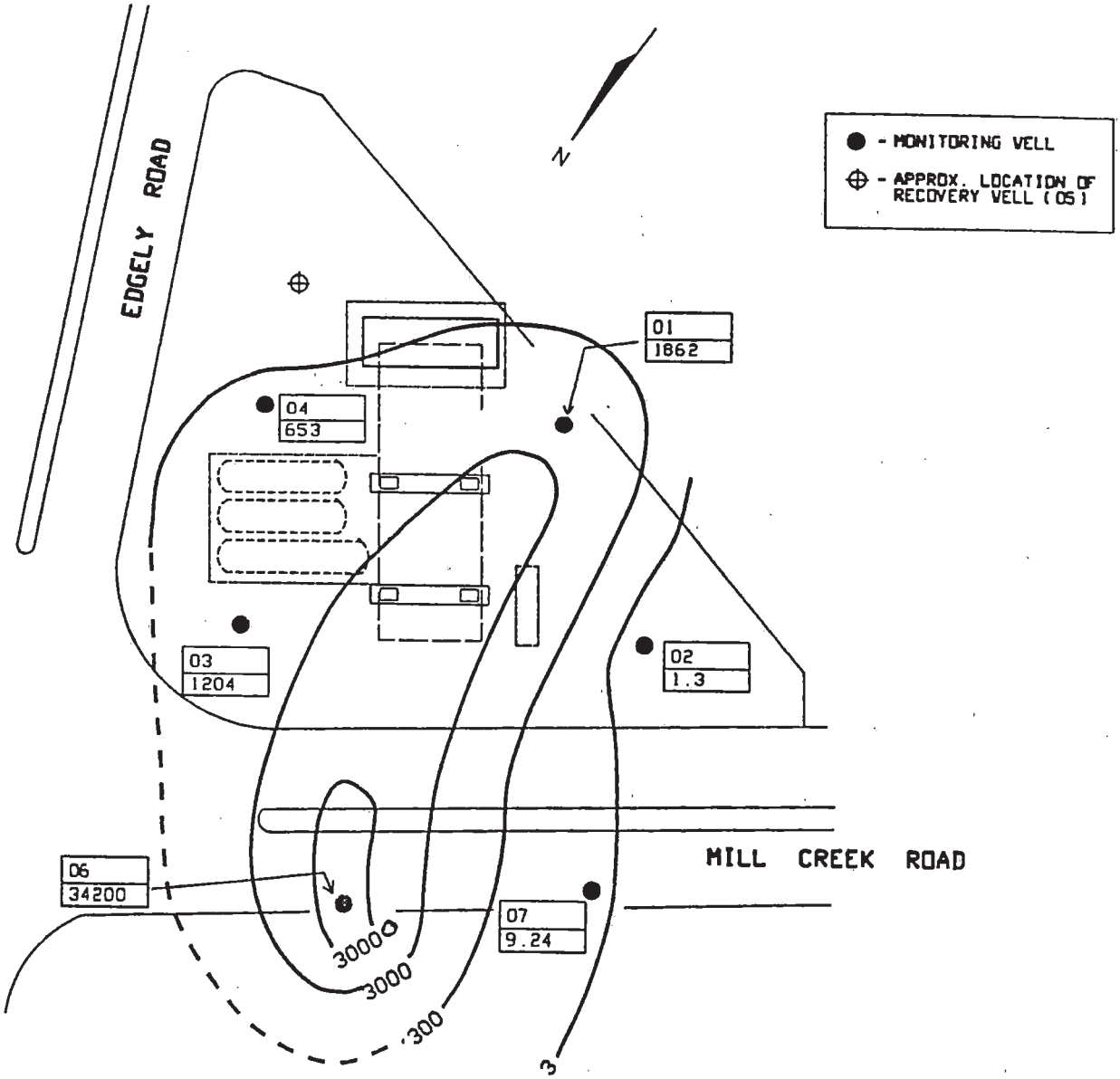
04 / 525 - WELL NUMBER / BTEX (PPB)

SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC. 151 Keith Valley Road Horsham, PA 19044 215-343-7705	
DATE: 12/13/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SRB

Figure 4 - Total BTEX in Groundwater (08/12/91)
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA



SCALE

0' 40' 80'

POLLUTION ENTERPRISES, INC.
151 Keith Valley Road Horsham, PA 19044 215-343-7705

DATE: 12/13/91	DRAWN BY: KKH
SCALE: See Legend	DRW No: 5055SB1

Figure 5 - Total BTEX in Groundwater (11/20/91)
Mobil Service Station #16-DAC
7040 Mill Creek Road
Levittown, PA

Environmental Services Laboratory
Mobil Technical Center
Princeton, New Jersey

November 8, 1995

W. Valencia
Fairfax, 5W218

cc:
C.L. Tatsch - Princeton

FREE PRODUCT CHARACTERIZATION
SS # 16-DAC
LEVITTOWN, PA

ESL ENDORSEMENT NO. 95030-SP

We have completed a free product characterization on the above subject as requested on October 24, 1995 by Chris Sassaman of Land Tech Remedial. Two monitoring well free products were received at ESL on October 24, 1995

All analytical data are provided in the attached Table 1. Overall, we conclude:

- On-site MW-1 product is a moderately weathered gasoline whose lead content is 1.50 g/gal.
- Off-site MW-6 product is slightly weathered gasline whose lead content is 1.05 g/gal.
- Even accounting for the loss of volatile gasoline components by weathering and the loss of aromatics such as benzene, toluene, and xylenes by their dissolution in ground water, the GC fingerprints of the two monitoring wells products are not similar to each other. This suggests that MW-1 and MW-6 products are not from the same source. However, the lead contents of the products suggest that these gasolines are not of recent origin.

A.J. Malanowicz

attachment/ levitt.doc

TABLE 1

FREE PRODUCT CHARACTERIZATION
SERVICE STATION NO. 16-DAC
ESL ENDORSEMENT NO. 95030-SP
LEVITTOWN, PA

SAMPLE INFORMATION

ESL Number:	9517038	9517039
Date of Sample:	10/24/95	10/24/95
Date Received:	10/24/95	10/24/95
Description on Label:	MW-1 (on-site)	MW-6 (off-site)
Appearance:	Dark amber hydro-carbon in a 1 pint glass bottle	Dark amber hydro-carbon in a 1 pint glass bottle

ANALYTICAL DATA

API Gravity @ 60 F	50.3 (SVM 263-51)	50.5 (ESL LP 78)
Lead Content, g/gal (ASTM D-3237)	1.50	1.05
Comparative Hydrocarbon Distribution by Gas Chromatography, GC fingerprint (ESL LP 26)	The fingerprint of MW-1 product shows a moderately weathered gasoline and the fingerprint of MW-6 product shows a slightly weathered gasoline. The fingerprints are not similar to each other.	

Environmental Services Laboratory, Mobil Technical Center, Princeton, NJ 08543-1027
AJMalanowicz

Environmental Services Laboratory
Mobil Technical Center
Princeton, New Jersey

November 14, 1995

W. Valencia
Fairfax, 5W218

cc:
C.L. Tatsch - Princeton

FREE PRODUCT CHARACTERIZATION
FINGERPRINTS
SS # 16-DAC
LEVITTOWN, PA

ESL ENDORSEMENT NO. 95032-SP

As you requested in our telephone conversation on November 10, 1995, attached you will find copies of the GC fingerprints of hydrocarbons sampled from MW-1 and MW-6 from the subject location. Also included is a copy of the fingerprint of the GC standard with a legend for the identification of the standard's components.

A.J. Malanowicz

attachment/ levitt2.doc

TABLE 1

LEGEND FOR GC FINGERPRINT
STANDARD COMPONENTS

Designation	Name of Component
1	2,2-Dimethylbutane
2	Benzene
3	Cyclohexane (solvent)
4	iso-Octane
5	Toluene
6	Octane
7	Ethylbenzene
8	m-Xylene
9	p-Xylene
10	o-Xylene
11	Nonane
12	1,2,3-Trimethylbenzene
13	Undecane

APPENDIX D
(Monitoring Well Construction Details)

POLLUTION ENTERPRISES, INC. - TEST BORING LOG

Client: Mobil Oil Corporation	Job #: 5055	Boring #: RW 05
Job Location: Levittown, PA	Dates Drilled: 9/4/91	
Boring Location: 40 ft. southeast of Well 04		
Drilling Method: Air rotary		
Logged by: D. Yonker	Well Installed? Y/N: Yes	
Total Depth: 24'	Casing Interval: 1.5' - 3.5'	
Boring Diameter: 10"	Screen Interval: 3.5' - 24'	
Depth to Water: 6'	Screen/Casing Diameter: 8"	
Backfill Material: #2 Sand	Screen/Casing Material: PVC	
Annular Seal Type: Bentonite	Screen Slot Size: 0.02"	
Seal Interval: 2.5' - 2.0'	Manhole or Standpipe?: Manhole	
Comments:		

Depth (ft)	Sample Interval	Recovery (%)	Blows/6"	OVA (ppm)	Lithologic Classification
0-5					Blacktop (0-3"). Angular fill w/ fine brown sand. Black organic matter. Slight petroleum odor.
5-13	5'-7'	50	3-7-6-8	3	Brown-gray sand w/ trace of silt. Moist to wet at 7'. No odor. Stream of deposit, poorly sorted.
13-25	13'-15'	40	2-2-3-7	0	Brownish-gray sand w/ misc. pebbles. Poorly sorted. Grades to orange silty sand at 14'-15'. Wet. No odor.

POLLUTION ENTERPRISES, INC. - TEST BORING LOG

Client: Mobil Oil Corporation	Job #: 5055	Boring #: MW 06
Job Location: Levittown, PA	Dates Drilled: 9/9/91	
Boring Location: Mill Creek Rd. nearest to intersection		
Drilling Method: Air rotary		
Logged by: D. Yonker	Well Installed? Y/N: Yes	
Total Depth: 15'	Casing Interval: 6" - 4'	
Boring Diameter: 8.5"	Screen Interval: 4.0' - 15'	
Depth to Water: 6'	Screen/Casing Diameter: 4"	
Backfill Material: #2 Sand	Screen/Casing Material: FJT PVC	
Annular Seal Type: Bentonite	Screen Slot Size: 0.02"	
Seal Interval: 2.5' - 1.0'	Manhole or Standpipe?: Manhole	
Comments: Lithology from 6' - 9' was heavily contaminated, strong odor.		

Depth (ft)	Sample Interval	Recovery (%)	Blows/6"	OVA (ppm)	Lithologic Classification
0-5					Asphalt and concrete to approx. 3'. Grades to brown, fine sand. Strong odor. Dry.
5-10	5'-7'	40	8-9-9-8	400	Dark gray-black fine sand. Wet. Strong odor.
10-15	10'-12'	10	16-6-9-10	0	Orange-gray sand w/ pebbles. Poorly sorted.

POLLUTION ENTERPRISES, INC. - TEST BORING LOG

Client: Mobil Oil Corporation	Job #: 5055	Boring #: MW 07
Job Location: Levittown, PA	Dates Drilled: 9/9/91	
Boring Location: Mill Creek Rd. furthest from intersection		
Drilling Method: Air rotary		
Logged by: D. Yonker	Well Installed? Y/N: Yes	
Total Depth: 16'	Casing Interval: 1' - 5'	
Boring Diameter: 8.5"	Screen Interval: 5' - 15'	
Depth to Water: 7'	Screen/Casing Diameter: 4"	
Backfill Material: #2 Sand	Screen/Casing Material: FJT PVC	
Annular Seal Type: Bentonite	Screen Slot Size: 0.02"	
Seal Interval: 2.5' - 1.0'	Manhole or Standpipe?: Manhole	
Comments:		

Depth (ft)	Sample Interval	Recovery (%)	Blows/6"	OVA (ppm)	Lithologic Classification
0-5					Asphalt and concrete to 3'. Grades to brown fine sand. Dry. No odor.
5-10	5'-7'	50	8-10-10-12	2	Brown-tan sand (fine - medium) w/ misc. pebbles. Wet at 7'. No odor.
10-16	10'-12'	70	8-8-7-11	2.3	Brown sand grading to orange, silty sand. Wet. No odor.

15-DAC
7040 MILL CREEK ROAD
LEVITTOWN, PENNSYLVANIA

RELEVANT SITE HISTORY	
SUBSURFACE IMPACT DELINEATED:	Groundwater impact from an off-site, upgradient source has been identified.
LIQUID PHASE HYDROCARBONS:	LPH has been identified in off-site, upgradient well (MW-6) as well as MW-1.
OFF-SITE IMPACTS:	No off-site impact has been identified originating from the Mobil source
DISSOLVED PHASE HYDROCARBON PLUME:	MTBE concentrations at the downgradient property wells exceed SWHB standards. BTEX plume is under SWHB standards within the property boundary.
SENSITIVE RECEPTORS:	A stream tributary is located 1000'south of the site, utilities under the roadway may be affected due to shallow groundwater conditions.

CLOSURE STRATEGY
WORKSCOPE FOR BASE TARGET: CONTINUED MONITORING
Continued sampling of on-site monitoring wells on a biannual basis. If concentrations indicate a decreasing trend, two geoprobe points should be installed across Edgely Road to demonstrate plume delineation. Prepare ROL using site specific standards.
ADDITIONAL WORKSCOPE FOR OPTIONAL TARGET : NONE

ADDITIONAL COMMENTS
A subsurface investigation to be completed by the PADEP on the former Citgo station upgradient of the Mobil site may result in the identification of an off-site source. Closure potential may be dependent upon the results of the investigation.

APPENDIX E
(Quick Domenico (Groundwater), Soil, and Inhalation Models)

AIR MODELING
RISK & INHALATION
Exxon Mobil Corporation
Former Service Station No. 15-DAC

Spreadsheet for Calculating a Risk Based Screening Level (RBSLw)
for Groundwater to Enclosed Space Vapor Inhalation Pathway
(Based on ASTM E1739-95, Table X2.2 and X2.3)

The following equation is used to determine the $RBSL_W$ (Carcinagenic and Noncarcinogenic Effects):

$$RBSL_W\left[\frac{mg}{L\text{-}H_2O}\right] = \frac{RBSL_{air}\left[\frac{\mu g}{m^3\text{-}air}\right]}{VF_{wesp}} \times 10^{-3}\,\frac{mg}{\mu g}$$

Benzene
$RBSL_W$ = 1.2690 mg/l
Toluene
$RBSL_W$ = 17.5572 mg/l
Ethylbenzene
$RBSL_W$ = 44.9301 mg/l
Xylenes
$RBSL_W$ = 343.1162 mg/l
Naphthalene
$RBSL_W$ = 7547.2659 mg/l

Where:

$RBSL_W$ - Risk Based Screening Level for Groundwater to an Enclosed Space Vapor Inhalation Pathway
$RBSL_{AIR}$ - Risk Based Screening Level for Air
VF_{WESP} - Volatilization Factor for Groundwater to Enclosed-space Vapors.

The following steps detail the method used to develop an allowable Compound of Concern in groundwater concentration (residential):

STEP 1A: Estimation of Allowable Indoor Air Concentration (Carcinagenic Effects)

$$RBSL_{AIR}\left[\frac{\mu g}{m^3\text{-}air}\right] = \frac{TR \times BW \times AT_C \times 365\,\frac{days}{years} \times 10^3\,\frac{\mu g}{mg}}{SF_i \times IR_{air} \times EF \times ED}$$

$RBSL_{AIR}$ = 39.1571 for Benzene

Where:

Chemical Specific	$RBSL_{air}$	=	Risk Based Screening Level for Air
0.0001	TR	=	Target excess individual lifetime cancer risk, (unitless)
70	BW	=	Adult body weight, (kg)
70	AT_C	=	Averaging time for carcinogens, (years)
0.029	SF_i	=	Oral cancer slope factor, $(mg/kg\text{-}day)^{-1}$
15	IR_{air}	=	Inhalation rate of indoor air, (m^3/hr)
350	EF	=	Exposure frequency, (days/year)
30	ED	=	Exposure duration, (years)

STEP 1B: Estimation of Allowable Indoor Air Concentration (Non-carcinagenic Effects)

$$RBSL_{AIR}\left[\frac{\mu g}{m^3\text{-}air}\right] = \frac{TRQ \times RfD_i \times BW \times AT_n \times 365\,\frac{days}{years} \times 10^3\,\frac{\mu g}{mg}}{IR_{air} \times EF \times ED}$$

$RBSL_{AIR}$ = 535 for Toluene
$RBSL_{AIR}$ = 1411 for Ethylbenzene
$RBSL_{AIR}$ = 9733 for Xylenes
$RBSL_{AIR}$ = 19 for Naphthalene

Toluene RfDi = 0.11
Ethylbenzene RfDi = 0.29
Xylenes RfDi = 2
Naphthalene RfDi = 0.004

Where:

Chemical Specific	$RBSL_{air}$	=	Risk Based Screening Level for Air
Chemical Specific	RfDi	=	Inhalation Chronic Reference Dose (mg/kg-day)
1	TRQ	=	Target hazard quotient for individual constitiuents, unitless
70	BW	=	Adult body weight, (kg)
30	AT_N	=	Averaging time for noncarcinogens, (years)
15	IR_{air}	=	Inhalation rate of indoor air, (m^3/hr)
350	EF	=	Exposure frequency, (days/year)
30	ED	=	Exposure duration, (years)

STEP 2: Calculating the Volatilization Factor for Groundwater to Enclosed-space Vapors

$$VF_{WESP}\left[\frac{mg/m^3\text{-}air}{mg/L\text{-}H_2O}\right] = \frac{H\left[\frac{D_{ws}^{eff}/L_{GW}}{ER\ L_B}\right]}{1+\left[\frac{D_{ws}^{eff}/L_{GW}}{ER\ L_B}\right]+\left[\frac{D_{ws}^{eff}/L_{GW}}{(D_{crack}^{eff}/L_{crack})\eta}\right]} X10^3\ \frac{L}{m^3}$$

VF_{WESP} =	3.09E-02	for Benzene	Chemical Specific
VF_{WESP} =	3.05E-02	for Toluene	Chemical Specific
VF_{WESP} =	3.14E-02	for Ethylbenzene	Chemical Specific
VF_{WESP} =	2.84E-02	for Xylenes	Chemical Specific
VF_{WESP} =	2.58E-06	for Naphthalene	

Benzene H = 0.22
Toluene H = 0.26
Ethylbenzene H = 0.32
Xylenes H = 0.29
Naphthalene H = 0.049

Where:

Chemical Specific	VF_{WESP}	=	Volatilization Factor for Groundwater to Enclosed Space Vapors
Chemical Specific	H	=	Henery's Law Constant, (cm^3-H2O)/(cm^3-air)
Chemical Specific	$D_{eff/ws}$	=	Effective diffusion coefficient between groundwater and soil surface
Chemical Specific	$D_{eff/crack}$	=	Effective diffusion coefficient through foundation cracks
183	L_{GW}	=	Depth to groundwater, cm
0.00014	ER	=	Enclosed space air exchange rate, 1/sec
200	L_B	=	Enclosed space volume/infiltration area ratio, cm
15	Lcrack	=	Enclosed space foundation or wall thickness, cm
0.01	η	=	Areal fraction of cracks in foundations/walls, cm^2-cracks/cm^2-total area

Average Depth to Groundwater (Ft)
6

Benzene Calculations

$$D_{ws}^{eff}\left[\frac{cm^2}{s}\right] = (hcap+hv)\left[\frac{hcap}{D_{cap}^{eff}}+\frac{hv}{D_s^{eff}}\right]-1$$

$D_{eff/ws}$ = 7.18E-04

$$D_{crack}^{eef}\left[\frac{cm^2}{s}\right] = D^{air}\frac{\theta_{acrack}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{wcrack}^{3.33}}{\theta_T^2}$$

$D_{eef/crack}$ = 7.26E-03

$$D_s^{eef}\left[\frac{cm^2}{s}\right] = D^{air}\frac{\theta_{as}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{ws}^{3.33}}{\theta_T^2}$$

$D_{eef/s}$ = 7.26E-03

$$D_{cap}^{eef}\left[\frac{cm^2}{s}\right] = D^{air}\frac{\theta_{acap}^{3.33}}{\theta_T^2}+D^{wat}\frac{1}{H}\frac{\theta_{wcap}^{3.33}}{\theta_T^2}$$

$D_{eef/cap}$ = 2.17E-05

Where:

Chemical Specific	$D_{eff/ws}$	=	Effective diffusion coefficient between groundwater and soil surface
Chemical Specific	$D_{eef/crack}$	=	Effective diffusion coefficient through foundation cracks
Chemical Specific	$D_{eef/s}$	=	Effective diffusion coefficient in soil based on vapor-phase concentration
Chemical Specific	$D_{eef/cap}$	=	Effective diffusion coefficient through capillary fringe
Chemical Specific	H	=	Henery's Law Constant, (cm^3-H2O)/(cm^3-air)
5	h_{cap}	=	Thickness of capillary fringe, cm
178	h_v	=	Thickness of vadose xone, cm
0.093	D^{air}	=	Diffusion coefficient in air, cm^2/s
0.000011	D^{wat}	=	Diffusion coefficient in water, cm^2/s
0.26	θ acrack	=	Volumetric air content in foundation/walls, cm^3-air/cm^3-total volume
0.038	θ acap	=	Volumetric air content in capillary fringe soils, cm^3-air/cm^3-soil
0.26	θ as	=	Volumetric air content in vadose zone soils, cm^3-air/cm^3-soil
0.12	θ wcrack	=	Volumetric water content in foundation/walls, cm^3-water/cm^3-total volume
0.342	θ wcap	=	Volumetric water content in capillary fringe soils, cm^3-water/cm^3-soil
0.12	θ ws	=	Volumetric water content in vadose zone soils, cm^3-water/cm^3-soil
0.38	θ T	=	Total soil porosity, cm^3/cm^3-soil

Toluene Calculations

$D_{eff/ws}$ = 6.01E-04
$D_{eef/crack}$ = 6.63E-03
$D_{eef/s}$ = 6.63E-03
$D_{eef/cap}$ = 1.80E-05

Where:

0.085	D^{air}	=	Diffusion coefficient in air, cm^2/s
0.0000094	D^{wat}	=	Diffusion coefficient in water, cm^2/s

Ethylbenzene Calculations

$D_{eff/ws}$ = 5.03E-04
$D_{eef/crack}$ = 5.93E-03
$D_{eef/s}$ = 5.93E-03
$D_{eef/cap}$ = 1.50E-05

Where:

0.076	D^{air}	=	Diffusion coefficient in air, cm^2/s
0.0000085	D^{wat}	=	Diffusion coefficient in water, cm^2/s

Xylenes Calculations

$D_{eff/ws}$ = 5.01E-04
$D_{eef/crack}$ = 5.62E-03
$D_{eef/s}$ = 5.62E-03
$D_{eef/cap}$ = 1.50E-05

Where:

0.072	D^{air}	=	Diffusion coefficient in air, cm^2/s
0.0000085	D^{wat}	=	Diffusion coefficient in water, cm^2/s

Naphthalene Calculations

$D_{eff/ws}$ = 1.32E-03
$D_{eef/crack}$ = 5.62E-03
$D_{eef/s}$ = 5.62E-03
$D_{eef/cap}$ = 4.66E-05

Where:

0.072	D^{air}	=	Diffusion coefficient in air, cm^2/s
0.0000094	D^{wat}	=	Diffusion coefficient in water, cm^2/s

Air Modeling:
Risk & Inhalation

Exoxn Mobil Corporation
Former Service Station No. 15-DAC

The following steps detail the method used to develop:

1) Allowable soil vapor
2) Allowable soil concentrations
3) Allowable groundwater concentrations

STEP 1: Estimation of Allowable Indoor Air Concentration (Carcinogenic Effects)

$$RBSLa = \frac{TR * BW * Atc * 365}{IRa * ED * EF * ET * SF}$$

$$RBSLa = 3569.0054$$

RBSLa		=	Risk-based screening level in air (mg/m3)
0.0001	TR	=	Target risk/increased chance of developing cancer over lifetime due to chemical exposure
70	BW	=	Body weight (kg)
70	Atc	=	Averaging time for carcinogens (years)
20	Ira	=	Inhalation rate of air (m3/hr)
0.0027	ED	=	Exposure duration (i.e., # of years a person stays in building with impacted air [years])
4	EF	=	Exposure frequency (i.e., number of days in a year a person breaths impacted air [days])
8	ET	=	Exposure time (i.e., number of hours a day a person breaths indoor air [hours])
0.029	SF	=	Chemical-specific slope factor

STEP 2: Estimation of Allowable Chemical Mass Circulating Indoors

"Leaky Sewer" Airspace

$$Acs = \frac{W * L * h * N}{86400}$$

$$Acs = 0.000118$$

	Acs	=	Air circulating per second	
	ACMCs	=	Allowable chemical mass circulating per second	Feet
0.91	W	=	Width of indoor space (m)	3
12.19	L	=	Length of indoor space (m)	40
0.91	h	=	Height of indoor space (m)	3
1	N	=	Volume of air changes per day (1/day)	

$$ACMCs = ACs * RBSLa$$

$$ACMCs = 0.421096$$

STEP 3: Estimation of Chemical Emission Rate (Fick's Law of Diffusion)

$$E = \frac{Deff}{d} * f * 100W * 100L * \frac{Cv}{1000} - \frac{RBSLa}{1000000}$$

$$E = 5.64904631$$

	E	=	Estimation of chemical emission rate (rate)	
0.093	Deff	=	Effective diffusion coefficient in soil (cm^2/s)	Avg. DTG
183	d	=	Depth to chemical in soil or groundwater (cm)	6
91	100W	=	Width of indoor space (cm)	
1219	100L	=	Length of indoor space (cm)	
0.1	f	=	Fraction of floor area through which diffusion occurs	
1	Cv / 1000	=	Vapor concentration in soil (mg/cm^3)	

STEP 4: Equating the Emission Rates in Step 2 and Step 3
Allowable Vapor Concentration in Soil calculated as:

$$Cv = \frac{RBSLa}{1000} * \frac{h * N * d}{f * 864 * Deff} + 1$$

$$Cv = 77.8457648$$

STEP 5: Converting Allowable Soil Vapor Concentration to Allowable Water Concentration

$$RBSL\ winh = \frac{Cv}{H}$$

	RBSLwinh	=	Allowable concentration in groundwater protective of indoor inhalation (mg/l)
0.232	H	=	Henry's Law Constant

RBSL winh =	335.54209 mg/l

Soil Modeling:
Allowable Risk & Leachate Determination

Exxon Mobil Corporation
Former Service Station No. 15-DAC

Allowable Risk =	Allowable Dose * Slope Factor (i.e. Intake)		Risk 4.14286E-06
Intake (mg/kg-day) = (aka Dose)	$\frac{CW * IR * EF * ED}{BW * AT}$		Intake 0.000142857

Input	Variable	Description	Source
0.005	CW	Chemical Concentration in Water (mg/liter) @ Distance X	Site-specific or modeled value
2	IR	Ingestion Rate (liters/day)	2 liters/day (adult, 90th percentile)
365	EF	Exposure Frequency (days/year)	Pathway-specific (for residents, daily 365 days/yr.
70	ED	Exposure Duration (years)	70 years (lifetime); 9 years (National Median at one residence)
70	BW	Body Weight (kg)	70 kg. (average adult)
25550	AT	Averaging Time (period over which exposure is averaged in days)	Pathway-specific period of exposure for non-carcinogenic effects(I.e. ED * 365 days/yr) Pathway-specific period of exposure for carcinogenic effects(I.e. 70 yrs. * 365 days/yr)
Benzene	(Carcinogenic)		
0.029	Slope Factor	Represents the upper 95th percent confidence limit on probability of a response per unit intake of chemical over a lifetime. Slope = Risk/Dose (kg-d/mg)	
		Toluene, Ethylbenzene, Xylenes: Not Applicable; Non-Carcinogenic	
1800	Solubility	Solubility (mg/l)	
58	Koc	Organic Carbon Partition Coefficient (mg/l) (cm3/g)	
0.29	Kd	Soil to Water Partition Coefficient (Kd = foc * Koc) (l/kg)	
1.8	pb	Dry Bulk Density of Unsaturated Zone Soil (g/ml) or (g/cc)	
1	pl	Density of Water (g/cc)	
0.1	Oa	Air Porosity	
0.2	Ow	Water Filled Porosity	
0.005	foc	Fractional Organic Carbon Content	
0.232	H	Henry's Law Constant (mg/l / mg/l)	
5		Concentration Reduction Factor (CRF) in Unsaturated Zone	
10		Concentration Reduction Factor (CRF) in Saturated Zone	

0.00001	**STEP 1:**	Total Acceptable Risk Due to Ingestion
0.029	**STEP 2:**	Slope Factor for Benzene
0.000344828	**STEP 3:**	Estimate Allowable Dose (=Allowable Risk/Slope Factor) (mg / kg-day)
0.012068966	**STEP 4:**	Estimate Allowable Receptor Point Concentration (Cw(benzene))
50	**STEP 5:**	Overall Concentration Reduction Factor (5 (Unsaturated) x 10 (Saturated) = 50)
0.120689655	**STEP 6:**	Estimation of **Allowable Leachate Concentration (mg/l)**
		Concentration at Top of Water Table Directly Below the Source (CRF(10) * Cw(benzene))

$$Cw = \frac{Dose * BW * AT}{IR * EF * ED}$$

0.603448276 Cl (mg/l)

Therefore, **Allowable Leachate Concentration (mg/l)** at the Source (Cw) =
CRF(5) * Concentration at Top of Water Table Below Source
Concentration Reduction Factor (CRF) in Unsaturated Zone = 5

0.224844828 Ct (mg/kg) **STEP 7:**

Estimation of **Allowable Total Soil Concentrations**
The total soil concentration is obtained from the leachate concentration using this equation:

$$Ct = Cl \frac{[(Kd * pb) + Ow + (Oa * H)]}{(pb + Ow * pl)}$$

EQUILIBRIUM RELATIONSHIPS BETWEEN TOTAL SOIL CONCENTRATION AND DISSOLVED PHASE (LEACHATE) CONCENTRATION - FORWARD MODEL

$$C\,td = \frac{Cl\,[\,pb * Kd + Ow + (O - Ow) * H}{pb}$$

C td = Total Soil Concentration on a Dry Weight Basis (mg/kg) (SOILS DATA)
O = Total Porosity of the Soil
Cl = Dissolved Contaminant Concentration in the Liquid Phase (mg/l)

INPUTS

0
0.3

Soil Data indicates undetectable concentration of BTEX (soil samples collected during MW-5 well install).

$$Cl = \frac{C\,td * pb}{[pb * Kd + Ow + (O - Ow) * H]}$$

Cl = 0 mg/l

Domenico Model Parameters & Assumptions

Exxon Mobil Corporation
Former Service Station No. 15-DAC

Fixed/Calibration & Entries:

Ax (Longitudinal Dispersivity) (X/10)	30	Dispersion parallel to direction of groundwater flow (X = plume length).
Ay (Transverse Dispersivity) (Ax/10)	1	Dispersion perpendicular to direction of groundwater flow.
Az (Vertical Dispersivity) (Ax/20 or Ax/100)	0.001	Dispersion perpendicular to direction of groundwater flow and water table (No vertical data 0.002).
Source Width	30	Maximum width of contaminated soils impacted.
Source Thickness	10	Thickness of contaminated soils that contribute contamination to water table.
Hydraulic Conductivity (K) (ft/day)	0.003 to 200	Ability of formation to transmit water (pump or slug test data)
Hydraulic Gradient	0.0068	Measured from groundwater flow map
Porosity (decimal fraction)	0.3	Obtained from description on boring logs, literature, lab
Bulk Density (g/cm3)	1.8	Dry weight of sample divided by its total volume (1.8 is often used)
Fractional Organic Carbon	0.005	Organic content of soil. (.005 commonly used)
y	0	For solution on centerline of plume, use 0.
z	0	Zero value will yield highest concentration at water table.

Assumptions:

* Probable sources of release were upgradient former Citgo station & current tankfield upgradient of MW-4.
* Probable timing of release was November 1990 or earlier. Offsite source exists at the site.
* Lambda (days-1) is a first order decay constant. The Quick Domenico Model is very sensitive to the Lambda variable.
* Lambda values available from Table 5 of Appendix A of the Act 2 regulations.
* Lambda values also available from the ASTM Emergency Std. Guide ES 38-94 for Risk-Based Corrective Action Applied at Petroleum Release Sites, page 33.
* Groundwater flow direction is to the south.
* Groundwater velocity in southeastern Pennsylvania are generally between 0.1 to 0.3 ft/day.
* Darcy' Law: V = K * I where I is the hydraulic gradient.
* Therefore, Hydraulic Conductivity (gpd/ft2 or ft/day): K = V / I, so 0.1 / 0.0068 = 14.7 ft/day ranging to 0.3 / 0.0068 = 44.11 ft/day
* Published Hydraulic Conductivity values range from 0.003 ft/day (tight clay) to 200 ft/day (silt, sandy silts, clayey sands, till, silty sands and fine sands).
* Hydraulic Conductivity testing (10/91 pump test) indicated a K value of 1.50 ft/day.
* KOC is the Organic Carbon Partition Coefficient and is chemical specific. Obtained from Appendix A, Table 5 of Act 2 regulations.
* Domenico Model Calibration was conducted from MW-4 to MW-5, MW3 to MW-4 & MW-5, and MW-6 to MW-1.

Compound of Concern	ASTM ES 38-94 Lambda	PADEP Table 5 Appendix A Lambda	KOC	MSC (ug/l)
Benzene	0.0009 to 0.069	0.0009	58	5
Toluene	0.025 to 0.099	0.0250	130	1000
Ethylbenzene	0.003 to 0.116	0.0030	220	700
Xylenes	0.0019 to 0.0495	0.0019	350	10000
MTBE	0.0019 to 0.0866	Not published	12	20
Napthalene	0.0027	0.0027	950	20
Isopropylbenzene	Not published	0.0433	2800	25

Methodology:

Step 1: Calibrate between "hot well" and downgradient well for each compound that exceeds its MSC.
Step 2: Input all fixed parameters. Enter peak concentration (source concentration) for compound of concern from hot well (e.g. benzene).
Step 3: Enter time in days from observed peak benzene concentration in "hot" well to calibration point in downgradient well.
Step 4: Adjust Lambda and/or Ax to match model's predicted benzene concentration in downgradient well to its actual benzene concentration. Once accomplished, calibration is achieved.
Step 5: Note: May also need to adjust hydraulic conductivity value from actual slug test value to published value to achieve calibration objective.
Step 6: Let all parameters remain fixed now and input the site's peak benzene concentration as the source concentration.
Step 7: Adjust "Time in Days" until model reaches steady state.
Step 8: Modify "Distance to Location of Concern" until "Projected Concentration" goes below the Compound of Concern's MSC.
Step 9: When "Proj. Conc. Reaches MSC, the "Dist. To Location of Concern" is distance where compound will attenuate below its MSC.
Step 10: Perform calibrations for each compound that exceeds its MSC, adjusting KOCs, lambda, input source concentration, and time in days.
Step 11: Repeat steps for predicting Distance to Location of Concern for each compound of concern.

Domenico Model Predictive Run Summary

Exxon Mobil Corporation
Former Service Station No. 15-DAC

CALIBRATION SUMMARY

Compound of Concern	Source Well	Downgradient Well	Start Date	End Date	Lambda (day-1)	Number of Days	Actual Source Concentration (ppb)	Predicted Downgradient Concentration (ppb)	Actual Downgradient Concentration (ppb)
Benzene	MW-3	MW-4	12/12/1996	12/29/1999	0.0009	1112	744	78	78
Benzene	MW-3	MW-5	12/12/1996	12/29/1999	0.0009	1112	744	3	<5.0
Toluene	MW-4	MW-5	4/2/1999	12/29/1999	0.0250	271	2,700	0	<5.0
Ethylbenzene	MW-6	MW-1	12/18/1997	12/29/1999	0.0030	741	4,100	0	1,200
Ethylbenzene	MW-1	N/A	10/13/1999	12/29/1999	0.0030	77	1,300	63	N/A
Methyl-tert-butyl-ether	MW-4	MW-5	4/2/1999	12/29/1999	0.0205	271	38,000	94	94
Naphthalene	MW-6	MW-1	12/18/1997	12/29/1999	0.0027	741	1,900	0	420
Naphthalene	MW-1	N/A	10/13/1999	12/29/1999	0.0027	77	530	0	N/A
Isopropylbenzene	MW-6	MW-1	10/13/1999	12/29/1999	0.0433	77	670	0	120
Isopropylbenzene	MW-1	N/A	10/13/1999	12/29/1999	0.0433	77	150	0	N/A

PREDICTIVE MODEL SUMMARY

Compound of Concern	Peak Concentration (ppb)	Peak Concentration Location	Lambda (day-1)	Time in Days	Time in Years	Distance to Location of Concern (feet)	Predicted Concentration (ppb)	MSC (ppb)	Distance to MSC (feet)
Benzene	744	MW-3	0.0009	8660	23.7	127	6	5	128
Toluene	2,700	MW-4	0.0250	450	1.2	76	0	1,000	3
Ethylbenzene	1,300	MW-1	0.0030	2985	8.2	8	446	700	4.6
Methyl-tert-butyl-ether	38,000	MW-4	0.0025	565	1.5	76	0	20	50
Naphthalene	530	MW-1	0.0027	2795	7.7	8	64	20	6.5
Isopropylbenzene	150	MW-1	0.0433	185	0.5	8	0	25	1
Benzene + Leachate	744	MW-3	0.0009	8660	23.7	127	6	5	128

Explanation:
ppb - parts per billion (ug/l)
MSC - medium specific concentration
N/A - Not Applicable

Benzene Calibration
Upgradient Well MW-3 (0.744 MG/L)
Downgradient Well MW-4 (0.078 MG/L)

ExxonMobil Corporation
Former Service Station No. 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY ar AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

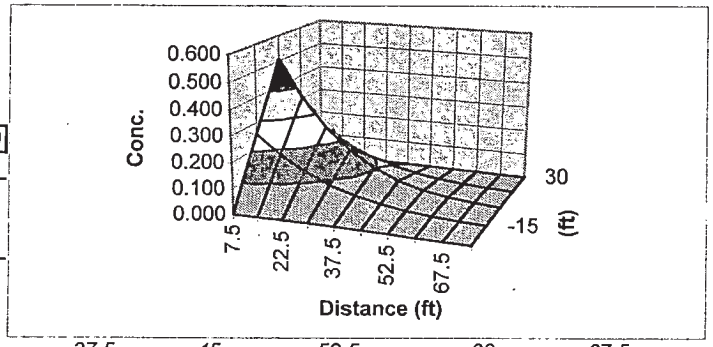
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.744	42	30	1	0.001	0.0009	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm^3)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	58	5.00E-03	2.74	0.012408759

	y(ft)	z(ft)	Time (days)
	42	0	1112

Projected Conc. at	42	0	0
at 1112 days			
0.078 mg/l			



AREAL MODEL CALCULATION DOMAIN
Length (ft) 75
Width (ft) 30

	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75
30	0.000	0.001	0.003	0.005	0.005	0.004	0.003	0.002	0.001	0.001
15	0.255	0.183	0.128	0.087	0.057	0.036	0.022	0.012	0.007	0.003
0	0.509	0.364	0.250	0.165	0.105	0.064	0.037	0.021	0.011	0.005
-15	0.255	0.183	0.128	0.087	0.057	0.036	0.022	0.012	0.007	0.003
-30	0.000	0.001	0.003	0.005	0.005	0.004	0.003	0.002	0.001	0.001

Benzene Calibration
Upgradient Well MW-3 (0.744 MG/L)
Downgradient Well MW-5 (<0.005 MG/L)

ExxonMobil Corporation
Former Service Station No. 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY ar AND RETARDATION

Project: ExxonMobil Corporation 15-DAC

Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

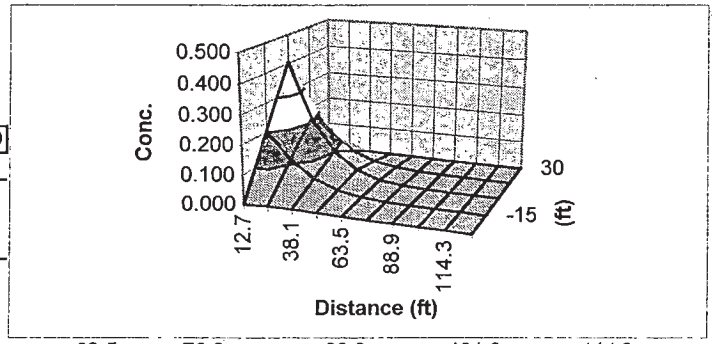
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.744	81	30	1	0.001	0.0009	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm^3)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	58	5.00E-03	2.74	0.012408759

	y(ft)	z(ft)	Time (days)
81	0	0	1112

Projected Conc. at	81	0	0
at 1112 days			
0.003 mg/l			



AREAL MODEL CALCULATION DOMAIN

Length (ft) 127

Width (ft) 30

	12.7	25.4	38.1	50.8	63.5	76.2	88.9	101.6	114.3	127
30	0.001	0.004	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000
15	0.203	0.111	0.055	0.024	0.009	0.003	0.001	0.000	0.000	0.000
0	0.405	0.214	0.101	0.042	0.015	0.005	0.001	0.000	0.000	0.000
-15	0.203	0.111	0.055	0.024	0.009	0.003	0.001	0.000	0.000	0.000
-30	0.001	0.004	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000

Benzene Prediction
Source Concentration MW-3 (0.744 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC

Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

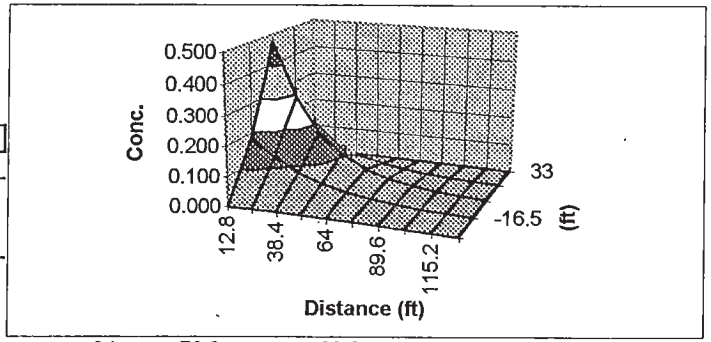
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.744	127	30	1	0.001	0.0009	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	58	5.00E-03	2.74	0.012408759

y(ft)	z(ft)	Time (days)
127	0	8660

Projected Conc. at 127 0 0
at 8660 days
0.006 mg/l



AREAL MODEL CALCULATION DOMAIN

Length (ft) 128
Width (ft) 33

	12.8	25.6	38.4	51.2	64	76.8	89.6	102.4	115.2	128
33	0.000	0.002	0.004	0.005	0.004	0.004	0.003	0.002	0.001	0.001
16.5	0.182	0.126	0.083	0.054	0.035	0.022	0.014	0.009	0.006	0.004
0	0.472	0.291	0.175	0.105	0.064	0.038	0.023	0.014	0.009	0.005
-16.5	0.182	0.126	0.083	0.054	0.035	0.022	0.014	0.009	0.006	0.004
-33	0.000	0.002	0.004	0.005	0.004	0.004	0.003	0.002	0.001	0.001

Toluene Calibration
Upgradient Well MW-4 (2.7 MG/L)
Downgradient Well MW-5 (<0.005 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

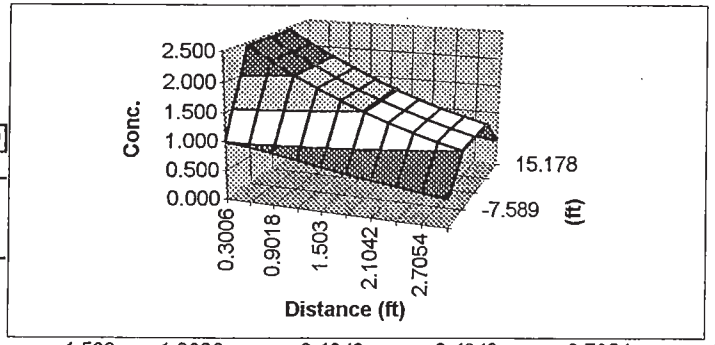
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
2.7	39	30	1	0.001	0.025	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	130	5.00E-03	4.9	0.006938776

y(ft)	z(ft)	Time (days)
39	0	271

Projected Conc. at	39	0	0
at	271 days		
0.000 mg/l			



AREAL MODEL CALCULATION DOMAIN
Length (ft) 3.006
Width (ft) 15.178

	0.3006	0.6012	0.9018	1.202	1.503	1.8036	2.1042	2.4048	2.7054	3.006
15.178	1.000	0.964	0.896	0.824	0.754	0.688	0.627	0.570	0.519	0.471
7.589	2.444	2.213	2.004	1.815	1.643	1.488	1.347	1.219	1.104	0.999
0	2.444	2.213	2.004	1.815	1.643	1.488	1.347	1.220	1.105	1.000
-7.589	2.444	2.213	2.004	1.815	1.643	1.488	1.347	1.219	1.104	0.999
-15.178	1.000	0.964	0.896	0.824	0.754	0.688	0.627	0.570	0.519	0.471

Toluene Prediction
Source Concentration MW-4 (2.7 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

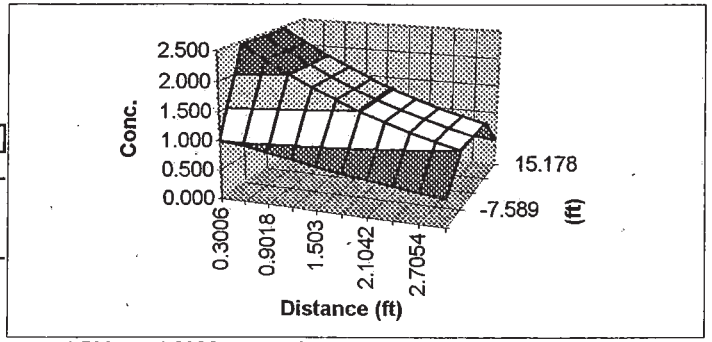
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
2.7	76	30	1	0.001	0.025	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm^3)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	130	5.00E-03	4.9	0.006938776

y(ft)	z(ft)	Time (days)
76	0	415

Projected Conc. at	76	0	0
at 415 days			
0.000 mg/l			



AREAL MODEL CALCULATION DOMAIN

Length (ft) 3.006
Width (ft) 15.178

	0.3006	0.6012	0.9018	1.202	1.503	1.8036	2.1042	2.4048	2.7054	3.006
15.178	1.000	0.964	0.897	0.825	0.755	0.689	0.627	0.571	0.519	0.471
7.589	2.445	2.214	2.005	1.815	1.643	1.488	1.347	1.220	1.104	0.999
0	2.445	2.214	2.005	1.815	1.644	1.488	1.348	1.220	1.105	1.000
-7.589	2.445	2.214	2.005	1.815	1.643	1.488	1.347	1.220	1.104	0.999
-15.178	1.000	0.964	0.897	0.825	0.755	0.689	0.627	0.571	0.519	0.471

Etylbenzene Calibration
Upgradient Well MW-6 (4.1 MG/L)
Downgradient Well MW-1 (1.2 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC

Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

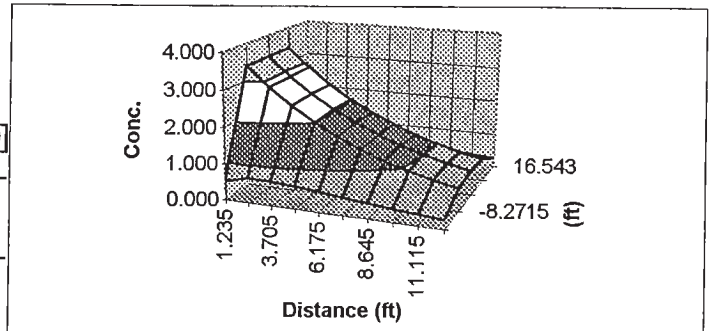
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

	X						
SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
4.1	124	30	1	0.001	0.003	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	220	5.00E-03	7.6	0.004473684

	y(ft)	z(ft)	Time (days)
124	0	0	741

Projected Conc. at	124	0	0
at	741 days		
0.000 mg/l			



AREAL CALCULATION DOMAIN

Length (ft) 12.35
Width (ft) 16.543

	1.235	2.47	3.705	4.94	6.175	7.41	8.645	9.88	11.115	12.35
16.543	0.555	0.700	0.690	0.635	0.566	0.495	0.428	0.367	0.313	0.266
8.2715	3.403	2.867	2.403	2.003	1.665	1.380	1.142	0.943	0.778	0.640
0	3.403	2.870	2.419	2.036	1.712	1.437	1.205	1.008	0.841	0.700
-8.2715	3.403	2.867	2.403	2.003	1.665	1.380	1.142	0.943	0.778	0.640
-16.543	0.555	0.700	0.690	0.635	0.566	0.495	0.428	0.367	0.313	0.266

Etylbenzene Calibration
Upgradient Well MW-1 (1.3 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC

Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

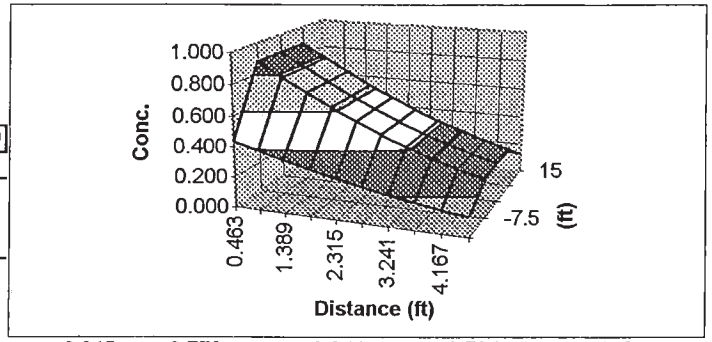
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
1.3	8	30	1	0.001	0.003	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	220	5.00E-03	7.6	0.004473684

	y(ft)	z(ft)	Time (days)
	8	0	77

Projected Conc. at	8	0	0
at	77 days		
0.063 mg/l			



AREAL MODEL CALCULATION DOMAIN

Length (ft) 4.63

Width (ft) 15

	0.463	0.926	1.389	1.852	2.315	2.778	3.241	3.704	4.167	4.63
15	0.440	0.393	0.349	0.309	0.272	0.237	0.206	0.177	0.152	0.129
7.5	0.879	0.786	0.699	0.618	0.543	0.474	0.411	0.354	0.302	0.256
0	0.879	0.786	0.699	0.618	0.543	0.474	0.412	0.355	0.304	0.258
-7.5	0.879	0.786	0.699	0.618	0.543	0.474	0.411	0.354	0.302	0.256
-15	0.440	0.393	0.349	0.309	0.272	0.237	0.206	0.177	0.152	0.129

Etylbenzene Prediction
Source Concentration MW-1 (1.2 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

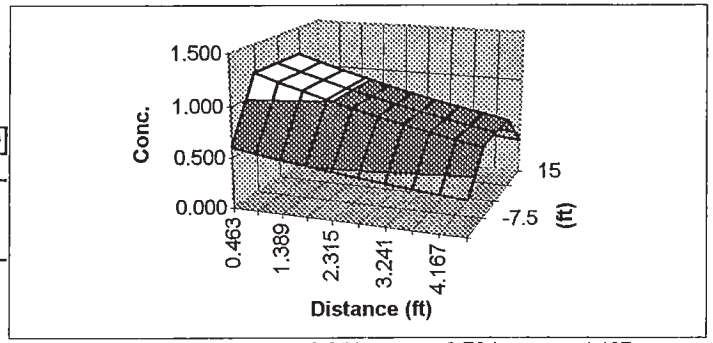
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

	X						
SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
1.3	8	30	1	0.001	0.003	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	220	5.00E-03	7.6	0.004473684

	y(ft)	z(ft)	Time (days)
	8	0	2985

Projected Conc. at	8	0	0
at 2985 days			
0.446 mg/l			



AREAL MODEL	CALCULATION DOMAIN
Length (ft)	4.63
Width (ft)	15

	0.463	0.926	1.389	1.852	2.315	2.778	3.241	3.704	4.167	4.63
15	0.611	0.574	0.540	0.507	0.477	0.448	0.421	0.396	0.372	0.350
7.5	1.222	1.149	1.080	1.015	0.954	0.896	0.841	0.790	0.741	0.695
0	1.222	1.149	1.080	1.015	0.954	0.896	0.843	0.792	0.744	0.700
-7.5	1.222	1.149	1.080	1.015	0.954	0.896	0.841	0.790	0.741	0.695
-15	0.611	0.574	0.540	0.507	0.477	0.448	0.421	0.396	0.372	0.350

Methyl Tertiary Butyl Ether Calibration
Upgradient Well MW-4 (38.0 MG/L)
Downgradient Well MW-5 (0.094 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC

Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

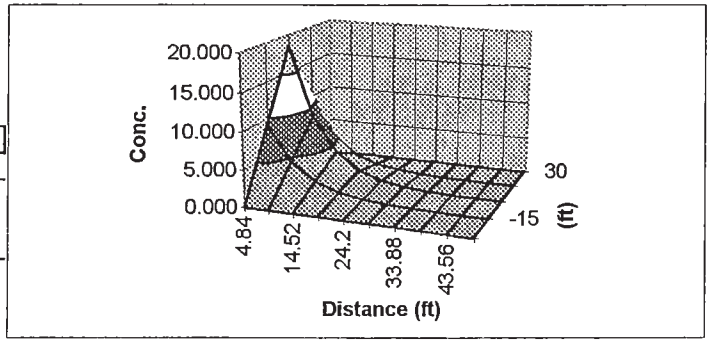
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
38	39	30	1	0.001	0.0205	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	12	5.00E-03	1.36	0.025

y(ft)	z(ft)	Time (days)
39	0	271

Projected Conc. at	39	0	0
at	271 days		
0.094 mg/l			



AREAL MODEL CALCULATION DOMAIN

Length (ft) 48.4

Width (ft) 30

	4.84	9.68	14.52	19.36	24.2	29.04	33.88	38.72	43.56	48.4
30	0.000	0.003	0.012	0.017	0.016	0.012	0.008	0.005	0.003	0.001
15	9.207	4.460	2.159	1.043	0.502	0.240	0.114	0.054	0.025	0.011
0	18.413	8.915	4.294	2.052	0.973	0.457	0.213	0.098	0.044	0.020
-15	9.207	4.460	2.159	1.043	0.502	0.240	0.114	0.054	0.025	0.011
-30	0.000	0.003	0.012	0.017	0.016	0.012	0.008	0.005	0.003	0.001

Methyl Tertiary Butyl Ether Prediction
Source Concentration MW-4 (38.0 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

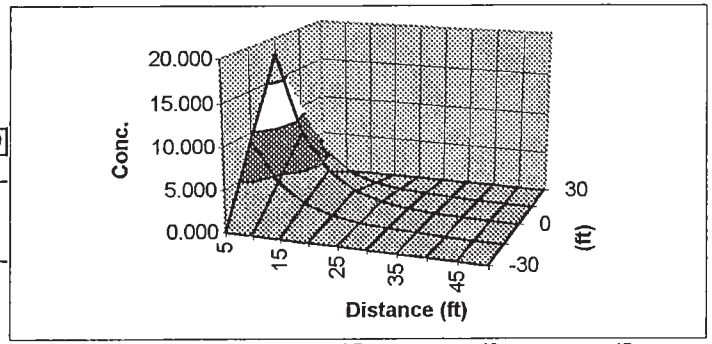
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
38	76	30	1	0.002	0.0205	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	12	5.00E-03	1.36	0.025

y(ft)	z(ft)	Time (days)
76	0	565

Projected Conc. at	76	0	0
at 565 days			
0.000 mg/l			



AREAL MODEL CALCULATION DOMAIN

Length (ft) 50
Width (ft) 30

	5	10	15	20	25	30	35	40	45	50
30	0.000	0.003	0.012	0.017	0.015	0.011	0.007	0.004	0.003	0.001
15	8.997	4.261	2.018	0.955	0.452	0.214	0.101	0.048	0.023	0.011
0	17.995	8.515	4.010	1.877	0.874	0.406	0.188	0.087	0.040	0.019
-15	8.997	4.261	2.018	0.955	0.452	0.214	0.101	0.048	0.023	0.011
-30	0.000	0.003	0.012	0.017	0.015	0.011	0.007	0.004	0.003	0.001

Naphthalene Calibration
Upgradient Well MW-6 (1.9 MG/L)
Downgradient Well MW-1 (0.420 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

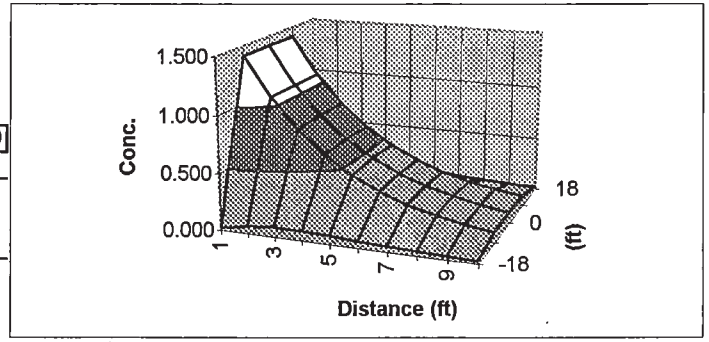
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

	X						
SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
1.9	124	30	1	0.002	0.0027	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	950	5.00E-03	29.5	0.001152542

	y(ft)	z(ft)	Time (days)
124	0	0	741

Projected Conc. at	124	0	0
at 741 days			
0.000 mg/l			



AREAL MODEL	CALCULATION DOMAIN
Length (ft)	10
Width (ft)	18

	1	2	3	4	5	6	7	8	9	10
18	0.024	0.072	0.090	0.089	0.079	0.066	0.054	0.043	0.033	0.025
9	1.415	1.073	0.808	0.603	0.447	0.329	0.241	0.175	0.126	0.090
0	1.415	1.075	0.814	0.614	0.461	0.344	0.255	0.188	0.137	0.099
-9	1.415	1.073	0.808	0.603	0.447	0.329	0.241	0.175	0.126	0.090
-18	0.024	0.072	0.090	0.089	0.079	0.066	0.054	0.043	0.033	0.025

Naphthalene Calibration
Upgradient Well MW-1 (0.530 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

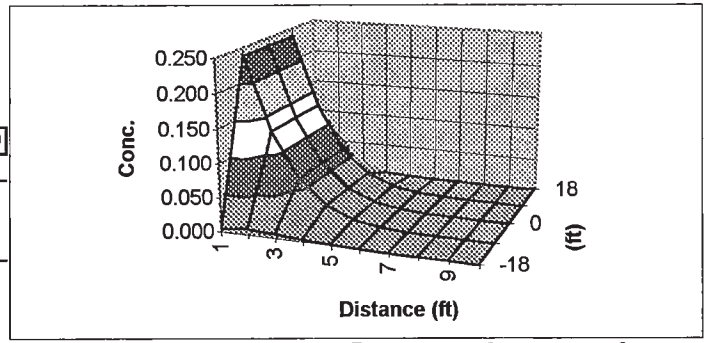
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.53	8	30	1	0.002	0.0027	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	950	5.00E-03	29.5	0.001152542

	y(ft)	z(ft)	Time (days)
8	0	0	77

Projected Conc. at	8	0	0
at 77 days			
0.000 mg/l			



AREAL MODEL CALCULATION DOMAIN
Length (ft) 10
Width (ft) 18

	1	2	3	4	5	6	7	8	9	10
18	0.004	0.009	0.007	0.004	0.002	0.001	0.000	0.000	0.000	0.000
9	0.238	0.129	0.061	0.025	0.009	0.003	0.001	0.000	0.000	0.000
0	0.238	0.129	0.062	0.026	0.009	0.003	0.001	0.000	0.000	0.000
-9	0.238	0.129	0.061	0.025	0.009	0.003	0.001	0.000	0.000	0.000
-18	0.004	0.009	0.007	0.004	0.002	0.001	0.000	0.000	0.000	0.000

Naphthalene Prediction
Source Concentration MW-1 (0.530 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

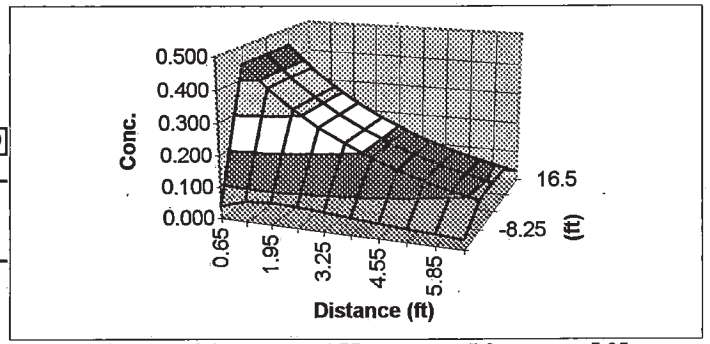
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.53	8	30	1	0.001	0.0027	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	950	5.00E-03	29.5	0.001152542

	y(ft)	z(ft)	Time (days)
8	0	0	2795

Projected Conc. at 8 0 0
at 2795 days
0.064 mg/l



AREAL MODEL CALCULATION DOMAIN
Length (ft) 6.5
Width (ft) 16.5

	0.65	1.3	1.95	2.6	3.25	3.9	4.55	5.2	5.85	6.5
16.5	0.042	0.066	0.071	0.068	0.063	0.056	0.050	0.043	0.038	0.032
8.25	0.447	0.376	0.317	0.267	0.224	0.188	0.158	0.132	0.111	0.093
0	0.447	0.376	0.317	0.267	0.225	0.190	0.160	0.135	0.114	0.096
-8.25	0.447	0.376	0.317	0.267	0.224	0.188	0.158	0.132	0.111	0.093
-16.5	0.042	0.066	0.071	0.068	0.063	0.056	0.050	0.043	0.038	0.032

Isopropylbenzene Calibration
Upgradient Well MW-6 (0.670 MG/L)
Downgradient Well MW-1 (0.120 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

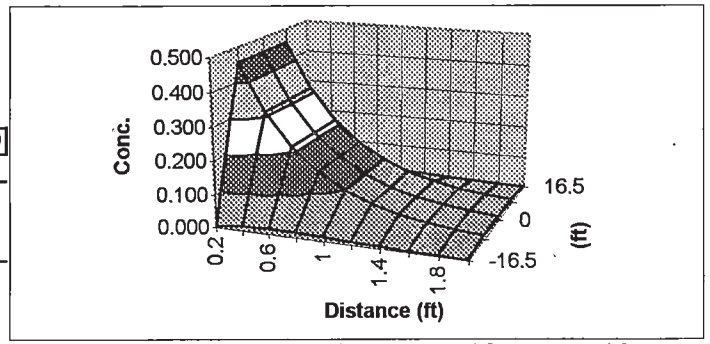
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.67	124	30	1	0.001	0.0433	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	2800	5.00E-03	85	0.0004

	y(ft)	z(ft)	Time (days)
124	0	0	77

Projected Conc. at 124 0 0
at 77 days
0.000 mg/l



AREAL MODEL CALCULATION DOMAIN
Length (ft) 2
Width (ft) 16.5

	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2
16.5	0.004	0.015	0.018	0.017	0.014	0.011	0.008	0.006	0.004	0.003
8.25	0.456	0.312	0.213	0.145	0.099	0.067	0.045	0.030	0.020	0.013
0	0.456	0.312	0.213	0.145	0.099	0.067	0.045	0.030	0.020	0.013
-8.25	0.456	0.312	0.213	0.145	0.099	0.067	0.045	0.030	0.020	0.013
-16.5	0.004	0.015	0.018	0.017	0.014	0.011	0.008	0.006	0.004	0.003

Isopropylbenzene Calibration
Upgradient Well MW-1 (0.150 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

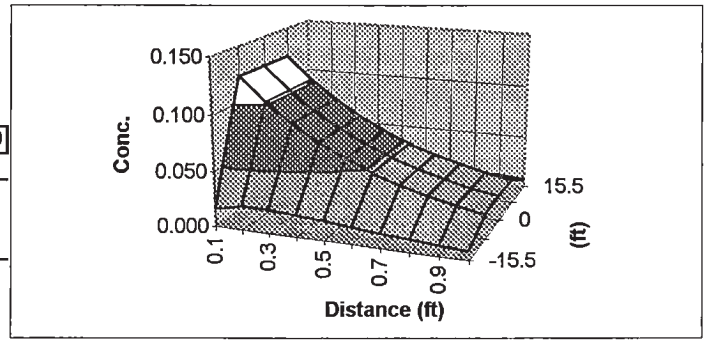
PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

SOURCE CONC (MG/L)	X DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.15	8	30	1	0.001	0.0433	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	2800	5.00E-03	85	0.0004

	y(ft)	z(ft)	Time (days)
8	0	0	77

Projected Conc. at	8	0	0
at 77 days			
0.000 mg/l			



AREAL MODEL CALCULATION DOMAIN
Length (ft) 1
Width (ft) 15.5

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
15.5	0.016	0.022	0.022	0.020	0.018	0.015	0.013	0.011	0.010	0.008
7.75	0.124	0.102	0.084	0.070	0.058	0.048	0.039	0.032	0.027	0.022
0	0.124	0.102	0.084	0.070	0.058	0.048	0.039	0.032	0.027	0.022
-7.75	0.124	0.102	0.084	0.070	0.058	0.048	0.039	0.032	0.027	0.022
-15.5	0.016	0.022	0.022	0.020	0.018	0.015	0.013	0.011	0.010	0.008

Isopropylbenzene Prediction
Source Concentration MW-1 (0.150 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

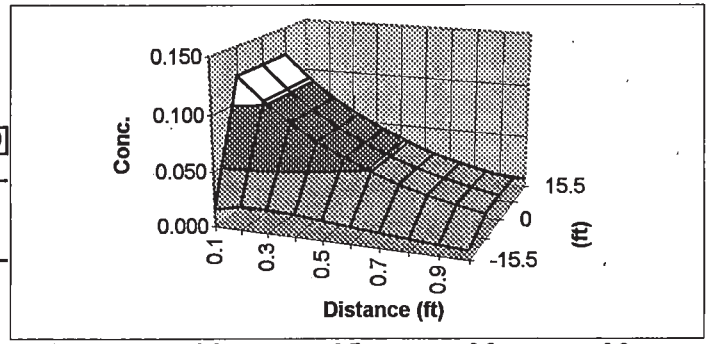
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.15	8	30	1	0.001	0.0433	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	2800	5.00E-03	85	0.0004

	y(ft)	z(ft)	Time (days)
8	0	0	185

Projected Conc. at 8 0 0
at 185 days
0.000 mg/l



AREAL MODEL CALCULATION DOMAIN
Length (ft) 1
Width (ft) 15.5

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
15.5	0.016	0.022	0.022	0.020	0.018	0.016	0.014	0.012	0.010	0.008
7.75	0.124	0.103	0.085	0.071	0.059	0.048	0.040	0.033	0.028	0.023
0	0.124	0.103	0.085	0.071	0.059	0.048	0.040	0.033	0.028	0.023
-7.75	0.124	0.103	0.085	0.071	0.059	0.048	0.040	0.033	0.028	0.023
-15.5	0.016	0.022	0.022	0.020	0.018	0.016	0.014	0.012	0.010	0.008

Benzene and Leachate Prediction
Source Concentrations MW-3 (0.744 MG/L)

ExxonMobil Corporation
Former Service Station 15-DAC

ADVECTIVE TRANSPORT WITH THREE DIMENSIONAL DISPERSION AND 1ST ORDER DECAY and AND RETARDATION

Project: ExxonMobil Corporation 15-DAC
Date: 9/17/2001 Prepared by: B & B Diversified Enterprises, Inc.

PA DEPARTMENT
OF ENVIRONMENTAL PROTECTION
QUICK_DOMENICO.XLS
SPREADSHEET APPLICATION OF
"AN ANALYTICAL MODEL FOR
MULTIDIMENSIONAL TRANSPORT OF A
DECAYING CONTAMINANT SPECIES"
P.A. Domenico (1987)
Modified to Include Retardation

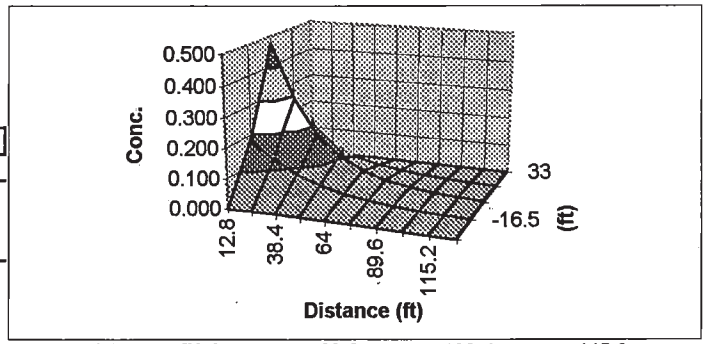
X

SOURCE CONC (MG/L)	DISTANCE TO LOCATION OF CONCERN (ft)	Ax (ft)	Ay (ft)	Az (ft) >=.001	LAMBDA day-1	SOURCE WIDTH (ft)	SOURCE THICKNESS (ft)
0.744	127	30	1	0.001	0.0009	30	10

Hydraulic Cond (ft/day)	Hydraulic Gradient (ft/ft)	Porosity (dec. frac.)	Soil Bulk Density (g/cm³)	KOC	Frac. Org. Carb.	Retard-ation (R)	V (=K*i/n*R) (ft/day)
1.50E+00	0.0068	0.3	1.8	58	5.00E-03	2.74	0.012408759

	y(ft)	z(ft)	Time (days)
127	0	0	8660

Projected Conc. at	127	0	0
at	8660 days		
0.006 mg/l			



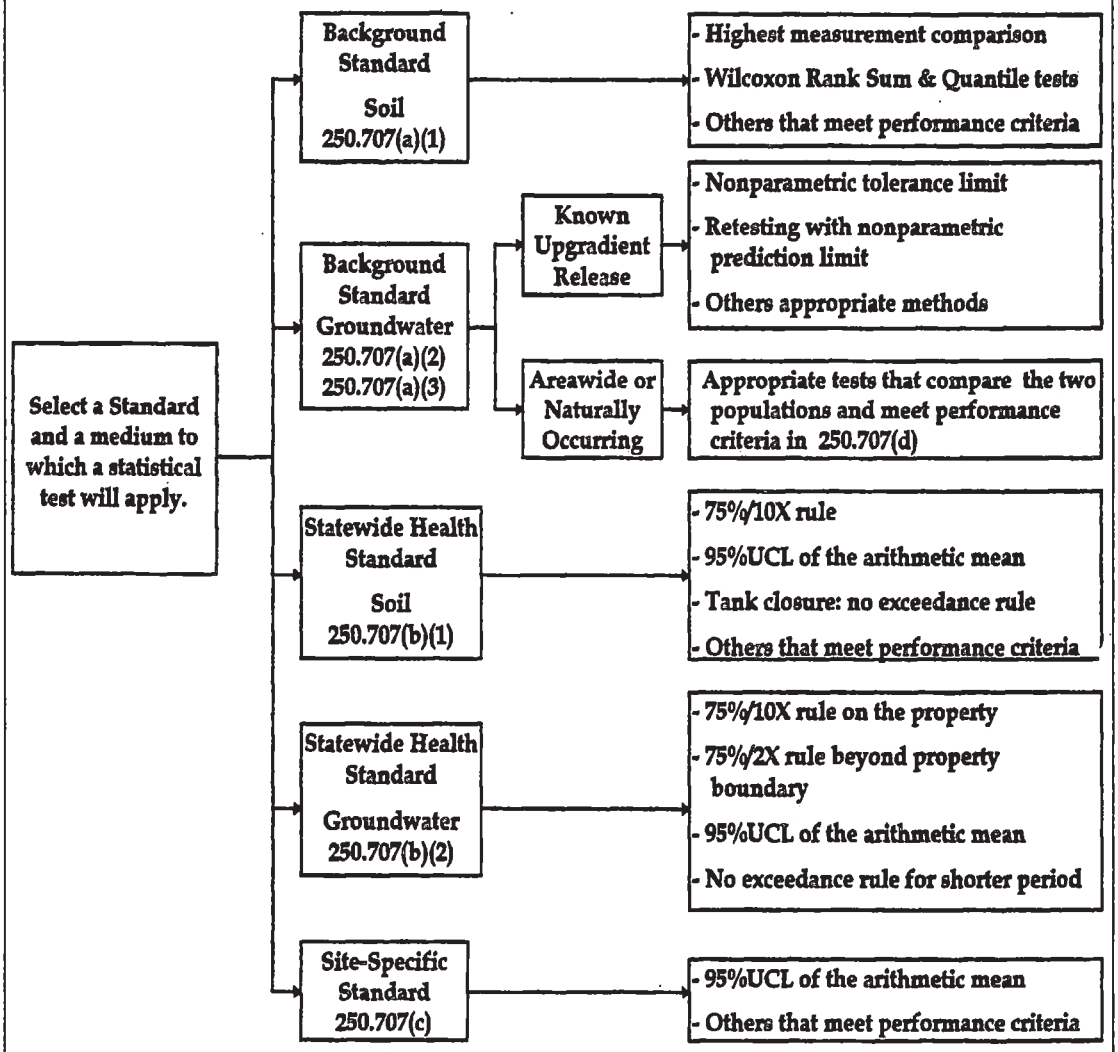
AREAL MODEL CALCULATION DOMAIN
Length (ft) 128
Width (ft) 33

	12.8	25.6	38.4	51.2	64	76.8	89.6	102.4	115.2	128
33	0.000	0.002	0.004	0.005	0.004	0.004	0.003	0.002	0.001	0.001
16.5	0.182	0.126	0.083	0.054	0.035	0.022	0.014	0.009	0.006	0.004
0	0.472	0.291	0.175	0.105	0.064	0.038	0.023	0.014	0.009	0.005
-16.5	0.182	0.126	0.083	0.054	0.035	0.022	0.014	0.009	0.006	0.004
-33	0.000	0.002	0.004	0.005	0.004	0.004	0.003	0.002	0.001	0.001

APPENDIX F
(Upper Confidence Limits (UCL) Statistical Tests)

STATISTICAL ATTAINMENT OF THE REMEDIATION CLEANUP STANDARDS

Figure IV-1. Flow Chart of Recommended Statistical Methods



STATISTICAL ATTAINMENT OF THE REMEDIATION CLEANUP STANDARDS

Figure IV-1 entitled, "Flow Chart of Recommended Statistical Methods" governs the selection of an appropriate statistical test(s) to apply for Background, Statewide Health, or Site-Specific Standards. For the Former Mobil Station No. 15-DAC, the Statewide Health and Site-Specific Standards were chosen, and therefore the appropriate statistical test to apply to the analytical data to demonstrate attainment of the proposed standards is the 95% Upper Confidence Limit (UCL) of the arithmetic mean[1]. The follow is a summary of the 95% UCL of the arithmetic mean:

The Statewide Health Standards that are being used at the site are as follows:

Soil	Benzene	0.5 mg/kg (statewide)
	Toluene	100 mg/kg (statewide)
	Ethylbenzene	70 mg/kg (statewide)
	Xylenes	1,000 mg/kg (statewide)

Groundwater

Product is present in the offsite upgradient well MW-6. Therefore, proposed Site-Specific Standards for the Site are based on the highest observed concentrations in onsite wells MW-1 through MW-5

Benzene	744 ug/l
Toluene	2,700 ug/l
Ethylbenzene	1,300 ug/l
Xylenes	10,000 ug/l (statewide)
MTBE	38,000 ug/l
Naphthalene	530 ug/l
Isopropylbenzene	150 ug/l

The following decision rule is used to determine if a site meets the Site-Specific cleanup standard[2]:

- If 95% UCL of arithmetic mean is greater than or equal to the cleanup standard, conclude the area is dirty.
- If 95% UCL of arithmetic mean is less than the cleanup standard, conclude the area is clean.

All observed concentrations in the historical trend profile for each of these compounds have never exceeded the historical peak concentration. Therefore, a 95% UCL of the arithmetic mean of the historical data cannot possible exceed the proposed cleanup standards for the compounds. Attainment of the proposed standards has therefore been achieved. An example is presented on the following page for the case of MTBE in MW-4.

---

[1] Section 250.707c of the Act 2 Regulations, p. 4228

[2] Cited from Page IV-26 of the Act 2 Technical Guidance Manual

Example: 95% UCL Statistical Attainment for MTBE in MW-4
(Page IV-35 of Act 2 Technical Guidance Manual)

Population: (n) = 22 MTBE concentrations from 10/20/91 - 08/13/99

Actual Data (readings): (X) =

110	22	14	44	250	580	73	320	240	147
170	5660	946	146	2790	29700	7770	1900	38000	71
21	640								

Sample Mean: $(\overline{X})$ = Divide sum of total readings (X) by the total number of readings (n).

= $(X_1 + X_2 + \ldots + X_n) / n$

$\overline{X}$ = 4073

Degrees of Freedom: (df) = Number of samples (n) - 1.

= n - 1

df = 21

Sample Variance: (Sb^2) = Take sum of squares of each reading (X) minus the mean $(\overline{X})$ and divide by the degrees of freedom (df).

= $[(x_1 - \overline{X})^2 + (x_2 - \overline{X})^2 + \ldots + (x_n - \overline{X})^2] / df$

Sb^2 = 98435720

Standard Deviation: (Sb) = The square root of the sample variance (Sb^2).

$\sqrt{Sb^2}$

Sb = 9921

Standard Error of Mean: (Sx) = Standard Error of Mean is inversely proportional to the square root of the number of samples. Where Standard Error of Mean is the Sb divided by the square root of n.

= $Sb / \sqrt{n}$

Sx = 2115

95% UCL: = $\overline{X} + t_{1\text{-alpha, n-1}} * Sx$

1.721 < $t_{1\text{-alpha, n-1}}$, Derived from the Student's t-Distribution Table

95% UCL: = 7714

UCL number resulting from the formula above will indicate with a 95% probability that it is above or below the Act 2 regulatory threshold.

Proposed Standard: = 38,000 ug/l

GEO-ENVIRO CONSULTING & REMEDIATION LLC (GECR)
371 Hoes Lane, (Suite 200), Piscataway NJ 08854
Phone: (732) 377-2028, Fax # 866-604-2364
Email: admin@geoenviroconsulting.com
www.gecr.org

APPENDIX E
UST DOCUMENTATION

2630-FM-BECB0575 Rev. 12/2018

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FOR DEP USE ONLY
Reviewer_____ Date_____
Entered by_____Date_____

UNDERGROUND STORAGE TANK MODIFICATION REPORT

I. FACILITY INFORMATION

Facility I.D. Number 09- 43609
Facility Name MILL CREEK SUNOCO STATION
Facility Address 7040 MILL CREEK RD
Municipality LEVITTOWN, PA
GPS Location Lat: 400830.90 Long: 745045.91

II. ACTIVITY INFORMATION

This modification activity is?

☒ Minor modification
☐ Major modification

Is this modification in response to an inspection?

☐ Yes ☒ No

If Yes: Inspector: _____

Inspection Date: _____

III. TANK INFORMATION

Tank modification is in accordance with manufacturer's specifications and current industry standards. If no, explain all irregularities in the comment section.

☒ Yes ☐ No

Tank modification complies with Fire Safety Requirements (for flammable & combustible liquids). If no, explain all irregularities in the comment section.

☐ Yes ☐ No ☒ Not Applicable

Fire/Safety Permit Number _____ Issued By _____ Date _____

IV. INSTALLER INFORMATION (If additional installers were involved, include their information in VII. Comments)

Installer Name	Installer Cert. No.	Certification Category(ies)	Company Name	Company Cert. No.
DENNIS LINEMAN	5631	UMX	BRISTOL ENV	1052

Installer Contact Name _____ Contact Email _____ Contact Phone _____

V. INSTALLER CERTIFICATION

This Section must be completed by the certified installer(s) for modifications performed on underground storage tank systems. By signing below, the certified installer verifies that the tank handling activity was conducted in compliance with the standards of Act 32 and applicable regulations. The signature also certifies, under penalty of law as provided in 18 PA C.S.A. Section 4904 (relating to unsworn falsification to authorities), that the information provided is true, accurate, and complete to the best of his/her knowledge and belief.

Signature(s)	Date(s) of Signature	Date(s) Work Completed
	1-5-22	1-3-22

FACILITY I.D. # 9 - 43609

VI. TANK SYSTEM COMPONENTS. (Describe only components that have been installed or modified.)

Tank # 4 | Tank # 5 | Tank # 6

(1) Tank Modification (describe in VII. Comments)

- ☐ ☐ ☐ C Cathodic protection (modified)
- ☐ ☐ ☐ 99 Other

(2) Underground Piping Installation or Modification (describe in VII. Comments)

- ☐ ☐ ☐ B Cathodic protection added
- ☐ ☐ ☐ Field design by a "corrosion expert"
- _____ Industry Standard used for CP
- ☐ ☐ ☐ H Modification of existing piping
- ☐ ☐ ☐ I Double walled steel piping
- ☐ ☐ ☐ J Double walled fiberglass
- ☐ ☐ ☐ K Double walled plastic
- ☐ ☐ ☐ M Jacketed piping
- ☐ ☐ ☐ 99 Other

(PFLEX) Piping Flexible Connection Installation or Modification (describe in VII. Comments)

- ☐ ☐ ☐ B Metallic w/cathodic protection added
- ☐ ☐ ☐ I Placed inside containment
- ☐ ☐ ☐ M Jacket added
- ☐ ☐ ☐ 99 Other

(4) Product Delivery (Pump) System Modification (describe in VII. Comments)

- ☐ ☐ ☐ A Suction: Check valve at pump
- ☐ ☐ ☐ B Suction: Check valve at tank
- ☐ ☐ ☐ C Pressure: Submersible pump (STP)
- ☐ ☐ ☐ D Gravity Fed
- ☐ ☐ ☐ 88 Installed/removed siphon bar

(5) Pipe Release Detection Modification (describe in VII. Comments)

- ☐ ☐ ☐ A Automatic line leak detector added
- ☐ ☐ ☐ D Interstitial monitoring added
- ☐ ☐ ☐ K Electronic line leak detector added
- ☐ ☐ ☐ L Continuous Interstitial monitor added
- ☐ ☐ ☐ 88 STP shut off added
- ☐ ☐ ☐ 99 Other

Tank # 4 | Tank # 5 | Tank # 6

(6) Spill Prevention Repair (describe repair, test and type in VII. Comments) ‡

- ☐ ☐ ☐ Spill Bucket Insert/Repair
- ☐ ☐ ☐ New Single-Wall
- ☐ ☐ ☐ New Double-Wall

(7) Overfill Prevention Installation or Modification (describe status of previous overfill prevention i.e. removed, remains as backup in VII. Comments)

- ☐ ☐ ☐ S Drop tube shut-off device added
- ☒ ☒ ☒ A Overfill alarm added

(12) Tank Release Detection Modification (include manufacturer and model number in VII. Comments)

- ☐ ☐ ☐ E Automatic tank gauge added/replaced
- ☐ ☐ ☐ H Interstitial monitor (2 walls) added
- ☐ ☐ ☐ J Groundwater monitoring added (attach site evaluation)
- ☐ ☐ ☐ K Vapor monitoring added (attach site evaluation)

(19) Stage I Vapor Recovery Modification

- ☐ ☐ ☐ A Coaxial added/replaced
- ☐ ☐ ☐ B 2 Port added/replaced

(20) Stage II Vapor Recovery Modification

- ☐ ☐ ☐ A Complete balance system added
- ☐ ☐ ☐ B Complete assist system added
- ☐ ☐ ☐ C Underground piping only added
- ☐ ☐ ☐ D Stage II decommissioned

(21) Tank top Sump Installation or Repair (describe installation and test in VII. Comments) ‡

- ☐ ☐ ☐ Y Yes

(22) Dispenser Pan Installation or Repair (describe installation and test in VII. Comments) ‡

- ☐ ☐ ☐ 88 New dispenser installed
- ☐ ☐ ☐ Y Under existing dispenser

‡ New, replaced, and repaired spill buckets, containment sumps, and dispenser pans must be tested for tightness in accordance with the manufacturer's recommendations and/or applicable industry standards.

FACILITY I.D. # 9 -43609

VII. COMMENTS (Describe activity completed in detail. Explain "other" modifications.)

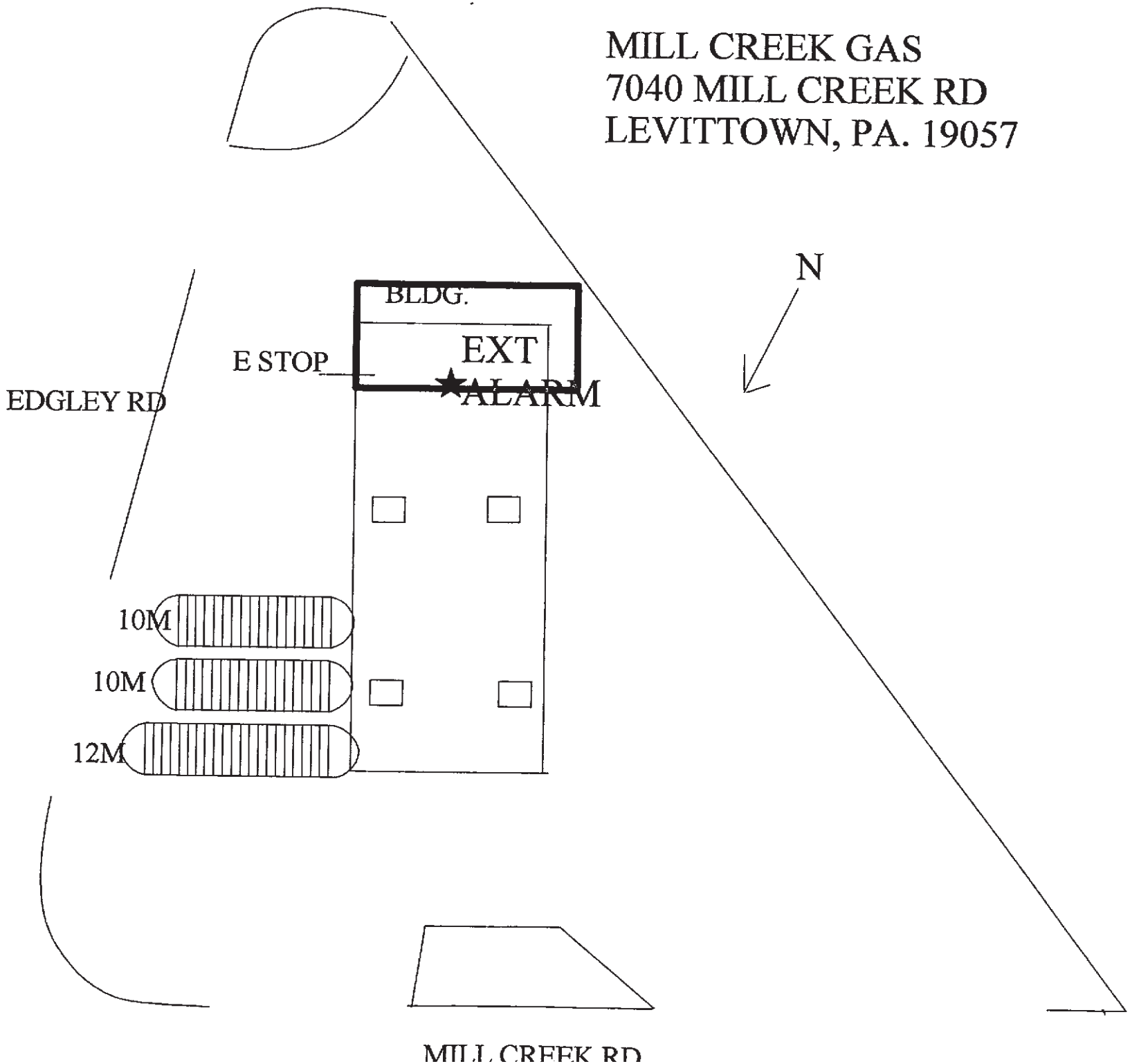
The modification report is not complete until all modified or installed components noted in Section VI. have been accurately and completely described in the comments section, below.

REMOVED DEFECTIVE OVER FILL PROTECTION DROP TUBES

INSTALLED EXTERIOR OVERFILL ALARM
INSTALLED NEW STRAIGHT DROP TUBES IN THE FILLS

PERFORMED TEST AND CERTIFICATION ON THE EXTERIOR ALARM

VIII.SITE DRAWING (Include layout, activity locations, and other drawings necessary to illustrate modifications)


MILL CREEK GAS
7040 MILL CREEK RD
LEVITTOWN, PA. 19057
N
BLDG.
EXT
E STOP
ALARM
EDGLEY RD
10M
10M
12M
MILL CREEK RD

2630-FM-BECB0018 1/2019
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

UNDERGROUND STORAGE TANK OVERFILL PREVENTION EVALUATION FORM

I. FACILITY INFORMATION – Type or print (in ink) all items.		
Facility ID #: 09- 43609	Facility Name: MILL CREEK SUNOCO	
Facility Street Address: 7040 MILL CREEK RD. LEVITTOWN, PA		
Facility Telephone:	County: BUCKS	Municipality: BRISTOL
II. TESTER INFORMATION		
Tester Name: DENNIS LINEMAN	Tester Cert. #: 5631	Tester Telephone: 215-788-8421
Company Name: BRISTOL ENV	Company Cert. #: 1052	Test Date: 1/4/2022

III. TANK AND DEVICE INFORMATION

Tank Number	004	005	006		
Tank Capacity	10000	10000	12000		
Tank Diameter	92"	92"	92"		
Product Stored	GASOLINE	GASOLINE	GASOLINE		
Overfill Manufacturer	OPW	OPW	OPW		
Overfill Model	TLS 350----------	----------	---------		
Product Delivery Method	☐ Pressurized ☐ Gravity	☐ Pressurized ☐ Gravity	☐ Pressurized ☐ Gravity	☐ Pressurized ☐ Gravity	☐ Pressurized ☐ Gravity
Overfill Type	☐ Drop Tube Shutoff ☒ Alarm ☐ Ball Float ☐ Whistle Vent	☐ Drop Tube Shutoff ☒ Alarm ☐ Ball Float ☐ Whistle Vent	☐ Drop Tube Shutoff ☒ Alarm ☐ Ball Float ☐ Whistle Vent	☐ Drop Tube Shutoff ☐ Alarm ☐ Ball Float ☐ Whistle Vent	☐ Drop Tube Shutoff ☐ Alarm ☐ Ball Float ☐ Whistle Vent

IV. TEST INFORMATION (Complete all applicable overfill types)

A. DROP TUBE SHUTOFF DEVICE

Drop tube and float free of debris?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Float and poppet move freely?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Poppet enters flow path when float is engaged?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank capacity when flow is stopped (%)					

B. OVERFILL ALARM

Visible or audible to delivery driver?	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Probe and float in good condition?	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Float moves freely?	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Does simulated overfill trigger alarm?	☐ Yes ☐ No	☐ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Tank capacity when alarm is triggered (%)	90	90	90		

Facility ID #: 09- 43609 **Facility Name:** MILL CREEK SUNOCO **Test Date:** 1/4/2022

C. BALL FLOAT VALVE										
Straight drop tube installed?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Is the only fill present a direct fill?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Ball and cage present and in good condition?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Ball moves freely in cage?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Is the bleed hole unobstructed?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Tank capacity when flow is restricted (%)										
D. WHISTLE VENT ALARM										
Permanently Installed?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Audible to delivery driver?	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
Tank capacity when whistle stops (%)										
V. TEST RESULTS	Any "No" answer in Section IV indicates the overfill device fails. Failed tests must be reported by submitting this form to the appropriate regional office. Underground Storage Tanks may not receive product deliveries without functional overfill prevention.									
	☒ **Pass**	☐ **Fail**	☒ **Pass**	☐ **Fail**	☒ **Pass**	☐ **Fail**	☐ **Pass**	☐ **Fail**	☐ **Pass**	☐ **Fail**

VI. COMMENTS

The comments section should be used to note additional information discovered or actions taken during functionality testing that affect compliance at the facility. For example, include comments concerning any observations made by the tester that would affect the test results.

Include actions taken to repair or replace failed devices. **Installation, repair and removal of overfill prevention devices requires the use of a Department certified individual.** Failed ball float valves may not be repaired or replaced; an alternate form of overfill prevention must be installed.

If additional comment sheets are needed, label each sheet with the report header information and attach the sheet(s) to the back of this form.

FOUND THE OVERFILL PROTECTION DROP TUBES TO NOT BE SET AT THE PROPER SETTING AND ALSO FOUND THEM TO BE CORRODED AND FAILING THE VAPOR RECOVERY DECAY TEST
INSTALLED NEW STRAIGHT DROP TUBES

INSTALLED NEW EXTERIOR OVERFILL ALARM

VII. OWNER'S REPRESENTATIVE CERTIFICATION

I have reviewed this report. I certify under penalty of law as provided in 18 PA C.S.A. Section 4904(relating to unsworn falsification to authorities), that the information provided by me is true, accurate, and complete to the best of my knowledge and belief.

Signature: [signature] Agent Date Signed: 1/5/22

VIII. TESTER CERTIFICATION

By signing this document as the Tester, I certify under penalty of law as provided in 18 PA C.S.A. Section 4904(relating to unsworn falsification to authorities), that the information provided by me is true, accurate, and complete to the best of my knowledge and belief.

Tester's Signature: [signature] Date Signed: 1-5-22

2630-FM-BECB0575 Rev. 12/2018

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FOR DEP USE ONLY
Reviewer_____ Date_____
Entered by_____ Date_____

UNDERGROUND STORAGE TANK MODIFICATION REPORT

DEP - RECEIVED
SOUTHEAST REGION
SEP 15 2020

I. FACILITY INFORMATION

Facility I.D. Number 09-43609

Facility Name Sunoco

Facility Address 2040 Millcreek Rd
Levittown PA

Municipality Levittown

GPS Location Lat: _____ Long: _____

II. ACTIVITY INFORMATION

This modification activity is?

☑ Minor modification
☐ Major modification

Is this modification in response to an inspection?

☐ Yes ☑ No

If Yes: Inspector: _____

Inspection Date: _____

III. TANK INFORMATION

Tank modification is in accordance with manufacturer's specifications and current industry standards. If no, explain all irregularities in the comment section.

☑ Yes ☐ No

Tank modification complies with Fire Safety Requirements (for flammable & combustible liquids). If no, explain all irregularities in the comment section.

☑ Yes ☐ No ☐ Not Applicable

Fire/Safety Permit Number 300462B Issued By PA Labor & Industry Date 6/12/2020

IV. INSTALLER INFORMATION (If additional installers were involved, include their information in VII. Comments)

Installer Name	Installer Cert. No.	Certification Category(ies)	Company Name	Company Cert. No.
Emanuel D Williams	4406	UMX	JDT Petroleum	415

Dawn Dymek
Installer Contact Name

JDTPUMPS@Aol.com
Contact Email

215-947-8374
Contact Phone

V. INSTALLER CERTIFICATION

This Section must be completed by the certified installer(s) for modifications performed on underground storage tank systems. By signing below, the certified installer verifies that the tank handling activity was conducted in compliance with the standards of Act 32 and applicable regulations. The signature also certifies, under penalty of law as provided in 18 PA C.S.A. Section 4904 (relating to unsworn falsification to authorities), that the information provided is true, accurate, and complete to the best of his/her knowledge and belief.

Signature(s)	Date(s) of Signature	Date(s) Work Completed
Emanuel D Williams	9-4-2020	9-2-2020

FACILITY I.D. # 04 - 43609

VI. TANK SYSTEM COMPONENTS. (Describe only components that have been installed or modified.)

Tank #	Tank #	Tank #
4	5	6

(1) Tank Modification (describe in VII. Comments)

- ☐ ☐ ☐ C Cathodic protection (modified)
- ☐ ☐ ☐ 99 Other

(2) Underground Piping Installation or Modification (describe in VII. Comments)

- ☐ ☐ ☐ B Cathodic protection added
- ☐ ☐ ☐ Field design by a "corrosion expert"
- _____ Industry Standard used for CP
- ☐ ☐ ☐ H Modification of existing piping
- ☐ ☐ ☐ I Double walled steel piping
- ☐ ☐ ☐ J Double walled fiberglass
- ☐ ☐ ☐ K Double walled plastic
- ☐ ☐ ☐ M Jacketed piping
- ☐ ☐ ☐ 99 Other

(PFLEX) Piping Flexible Connection Installation or Modification (describe in VII. Comments)

- ☐ ☐ ☐ B Metallic w/cathodic protection added
- ☐ ☐ ☐ I Placed inside containment
- ☐ ☐ ☐ M Jacket added
- ☐ ☐ ☐ 99 Other

(4) Product Delivery (Pump) System Modification (describe in VII. Comments)

- ☐ ☐ ☐ A Suction: Check valve at pump
- ☐ ☐ ☐ B Suction: Check valve at tank
- ☐ ☐ ☐ C Pressure: Submersible pump (STP)
- ☐ ☐ ☐ D Gravity Fed
- ☐ ☐ ☐ 88 Installed/removed siphon bar

(5) Pipe Release Detection Modification (describe in VII. Comments)

- ☐ ☐ ☐ A Automatic line leak detector added
- ☐ ☐ ☐ D Interstitial monitoring added
- ☐ ☐ ☐ K Electronic line leak detector added
- ☐ ☐ ☐ L Continuous Interstitial monitor added
- ☐ ☐ ☐ 88 STP shut off added
- ☐ ☐ ☐ 99 Other

Tank #	Tank #	Tank #
4	5	6

(6) Spill Prevention Repair (describe repair, test and type in VII. Comments) ‡

- ☐ ☐ ☐ Spill Bucket Insert/Repair
- ☐ ☐ ☐ New Single-Wall
- ☐ ☐ ☐ New Double-Wall

(7) Overfill Prevention Installation or Modification (describe status of previous overfill prevention i.e. removed, remains as backup in VII. Comments)

- ☐ ☐ ☐ S Drop tube shut-off device added
- ☐ ☐ ☐ A Overfill alarm added

(12) Tank Release Detection Modification (include manufacturer and model number in VII. Comments)

- ☐ ☐ ☐ E Automatic tank gauge added/replaced
- ☐ ☐ ☐ H Interstitial monitor (2 walls) added
- ☐ ☐ ☐ J Groundwater monitoring added (attach site evaluation)
- ☐ ☐ ☐ K Vapor monitoring added (attach site evaluation)

(19) Stage I Vapor Recovery Modification

- ☐ ☐ ☐ A Coaxial added/replaced
- ☐ ☐ ☐ B 2 Port added/replaced

(20) Stage II Vapor Recovery Modification

- ☐ ☐ ☐ A Complete balance system added
- ☐ ☐ ☐ B Complete assist system added
- ☐ ☐ ☐ C Underground piping only added
- ☐ ☐ ☐ D Stage II decommissioned

(21) Tank top Sump Installation or Repair (describe installation and test in VII. Comments) ‡

- ☐ ☐ ☐ Y Yes

(22) Dispenser Pan Installation or Repair (describe installation and test in VII. Comments) ‡

- ☑ ☑ ☑ 88 New dispenser installed
- ☐ ☐ ☐ Y Under existing dispenser

‡ New, replaced, and repaired spill buckets, containment sumps, and dispenser pans must be tested for tightness in accordance with the manufacturer's recommendations and/or applicable industry standards.

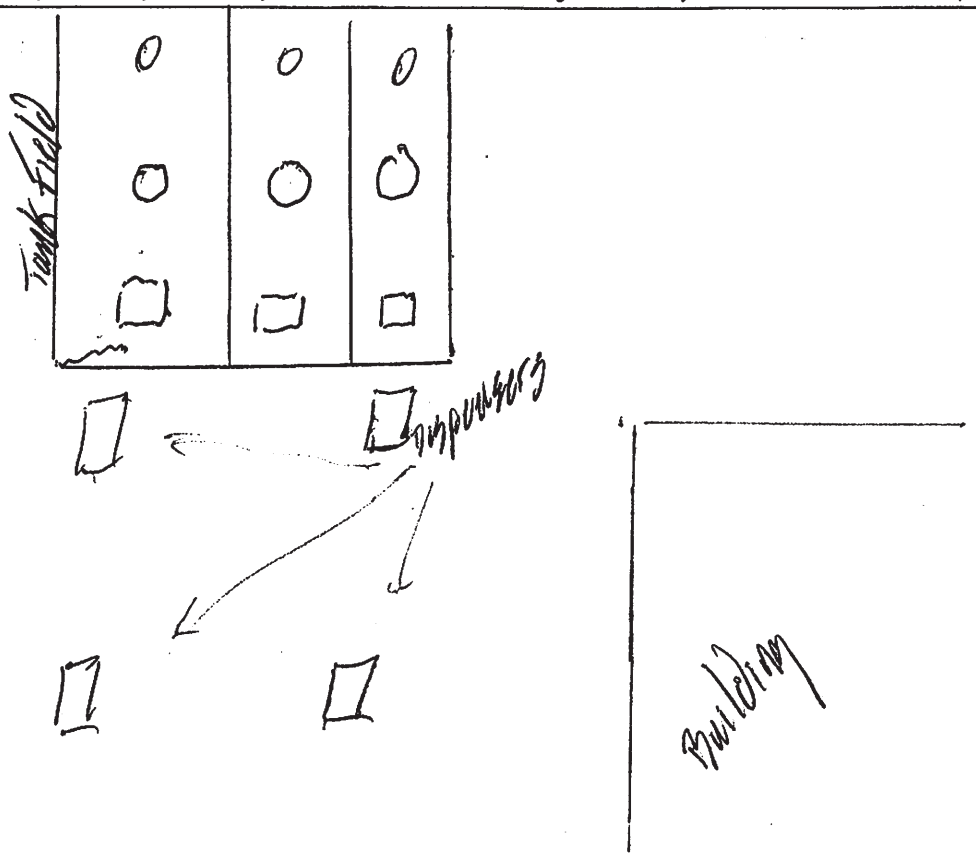
FACILITY I.D. # 09 - 43609

VII. COMMENTS (Describe activity completed in detail. Explain "other" modifications.)

The modification report is not complete until all modified or installed components noted in Section VI. have been accurately and completely described in the comments section, below.

Removed and Replaced Dispensers

VIII.SITE DRAWING (Include layout, activity locations, and other drawings necessary to illustrate modifications)



2630-FM-BECB0021 1/2019
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL CLEANUP AND BROWNFIELDS

UNDERGROUND STORAGE TANK
AUTOMATIC LINE LEAK DETECTOR FUNCTIONALITY TESTING FORM

I. FACILITY INFORMATION – Type or print (in ink) all items.		
Facility ID #: 09-43609	Facility Name: SUNOCO STATION	
Facility Street Address: 7040 MILL CREEK RD LEVITTOWN PA		
Facility Telephone:	County: BUCKS	Municipality: BRISTOL
II. TESTER INFORMATION		
Tester Name: BRIAN FORREST	Tester Cert. #: 5423	Tester Telephone:
Company Name: BRISTOL ENV	Company Cert. #: 1052	Test Date: 10/29/2021
III. TEST PROCEDURE – Briefly describe procedure(s) used to test the line leak detector(s) (i.e. PEI/RP1200, manufacturer's testing procedure, etc.)		
AS PER RP1200		

IV. LINE LEAK DETECTOR TESTING INFORMATION – When more than five LLDs are tested at a facility, use additional testing forms.

Tank Number	1	2	3		
Product Stored	REG	REG	SUPER		
Line Number[1]	1-2 5-6	3-4 7-8	1-8		
Manufacturer	VAPORLESS	VAPORLESS	VAPORLESS		
Model	VMI 2000	VMI 2000	VMI 2000		
Leak Detector Type	☐ Electronic ☒ Mechanical	☐ Electronic ☒ Mechanical	☐ Electronic ☒ Mechanical	☐ Electronic ☐ Mechanical	☐ Electronic ☐ Mechanical
STP Operating Pressure	33	32	28		
A. MECHANICAL LINE LEAK DETECTORS					
Check Valve Holding Pressure	28	30	26		
Metering Pressure	18	16	17		
Opening Time	2.5	3.0	3.0		
Simulated leak causes slow-flow	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Leak detector resets when line pressure is bled off to zero	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
B. ELECTRONIC LINE LEAK DETECTORS					
Simulated leak causes an alarm	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Simulated leak disables the STP[2]	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
V. TEST RESULT[3]	☒ **Pass** ☐ **Fail**	☒ **Pass** ☐ **Fail**	☒ **Pass** ☐ **Fail**	☐ **Pass** ☐ **Fail**	☐ **Pass** ☐ **Fail**

1. Designate each product line, on which a line leak detector was tested, numerically or by code on the site drawing.
2. Required for pressurized piping systems installed after November 10, 2007, using LLD for 3gph piping release detection.

LINE TEST DATA FORM

PETRO- TIGHT- LINE/LEAK DETECTOR TEST

BRISTOL ENVIRONMENTAL & SERVICES CO. INC.

OWNER/OPERATOR:	SUNOCO STATION		
LOCATION:	7040 MILL CREEK RD	LEVITTOWN PA 19057	
WEATHER:	CLOUDY 57	COVER OVER LINES:	CONCRETE
RED JACKET		APPROX BURIAL DEPTH:	48"
		WAS PRETEST REQUIRED:	YES

LINE TEST INFO:			PRESSURE		VOLUME			TEST METHOD / REMARKS		
IDENTIFY	TIME	LOG OF TEST	BEFORE	AFTER	BEFORE	AFTER	CHANGE			
REG		1st reading	50	50	0.025	0.025	0	BULLET	VALVE	F.E SCREW
1-2 5-6		2nd reading	50	50	0.025	0.025	0		XXXXXX	
		3rd reading	49	50	0.0255	0.025	-0.0005	ALLOWED BLEED BACK		0.080
		4th reading	50	50	0.026	0.026	0	FINAL BLEED BACK		0.040
		5th reading	50	50	0.026	0.026	0	CORRECTION FACTOR		0.050
		6th reading	49	50	0.027	0.0265	-0.0005	(-.001) GAL PER 1/2 HR		

LINE TEST INFO:			PRESSURE		VOLUME			TEST METHOD / REMARKS		
IDENTIFY	TIME	LOG OF TEST	BEFORE	AFTER	BEFORE	AFTER	CHANGE			
REG		1st reading	50	50	0.025	0.025	0	BULLET	VALVE	F.E SCREW
3-4 7-8		2nd reading	50	50	0.025	0.025	0			XXXXXX
		3rd reading	51	50	0.025	0.0255	0.0005	ALLOWED BLEED BACK		0.080
		4th reading	50	50	0.026	0.026	0	FINAL BLEED BACK		0.040
		5th reading	51	50	0.026	0.0265	0.0005	CORRECTION FACTOR		0.050
		6th reading	50	50	0.0265	0.0265	0	.001 GAL PER 1/2 HR		

LINE TEST INFO:			PRESSURE		VOLUME			TEST METHOD / REMARKS		
IDENTIFY	TIME	LOG OF TEST	BEFORE	AFTER	BEFORE	AFTER	CHANGE			
SUPER		1st reading	50	50	0.025	0.025	0	BULLET	VALVE	F.E SCREW
		2nd reading	51	50	0.025	0.0255	0.0005		XXXXXX	
		3rd reading	51	50	0.0255	0.026	0.0005	ALLOWED BLEED BACK		0.080
		4th reading	50	50	0.026	0.026	0	RESULTS PASS/FAIL		0.043
		5th reading	51	50	0.0265	0.027	0.0005	CORRECTION FACTOR		0.050
		6th reading	51	50	0.0265	0.027	0.0005	.002 GAL PER 1/2 HR		

LEAK DETECTOR INFO:			OPR	IDLE	LEAK	OPENING	LINE	LINE	FLEX	PASS/
	MODEL OF L.D.		PSI	PSI	RATE	TIME	LENGTH	TYPE	CONN.	FAIL
REG	VMI 2000	VAPORLESS	33	28	3.0	2.5	110'	SW/FG	5	PASS
REG	VMI 2000	VAPORLESS	32	30	3.0	3.0	110'	SW/FG	5	PASS
SUPER	VMI 2000	VAPORLESS	28	26	3.0	3.0	110'	SW/FG	5	PASS

TESTING TECH BRIAN FORREST

Tests were made on the above line systems in accordance with test procedures for as detailed on the attached test charts with the results as follows:

TEST RESULTS	LINE IDENTIFICATION	MEETS CRITERIA	NET VOLUME CHANGE PER HR	DATE TESTED
REG STREET		YES	-0.001	10/29/2021
REG MIDDLE		YES	0.001	10/29/2021
SUPER		YES	0.002	10/29/2021

CONTRACTOR CERTIFICATION

CERTIFICATION #

3. Failed line leak detectors must be repaired or replaced immediately.

Facility ID #: 09-3609 **Facility Name:** SUNOCO **Test Date:** 10/29/2021

VI. COMMENTS

The comments section should be used to note additional information discovered or actions taken during functionality testing that affect compliance at the facility. For example, include comments concerning any observations made by the tester that would affect the test results.

Include actions taken to repair or replace failed devices.

If additional comment sheets are needed, label each sheet with the report header information and attach the sheet(s) to the back of this form.

VII. SITE DRAWING

Provide a detailed site drawing of the applicable UST(s), product piping, and containment structure layout in the space below (or attach a detailed site drawing prepared on a separate sheet). Any other pertinent information should also be included.

VII. OWNER'S REPRESENTATIVE CERTIFICATION

I have reviewed this report. I certify under penalty of law as provided in 18 PA C.S.A. Section 4904(relating to unsworn falsification to authorities), that the information provided by me is true, accurate, and complete to the best of my knowledge and belief.

Signature:	Date Signed:

VIII. TESTER CERTIFICATION

By signing this document as the Tester, I certify under penalty of law as provided in 18 PA C.S.A. Section 4904(relating to unsworn falsification to authorities), that the information provided by me is true, accurate, and complete to the best of my knowledge and belief.

Tester's Signature:	Date Signed: 10/29/2021