SITE CHARACTERIZATION REPORT

(Pennsylvania Code, Title 25, Chapter 245)

Kwik Fill Station #M-209
Facility ID #61-23779
USTIF Claim #2015-0054(F)
5574 State Route 8
Barkeyville, Pennsylvania
Venango County

Prepared for:

United Refining Company of Pennsylvania
814 Lexington Ave, P.O. Box 688
Warren, Pennsylvania, 16365

Prepared by:

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
301 Commerce Park Drive
Cranberry Township, Pennsylvania 16066

September 2016

SITE CHARACTERIZATION REPORT

Kwik Fill Station #M-209
Facility ID #61-23779
USTIF Claim #2015-0054(F)
5574 State Route 8
Barkeyville, Pennsylvania
Venango County

Prepared for:

United Refining Company of Pennsylvania
814 Lexington Ave, P.O. Box 688
Warren, Pennsylvania, 16365

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ERIN MARIE LETRICK
GEOLOGIST
No. PG005044

Prepared by:

Groundwater & Environmental Services, Inc.
301 Commerce Park Drive
Cranberry Township, Pennsylvania 16066

Prepared by:

Justin M. Paul
Associate Scientist

Lauren A. Bidwell
Staff Scientist

Reviewed by:

Erin Letrick, P.G.
Project Geologist

Joseph Skurka
Senior Project Manager

Joseph E. Hinkle
Project Manager

By affixing my seal to this document, I am certifying that to the best of my knowledge the information is true and correct. I further certify that I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information.

September 2016

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS vi

EXECUTIVE SUMMARY viii

1.0 INTRODUCTION 1-1

2.0 FACILITY LOCATION AND DESCRIPTION 2-1

2.1 Location 2-1
2.2 Description 2-1
2.3 Sensitive Receptor Evaluation 2-2
2.3.1 Well Search 2-2
2.3.2 Potential Sensitive Receptors 2-3
2.3.3 Potential Ecological Receptors 2-4
2.3.4 Potential Migration Pathways 2-4
2.3.5 Current and Future Land Use 2-5
2.4 Physical Setting 2-5
2.4.1 Topography and Drainage 2-5
2.4.2 Stratigraphy 2-5
2.4.3 Hydrology 2-7

3.0 REGIONAL HISTORY 3-1

3.1 Local Tank Search 3-1
3.2 Local Mining Activities 3-2

4.0 FACILITY HISTORY 4-1

4.1 1996 Reportable Release - Unleaded Gasoline 4-1
4.2 1997 Reportable Release - Unleaded Gasoline 4-1
4.3 UST Closure Activities - April 1998 4-1
4.4 2015 Reportable Release - Diesel 4-2

5.0 SITE CHARACTERIZATION ACTIVITIES 5-1

5.1 Investigation Methods 5-1
5.2 Soil Investigation 5-2
5.2.1 Number and Location of Soil Borings 5-2
5.2.2 Sample Collection 5-3
5.2.3 Soil Analytical Results 5-3
5.2.4 Geotechnical Analytical Results 5-3
5.3 Groundwater Investigation 5-4
5.3.1 Well Installation and Construction 5-4
5.3.2 Well Development/Survey 5-4
5.3.3 Groundwater Sampling – Monitoring Wells 5-4
5.4 Vapor Intrusion Investigation 5-5
5.5 Investigation-Derived Waste 5-5

6.0 CONCEPTUAL SITE MODEL 6-1

6.1 Nature and Extent of Release 6-1
6.2 Soil 6-1
6.3 Groundwater 6-3

TABLE OF CONTENTS (continued)

6.3.1 Benzene and 1,2,4-trimethylbenzene 6-4
6.3.2 MTBE and Naphthalene 6-5
6.4 Soil Gas 6-5
6.5 Fate and Transport Assessment 6-5
6.5.1 Shallow Overburden Aquifer 6-5
6.5.2 Deep Overburden Aquifer 6-6

7.0 POTENTIAL EXPOSURE PATHWAYS AND SENSITIVE RECEPTORS 7-1

7.1 Soil Exposure Pathways 7-1
7.2 Groundwater Exposure Pathways 7-1
7.3 Surface Water Exposure Pathways 7-2
7.4 Vapor Exposure Pathways 7-3
7.4.1 Soil Vapor Inhalation 7-3
7.4.2 Groundwater Vapor Inhalation 7-3

8.0 SELECTION OF CLEANUP STANDARDS AND RATIONALE 8-1

8.1 Statewide Health Standard 8-1
8.1.1 Soil MSCs 8-1
8.1.2 Groundwater MSCs 8-3
8.2 Site-Specific Standard 8-3
8.3 Standard Selection 8-3

9.0 REMEDIAL OPTIONS EVALUATION 9-1

9.1 Soil 9-1
9.2 Groundwater 9-2

10.0 PLANNED ACTIVITIES 10-1

10.1 Schedule 10-1

11.0 SUMMARY 11-1

12.0 REFERENCES 12-1

TABLE OF CONTENTS (continued)

LIST OF FIGURES

1 Site Location Map
2 Local Area Map
3 Site Map
4 Soil Survey Map
5 Bedrock Geologic Map
6A Cross-Section Location Map
6B Cross-Section A-A', B-B' and C-C'
7 Groundwater Contour Map (Shallow Overburden Aquifer) July 14, 2016
8 Groundwater Contour Map (Deep Overburden Aquifer) July 14, 2016
9 Groundwater Contour Map (Shallow Overburden Aquifer) August15, 2016
10 Groundwater Contour Map (Deep Overburden Aquifer) August 15, 2016
11 Soil Boring Location Map
12 Area of Concern Location Map
13 Benzene Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
14 MTBE Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
15 1,2,4-TMB Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
16 Benzene Groundwater Isoconcentration Map, August 15, 2016
17 MTBE Groundwater Isoconcentration Map, August 15, 2016
18 Naphthalene Groundwater Isoconcentration Map, August 15, 2016
19 1,2,4-TMB Groundwater Isoconcentration Map, August 15, 2016
20 Proposed Monitoring Location Map

LIST OF TABLES

1 Groundwater Data Summary
2 Well Construction Summary
3 Soil Data Summary

LIST OF APPENDICES

A Facility Photographs
B Water Well Inventory Report, Local Water Supply Well Documentation & Ordinance Correspondence
C Soil Boring Logs and Well Construction Diagrams
D PADEP eMap PA Documentation
E Sampling and Analysis and Quality Assurance Project Plan
F Soil Laboratory Analytical Reports, 2015 and 2016
G Geotechnical Laboratory Report, 2016
H Groundwater Laboratory Analytical Reports, 2015 and 2016
I Investigation Derived Waste Documentation

ABBREVIATIONS AND ACRONYMS

Act 2	Pennsylvania Land Recycling Act, Title 25, 25 PA Code Chapter 250
APH	adsorbed phase hydrocarbons
AOC 1	Area of Concern 1
AOC 2	Area of Concern 2
AS	air sparge
ASTM	American Standard Test Method
bgs	below ground surface
CWF	cold water fishery
COC	constituents of concern
COPIAC	chemical of potential indoor air concern
CSM	conceptual site model
DC	direct contact
DOT	Department of Transportation
DPH	dissolved phase hydrocarbons
EPA	Environmental Protection Agency
facility	Kwik Fill Station #M-209, 5574 State Route 8, Barkeyville, Pennsylvania
FeB	Frenchtown Silt Loam
f_{oc}	fraction of organic carbon
GES	Groundwater & Environmental Services, Inc.
gpm	gallons per minute
GPR	ground penetrating radar
HASP	health and safety plan
In. Hg	inches of mercury
in w.c.	inches of water column
LNAPL	light non-aqueous phase liquid
LRP	liquid ring pump
MEI	McCutcheon Enterprises, Inc.
mg/kg	milligrams per kilogram
mm Hg	millimeters of mercury
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
MNA	monitored natural attenuation
MSC	medium-specific concentration
MSC_{SG}	medium-specific concentration - soil gas
MSL	mean sea level
MTBE	methyl tert-butyl ether
MW	monitoring well
NOCR	Notification of Confirmed Release
NORR	Notification of Reportable Release
NR	non-residential
NU	non-use aquifer
NWI	National Wetland Inventory
NWRO	Northwest Regional Office
OSM	Office of Surface Mining
PA	Pennsylvania
PADCNR	Pennsylvania Department of Conservation and Natural Resources

ABBREVIATIONS AND ACRONYMS (continued)

PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PD	positive displacement
PID	photoionization detector
POC	point of compliance
PRCP	Post Remedial Care Plan
PVC	poly-vinyl chloride
QD	Quick Domenico
R	residential
RACR	Remedial Action Completion Report
RAP	Remedial Action Plan
S/GW	soil-to-groundwater
SAP/QAPP	Sampling and Analysis and Quality Assurance Project Plan
SB	soil boring
scfm	standard cubic feet per minute
SCR	Site Characterization Report
SCRA	Site Characterization Report Addendum
SHS	statewide health standard
SPLP	synthetic precipitation leaching procedure
SSS	site-specific standard
SVE	soil vapor extraction
TDS	total dissolved solids
TMB	trimethylbenzene
TOC	top of casing
TPE	total phase extraction
U	used aquifer
U/NR	used aquifer, non-residential
U/R	used aquifer, residential
UPA	United Refining Company of Pennsylvania
USGS	United States Geologic Survey
UST	underground storage tank
VEGE	vacuum enhanced groundwater extraction
VOC	volatile organic compound

EXECUTIVE SUMMARY

Groundwater & Environmental Services, Inc. (GES) was contracted by United Refining Company of Pennsylvania (UPA) to complete site characterization for an active Kwik Fill retail petroleum facility located at 5574 State Route 8 in Barkeyville, Venango County, Pennsylvania (Kwik Fill Station #M-209, PADEP ID #61-23779) (facility). The results of these activities were to be utilized to complete a *Site Characterization Report* (SCR).

During a third party inspection on April 14, 2015, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined. A verbal *Notification of Reportable Release* (NORR) was made to the Northwest Regional Office (NWRO) of the Pennsylvania Department of Environmental Protection (PADEP) by UPA on April 15, 2015, and a written NORR was submitted to PADEP by UPA on April 15, 2015, describing the reportable release (UPA, 2015). Corrective action activities were initiated consistent with the requirements of 25 PA Code § 245 (Administration of the Storage Tank and Spill Prevention Program, Subchapter D) (PADEP, 2001) and Act 2 (Pennsylvania Land Recycling Act, 25 PA Code § 250).

Site characterization activities were initiated in August 2015, and assessment/delineation of site soil and groundwater continued through August 2016. Two water-bearing zones were observed during site characterization activities, a shallow overburden aquifer and a deep overburden aquifer. A total of thirteen shallow (MW-1 through MW-9, MW-10S, MW-11, MW-14, and MW-15) and four deep (MW-10D, MW-12, MW-13, and MW-16) overburden groundwater monitoring wells were installed. Soil screening and sampling was performed during monitoring well installation and at 11 soil boring locations (SB-1 through SB-11).

Site topography slopes sharply to the west separating the upper paved portion of the site where the 2015 diesel release occurred from the lower area of the site near the on-site stormwater retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond at a maximum depth of 27.35 feet below ground surface (bgs). The deep overburden aquifer was observed at a minimum depth of approximately 39.38 feet bgs below the upper paved portion of the site and at a minimum depth of approximately 8.79 feet bgs downgradient of the paved portion of the facility near the retention pond. Site characterization activities indicate the subsurface of the upper portion of the site, to a maximum depth of approximately 45 feet bgs, consists of unconsolidated fill material overlying layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel. Bedrock was encountered in monitoring well MW-10D at approximately 41 feet bgs and consisted of weathered sandstone. Downgradient facility lithology near the retention pond is similar with the exception of the unconsolidated fill. Facility lithology in the lower portion of the site was observed to a maximum depth of 20 feet bgs. Bedrock (weathered sandstone) was observed at approximately 19 feet bgs in monitoring well MW-12 and at approximately 15 feet bgs in groundwater monitoring well MW-13.

Adsorbed phase hydrocarbon (APH) impacts were observed in site subsurface (>2 feet bgs) soil in the vicinity of diesel dispensers #1/2 and 7/8 (release areas) and near the retention pond (downgradient). Diesel constituents were detected in soil between 2 and 14 feet bgs at concentrations above current Act 2 Statewide Health Standard (SHS) used aquifer, non-residential (U/NR), medium-specific concentrations (MSCs).

Groundwater monitoring wells have been gauged and/or sampled at the facility since October 2015. Dissolved phase hydrocarbon (DPH) impacts were observed in the shallow overburden aquifer near the release areas (diesel dispensers #1/2 and 7/8) and to the west (downgradient) at concentrations above current U/NR MSCs. DPH impacts were detected in groundwater in the deep overburden aquifer west (downgradient) of the release areas (diesel dispensers #1/2 and 7/8) at concentrations above current U/NR MSCs. Light non-aqueous phase liquid (LNAPL) has not been detected at the site since groundwater gauging was initiated in October 2015. The most recent site groundwater gauging and sampling event was conducted in August 2016. Based on current and future land use of the site and the distance to off-site residential receptors, the data were compared only to current applicable U/NR MSCs. Dissolved phase benzene, methyl tert-butyl ether (MTBE), naphthalene, and 1,2,4-trimethylbenzene were detected at concentrations above current U/NR MSCs.

Soil gas sampling activities have not been performed at the facility to date. However, APH and DPH impacts observed during site characterization activities were evaluated by comparing the analytical data from soil and groundwater samples collected to the PA Default Residential (R) and Non-Residential (NR) Screening Values for volatilization to indoor air. Based on the assessment, migration of soil gas from APH impacts to potential receptors is a concern and will be further evaluated during future site activities (i.e., active remediation). Migration of soil gas generated from existing DPH impacts is not a concern based on the assessment; however, DPH impacts were identified in facility groundwater, so further vapor intrusion assessment will be completed to confirm potential groundwater vapor inhalation pathways are not a concern. Mitigation of APH and DPH impacts will be required, and will be addressed in a *Site Characterization Report Addendum/Remedial Action Plan* (SCRA/RAP).

Historical documented unleaded gasoline releases occurred at the facility in 1996 and 1997, and according to the *Remedial Action Completion Report* (RACR) submitted by GSC/Kleinfelder in June 2006, residual DPH and APH impacts remained in facility soil and groundwater at concentrations above current U/NR MSCs (GSC/Kleinfelder, 2006). Based on remaining historical impacts, two areas of concern have been identified for APH and DPH impacts observed during current site characterization activities. APH and DPH impacts related to historical releases are referred to as Area of Concern 1 (AOC 1). APH and DPH impacts related to the 2015 diesel release are referred to as Area of Concern 2 (AOC 2). A conceptual site model (CSM) was developed based on evaluation of site characterization observations and data related to the 2015 diesel release. The CSM was used to evaluate potential remedial options to remediate identified APH and DPH impacts in AOC 2 (i.e., the subject 2015 release). The following report summarizes site characterization activities and findings, describes the CSM, evaluates potential exposure pathways and receptors, discusses the Act 2 standard selection rationale, presents planned supplemental site characterization activities and evaluates potential remedial options. The Act 2 attainment goal for site soil and groundwater are SHS, U/NR MSCs. Vapor intrusion for the facility will be addressed consistent with SHS requirements. Planned activity findings and the selected approach for remediation of identified diesel fuel impacts related to the 2015 diesel release will be presented in a SCRA/RAP.

1.0 INTRODUCTION

Ponded product and stained backfill was observed in diesel dispensers #1/2 and 7/8 during a third party inspection in April 2015. In response, corrective action activities were initiated consistent with the requirements of 25 PA Code § 245 and Act 2 (25 PA Code § 250). The following report provides facility background, a summary of site characterization activities, and proposed strategies planned to demonstrate attainment of the Act 2 Statewide Health Standard for diesel fuel constituents in site soil and groundwater and assessing vapor intrusion.

2.0 FACILITY LOCATION AND DESCRIPTION

2.1 Location

The facility is located at 5574 State Route 8, Barkeyville, Venango County, Pennsylvania. **Figure 1** (Site Location Map) illustrates the location of the facility on a U.S. Geological Survey (USGS) 7.5-Minute Topographic Quadrangle, Barkeyville, Pennsylvania (1980).

The facility is located in a mixed commercial and residential area. The facility is bordered to the north, beyond Stevenson Road, by a commercial property (Barkeyville Travel Center), to the east, beyond State Route 8, by commercial properties (Gahr's Truck and Tire Service and Heath Oil, Inc.) and residential properties, to the south by residential properties and undeveloped land, and to the west by undeveloped land. **Figure 2** (Local Area Map) illustrates the facility and adjacent properties. Photographs are provided in **Appendix A** (Facility Photographs).

2.2 Description

According to the Venango County Recorder of Deeds, the property is owned by UPA and has operated as a retail petroleum facility since at least 1980. The facility occupies an irregular-shaped parcel (Parcel ID #31,001.-026..-000) that measures approximately 2,300 feet along the northern property boundary, approximately 2,200 feet along the western property boundary, approximately 1,200 feet along the southern property boundary and approximately 2,500 feet along the eastern property boundary (**Figure 2**). The subject parcel encompasses approximately 93.4 acres.

Facility features include a single-story, slab-on-grade convenience store (Kwik Fill station #M-209), a two-story, slab-on-grade motel/restaurant, four 10,000-gallon steel underground storage tanks (USTs), and six associated product dispensers located on six concrete islands. According to the Regulated Storage Tank List for the PADEP-NWRO, the four steel USTs (#001, #002, #003 and #004) were installed at the facility in December 1972. All four USTs have steel piping and impressed current cathodic protection. Each UST contains and dispenses diesel fuel. Facility features are illustrated on **Figure 3** (Site Map). Photographs are provided in **Appendix A.**

An additional single-story, slab-on-grade unleaded gasoline/diesel fuel retail convenience store (Kwik Fill station #M-229), three USTs (two 10,000-gallon USTs containing unleaded gasoline and one 10,000-gallon UST containing diesel fuel) and three associated bi-product dispensers located on three concrete islands are also located beyond the motel/restaurant on the property to the east (upgradient) of the truck stop operations (station #M-209).

A sewage treatment plant operates in the northwestern portion of the parcel beyond the parking lot. The plant is located approximately 0.16 miles west (downgradient) of the facility along Stevenson Road.

The facility lot is comprised of asphalt and concrete with grassy areas along the northern, eastern, southern, and western property boundaries. Based on current grading at the facility, surface water runoff in the asphalt-paved and concrete areas is directed towards multiple stormwater catch basins located in the northern and central portions of the facility which all direct surface water runoff to the west. Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, site topography decreases sharply by approximately 35 feet in elevation. Subsurface stormwater lines connecting the stormwater catch basins run beyond the western parking lot boundary downgradient to the west to a stormwater retention pond.

Overhead electric lines run along the northern property boundary parallel with Stevenson Road. Electric service enters the facility from a utility pole near the intersection of State Route 8 and Stevenson Road where a series of utility poles and overhead lines connect the main service lines to the motel/restaurant, station and light poles surrounding the lot. An overhead telephone line runs from the motel/restaurant to light poles surrounding the motel/restaurant and connects to the main service line along State Route 8.

Seventeen groundwater monitoring wells (MW-1 through MW-9, MW-10D, MW-10S and MW-11 through MW-16) are located on-site. Observations during site characterization activities identified an overburden aquifer with two water-bearing zones (shallow and deep). Monitoring wells MW-1 through MW-9, MW-10S, MW-11, MW-14 and MW-15 monitor the shallow overburden aquifer. Monitoring wells MW-10D, MW-12, MW-13 and MW-16 monitor the deep overburden aquifer. **Figure 3** illustrates the location of relevant facility features and a portion of the approximate property boundary. The entire, approximate property boundary is illustrated on **Figure 2**.

2.3 Sensitive Receptor Evaluation

2.3.1 Well Search

The Pennsylvania Department of Conservation and Natural Resources (PADCNR) Groundwater Information System (PaGWIS) and PADEP eMap databases were used to identify potable or withdrawal wells within a ½-mile radius of the facility.

The PaGWIS database identified one domestic well (Record #1 [PA Well ID #145517]) and four industrial withdrawal wells (Record #2 [PA Well ID #145537], Record #3 [PA Well ID #145516], Record #4 [PA Well ID #145510] and Record #5 [PA Well ID #145509]) within ½-mile of the facility. The PaGWIS database also identified an abandoned well north of Interstate 80 (Record #6 [PA Well ID #515425]), four monitoring wells on the Heath Oil property (Record #7 [PA Well ID #642144], Record #8 [PA Well ID #642203], Record #9 [PA Well ID #642204), Record #10 [PA Well ID #642205] and four on-site monitoring wells (Record #11 [PA Well ID #626601], Record #12 [PA Well ID #626602], Record #13 [PA Well ID #626769), Record #14 [PA Well ID #626770], associated with this SCR investigation. A copy of the PaGWIS report is contained in **Appendix B** (Water Well Inventory Report, Local Water Supply Well Documentation & Ordinance Correspondence) which includes a map (**Figure B-1** [PaGWIS Well Search Location Map]) illustrating approximate well locations. The table below summarizes details for the one domestic well and four industrial withdrawal wells identified within a ½-mile radius of the facility (details for the referenced monitoring wells are not included in the below table).

Well ID	Name	Distance (miles)	Direction	Depth (feet)	Notes
145517	Beaver Oil	0.15	Northeast (upgradient)	88	Domestic
145509	Humble Oil	0.27	Northeast (upgradient)	68	Industrial
145537	Elliot Oil Co.	0.41	North (upgradient)	159	Industrial
145510	Texaco Inc.	0.44	North/Northeast (upgradient)	55	Industrial
145516	Texaco Inc.	0.44	North/Northeast (upgradient)	85	Industrial

The PADEP eMap database identified eight additional withdrawal wells (one domestic [PA Well ID #141385], two public supply [PA Well ID #141389 and #141440] and five industrial [PA Well ID #141413, #141414, #141421, #141433 and #141441]) within a ½-mile radius of the facility. However, the locations of these withdrawal wells could not be verified through PaGWIS. The table below

summarizes details for the additional withdrawal wells identified. A map (**Figure B-2** [eMap Well Search Location Map]) illustrating the approximate well locations is included in **Appendix B**.

Well ID	Name	Distance (miles)	Direction	Depth (feet)	Notes
141385	J. Borger	0.36	Northeast (upgradient)	60	Domestic
141440	Barkeyville Bor.	0.18	East/Southeast (upgradient)	357	Public Supply
141389	Elliot Oil Co.	0.27	North/Northwest (sidegradient)	135	Public Supply
141421	Beaver Oil Co.	0.11	East (upgradient)	88	Industrial
141413	Humble Oil Co.	0.16	Northeast (upgradient)	68	Industrial
141414	Texaco Inc.	0.27	North (upgradient)	55	Industrial
141441	Elliot Oil Co.	0.32	North (upgradient)	159	Industrial
141433	R. Weibel	0.50	North/Northeast (upgradient)	407	Industrial

Mr. Jeremy Holtz of Barkeyville Borough was contacted in September 2016 in regards to the public water supply near the facility. Mr. Holtz indicated that potable water is supplied to the facility and surrounding area by the Barkeyville Borough. The PADEP eMap database confirmed the facility and surrounding areas are within public water supply service area. Mr. Holtz also indicated the facility is within Zone 3 of the Wellhead Protection Plan which limits land use, facilities and their activities. Furthermore, Mr. William Coursen of the Barkeyville Borough Council confirmed an ordinance is in effect requiring the connection of all occupied buildings within the Barkeyville Municipal Authority service area to the public water supply and prohibiting all private drinking water sources. Correspondence relating to local water supply distribution and ordinances is provided in **Appendix B**.

The Barkeyville Borough obtains its raw water from withdrawal wells located at the Barkeyville Borough Municipal office approximately 0.63 miles south/southwest (sidegradient) of the facility. The water is transferred to a water treatment plant and then pumped to the residential and commercial customers.

2.3.2 Potential Sensitive Receptors

A sensitive receptor survey was conducted for the facility and adjacent properties within a one-mile radius of the facility. Petroleum hydrocarbon impacts are currently present in facility soil and groundwater at concentrations above current U/NR MSCs. Potential on- and off-site sensitive receptors include the following relative to groundwater flow direction at the facility:

- the subject property including station buildings M #209 and M #229 and the motel/restaurant building;
- residential properties located to the south (sidegradient) beyond the southern parking lot boundary between 100 feet and one mile from the facility;
- commercial and residential properties located to the east (upgradient) beyond State Route 8 between 200 feet and one mile from the facility;
- commercial and residential properties located to the north (sidegradient) beyond Stevenson Road between 150 feet and one mile from the facility;
- commercial and residential properties located to the west (downgradient) beyond the western parking lot boundary at a minimum of 0.30 miles from the facility;
- retention pond located to the west (downgradient) approximately 150 feet beyond the western parking lot boundary;
- unnamed pond located to the northwest (downgradient) beyond Stevenson Road approximately 400 feet from the facility;

- unnamed tributary of the North Branch of Slippery Rock Creek located to the west (downgradient) approximately 0.20 miles from the facility;
- sewage treatment plant located to the west (downgradient) approximately 700 feet beyond the western parking lot boundary;
- North Branch of Slippery Rock Creek located to the west (downgradient) approximately 0.25 miles from the facility; and
- unnamed pond located to the west (downgradient) approximately 0.25 miles from the facility near North Branch of Slippery Rock Creek.

The nearest downgradient surface body of water is an unnamed pond located approximately 400 feet northwest of the facility beyond Stevenson Road. The pond is listed on the National Wetland Inventory (NWI) (US EPA - My Waters Mapper). The unnamed pond may be a stormwater retention pond for the adjacent Barkeyville Travel Center truck stop. A stormwater retention pond for the Kwik Fill facility is located approximately 200 feet west of the dispenser islands.

The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility. The US EPA My Waters Mapper identified another unnamed pond on the NWI directly west (downgradient) of the facility near the North Branch of Slippery Rock Creek. The waters of the North Branch of Slippery Rock Creek (Ohio River Basin) are designated as a cold water fishery (CWF) by PADEP (25 PA Code § 93) (PADEP, 2016). The CWF designation is defined as surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying 25 PA Code § 93.4b(a). The CWF designation relates to the maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to cold water.

2.3.3 Potential Ecological Receptors

Title 25 PA Code § 250.311 requires that potential ecological receptors be evaluated unless one or more of the following conditions are met:

- Jet fuel, gasoline, kerosene, No. 2 fuel oil or diesel fuel are the only constituents detected on-site;
- The area of contaminated soil is less than two acres, and the area of contaminated sediment is less than 1,000 square feet;
- The facility has features such as buildings, parking lots, or gravel-paved areas that eliminate specific exposure pathways (e.g., soil exposure).

As discussed throughout this report, diesel fuel constituents are the only constituents of concern (COCs) at the facility relating to the subject release. APH impacts were identified in facility soil in the vicinity of dispenser islands #1/2 and 7/8 and downgradient near the retention pond west of the dispensers. The area of impact is less than two acres. There are no sediment impacts at the facility and no specific ecological exposure pathways related to facility groundwater as the depth to groundwater observed to date ranges from approximately 5 to 44 feet bgs. Based on the evaluation, no further ecological assessment is warranted.

2.3.4 Potential Migration Pathways

Underground utilities are typically located at depths ranging from 2 to 6 feet bgs and may serve as a potential pathway for groundwater and/or soil gas migration. Known subsurface utilities are identified in **Section 2.2** and illustrated on **Figure 3**. Depth to water observations during site gauging activities on August 15, 2016, indicate the average depth to groundwater in the shallow overburden aquifer is 14.82

feet, which is below the likely depth of underground utility trenching. Soil and groundwater vapor migration to potential receptors is discussed further in **Section 7.4**.

2.3.5 Current and Future Land Use

The facility is currently an active retail petroleum facility. There are no plans for sale or redevelopment of the property at this time.

2.4 Physical Setting

2.4.1 Topography and Drainage

The facility is located at an elevation of approximately 1,430 feet above mean sea level (MSL). Local topography slopes toward an intermittent, unnamed tributary to the North Branch of Slippery Rock Creek, at an elevation of approximately 1,360 feet above MSL. The unnamed tributary is located approximately 0.20 miles west of the facility and flows to the southwest where it meets the North Branch of Slippery Rock Creek.

The facility lot is comprised of asphalt and concrete with grassy areas along the northern, eastern, southern, and western property boundaries. Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, site topography decreases sharply by approximately 35 feet in elevation. Surface water runoff in the asphalt-paved and concrete areas is directed towards multiple storm water catch basins located in the northern and central portions of the facility, which all direct surface water runoff to the west. Underground stormwater lines connecting the stormwater catch basins run beyond the western parking lot boundary downgradient to the west to a stormwater retention pond.

2.4.2 Stratigraphy

Regional Soil Lithology

Soil type at the facility was evaluated using current U.S. Department of Agriculture Natural Resources Conservation Service Website data. Information obtained from the website indicates that facility soils belong to the Frenchtown Silt Loam (FeB) association. The FeB association consists of Frenchtown and similar soils and approximately 10% of minor components, and 3 to 8 percent slopes. Frenchtown Silt loam is poorly drained. Soil survey information in the vicinity of the facility is illustrated on **Figure 4** (Soil Survey Map).

Regional Bedrock Geology

The facility is situated within the Pittsburgh Low Plateau Section-Prototypical area of the Appalachian Plateau Physiographic Province. The Prototypical Area is characterized by broad, rolling interfluves separated by relatively narrow, steep-walled, moderately incised valleys (Shultz, 1999).

The underlying bedrock at the site belongs to the Allegheny Formation (Berg, T.M. et. al., 1980). The Formation consists of cyclic, sequences of sandstone, shale, limestone, clay and coal; includes valuable clay deposits and Vanport Limestone; commercially valuable Freeport, Kittanning, and Brookeville-Clarion coals are present in varying proportions as shown in **Figure 5** (Bedrock Geologic Map).

Facility Lithology

Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, the site topography decreases sharply separating the upper portion of the site where the 2015 diesel release occurred from the lower portion of the site near the

retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond. The deep overburden aquifer was observed below the shallow overburden aquifer in the upper paved portion of the site and continues downgradient of the paved portion of the site near the retention pond. Monitoring wells MW-1 through MW-9, MW-10S, MW-11, MW-14 and MW-15 monitor the shallow overburden aquifer. Monitoring wells MW-10D, MW-12, MW-13 and MW-16 monitor the deep overburden aquifer.

Groundwater monitoring well MW-10D is located in the upper paved portion of the site near the western asphalt-grass boundary and was constructed to monitor the deep overburden aquifer (**Figure 3**). During drilling activities, groundwater in the deep overburden aquifer was observed near the soil-bedrock interface. Monitoring well MW-10D was constructed with well screen to a maximum depth of 40 feet bgs, directly above bedrock which was observed at approximately 41 feet bgs. Since groundwater was observed near the bottom of the deep overburden aquifer, approximately 5 feet of poly-vinyl chloride (PVC) riser was installed from 45 feet bgs to 40 feet bgs to allow for additional space for groundwater from the deep overburden aquifer to collect in to achieve a sufficient amount of water for groundwater sampling collection and analysis. The well was constructed with bentonite seal from 45 feet bgs to 42 feet bgs to eliminate the potential of vertical migration of groundwater from the bedrock aquifer. Sand pack was added from 42 feet bgs to 1 foot above the screened interval. Monitoring well MW-10D is not screened in the bedrock aquifer, however, bedrock was observed at approximately 41 feet bgs and there is 1 foot of sand pack material at a maximum depth of 42 feet bgs. Although there is the potential for groundwater from the bedrock aquifer to migrate vertically through the sand pack between 42 feet bgs to the well screen at 40 feet bgs, monitoring well MW-10D is not screened in the bedrock aquifer and is likely monitoring groundwater observed in the deep overburden aquifer.

Soil boring logs and well construction diagrams are provided in **Appendix C** (Soil Boring Logs and Well Construction Diagrams). The logs were developed from site characterization activities which indicate the subsurface of the upper portion of the site, to a maximum depth of approximately 45 feet bgs, consists of unconsolidated fill material overlying layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel. Bedrock was encountered in monitoring well MW-10D at approximately 41 feet bgs and consisted of weathered sandstone. Facility lithology downgradient of the diesel station building near the retention pond is similar with the exception of the unconsolidated fill. Facility lithology in the lower portion of the site was observed to a maximum depth of 20 feet bgs. Bedrock (weathered sandstone) was observed at approximately 19 feet bgs in monitoring well MW-12 and at approximately 15 feet bgs in monitoring well MW-13. Using these data, cross sections A-A', B-B' and C-C' were constructed. **Figure 6A** (Cross-Section Location Map) shows the location and orientation of each cross-section.

Figure 6B (Cross-Section A-A', B-B' and C-C') illustrates cross section A-A' extending from monitoring well MW-13 (located downgradient, west of the grass-asphalt boundary near the retention pond) east to soil boring SB-7 (located near the motel/restaurant). The cross section illustrates a 1 to 2 feet layer of asphalt overlying unconsolidated fill material to a maximum depth of approximately 7 feet bgs, excluding the area west of parking lot which is comprised of topsoil. The fill material is underlain predominantly by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 41 feet bgs in monitoring well MW-10D. Intervals of clayey sand are present in monitoring well MW-13 from 2 to 4 feet bgs and 15 to 17 feet bgs with sandy clay in between. Weathered sandstone was encountered in monitoring well MW-10D from 41 to 45 feet bgs.

Cross section B-B' extends along the western grass-asphalt boundary from monitoring well MW-10S south to monitoring well MW-15 (located at the southern extent of site characterization activities). Similar to cross-section A-A', a 1 foot layer of asphalt overlies unconsolidated fill material to a maximum

depth of 7 feet bgs. The fill material is underlain by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 41 feet bgs in monitoring well MW-10D. A 2 foot lens of clayey gravel is present from 11 to 13 feet bgs in monitoring well MW-15 and 15 to 17 feet bgs in monitoring well MW-11, however, this gravel lens is not present north of monitoring well MW-11 in monitoring wells MW-10D and MW-10S. Weathered sandstone was encountered in MW-10D from 41 to 45 feet bgs.

Cross section C-C' extends from soil boring SB-7 south through the concrete dispenser drive pad to soil boring SB-3 (located along the southern boundary of site characterization activities). A 1 to 2 foot layer of asphalt overlies unconsolidated fill material to a maximum depth of 5 feet bgs, except for where the dispenser drive pad is present. There, a 1 foot layer of concrete overlies unconsolidated fill material to a depth of 3 feet bgs. The fill material is underlain exclusively by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 21 feet bgs in soil boring SB-5. Bedrock was not encountered.

2.4.3 Hydrology

Surface Water

The facility is located at an elevation of approximately 1,430 feet above MSL. Local topography slopes toward an intermittent, unnamed tributary to the North Branch of Slippery Rock Creek, at an elevation of approximately 1,360 feet above MSL. The unnamed tributary is located approximately 0.20 miles west of the facility and flows to the southwest where it meets the North Branch of Slippery Rock Creek.

The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility and flows southeast then west/southwest toward Slippery Rock Creek. The North Branch of Slippery Rock Creek is located in the North Branch of Slippery Rock Creek Watershed (Watershed HUC12) and is located within the Connoquenessing Subbasin (Subbasin HUC8). The waters within the Connoquenessing Subbasin are located within the Ohio River Basin (US EPA - My Waters Mapper).

Groundwater

Site groundwater was gauged and/or sampled during seven separate events conducted between October 2015 and August 2016. Based on gauging data, the following table shows minimum, maximum and average depths to groundwater, general groundwater flow direction and average gradient of the shallow and deep overburden aquifers for the two most recent events conducted in July and August 2016.

Date	Aquifer	Minimum Depth to Groundwater (feet)	Maximum Depth to Groundwater (feet)	Average Depth to Groundwater (feet)	Groundwater Flow Direction	Average Groundwater Gradient (feet/foot)
July 14, 2016	Shallow Overburden	7.52 (MW-5)	28.44 (MW-9)	14.55	Radial-West/ Southwest and Northwest	0.20
	Deep Overburden	8.08 (MW-13)	43.69 (MW-10D)	18.64	Northwest	0.03
August 15, 2016	Shallow Overburden	7.31 (MW-5)	27.35 (MW-9)	14.82	Radial-West/ Southwest and Northwest	0.18
	Deep Overburden	8.79 (MW-13)	44.31 (MW-10D)	19.36	Northwest	0.03

Groundwater gauging information is summarized in **Table 1** (Groundwater Data Summary). Well construction details are summarized in **Table 2** (Well Construction Summary). **Figure 7** (Groundwater Contour Map [Shallow Overburden Aquifer] July 14, 2016), **Figure 8** (Groundwater Contour Map [Deep Overburden Aquifer] July 14, 2016), **Figure 9** (Groundwater Contour Map [Shallow Overburden Aquifer] August 15, 2016) and **Figure 10** (Groundwater Contour Map [Deep Overburden Aquifer] August 15, 2016) illustrate the groundwater flow patterns for the two most recent groundwater gauging and sampling events.

3.0 REGIONAL HISTORY

3.1 Local Tank Search

The PADEP Regulated Storage Tank List (PADEP, 2016) was utilized to determine potential off-site sources of contamination at the site. A search radius of one mile was utilized. Search results are summarized in the following table.

Facility Name	Distance (miles)	Direction	UST Information
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Site	(4) 10,000-gallon diesel UST
Kwik Fill # M-229 5574 State Route 8 Barkeyville, PA 16038	0.07	East	(2) 10,000-gallon gasoline UST (1) 10,000-gallon diesel UST
Barkeyville Travel Center 5644 State Route 8 Barkeyville, PA 15853	0.10	North	(2) 10,000-gallon gasoline UST (8) 10,000-gallon diesel UST (1) 520-gallon used oil UST
Rich's Fuel Stop 5609 State Route 8 Barkeyville, PA 15853	0.14	Northeast	(1) 3,000-gallon diesel UST (1) 6,000-gallon gasoline UST (1) 10,000-gallon unleaded gasoline UST (1) 10,000-gallon diesel UST (1) 1,000-gallon kerosene AST (1) 1,000-gallon heating oil (second grade) AST (1) 20,000-gallon heating oil AST (2) 20,000-gallon biodiesel AST (2) 20,000-gallon ethanol AST (1) 20,000-gallon other AST (2) 20,000-gallon kerosene AST
Speedway # 2921 5742 State Route 8 Barkeyville, PA 16038	0.40	North	(2) 20,000-gallon diesel UST (1) 12,000-gallon diesel UST (1) 20,000-gallon gasoline UST (1) 8,000-gallon gasoline UST (1) 4,000-gallon gasohol UST
Glenn O. Hawbaker Inc. 157 Hawbaker Industrial Blvd. Grove City, PA 16127	0.50	West	(1) 12,000-gallon diesel AST (1) 2,000-gallon diesel AST

AST = Above ground storage tank
UST = Underground storage tank

The PADEP Storage Tank Clean-Up Location database (PADEP, 2016) was utilized to identify sites within a one mile search radius with a confirmed release and associated site characterization and/or remedial activity. Search results are summarized in the following table.

Facility Name	Distance (miles)	Direction	Facility Information
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Property	Release Date: 08/05/1989 Current Status: Cleanup Complete as of 12/12/2006
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Property	Release Date: 04/15/2015 Current Status: Interim Remedial Actions not Initiated
Barkeyville Travel Center Truckstops of America 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 11/01/1992 Current Status: Cleanup complete as of 07/25/2005
Barkeyville Travel Center BP # 07124 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 08/05/2000 Current Status: Cleanup complete as of 02/12/2014
Barkeyville Travel Center BP # 07124 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 10/29/2014 Current Status: Cleanup complete as of 05/25/2015
Rich's Fuel Stop 5609 State Route 8 Barkeyville, PA 15853	0.14	Northeast	Release Date: 04/09/2015 Current Status: Interim Remedial Actions not Initiated
Speedway # 2921 5742 State Route 8 Barkeyville, PA 16038	0.40	North	Release Date: 10/18/2007 Current Status: Cleanup complete as of 07/10/2014

Information regarding the current environmental status of these facilities was not reviewed.

3.2 Local Mining Activities

Information obtained from the PADCNR and the Department of Interior, Office of Surface Mining (OSM), website (OSM, 2016) indicates no historical mining activities occurred in the area. Information obtained from the PADEP eMap PA website (PADEP, 2016) indicates historical underground mining activities occurred in the area of the facility. However, mining activities do not appear to have taken place directly beneath the facility and mine related problems were not identified near the facility. An active surface mining operation is located approximately 0.4 miles west of the facility. A copy of the map (**Figure D-1** – eMAP Mining Locations) obtained through the PADEP eMap PA website is provided in **Appendix D** (PADEP eMap PA Documentation).

4.0 FACILITY HISTORY

4.1 1996 Reportable Release - Unleaded Gasoline

In November 1996, a plus product line failed annual tightness testing and was subsequently removed from service. UPA initiated corrective action activities in January 1997. Initial site characterization activities included installation of eight soil borings and four groundwater monitoring wells which confirmed that unleaded gasoline constituents were present in facility soil and groundwater at concentrations above PADEP 1996 standards for UST closure site assessments north of the station building and dispenser islands east of the station building. LNAPL recovery was also initiated at the facility. A verbal *Notification of Confirmed Release* (NOCR) was called into the PADEP on January 20, 1997 followed by a written NORR submitted on February 10, 1997. In June 1997, additional site characterization activities were completed including the installation of six soil borings, three groundwater monitoring wells, and seven drive points and additional LNAPL recovery events. Additional site characterization activities identified soil and groundwater impacts above PADEP standards.

4.2 1997 Reportable Release - Unleaded Gasoline

A premium product line failed during annual line testing in October 1997. Additional site characterization activities were completed at the facility from November 1997 through January 2004. A total of thirty-eight soil borings, twenty-one groundwater monitoring wells, seven extraction wells, and seven drive points were installed at the facility as part of site characterization activities. Site characterization activities confirmed that unleaded gasoline constituents were present in facility soil and groundwater at concentrations above U/NR MSCs around the dispenser islands, north of the restaurant/motel building, and north, east, and west of the retention pond downgradient of the station building.

Pilot testing was completed in November 1997, and approximately 700 gallons of LNAPL were recovered via dual phase extraction activities. A remediation system was installed at the facility to mitigate soil and groundwater impacts identified and operated from November 1998 through January 2004. Site-specific standards were chosen as the remedial goals for the facility. A baseline risk assessment was completed which concluded that no unacceptable risk was present for identified receptors via complete and potentially complete exposure pathways. Ecological screening determined that no additional ecological evaluation is required in accordance with PA Code § 250.311(c). A *Comprehensive Site Characterization/Risk Assessment Report* was submitted to PADEP in May 2004 (GSC/Kleinfelder, 2004) and subsequently approved, with modifications, in November 2004. PADEP requested additional data related to the diesel USTs removed in April 1998.

4.3 UST Closure Activities - April 1998

During an internal inspection of the USTs in April 1998, several holes were observed in one of the steel USTs. Seven diesel USTs were removed in February 1999. It is not known if UST closure activities were performed at that time, and no record of a NORR submittal to PADEP was identified. Additional site characterization activities were performed in October 2005 with the completion of 12 soil borings in the former diesel UST area and collection of soil samples for the 1999 diesel UST closure per PADEP's request. Soil samples collected during the additional soil boring investigation indicated diesel constituent concentrations in soil were either not detected or detected at concentrations below applicable U/NR MSCs.

Following the completion of the additional soil boring investigation around the diesel UST field, four soil gas monitoring points were installed at the facility and sampled in November and December 2005. Soil gas sampling confirmed unleaded gasoline constituent concentrations were below PADEP R-NR soil gas screening criteria (MSC_{SG}). An *Additional Site Characterization/Remedial Action Completion Report* (ASC/RACR) was submitted by GSC/Kleinfelder and approved by PADEP in June 2006 (GSC/Kleinfelder, 2006). The selected remedial closure standards for the historical releases noted above were a combination of Statewide Health Standards and Site-Specific Standards (SSS). Total xylenes, MTBE, naphthalene, isopropylbenzene, benzo(a)anthracene, benzo(a)pyrene, fluorene, and phenanthrene in facility soil were demonstrated to be in attainment with the SHS. Benzene, toluene, and ethylbenzene in facility soil were demonstrated to be in attainment with the SSS. For facility groundwater, benzene, toluene, ethylbenzene, total xylenes, MTBE, naphthalene, and isopropylbenzene were demonstrated to be in attainment with the SHS. As noted in the 2006 RACR, residual concentrations of benzene, toluene, and ethylbenzene remain in facility soil, and residual concentrations of benzene and MTBE in facility groundwater (GSC/Kleinfelder, 2006). Following approval of the ASC/RACR, a *Post Remedial Care Plan* (PRCP) was initiated at the facility and consisted of annual site inspections to document that groundwater is not being utilized within areas of remaining soil and groundwater exceedances of the SHS.

4.4 2015 Reportable Release - Diesel

On April 14, 2015 during a third party inspection, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection and the source of the product was undetermined. A verbal NORR was made to the PADEP-NWRO by UPA on April 15, 2015, and a written NORR was submitted to PADEP on April 16, 2015 (UPA, 2015). Corrective action activities were initiated in August 2015 and are ongoing. The results of initial site characterization activities completed to date for the April 2015 diesel release are compared to applicable Act 2 MSCs and also in the context of known historical petroleum impacts and areas of concern.

5.0 SITE CHARACTERIZATION ACTIVITIES

Site characterization activities were completed from August 2015 through August 2016 to:

- Identify and quantify COCs in environmental media;
- Define the vertical and horizontal extent of COCs in environmental media;
- Identify appropriate interim remedial response measures; and
- Define the nature and scope of appropriate response actions.

To achieve these objectives, the following tasks were completed:

- Advanced 11 soil borings (SB-1 through SB-11);
- Collected one Shelby tube to evaluate soil properties;
- Constructed 13 shallow overburden aquifer groundwater monitoring wells (MW-1 through MW-9, MW-10S, MW-11, MW-14, and MW-15);
- Constructed 4 deep overburden aquifer groundwater monitoring wells (MW-10D, MW-12, MW-13, and MW-16);
- Collected 81 soil samples at soil boring and groundwater monitoring well locations; and
- Completed seven rounds of groundwater gauging and sampling.

All samples were submitted for laboratory analysis of the revised (March 2008) PADEP short list of diesel constituents via Environmental Protection Agency (EPA) Method 5035/8260B.

The following sections describe investigative and sample collection methodologies utilized during site characterization activities and summarize sample analytical results relative to current applicable Act 2 MSCs. Environmental media sampling was completed in accordance with a site-specific *Sampling and Analysis and Quality Assurance Project Plan* (SAP/QAPP). The SAP/QAPP is included in **Appendix E**.

5.1 Investigation Methods

The following sample collection methods were utilized during site characterization activities. Field activities were conducted in accordance with a site-specific Health and Safety Plan (HASP) (available on file).

Hand auguring and air knife methods were used to clear proposed soil boring and groundwater monitoring well locations to a minimum of five feet bgs to prevent damage to underground utilities, when possible. When within 10 feet of dispensers, product piping and/or the UST field, soil boring and monitoring well locations were pre-cleared to a minimum depth of 8 feet bgs, when possible. Groundwater monitoring wells were either installed using a Geoprobe 7822DT track rig via direct-push methods or CME LC-60 drill rig with hollow-stem augers. Soil samples were collected via two-foot split spoons or 5-foot acetate sleeves. Soil samples were screened for volatile organic compounds (VOCs) with a calibrated photoionization detector (PID).

During air knife/hand auguring activities, a soil sample was collected for laboratory analysis from the interval with the highest observed PID reading or at the base of the borehole (up to eight feet bgs) to assess potential shallow subsurface impacts. If the soil sample was collected from the base of the borehole, the sample was collected via a hand auger six inches below the contact point of the air knife (i.e., undisturbed soil). During drilling, soil samples were collected from the interval with the highest observed PID reading and one interval below for delineation purposes. If PID readings were not observed, one sample was collected from the interval directly above the apparent soil/groundwater interface. Soil samples were collected from 1 to 31 feet bgs using laboratory-supplied disposable

syringes, placed into the appropriate laboratory vials containing methanol or sodium bisulfate (EPA Method 5035), mixed and sealed. Samples were immediately placed on ice in a cooler to maintain appropriate sample temperature. Chain-of-custody forms were maintained from sample collection to laboratory receipt. Soil samples were analyzed for the revised (March 2008) PADEP short list of diesel constituents (benzene, toluene, ethylbenzene, MTBE, naphthalene, isopropylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene) via EPA Method 8260B.

Groundwater monitoring wells were constructed with varying lengths of either 2 or 4-inch diameter, 0.010 or 0.020-inch machine-slot well screen set across the saturated zone to monitor the groundwater table interface. PVC riser was added to the well screen to bring the monitoring wells to ground surface. The screen annulus was backfilled with sand from the base of the borehole to approximately 1 foot above the well screen. The remaining annulus was filled to approximately 1 to 2 feet bgs with hydrated bentonite chips. Groundwater monitoring wells MW-12, MW-13, and MW-16 were cased within 4-inch diameter steel pro-casing (with locking cap) which extends from 3 feet above ground surface to approximately 2 feet bgs and secured in a concrete pad. All other groundwater monitoring wells were finished flush with grade with an eight-inch diameter road box and locking cap secured in a concrete pad. Borings that were not converted to monitoring wells were backfilled with bentonite to two feet bgs and concrete or asphalt flush to grade to match existing site conditions.

Soil boring and groundwater monitoring well locations are illustrated on **Figure 11** (Soil Boring Location Map). Boring logs, including lithologic descriptions and PID readings, are included in **Appendix C**. Soil and decontamination water generated during drilling activities were containerized in steel 55-gallon, PA Department of Transportation (DOT) approved drums for disposal. Investigation derived waste was transported off-site for appropriate disposal (**Section 5.6**).

5.2 Soil Investigation

5.2.1 Number and Location of Soil Borings

From August 31 through September 8, 2015, two soil borings (SB-1 and SB-2) were completed and four groundwater monitoring wells (MW-1 through MW-4) were installed north, south, east, and west of the release area (diesel dispensers #1/2 and 7/8) in order to identify potential DPH impacts in groundwater, confirm localized groundwater flow direction(s), and confirm the presence or absence of APH impacts in soil. Due to the presence of historical APH and DPH impacts at the facility, soil borings and groundwater monitoring well locations were selected in as close proximity to diesel dispensers #1/2 and 7/8 as possible (i.e., in the concrete drive pad). Prior to completing intrusive work, a Limited Geophysical Survey (i.e., ground penetrating radar [GPR] and electromagnetic survey) was completed to assess the location of subsurface product lines and/or utilities in the vicinity of the dispenser islands.

From November 30 through December 2, 2015, four soil borings (SB-3 through SB-6) and four groundwater monitoring wells (MW-5 through MW-8) were installed to further delineate and assess on-site APH and DPH impacts. Further horizontal and vertical delineation of soil impacts and horizontal delineation of groundwater impacts was completed from February 15 through 23, 2016, by installing three additional soil borings (SB-7 through SB-9) and six groundwater monitoring wells (MW-9, MW-10S, MW-10D, and MW-11 through MW-13). Groundwater monitoring well MW-10D was installed downgradient of the station building to assess if identified DPH impacts were migrating vertically downgradient of the release area (i.e., dispenser islands). Groundwater monitoring wells MW-12 and MW-13 were completed downgradient of the station building near the retention pond to further assess the extent of DPH impacts observed in the vicinity of the dispenser islands at the base of the slope; however,

upon installation of monitoring wells MW-10D, MW-12 and MW-13, it was determined that an overburden aquifer with two water-bearing zones (shallow and deep) was present

Further horizontal and/or vertical delineation of APH and DPH impacts were completed from June 20 through 22, 2016 with the installation of two soil borings (SB-10 and SB-11) and three groundwater monitoring wells (MW-14 through MW-16).

5.2.2 Sample Collection

A total of 81 soil samples were collected during soil investigation activities. Soil samples were collected at depths ranging from 1 to 31 feet bgs to evaluate potential soil impacts in the shallow and deep overburden clay. Samples were collected consistent with the methods described in **Section 5.1**. Surficial soil samples were only collected where field screening and observations indicated a potential concern. Soil samples were analyzed by a PA-certified laboratory for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 5035/8260B.

5.2.3 Soil Analytical Results

Soil analytical results are summarized in **Table 3** (Soil Data Summary) relative to current U/NR MSCs. Accurate assessment of unsaturated (and periodically saturated) and saturated soil intervals is not possible at this point in time due to the limited seasonal groundwater elevation data set for the entire groundwater monitoring well network. The data were evaluated based on an assumed unsaturated soil column. The following COCs were identified at concentrations above current U/NR MSCs at the following locations:

- Benzene in MW-1, MW-3, MW-4, MW-16, SB-1, SB-5, SB-8, and SB-10;
- MTBE in SB-5 (reporting limit exceedance); and
- 1,2,4-trimethylbenzene in MW-3, MW-4, MW-16, SB-5, and SB-10.

Diesel constituents in the remaining soil borings and groundwater monitoring wells were either not detected or detected at concentrations below current U/NR MSCs. Laboratory reports and associated chain-of-custody forms are provided in **Appendix F** (Soil Laboratory Analytical Reports, 2015 and 2016).

5.2.4 Geotechnical Analytical Results

One Shelby tube sample was collected for geotechnical analysis at soil boring SB-8 from 9 to 11 feet bgs. Analyses conducted provided site-specific data to be used for fate and transport assessment and further CSM development. Samples were submitted to Geotechnics, Inc. of East Pittsburgh, Pennsylvania for analysis of the following parameters:

- Loss-on-ignition (American Standard Test Method [ASTM] D2974-14)
- Unit weight with porosity (ASTM D7263-09)
- Hydrometer analysis and wash sieve analysis (ASTM D422-63)
- Specific gravity (ASTM D854-14)

A sub-sample was collected from the Shelby tube from 10.2 to 10.8 feet bgs for analysis. Analytical results indicated the organic matter content of the sample was 4.5% from the loss-on-ignition processes. To determine the fraction of organic carbon (f_{oc}) from soil organic matter, a correction factor of 58% was utilized as recommended by the Indiana Department of Environmental Management (IDEM, 2007). Therefore, the f_{oc} for the SB-8 sample was approximately 2.61%. The average specific gravity and

porosity were 2.60 and 0.32, respectively. Sieve analysis classified the soil as silty, clayey sand with gravel (SC-SM).

The geotechnical laboratory report is included in **Appendix G** (Geotechnical Laboratory Report, 2016) and data are summarized in the following table:

Sample ID	Sample Depth (feet)	Soil Organic Matter	Fraction of Organic Carbon	Specific Gravity	Porosity	Sieve Analysis (USCS Classification)
SB-8	10.2-10.8	4.5%	2.61% (0.0261)	2.60	0.32	Silty, clayey sand with gravel

USCS = Unified Soil Classification System

5.3 Groundwater Investigation

5.3.1 Well Installation and Construction

Groundwater monitoring wells MW-1 through MW-9, MW-10D, MW-10S, and MW-11 through MW-16 were installed at the locations illustrated on **Figure 3** to identify and delineate the extent of DPH impacts in facility groundwater. Construction details are included on the well construction logs in **Appendix C** and are summarized in **Table 2**.

5.3.2 Well Development/Survey

Groundwater monitoring wells were developed and surveyed following installation. Monitoring wells were developed following installation to remove sediments and fines from around the well screens and the well bore by bailing a minimum of five well volumes from each monitoring well if sufficient recharge was available. Monitoring wells were surveyed to determine top-of-casing (TOC) elevations and horizontal positions relative to an on-site benchmark. Survey elevations are provided in **Table 1**. Monitoring well positions were measured from existing facility features.

5.3.3 Groundwater Sampling – Monitoring Wells

Prior to collecting groundwater samples from the monitoring well network, static water level elevations were recorded for each monitoring well using an electronic oil/water interface probe capable of measuring to an accuracy of 0.01 feet. The interface probe is also capable of detecting static elevations of LNAPL to an accuracy of 0.01 feet. Three well volumes were purged from each monitoring well before sampling if sufficient recharge was available.

Groundwater monitoring wells monitoring the shallow overburden aquifer were gauged and/or sampled during seven separate events conducted between October 2015 and August 2016. One groundwater sample from each monitoring well was analyzed for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 8260B during each event. Groundwater data are summarized in **Table 1** relative to current U/NR MSCs. The following COCs were identified at concentrations above current U/NR MSCs at the following shallow overburden groundwater monitoring wells:

- Benzene in MW-1, MW-3, MW-4, and MW-7;
- MTBE in MW-3, MW-5 through MW-8, MW-10S, and MW-11; and
- 1,2,4-trimethylbenzene in MW-3 and MW-7.

Diesel constituents in the remaining shallow overburden aquifer monitoring wells were either not detected or detected at concentrations below current U/NR MSCs. Laboratory analytical reports are provided in **Appendix H** (Groundwater Laboratory Analytical Reports, 2015 and 2016).

Groundwater monitoring wells monitoring the deep overburden aquifer were gauged and/or sampled during four separate events conducted between April 2016 and August 2016. One groundwater sample from each monitoring well was analyzed for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 8260B during each event. Groundwater data are summarized in **Table 1** relative to current U/NR MSCs. The following COCs were identified at concentrations above current U/NR MSCs at the following deep overburden groundwater monitoring wells:

- Benzene in MW-12, MW-13, and MW-16;
- MTBE in MW-10D;
- Naphthalene in MW-16; and
- 1,2,4-trimethylbenzene in MW-16.

Laboratory analytical reports are provided in **Appendix H**.

5.4 Vapor Intrusion Investigation

A vapor intrusion assessment was not initiated as part of site characterization activities completed at the facility to date. However, potential vapor intrusion pathways were evaluated relative to the February 2015 diesel release consistent with PADEP's *Land Recycling Program Technical Guidance Manual-Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard* (January, 2004) which provides additional screening requirements to prevent the occurrence of unacceptable risks resulting from intrusion of vapors from soil and/or groundwater into indoor structures. The guidance identifies chemicals of potential indoor air concern (COPIACs) and determines if additional characterization or remedial actions are required to mitigate vapor impacts to sensitive receptors. Certain constituents typically associated with a release of diesel fuel are identified as COPIACs and may represent a concern even at concentrations below U/NR soil-to-groundwater (S/GW) pathway MSCs. The guidance provides for utilizing the Indoor Air Quality Decision Matrix for Statewide Health Standards flow charts to determine if additional evaluation is necessary. Further evaluation of the decision matrices and vapor exposure pathways is presented in **Section 7.4**.

5.5 Investigation-Derived Waste

Solid waste including soil cuttings and construction debris (i.e., asphalt and/or concrete) generated during drilling activities were containerized in steel 55-gallon, DOT-approved drums and stored in a secure on-site location. The solid waste was transported by McCutcheon Enterprises, Inc. (MEI) of Apollo, Pennsylvania, as non-hazardous waste to MEI's Biosolids Treatment Facility in Apollo, PA for disposal. A total of 26.96 tons of solid waste were transported to MEI for disposal between December 2015 and July 2016 from site characterization activities. Waste disposal manifests are provided in **Appendix I** (Investigation Derived Waste Documentation).

Approximately 750 gallons of decontamination, well development, and purge water from drilling and groundwater sampling activities were containerized in steel 55-gallon, DOT-approved drums and stored in a secure on-site location. The liquid waste was transported by MEI as non-hazardous waste to MEI's Biosolids Treatment Facility for disposal. Waste disposal documentation is provided in **Appendix I**.

Purged groundwater from groundwater monitoring events that was not containerized was treated using granular activated carbon prior to discharge on-site.

6.0 CONCEPTUAL SITE MODEL

Analytical results from soil and groundwater samples collected during site characterization activities indicate petroleum hydrocarbon constituents typically associated with a release of diesel fuel are present at the site at concentrations above current applicable PADEP Act 2 U/R-NR MSCs. The nature and extent of the diesel release and potential migration pathways were evaluated through the comparison of current soil and groundwater analytical data in relation to the geologic and hydrogeologic settings of the facility. The CSM developed from this evaluation is discussed in the following sections.

6.1 Nature and Extent of Release

During a third party inspection on April 14, 2015, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined. A written NORR was submitted by UPA on April 15, 2015 describing the reportable release. The exact volume and timing of the 2015 diesel release is unknown, and the nature and extent of the release was further evaluated through site characterization activities.

Based on details of the release and evaluation of the existing site data, diesel constituents have migrated through unconsolidated fill material below diesel dispensers #1/2 and 7/8. Further evaluation of current site characterization data indicates diesel constituents continued to migrate vertically into the shallow overburden clay aquifer underlying dispenser islands #1/2 and 7/8. Impacts remained isolated near the dispenser islands and confined within the shallow overburden clay aquifer. A more detailed summary of areas and COCs for facility soil, groundwater, and soil gas are provided in the following sections.

As noted in the 2006 RACR (GSC/Kleinfelder, 2006), APH and DPH impacts remained in facility soil and groundwater at concentrations above current U/R-NR MSCs from historical unleaded gasoline releases in 1996 and 1997. Relief of liability was granted for COCs identified in facility soil and groundwater with approval of the 2006 RACR in June 2006. Due to the presence of these remaining historical impacts, two areas of concern have been identified. APH and DPH impacts related to historical releases are referred to as Area of Concern 1 (AOC 1). APH and DPH impacts related to the 2015 diesel release are referred to as Area of Concern 2 (AOC 2). AOC 1 and AOC 2 are illustrated on **Figure 12** (Area of Concern Location Map). This CSM summarizes the results of current site characterization activities conducted at the site in 2015 and 2016 and is intended to focus on AOC 2. APH and DPH impacts identified during current site characterization activities that are related to historical facility releases based on the location and nature of the impacts will be discussed, as applicable.

6.2 Soil

The lithology of the facility subsurface is composed of unconsolidated fill material consisting of clay with varying amounts of silt, sand, and gravel to a maximum depth of approximately 7 feet bgs. The fill material is underlain predominantly by layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel to a maximum observed depth of 41 feet bgs (**Section 2.4.2**). Bedrock was not encountered in the shallow overburden aquifer during drilling activities. Weathered sandstone was encountered in the deep overburden aquifer at approximately 41 feet bgs at groundwater monitoring well MW-10D and at depths ranging from 15 to 19 feet bgs in the deep overburden aquifer near the retention pond (**Figure 3**).

Benzene and 1,2,4-trimethylbenzene were detected in facility subsurface (>2 feet bgs) soil near diesel dispenser islands #1/2 and 7/8 between 2 to 12 feet bgs at concentrations above current U/NR MSCs for

unsaturated soil. Adsorbed phase MTBE was detected in soil boring SB-5 (north of dispenser island #1/2) at 3 to 4 feet bgs above current U/NR MSCs for unsaturated soil; however, the detected MTBE concentration was a reporting limit exceedance. Benzene and 1,2,4-trimethylbenzene were also detected in one soil sample collected at monitoring well MW-16 downgradient of the station building near the retention pond (AOC 1) at 13 to 14 feet bgs at concentrations above current U/NR MSCs for unsaturated soil.

Constituent concentrations observed in facility soil likely reflect both constituents absorbed to the soil particles as well as residual liquid diesel being held within the soil matrix by capillary forces. Accurate assessment of unsaturated (and periodically saturated) and saturated soil intervals is not possible at this point in time due to the limited seasonal groundwater elevation data set for the entire groundwater monitoring well network. Therefore, for the purpose of presentation throughout this report, soil impacts are collectively referred to as adsorbed phase and are compared to current U/NR MSCs for unsaturated soil. The unsaturated, periodically saturated and permanently saturated soil intervals will be further evaluated and established in more detail as additional seasonal groundwater elevation data is collected. Note that samples were only collected for surface soils (0-2 feet bgs) where field screening and observations indicated the potential presence of petroleum hydrocarbon impacts.

Adsorbed phase benzene, MTBE, and 1,2,4-trimethylbenzene were detected at concentrations above current applicable U/NR MSCs for subsurface soil as follows:

Sample ID	Sample Date	Sample Depth (feet)	Benzene (µg/kg)	MTBE (µg/kg)	1,2,4-TMB (µg/kg)
Act 2 U/NR MSC (2-15 ft bgs)(unsaturated)			***500***	***2,000***	***35,000***
MW-1	09/01/2015	3-4	886	-	-
MW-3	08/31/2015	6-7	3,770	-	55,700
MW-3	09/03/2015	8-9	2,260	-	-
MW-3	09/03/2015	10-11	3,150	-	-
MW-4	08/31/2015	7-8	1,750	-	-
MW-4	09/03/2015	10-11	8,180	-	41,600
MW-16	06/21/2016	13-14	511	-	113,000
SB-1	09/02/2015	2-3	4,370	-	-
SB-5	11/24/2015	3-4	<2,420	<2,420	130,000
SB-5	12/01/2015	6-7	2,880	-	-
SB-8	02/17/2016	5-6	<1,770	-	-
SB-10	06/20/2016	7-8	627	-	-
SB-10	06/22/2016	11-12	7,820	-	44,100

U/NR MSC = used aquifer, non-residential medium-specific concentration
µg/kg = micrograms per kilogram
TMB = Trimethylbenzene
- = concentration reported below Act 2 U/NR MSCs
<# = Less than laboratory reporting limit of #

The approximate extent of APH impacts in unsaturated soil is illustrated on the following figures:

- **Figure 13** - Benzene Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs),
- **Figure 14** - MTBE Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs); and
- **Figure 15** - 1,2,4-TMB Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs).

APH impacts identified are limited to the upper shallow overburden clay layer observed below dispenser islands #1/2 and 7/8 and define the approximate extent of AOC 2 (**Figure 12**). APH impacts related to the 2015 diesel release appear to be limited to facility soil within the shallow overburden aquifer.

Based on the location and extent of the 2015 diesel release and approximate limits of identified APH impacts near dispenser islands #1/2 and 7/8, the APH impacts observed at monitoring well MW-16 are considered to be related to historical releases documented in the 2006 RACR (GSC/Kleinfelder, 2006). The depth to water for monitoring well MW-16 during the July and August 2016 groundwater gauging and sampling events were 12.84 feet bgs and 13.39 feet bgs, respectively (**Table 1**). Based on the depth to water measurements, the APH impacts in soil at monitoring well MW-16 observed at 13 to 14 feet bgs may be permanently saturated. The unsaturated, periodically saturated and permanently saturated soil intervals will be further evaluated and established in more detail as additional seasonal groundwater elevation data is collected.

Adsorbed phase soil impacts are delineated horizontally and vertically in AOC 2. A plan for remediation of soil impacts identified in AOC 2 and demonstration of attainment of a selected standard will be discussed further in a SCRA/RAP. Adsorbed phase soil impacts identified in AOC 1 appear to be isolated near monitoring well MW-16, and no further horizontal or vertical delineation is warranted.

6.3 Groundwater

Constituents of concern in groundwater are defined as regulated substances whose concentrations exceed Act 2 MSCs at and beyond the point of compliance (POC). For groundwater, Act 2 defines the POC as the property boundary that existed at the time of the release. Based on the distribution of groundwater monitoring wells currently being used to monitor the diesel release across the property, groundwater monitoring wells MW-5, MW-9, MW-12, MW-13, MW-14, MW-15, and MW-16 are currently considered POC wells. Based on the current observed groundwater flow (west/northwest/southwest), all POC wells are considered relevant to evaluate groundwater attainment for the site.

Groundwater analytical data from sampling events completed between October 2015 and August 2016 identified diesel constituents in facility groundwater at concentrations above current U/NR MSCs including benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene (**Table 1**). Groundwater isoconcentration maps were generated from data collected in August 2016 to illustrate the current horizontal extent of diesel constituents in facility groundwater. Analytical data from the August 2016 groundwater sampling event indicate that dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene are currently present within the overburden aquifer at concentrations above current U/NR MSCs. The approximate current extent of DPH impacts in facility groundwater is illustrated on the following figures:

- **Figure 16** - Benzene Groundwater Isoconcentration Map, August 15, 2016,
- **Figure 17** - MTBE Groundwater Isoconcentration Map, August 15, 2016,
- **Figure 18** - Naphthalene Groundwater Isoconcentration Map, August 15, 2016; and
- **Figure 19** - 1,2,4-TMB Groundwater Isoconcentration Map, August 15, 2016.

Refer to **Table 1** for a summary of constituents observed in site groundwater to date at concentrations above current U/NR MSCs.

6.3.1 Benzene and 1,2,4-trimethylbenzene

Since groundwater monitoring was initiated in October 2015, dissolved phase benzene and 1,2,4-trimethylbenzene have been observed in facility groundwater at concentrations above current U/NR MSCs. The DPH impacts are located near dispenser islands #1/2 and 7/8 (AOC 2) in the shallow overburden aquifer and near the retention pond (AOC 1) in the deep overburden aquifer. The current extent of dissolved phase benzene in the shallow overburden aquifer is limited to dispenser islands #1/2 and 7/8, and dissolved phase 1,2,4-trimethylbenzene in the shallow overburden aquifer is limited to dispenser island #7/8 as illustrated on **Figure 16** and **Figure 19**, respectively. Since groundwater monitoring was initiated, dissolved phase benzene and 1,2,4-trimethylbenzene have not been detected in monitoring well MW-10D, which is located in the paved portion of the site and monitors the deep overburden aquifer or in groundwater monitoring wells MW-9, MW-10S, MW-11, and MW-15 along the western boundary of the paved area on-site. This indicates dissolved phase benzene and 1,2,4-trimethylbenzene impacts near the dispenser islands in AOC 2 are related to the 2015 diesel release and have not migrated horizontally or vertically from the release area. The dissolved phase benzene and 1,2,4-trimethylbenzene impacts in the deep overburden aquifer near the retention pond in AOC 1 are residual impacts from the historical unleaded gasoline releases in 1996 and 1997. Based on the average depth to water in the deep overburden aquifer downgradient of the parking lot near the retention pond (10 feet bgs), it is not likely that groundwater impacts are migrating into the retention pond.

Relief of liability was granted for dissolved phase benzene impacts remaining in facility groundwater as described in the 2006 RACR (GSC/Kleinfelder, 2006). During site characterization activities for historical unleaded gasoline releases at the facility, groundwater samples were analyzed for the pre-March 2008 short list of unleaded gasoline constituents. Relief of liability was not granted for 1,2,4-trimethylbenzene since this constituent was not analyzed as part of the pre-March 2008 unleaded gasoline short list. However, 1,2,4-trimethylbezene was likely present along with the other unleaded gasoline constituents, and the 1,2,4-trimethylbenzene impacts identified in AOC 1 are most likely attributed to the historical releases documented in the 2006 RACR.

The shallow overburden aquifer terminates west of the paved portion of the site due to the 35 foot vertical change in topography (**Section 2.2**). The shallow overburden aquifer may appear as seeps or springs in the hillside. Seeps in the hillside were historically observed and documented in the GSC/Kleinfelder May 2004 SCR (GSC/Kleinfelder, 2004). Springs and seeps from the shallow overburden aquifer were not assessed along the hillside during site characterization activities. Dissolved phase benzene and 1,2,4-trimethylbenzene impacts related to the 2015 diesel release are fully delineated and appear to be confined horizontally to the shallow overburden aquifer near the dispenser islands; therefore, evaluation of hillside seeps is not warranted at this time.

Dissolved phase benzene and 1,2,4-trimethylbenzene in the deep overburden aquifer are not fully delineated. Although these impacts in the deep overburden aquifer are related to the documented historical releases, POC wells located in the deep overburden aquifer will continue to be monitored, and additional groundwater monitoring well installation is proposed downgradient of the current POC wells in order to further delineate potential remaining historical impacts to the west. Additional site characterization and delineation activities and a remedial action plan will be summarized in a SCRA/RAP. Upon installation of additional groundwater monitoring wells to the west of the retention pond, the current POC well network will be re-evaluated.

6.3.2 MTBE and Naphthalene

Dissolved phase MTBE was identified within AOC 1 in the shallow overburden aquifer in the western portion of the paved area of the facility parking lot, downgradient and sidegradient of the dispenser islands, at concentrations above current U/NR MSCs. In the deep overburden aquifer within AOC 1, dissolved phase MTBE was identified in monitoring well MW-10D at concentrations above current U/NR MSCs. Between October 2015 and April 2016, dissolved phase MTBE concentrations above current U/NR MSCs were also identified (**Table 1**) in the shallow overburden aquifer in groundwater monitoring wells MW-3 and MW-5 near dispenser island #7/8. MTBE was not being used as a fuel additive at the facility at the time of the 2015 release. Furthermore, based on the extent of dissolved phase MTBE as illustrated on **Figure 17** and similar concentrations and locations of residual dissolved phase MTBE observed and presented in the 2006 RACR (GSC/Kleinfelder, 2006), the MTBE impacts are related to the historical unleaded gasoline releases in 1996 and 1997.

Dissolved phase naphthalene was identified in AOC 1 in one groundwater monitoring well (MW-16) in the deep overburden aquifer, east of the retention pond, at concentrations above current U/NR MSCs in groundwater. Dissolved phase naphthalene was not detected at concentrations above current U/NR MSCs in AOC 2 since groundwater monitoring was initiated at the facility in October 2015 (**Table 1**). The dissolved phase naphthalene impacts identified are within AOC 1 and are related to the historical unleaded gasoline releases in 1996 and 1997.

Dissolved phase MTBE impacts in the shallow and deep overburden aquifer are fully delineated. Dissolved phase naphthalene impacts are not currently delineated to the west in the deep overburden aquifer. Following the approval of the 2006 RACR (GSC/Kleinfelder, 2006), relief of liability was granted for facility groundwater for dissolved phase MTBE and naphthalene. Although the dissolved phase MTBE and naphthalene impacts are within AOC 1 and related to historical releases, installation of additional groundwater monitoring wells is proposed downgradient of the current POC wells as mentioned in **Section 6.3.1**. Further details summarizing planned monitoring well installation activities will be discussed in **Section 10.0**.

6.4 Soil Gas

Currently, no soil gas monitoring points are installed at the facility. A vapor intrusion assessment is planned to be completed and is discussed further in **Section 10.0**.

6.5 Fate and Transport Assessment

6.5.1 Shallow Overburden Aquifer

As described above, DPH impacts related to the 2015 diesel release are confined to the shallow overburden aquifer in the area of the dispenser islands. Groundwater monitoring wells located downgradient to the west are not currently impacted with DPH constituents associated with the current release suggesting that the current release has not migrated from the source area. DPH constituents currently identified in AOC 1 within the shallow overburden aquifer (i.e., MTBE) remain at similar concentrations and plume extents historically observed and summarized in the 2006 RACR (GSC/Kleinfelder, 2006), indicating these impacts are stable and have not migrated since they were last evaluated.

No additional quantitative fate and transport modeling is warranted at this time for the shallow overburden aquifer. Further fate and transport evaluation for all COCs will be re-evaluated and

completed, as necessary, upon completion of additional groundwater monitoring well installation and any remedial action activities.

6.5.2 Deep Overburden Aquifer

The DPH impacts identified in the deep overburden aquifer are related to documented historical releases at the facility (**Section 6.3**). Dissolved phase benzene and MTBE were previously modeled using the PADEP-approved Quick Domenico (QD) groundwater modeling program and summarized in the 2006 RACR (GSC/Kleinfelder, 2006). According to the model outputs, dissolved phase benzene will not migrate to the POC at concentrations above U/NR MSCs, and dissolved phase MTBE will not migrate to the POC in the future (GSC/Kleinfelder, 2006). Since DPH impacts identified during site characterization activities completed in 2015 and 2016 in the deep overburden aquifer are related to documented historical facility releases and further evaluation of potential downgradient impacts is planned via additional POC well installation, no additional quantitative fate and transport analysis is warranted at this time for the deep overburden aquifer.

7.0 POTENTIAL EXPOSURE PATHWAYS AND SENSITIVE RECEPTORS

An initial qualitative analysis of potential current and future exposure pathways and sensitive receptors was completed consistent with the procedures contained in the *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, 2002). The following potential exposure pathways were evaluated:

- ingestion of surface soils, inhalation of outdoor vapors and particulates from surface soils, and dermal absorption from surface soils in contact with skin;
- ingestion and dermal absorption in subsurface soils;
- groundwater ingestion;
- inhalation of vapors generated from existing subsurface soil impacts;
- inhalation of vapors generated from existing groundwater impacts; and
- ingestion, dermal absorption and inhalation relating to potential surface water impacts.

The following potential non-residential receptors were evaluated:

- facility employees,
- facility visitors,
- trespassers, and
- construction/utility workers.

7.1 Soil Exposure Pathways

The ingestion of surface soils, inhalation of outdoor vapors and particulates from surface soils, and dermal absorption from surface soils in contact with skin were evaluated. Field readings and soil samples collected during site characterization activities suggest no petroleum hydrocarbon impacts are present within surface soils (0 to 2 feet bgs) at the facility. Therefore, ingestion, inhalation and dermal absorption of petroleum hydrocarbon impacts from surface soils are not considered potential exposure pathways.

Ingestion of and dermal contact with petroleum hydrocarbons in subsurface soils were evaluated for potential non-residential receptors. Site characterization data identified benzene, MTBE, and 1,2,4-trimethylbenzene in subsurface soils between 2 and 14 feet bgs at concentrations above current U/NR MSCs (**Table 3**). The non-residential direct contact MSCs for benzene (330,000 µg/kg), MTBE (9,900,000 µg/kg), and 1,2,4-trimethylbenzene (640,000 µg/kg) were not exceeded for subsurface (2 to 15 feet bgs) soil; therefore, no complete direct contact pathways exist for potential non-residential receptors. Potential exposure to indoor and outdoor vapors associated with subsurface petroleum impacts in soil is discussed further in **Section 7.3**.

Although no complete direct contact exposure pathways are identified for soil impacts, further mitigation will be required for attainment of applicable SHS U/NR MSCs.

7.2 Groundwater Exposure Pathways

Dissolved phase benzene, MTBE, and 1,2,4-trimethylbenzene impacts were identified in groundwater in the shallow overburden aquifer at concentrations above current U/NR MSCs. Dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene were identified in the deep overburden aquifer at concentrations above current U/NR MSCs. Groundwater in the shallow overburden aquifer ranges in depth from 5.42 feet bgs (MW-4, December 2015) to 28.68 feet bgs (MW-9, May 2016). Groundwater in

the deep overburden aquifer ranges from 7.74 feet bgs (MW-13, April 2016) to 44.31 feet bgs (MW-10D, August 2016). Based on the minimum depth to water in the shallow and deep overburden aquifers, direct contact with groundwater during intrusive activities is a potential complete exposure pathway. Further evaluation of this potential exposure pathway will be completed following proposed additional site characterization activities.

The PaGWIS database identified one domestic well and four industrial withdrawal wells within a ½-mile radius of the facility (**Section 2.3.1**). The domestic well is located approximately 0.15 miles northeast of the facility in an upgradient direction (relative to the inferred western direction of regional groundwater flow). The PADEP eMap database identified one additional domestic, two public supply, and five industrial withdrawal wells within a ½-mile radius of the facility (**Section 2.3.1**). The domestic well is located approximately 0.36 miles northeast of the facility in an upgradient direction. The public supply withdrawal wells are located approximately 0.18 miles east/southeast and 0.27 miles north/northwest of the facility in upgradient and sidegradient directions, respectively. Potable water is supplied to the facility and surrounding area by the Barkeyville Borough which obtains its raw water from withdrawal wells located approximately 0.63 miles south/southwest of the facility. An ordinance exists requiring all property owners in the borough to connect to the public water supply (**Appendix B**). Based on this assessment, groundwater ingestion is not considered a current or future exposure pathway of concern.

7.3 Surface Water Exposure Pathways

Diesel constituents have been observed in facility groundwater near the station building and downgradient of the facility near the retention pond at concentrations above current U/NR MSCs. The nearest downgradient surface body of water is an unnamed pond located approximately 400 feet northwest of the facility, beyond Stevenson Road and north of the on-site retention pond. The approximate groundwater flow direction near the northern property boundary of the facility and on-site retention pond is to the northwest. Diesel constituents were not identified at concentrations above current U/NR MSCs at POC wells MW-9 and MW-12 during the most recent groundwater sampling event in August 2016. The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility, and another unnamed pond is also located near the North Branch Slippery Rock Creek. Although the North Branch Slippery Rock Creek is in the downgradient direction of groundwater flow, the current CSM and results of previous QD modeling presented in **Section 6.5.2** indicate that the migration and discharge of impacted groundwater to surface water is not likely.

Although DPH impacts were not observed at concentrations above current U/NR MSCs in POC well MW-12 located north of the retention pond, dissolved phase benzene impacts were identified in monitoring well MW-12 at concentrations above current U/NR MSCs during the May and July 2016 groundwater sampling events. Based on the presence of dissolved phase benzene in POC well MW-12 during the May and July 2016 groundwater sampling events and the approximate direction of groundwater flow to the northwest in this area of the deep overburden aquifer, there is a potential for off-site migration and discharge of impacted groundwater to the unnamed pond northwest of the facility beyond Stevenson Road. Further evaluation of this potential pathway of concern is proposed, as needed, based on continued groundwater monitoring and sampling activities. Results of additional groundwater sampling activities and continued evaluation of groundwater flow direction will be included in a SCRA/RAP submitted to PADEP.

7.4 Vapor Exposure Pathways

7.4.1 Soil Vapor Inhalation

Soil vapor samples were not collected during site characterization activities at the facility. The inhalation of soil vapors potentially generated from existing adsorbed phase soil impacts at the facility was evaluated by comparing the analytical data from soil samples collected during site characterization activities to the PA Default R-NR Screening Values for volatilization to indoor air in Table 4 and Table 5 in Section IV.A.4 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004). According to Table 10 in Section IV.A.4 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004), benzene, toluene, and ethylbenzene are considered COPIACs under a residential setting. Ethylbenzene is considered a COPIAC under a non-residential setting. The following table summarizes the comparison of the highest detected concentrations of COCs in soil to indoor air screening values.

Constituent	Maximum On-site Soil Concentration (µg/kg)	Residential J&E Default Indoor Air Screening Value (µg/kg)	Non-Residential J&E Default Indoor Air Screening Value (µg/kg)
Benzene	8,180 (MW-4)	370	630
Toluene	76,000 (SB-5)	76,000	110,000
Ethylbenzene	38,700 (SB-5)	5,700	9,500
MTBE	<2,420 (SB-5)	51,000	86,000
Isopropylbenzene	5,350 (SB-5)	360,000+	360,000+
Naphthalene	21,700 (MW-3)	64,000	Not of Concern
1,2,4-Trimethylbenzene	130,000 (SB-5)	20,000	29,000
1,3,5-Trimethylbenzene	46,900 (SB-5)	4,600	6,400

Bold constituents indicate residential COPIACs
Bold & Italicized constituents indicate residential and non-residential COPIACs
µg/kg = microgram per kilogram
<# = reporting limit exceedance

Current maximum benzene, ethylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene concentrations in soil exceed respective J&E default screening values for residential and non-residential settings. Based on the assessment above, migration of vapors from APH impacts to potential receptors is a potentially complete exposure pathway. Vapor intrusion will be further evaluated and soil gas data will be presented in a SCRA/RAP. Planned vapor intrusion assessment activities will be discussed further in **Section 9.0**.

7.4.2 Groundwater Vapor Inhalation

The inhalation of soil vapors potentially generated from existing dissolved phase groundwater impacts at the facility was evaluated. According to the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004), ethylbenzene and naphthalene are residential COPIACs in groundwater. Ethylbenzene is also a non-residential COPIAC in groundwater. Since groundwater sampling was initiated in October 2015, benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene have been identified in groundwater at concentrations exceeding U/NR MSCs. Maximum on-site groundwater concentrations observed since October 2015 are compared to the default screening values for volatilization to indoor air from Table 1 and Table 2 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004) for the following constituents:

Constituent	Maximum On-site Groundwater Concentration (µg/L)	Residential J&E Default Indoor Air Screening Value (µg/L)	Non-Residential J&E Default Indoor Air Screening Value (µg/L)	U/NR MSC (µg/L)
Benzene	371 (MW-1)	3,500	5,900	5
Toluene	218 (MW-16)	490,000	Not of Concern	1,000
Ethylbenzene	456 (MW-16)	27,000	45,000	700
MTBE	1,850 (MW-6)	380,000	640,000	20
Isopropylbenzene	51.8 (MW-16)	Not of Concern	Not of Concern	3,500
Naphthalene	165 (MW-16)	25,000	Not of Concern	100
1,2,4-Trimethylbenzene	1,740 (MW-16)	8,600	12,000	62
1,3,5-Trimethylbenzene	646 (MW-16)	7,200	10,000	1,200

Bold constituents indicate residential COPIACs
Bold & Italicized constituents indicate residential and non-residential COPIACs
U/NR MSC = used aquifer, non-residential medium-specific concentration
µg/L = micrograms per Liter

No maximum dissolved phase concentrations in facility groundwater exceed respective J&E default screening values for residential and non-residential settings; therefore, ongoing migration of soil vapor generated from existing dissolved phase groundwater impacts is not a concern with respect to potential future groundwater vapor inhalation exposure pathways. However, based on DPH impacts identified within AOC 2, groundwater mitigation is required and further vapor intrusion assessment will be completed to confirm potential groundwater vapor inhalation pathways are not a concern.

8.0 SELECTION OF CLEANUP STANDARDS AND RATIONALE

Cleanup standards are established by PADEP in the Land Recycling Act (Act 2) which is codified in 25 PA Code Chapter § 250 (PADEP, 2011). The Act 2 regulations establish the following three potential standards for remediating a site from which an owner/operator can select one or a combination of standards to successfully remediate a site and obtain liability relief.

The three cleanup standards are identified as the:

- Background Standard,
- Statewide Health Standard; and
- Site-Specific Standard.

Each standard is associated with a unique set of compliance criteria that establish acceptable procedures for determining the concentrations of regulated substances allowed in various media, identify points of compliance, define attainment criteria, and specify reporting and public involvement requirements. There is no current evidence that the site is being impacted by an off-site source; therefore, the Background Standard will be eliminated from further consideration at this time. The remaining standards to be considered are the SHS and the SSS.

8.1 Statewide Health Standard

8.1.1 Soil MSCs

The SHS for soils are intended to protect: (1) direct contact with the regulated substances in soils; and, (2) groundwater in the underlying aquifer. In order to accomplish this goal, Act 2 establishes two sets of MSCs for soils. The first group of MSCs for soils is the direct contact (DC) numeric values. In this set of values, the PADEP formalized MSCs for two potential risk-based scenarios: residential and non-residential direct contact. For the residential scenario, only one direct contact MSC is specified which is applicable to the soil column from the surface to a depth of 15 feet bgs. For the non-residential scenario, two MSCs are established: a direct contact MSC for surface soils (0 to 2 feet bgs); and a direct contact MSC for subsurface soils (2 to 15 feet bgs). The site is currently non-residential and the property will remain non-residential; therefore, the NR-DC soil MSCs are applicable to the site. However, to remain conservative and protective of potential residential receptors, the R-DC soil MSCs can also be utilized.

To protect groundwater in the underlying aquifer, Act 2 specifies a S/GW pathway numeric value. This value is the concentration of a regulated substance that may remain in soil without adversely affecting groundwater quality. S/GW pathway numeric values are based upon a determination of an aquifer's current and projected use. Aquifers that are currently used (U) are further subdivided based upon the current and future land use and the concentration of total dissolved solids (TDS) in the groundwater. Non-use (NU) aquifers are also subdivided by current and future land use.

There are five options for selecting the appropriate S/GW pathway numeric value:

- one hundred times the appropriate groundwater MSC expressed as milligrams per kilogram (mg/kg) of soil (published value),
- a generic published value determined not to produce a concentration in groundwater in excess of the appropriate MSC as calculated using equilibrium partitioning methods (the generic value is replaced by $1/10^{th}$ of the published value for soils collected in the saturated zone),

- using the Synthetic Precipitation Leaching Procedure (SPLP) to calculate a concentration in soil that does not produce a concentration in groundwater at the site in excess of the MSC for groundwater,
- document the presence of a S/GW buffer zone as specified in 25 PA Code § 250.308(c); or
- meet the requirements for a S/GW equivalency demonstration as specified in 25 PA Code § 250.308(d).

The S/GW buffer option cannot be selected here since there is no buffer distances specified for several constituents including benzene. The S/GW equivalency demonstration not is applicable to this site since it requires that site groundwater be below respective MSCs or the background standard prior to remediation. Also, soil samples were not analyzed by SPLP, eliminating the third option from current consideration. The S/GW pathway numeric value, therefore, was selected as the higher of 100 times the groundwater MSC or the generic value.

In order to evaluate site soil relative to the SHS MSCs contained in Act 2, 25 PA Code § 250.305 states that the MSCs for regulated substances contained in surface or subsurface soils at a depth of 0 to 15 feet bgs is the lowest of the following:

- The direct contact MSC; or
- The S/GW pathway numeric value.

Alternatively, the direct contact MSC may be selected as the appropriate MSC provided either the S/GW buffer zone or the S/GW equivalency demonstration could be applied. Since neither of these was applicable, the appropriate unsaturated soil MSC is the lowest of the direct contact value or the S/GW pathway numeric value. In accordance with 25 PA Code § 250.308(a)(2)(ii), the applicable MSC is $1/10^{th}$ the generic value for soil in the zone of periodic and/or permanent groundwater saturation.

Adsorbed phase benzene, MTBE, and 1,2,4-trimethylbenzene have been identified in facility soil at concentrations above current applicable U/NR MSCs. Therefore, soil is a medium of concern. Further evaluation of the zone of permanent and periodic saturation via collection of seasonal groundwater elevation data is required. Using the SHS, soil attainment will be pursued relative to the MSCs summarized below for site COCs.

Constituent of Concern	**Soil U/NR MSC (µg/kg) (unsaturated)**	**Soil U/NR MSC (µg/kg) (saturated)**	**Soil U/NR MSC (µg/kg) (unsaturated)**
	0-2 feet bgs	***2-15 feet bgs***	
Benzene	500	13	500
Toluene	100,000	4,400	100,000
Ethylbenzene	70,000	4,600	70,000
Methyl tert-butyl ether	2,000	28	2,000
Isopropylbenzene	2,500,000	250,000	2,500,000
Naphthalene	25,000	2,500	25,000
1,2,4-Trimethylbenzene	35,000	3,500	35,000
1,3,5-Trimethylbenzene	210,000	21,000	210,000

U/NR MSC = used aquifer, non-residential medium-specific concentrations
µg/kg = micrograms per kilogram

8.1.2 Groundwater MSCs

The SHS MSCs have been established for groundwater under Act 2 for U or NU aquifers. In this set of values, PADEP formalized MSCs for both R and NR scenarios. The U aquifer MSCs are further divided into two categories based upon TDS within the aquifer. A NU aquifer determination may be applied if NU aquifer determination requirements are met and approved by PADEP.

Dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene have been identified in facility groundwater at concentrations above U/NR MSCs. Therefore, groundwater is a medium of concern. At this time, there is an ordinance which requires property owners to connect to the municipal water supply. Based on site conditions, the U aquifer (<2,500 TDS), NR MSC was selected as the appropriate SHS criterion for the facility. Using the SHS, groundwater attainment will be pursued relative to the MSCs summarized below for site COCs.

Constituent of Concern	Groundwater U/NR MSC (µg/L)
Benzene	5
Toluene	1,000
Ethylbenzene	700
Methyl tert-butyl ether	20
Isopropylbenzene	3,500
Naphthalene	100
1,2,4-Trimethylbenzene	62
1,3,5-Trimethylbenzene	1,200

U/NR MSC = used aquifer, non-residential medium-specific concentrations
µg/L = micrograms per Liter

8.2 Site-Specific Standard

Remediating to the SSS requires a more detailed evaluation of potential receptors and exposure pathways. If complete exposure pathways exist after considering engineering and institutional controls, then a risk assessment and an ecological assessment would be needed to quantify environmental impacts to sensitive receptors and to develop site-specific cleanup levels that are protective of human health and the environment. Based on data acquired during site characterization activities collected to date, a site-specific standard does not appear appropriate at this site at this time. An evaluation of the SSS will be completed in the future, if necessary.

8.3 Standard Selection

Based on the preceding discussion and the current knowledge of the site, the following options are available in selecting appropriate cleanup standards for the site:

- *Statewide Health Standards, Used Aquifer*: Attaining SHS MSCs will require:
  - Mitigating facility soil to meet applicable saturated/unsaturated U/NR MSCs for benzene, MTBE, and1,2,4-trimethylbenzene.
  - Additional groundwater monitoring well installation for attainment of horizontal delineation of DPH impacts in facility groundwater.
  - Mitigation of groundwater impacts to meet applicable U/NR MSCs for benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene.
  - Completing a vapor intrusion assessment.

- *Site-Specific Standard*:
  - Remediating to the SSS will require evaluation of potential receptors and exposure pathways. If a complete exposure pathway exists even after engineering and institutional controls are considered, then a formal risk assessment would need to be completed and site-specific cleanup levels determined.

Due to the current and future land use of the property and the proximity of potential sensitive receptors (e.g., station building, utility trenches, surface water, etc.), the selected approach to obtaining Act 2 liability relief for facility soil and groundwater is the statewide health standard for a used aquifer, non-residential scenario. Historical impacts will be considered throughout the corrective action process for the 2015 diesel release as they relate to SHS attainment demonstrations. Therefore, historical impacts are included in the remedial options evaluation.

9.0 REMEDIAL OPTIONS EVALUATION

Remedial technologies considered as potentially viable in addressing current petroleum hydrocarbon impacts in facility soil and groundwater are discussed in the following sections:

9.1 Soil

Following removal of the ponded product observed in diesel dispensers #1/2 and 7/8, any continuing source of diesel impacts to site soil should have been removed. Based on site characterization findings, current impacts in facility soil include benzene, MTBE, and 1,2,4-trimethylbenzene in the vicinity of soil sample locations MW-1, MW-3, MW-4, SB-1, SB-5, SB-8, and SB-10 ranging in depth from 2 to 14 feet bgs. The following alternatives are considered for remediation of these soil impacts:

- *No Action:* Eighty-one soil samples were analyzed for diesel constituents during various characterization activities conducted from August 2015 to June 2016. Exceedances of potentially applicable soil MSCs were identified at locations MW-1, MW-3, MW-4, MW-16, SB-1, SB-5, SB-8, and SB-10 at depths ranging from 2 to 14 feet bgs. Based on these results, active remediation appears necessary.

- *Soil Excavation (Ex Situ Treatment)*: This option requires the excavation and removal of impacted soil for off-site treatment/disposal. Excavation can be effective to complete APH source removal in a relatively short time frame. Due to the location of the impacts related to the release (between 2 to 14 feet bgs) being mostly beneath the dispenser area, an in-situ remediation option will be considered for soil impacts.

- *Soil Vapor Extraction (SVE):* SVE is an in-situ remedial technology that is effective in removing volatile constituents from the vadose or unsaturated zone. SVE utilizes a blower (regenerative, positive displacement, or liquid ring pump) to extract soil vapors from the pore space of the soil matrix. The effectiveness of an SVE system is determined by two major factors: permeability of the soil and volatility of the constituent to be extracted. Permeability of the soil determines the rate at which soil vapors can be removed. Soils that tend to be fine-grained (i.e., clays and silts) are less likely to allow sufficient vapor flow than coarse-grained soils (i.e., sands and gravels). The composition of the impacted soil is unconsolidated fill material underlain by varying amounts of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel.

The volatility of the constituent to be removed determines the rate or degree at which the constituent will vaporize from the adsorbed phase to the vapor phase. Vapor pressure is a key factor to determining the volatility of a constituent. In general, vapor pressures greater than 0.5 millimeters of mercury (mm Hg) are generally considered amenable for soil vapor extraction. The vapor pressure for diesel range organic compounds varies from 75 mm Hg for benzene to 7.1 mm Hg for ethylbenzene. Because the impacts are diesel-range organic compounds, SVE could be effective at achieving VPH and APH mass reduction in on-site unsaturated soil; however, SVE alone would not address saturated APH impacts or DPH impacts. Remedial feasibility testing is required to determine the applicability to this site.

- *Natural Attenuation:* Natural attenuation relies upon natural subsurface processes to reduce constituent concentrations to below current Act 2 MSCs. This option typically requires long-term sampling and data evaluation to establish constituent reduction and degradation by-product trends.

Natural attenuation is eliminated from current consideration due to the elevated APH impacts and potential on-/off-site and downgradient receptors.

9.2 Groundwater

DPH impacts identified to date in facility groundwater include benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene at concentrations above U/NR MSCs at groundwater monitoring wells MW-1, MW-3, MW-6, MW-7, MW-8, MW-10S, MW-10D, MW-11, MW-12, MW-13, and MW-16. The DPH plume related to the 2015 diesel release appears to be limited to the area sidegradient and downgradient of dispensers #1/2 and 7/8. The following alternatives are considered for remediation of these impacts:

- *Groundwater Extraction:* Groundwater extraction is a practical remedial technology to gain hydraulic control and to retard downgradient migration of DPH. However, groundwater pump-and-treat remediation technology may lead to many years of system operation and maintenance before MSCs are attained. In addition pump-and-treat remediation would not address the observed APH impacts. Groundwater extraction may be enhanced through the application of a vacuum to the wellheads. Remedial feasibility testing will be required to evaluate groundwater extraction rates and estimate the effective hydraulic radius of influence..

- *Dual Phase Extraction:* Dual phase extraction or vacuum enhanced groundwater extraction (VEGE) combines both SVE and pump-and-treat remedial technologies. The application of a vacuum to an extraction well creates pressure gradients that enhance total fluid flow towards the extraction well. Conventional dual-phase/VEGE extraction systems use a submersible pump to extract liquids from the well and a surface blower to extract vapors. A dual-phase/VEGE remedial system removes vapor and groundwater independently using one of several methodologies.

The first option involves the use of low vacuums (<50 inches of water column [in w.c.]) and submersible pumps (pneumatic or electric). Low vacuum dual-phase/VEGE systems are most effective in high yielding, high transmissivity formations. The second dual-phase/VEGE option involves the use of mid-range vacuums (50–100 in w.c.) and submersible pumps. Mid-range vacuum dual-phase/VEGE systems are most effective in medium yielding, medium transmissivity formations. The third type of dual-phase/VEGE system involves the use of a high vacuum (>100 in w.c.) positive displacement (PD) blower and submersible pumps. PD blowers are capable of vacuum levels approaching 18 inches of mercury (in. Hg).

Dual phase extraction may be a viable option to remediate DPH impacts in facility groundwater; however, further remedial feasibility testing will be required to determine the applicability to this site.

- *Total Phase Extraction (TPE):* TPE typically utilizes a single blower to extract groundwater and soil vapor simultaneously through the same extraction pipe. Liquid ring pumps (LRPs) and PD blowers are capable of high vacuum levels (approaching 30 in. Hg for LRPs, and 18 in. Hg for PD blowers) and are most effective in low yield (<1.0 gallon per minute [gpm]/well) formations. A TPE system utilizes a drop tube inside the well to extract total fluids. A pitless adapter attached to the extraction well connects the drop tube to a piping network. During conveyance of the extracted fluids through the piping network, turbulence causes dissolved phase VOCs to partition to the vapor-phase. The total fluids enter the equipment compound and are separated inside a vapor/liquid separator.

A typical TPE system is designed to handle groundwater recovery rates less than one gpm per extraction well and vapor flow rates less than 20 standard cubic feet per minute (scfm) per extraction well. Dual

phase/VEGE systems which utilize submersible pumps and surface blowers are more appropriately designed to handle groundwater recovery rates greater than one gpm per well.

TPE may be a viable option to remediate APH and DPH impacts in facility soil and groundwater; however, further remedial feasibility testing will be required to determine the applicability to this site.

- *Air Sparge/Soil Vapor Extraction (AS/SVE):* Air sparging involves the delivery of air into the saturated zone to volatilize DPH and APH constituents. Typically, the volatilized constituents are removed from the vadose zone by an SVE system. The effectiveness of air sparging primarily depends on two key factors, vapor/dissolved phase partitioning and permeability of the soil.

AS/SVE may be effective at remediation APH and DPH impacts at this facility; however, due to the varying clay lithology at the site, short circuiting (i.e., preferential pathway) to more permeable layers may occur. As a result, this remedial technology is not considered a viable remedial option at this time. A more passive form of remediation (low flow oxygen injection) may be considered as a polishing step following active remediation.

- *Oxidation:* Oxidants, such as ozone, peroxides and oxygen may be added to the groundwater to promote both biological activity and chemical oxidation. The oxidation process breaks the chemical bonds of organic compounds and renders innocuous by-products, depending on the strength of the oxidant. Introduction of oxidants into facility groundwater may be a viable option to remediate DPH in the overburden aquifer; however, oxidation is not selected as a remedial strategy at this time. Due to the proximity to subsurface features (i.e., UST field, product piping, etc.), oxidation is eliminated as a potential polishing technology.

- *In-Situ Bioremediation:* Bioremediation involves the introduction of nutrients, such as nitrogen and phosphorus, and oxygen to the groundwater to enhance microbial growth. Remedial feasibility testing will be required to determine if subsurface conditions are favorable for injection; however, bioremediation is not being considered at this time. Bioremediation may be re-evaluated following active remediation via the VEGE system, as a polishing technology.

- *Monitored Natural Attenuation (MNA):* Natural attenuation relies upon natural subsurface microbiological and chemical processes to reduce constituent concentrations to below MSCs. This option typically requires long-term sampling and data evaluation to establish constituent reduction and degradation by-product trends. Benzene is currently one of the primary COCs in site groundwater and is widely considered to be susceptible to natural bio-chemical degradation in subsurface environments. Based on the susceptibility of benzene to natural attenuation processes MNA appears to be a potentially viable remedial alternative for site groundwater following reduction of DPH concentrations by a more aggressive/active remedial approach and will be re-evaluated following active remediation.

10.0 PLANNED ACTIVITIES

In order to validate the current CSM and fill potential data gaps, the following activities will be completed:

- Install two additional deep overburden aquifer groundwater monitoring wells west of the retention pond to horizontally delineate DPH impacts identified in AOC 1.
- Install two additional deep overburden aquifer groundwater monitoring wells in the paved area of the site to verify DPH impacts identified in AOC 2 related to the April 2015 diesel release are confined to the shallow overburden aquifer near the dispenser islands.
- Re-install and re-construct groundwater monitoring well MW-10D to confirm that the well is monitoring the deep overburden aquifer water-bearing zone and not the bedrock aquifer.
- Perform a vapor intrusion assessment to further identify if migration of soil gas via preferential pathways is a potentially complete exposure pathway to potential receptors identified at the facility. Three to four soil gas monitoring points will be installed at the following locations:
  - near dispenser islands #1/2 and 7/8 (source areas),
  - along preferential pathways between the source areas and the diesel station building, and
  - along preferential pathways between the source areas and the motel building.
- Verify the depth and elevation of the retention pond to confirm that DPH impacts in the deep overburden aquifer are not impacting the retention pond.
- Preparation and submittal of an SCRA/RAP including results of additional site characterization activities and further evaluation/selection of options for remediation of APH and DPH impacts identified at the facility.

10.1 Schedule

Results of planned activities and further evaluation of APH and DPH impacts related to the April 2015 diesel release will be summarized in an SCRA/RAP. Installation of additional groundwater monitoring wells and soil gas points, and gauging the retention pond are anticipated to be completed in October 2016. Two additional rounds of groundwater sampling and soil gas sampling will be completed following the installation of proposed additional monitoring locations which are illustrated on **Figure 20** (Proposed Monitoring Location Map). The SCRA/RAP is currently due in November 2016; however, to allow for completion of proposed additional site characterization activities, an extension request for submittal of the SCRA/RAP may be required.

11.0 SUMMARY

United Refining Company currently operates a retail diesel station at 5574 State Route 8 in Barkeyville, Pennsylvania. A NORR was submitted for the facility in April 2015 and petroleum impacts were identified in soil and groundwater during site characterization activities completed in August and September 2015. Additional site characterization activities were performed from November 2015 through June 2016 in order to further evaluate the nature and extent of the release. The following summarizes key findings discussed in this SCR.

- A NORR was submitted by UPA on April 15, 2015 after ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined.
- Subsurface soil is composed of unconsolidated fill material consisting of clay with varying amounts of silt, sand, and gravel (weathered sandstone) underlain predominantly by clay with lenses of sand and gravel with varying amounts of clay and silt.
- Soil samples collected from soil borings SB-1, SB-5, SB-8, SB-10 and groundwater monitoring wells MW-1, MW-3, MW-4 and MW-16 identified diesel constituents in subsurface soil at concentrations above current U/NR MSCs from approximately 2 to 14 feet bgs.
- Observations during site characterization activities identified an overburden aquifer with two water-bearing zones (shallow and deep). Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, the site topography decreases sharply, separating the upper portion of the site where the 2015 release occurred from the lower portion of the site near the retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond at a maximum depth of 27.35 feet bgs. The deep overburden aquifer was observed at a minimum depth of approximately 39.38 feet bgs below the upper paved portion of the site and at a minimum depth of approximately 8.79 feet bgs downgradient of the paved portion of the facility near the retention pond.
- Groundwater gauging during site characterization activities identified consistent radial flow with primary flow components to the west/southwest and northwest for the shallow overburden aquifer and to the northwest for the deep overburden aquifer. During the most recent gauging event conducted in August 2016, groundwater depths in the shallow overburden aquifer ranged from 7.31 feet bgs (MW-5) to 27.35 feet bgs (MW-9) with an average depth of 14.82 feet bgs. Groundwater depths in the deep overburden aquifer ranged from 39.38 feet bgs (MW-10D) to 44.31 feet bgs (MW-10D) with an average depth of 41.72 feet bgs in the upper paved portion of the facility and from 8.79 feet bgs (MW-13) to 13.39 feet bgs (MW-16) with an average of 11.04 feet bgs downgradient near the retention pond.
- Groundwater samples collected from groundwater monitoring wells MW-1, MW-3, MW-6, MW-8, MW-10S, and MW-11 monitoring the shallow overburden aquifer confirmed the presence of diesel constituents in facility groundwater from dispenser island #1/2 to the western edge of the paved area at the facility west of the diesel station building. Based on the August 2016 sampling data, dissolved phase benzene, MTBE, and 1,2,4-trimethylbenzene are currently the only COCs identified at concentrations above current U/NR MSCs in the shallow overburden aquifer.
- Groundwater samples collected from groundwater monitoring wells MW-10D, MW-12, MW-13, and MW-16 monitoring the deep overburden aquifer confirmed the presence of diesel constituents in groundwater from the western edge of the upper paved portion of the facility west of the diesel station building downgradient to the retention pond. Based on the August 2016 sampling data, dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene are

currently the only COCs identified at concentrations above current U/NR MSCs in the deep overburden aquifer.

- Due to the presence of historical APH and DPH impacts remaining in facility soil and groundwater as documented in the 2006 RACR (GSC/Kleinfelder, 2006), two areas of concern were proposed based on the evaluation of site characterization activities completed to date. DPH and APH impacts identified during site characterization activities related to historical releases at the facility are generally defined as AOC 1, and impacts related to the 2015 diesel release are generally defined as AOC 2. Based on details of the April 2015 diesel release and evaluation of existing site data, APH and DPH impacts in AOC 2 appear isolated near the dispenser islands and are confined within the shallow overburden clay aquifer. APH and DPH impacts identified west of the dispenser islands and downgradient near the retention pond appear to be related to historical releases (AOC 1).
- Current maximum adsorbed phase benzene, ethylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene concentrations in soil exceed respective PADEP default vapor intrusion screening values for residential and non-residential settings. Based on APH and DPH impacts identified in facility soil and groundwater in AOC 2, further vapor intrusion assessment and mitigation will be completed to confirm potential vapor inhalation pathways are not a concern at the facility.
- The selected Act 2 standard for obtaining liability relief for diesel constituents in soil and groundwater related to the subject 2015 release is the Statewide Health Standard for a used aquifer, non-residential scenario. Historical impacts will be considered throughout the corrective action process for the 2015 diesel release as they relate to SHS attainment demonstrations.

Pending completion of proposed planned activities, additional site characterization findings and remedial options evaluation/selection will be presented to the PADEP in an SCRA/RAP.

12.0 REFERENCES

ASTM International (ASTM E1739-95) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Site.* 2002.

Berg, T.M., Geyer, A.R., Edmunds, W.E., and other, compilers. 1980. *Geologic Map of Pennsylvania.* Pennsylvania Geological Survey.

Environmental Protection Agency My Water Mapper. <https://watersgeo.epa.gov/mwm/>. Accessed September 2016.

GSC/Kleinfelder, May 2004. *Comprehensive Site Characterization/Risk Assessment Report.*

GSC/Kleinfelder, June 2006. *Remedial Action Completion Report.*

Indiana Department of Environmental Management, Office of Land Quality. 2007. *Determining the Fraction of Organic Carbon RISC Nondefault Option.* IDEM Technical Guidance Document OLQ-General ID-0119. http://www.in.gov/idem/files/Foc_Guidance_070925_Final.pdf

Pennsylvania Code Online Website (Chaper 93): <http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>. Accessed September 2016.

Pennsylvania Department of Conservation and Natural Resources (PADCNR) Website: < http://www.dcnr.state.pa.us/topogeo/>. Accessed September 2016.

Pennsylvania Department of Conservation and Natural Resources (PADCNR) and the Department of Interior – Office of Surface Mining (OSM) Website: < https://amlis.osmre.gov/Default.aspx>. Accessed September 2016.

Pennsylvania Department of Environmental Protection, December 2001. Pennsylvania Code. Title 25, Chapter 245: Administration of the Storage Tank and Spill Prevention Program, Subchapter D.

Pennsylvania Department of Environmental Protection, January 2016. Pennsylvania Code. Title 25, Chapter 50: Administration of Land Recycling Program.

Pennsylvania Department of Environmental Protection eMapPA Website: <http://www.depgis.state.pa.us/emappa/>. Accessed September 2016.

Pennsylvania Department of Environmental Protection Regulated Tank List Website: <http://www.portal.state.pa.us/portal/server.pt/community/hide_registration/20606/regulated_tank_list/1054359>. Accessed September 2016.

Pennsylvania Department of Environmental Protection Storage Tank Cleanup Locations Website: <http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1241&Q=461926&landrecwasteNav=|30816|>. Accessed September 2016.

Pennsylvania Department of Environmental Protection. 2004. *Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standards*. Land Recycling Technical Guidance Manual-Section IV.A.4. Technical Document: 253-4500-601.

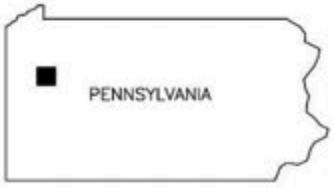
Pennsylvania Groundwater Well Inventory System (PaGWIS) Website: <http://www.dcnr.state.pa.us/topogeo/groundwater/pagwis/records/index.htm >. Accessed September 2016.

Shultz, Charles H., editor. 1999. *The Geology of Pennsylvania*. Pennsylvania Geological Survey.

United Refining Company of Pennsylvania. April 2015. *Notification of Reportable Release.*

United States Department of Agriculture, Natural Resources Conservation Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed September 2016.

SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1980
BARKEYVILLE, PENNSYLVANIA
CONTOUR INTERVAL = 20'



QUADRANGLE LOCATION

DRAFTED BY: TP (EXTON)	SITE LOCATION MAP
CHECKED BY: JH	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 — 2000 / DATE: 08-05-15 / FIGURE: 1

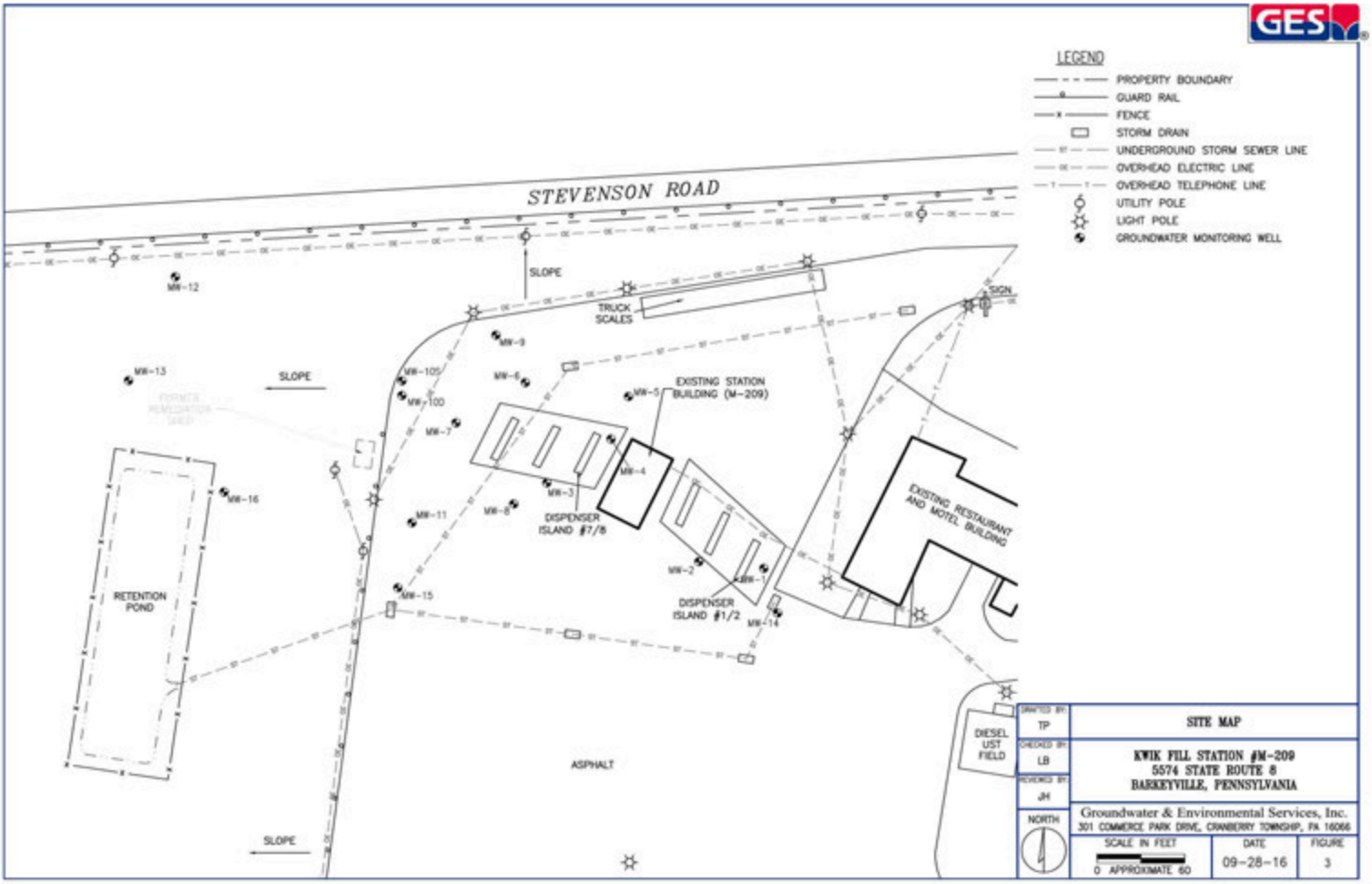
M:\Graphics\0700-Pittsburgh\URC\Kwik Fill\M-209_229 Barkeyville\M-209_229 barkeyville SLM.dwg, Layout1

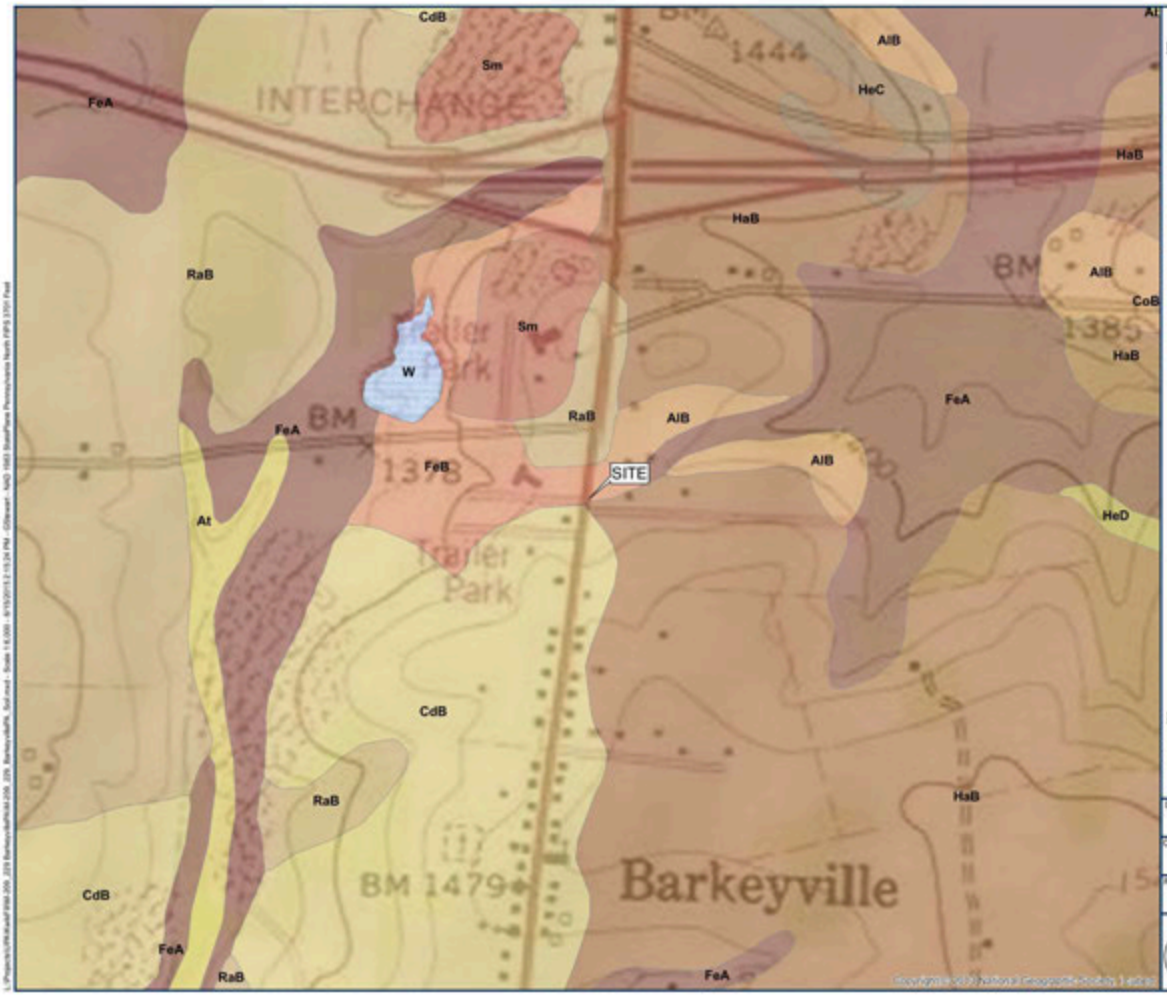
GES

LEGEND

	PROPERTY BOUNDARY (approx.)
R	RESIDENTIAL PROPERTY
C	COMMERCIAL PROPERTY
V	VACANT PROPERTY

DRAFTED BY: TP	LOCAL AREA MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 300 — DATE: 09-19-16 — FIGURE: 2


LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
MW-12
MW-13
MW-105
MW-100
MW-9
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-7
MW-4
MW-3
MW-8
MW-16
MW-11
DISPENSER ISLAND #7/8
EXISTING RESTAURANT AND MOTEL BUILDING
MW-2
MW-1
MW-15
MW-14
DISPENSER ISLAND #1/2
RETENTION POND
DIESEL UST FIELD
ASPHALT
SLOPE
SLOPE
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
SITE MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
3

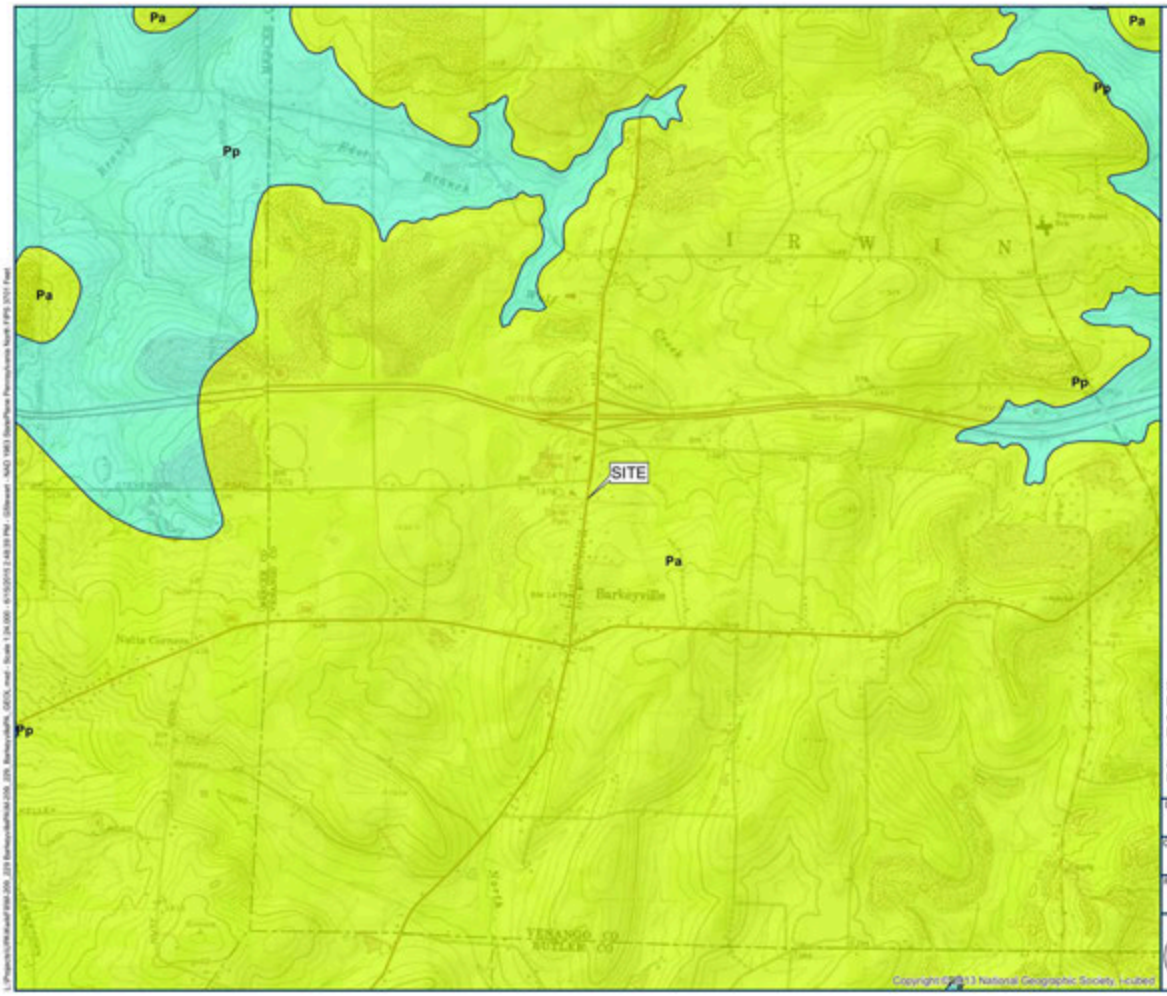


Legend

AlB	Alvira silt loam, 3 to 8 percent slopes
At	Atkins silt loam
CdB	Canfield gravelly silt loam, 3 to 8 percent slopes
CoB	Cookport loam, 3 to 8 percent slopes
FeA	Frenchtown silt loam, 0 to 3 percent slopes
FeB	Frenchtown silt loam, 3 to 8 percent slopes
HaB	Hanover silt loam, 3 to 8 percent slopes
HeC	Hazleton channery loam, 8 to 15 percent slopes
HeD	Hazleton channery loam, 15 to 25 percent slopes
RaB	Ravenna silt loam, 3 to 8 percent slopes
Sm	Strip mines
W	Water

Sources:
-Soil Survey Geographic (SSURGO) database for Venango County, Pennsylvania, USDA, 1981, scale 1:20,000
-USGS 7.5 minute topographic quadrangles, scale 1:24,000
(Shown greatly enlarged, locations considered approximate.)

DRAFTED BY: GKS	SOIL SURVEY MAP
CHECKED BY: DMC	KWIK FILL STATION #M-209/229 5574 STATE ROUTE 8 BARKEYVILLE, PA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DR, CRANBERRY TOWNSHIP, PA 16066
NORTH	APPROX. SCALE IN FEET: 0 500
	DATE: 6-15-15
	FIGURE: 4



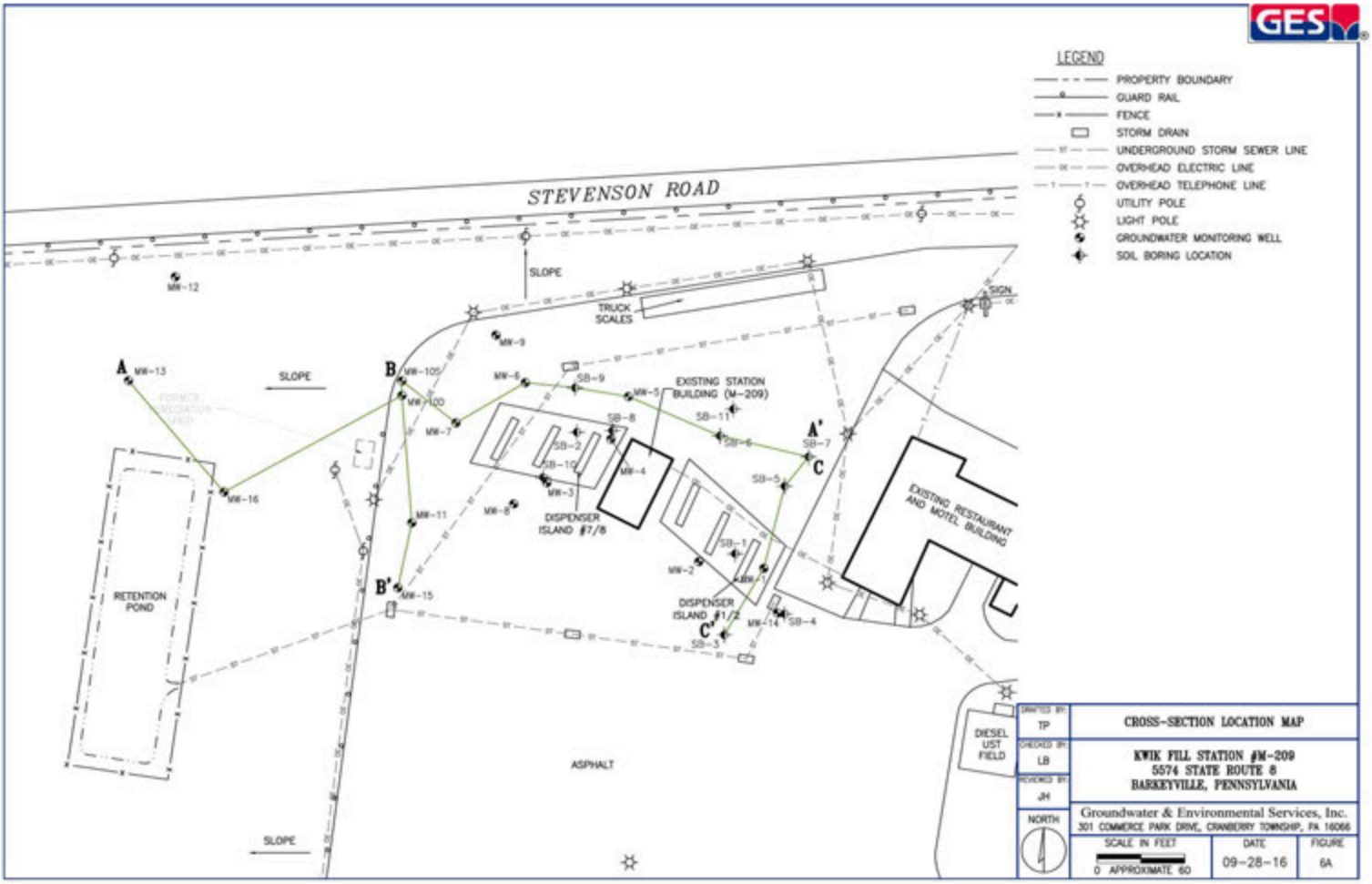
Legend

Pennsylvanian

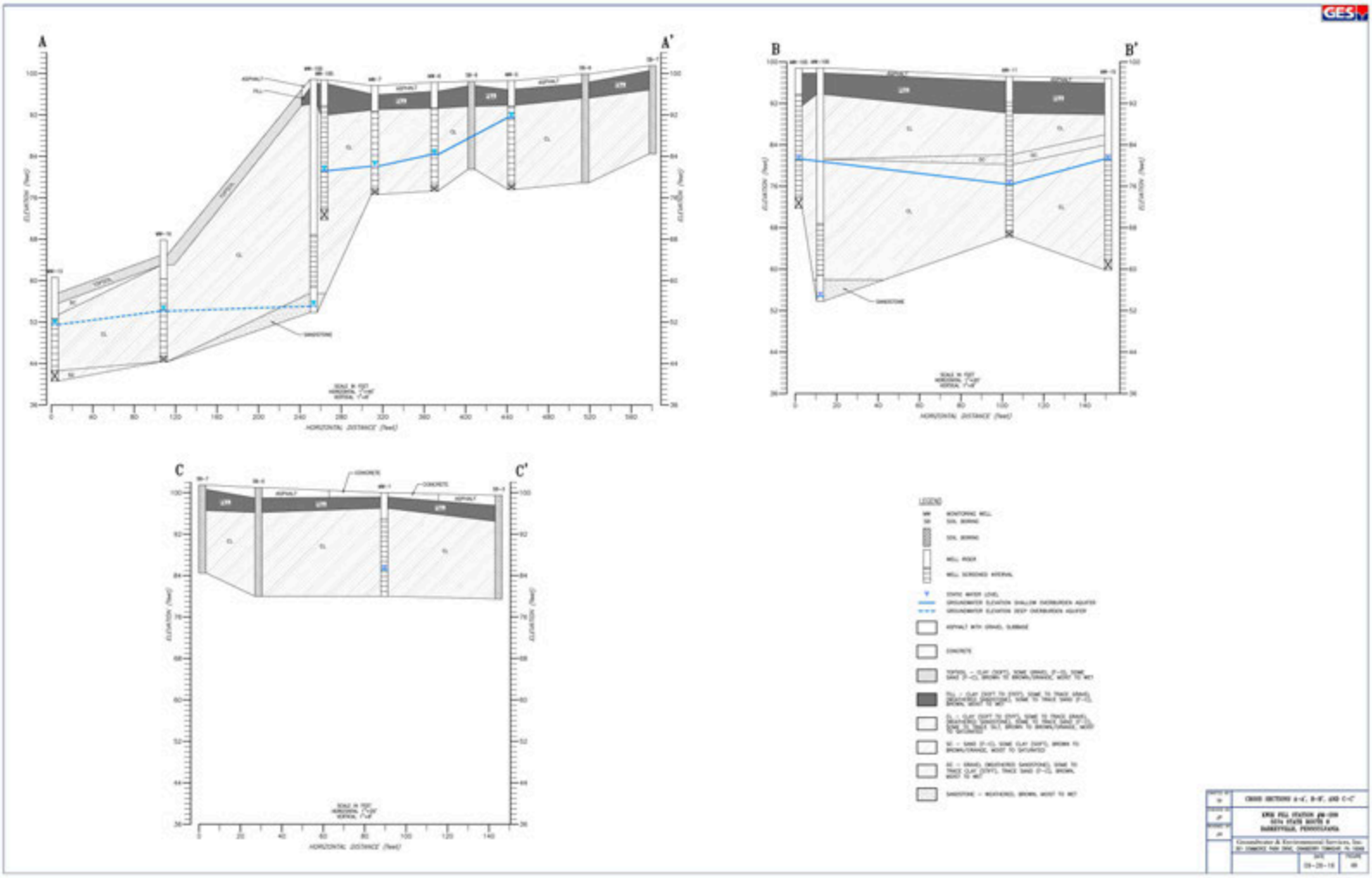
- Pa — Allegheny Formation
- Pp — Pottsville Formation

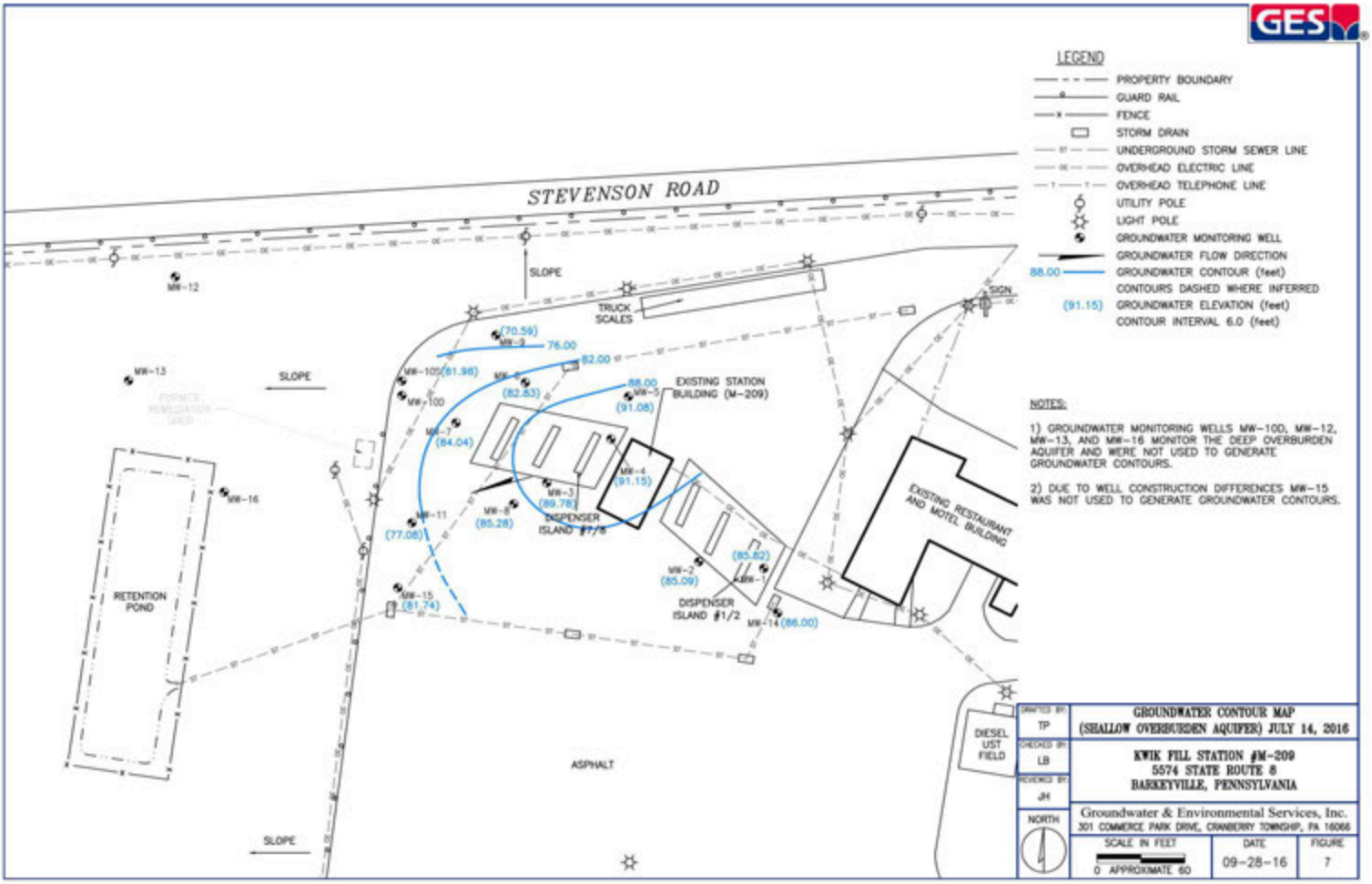
Sources:
Berg, T. M., Geyer, A. R., Edmunds, W. E., and others, compilers, 1980, Geologic map of Pennsylvania, Pennsylvania Geological Survey, 4th ser., Map 1. Scale 1:250,000.Shown greatly enlarged, locations considered approximate.
USGS 7.5 minute topographic quadrangles, scale 1:24,000

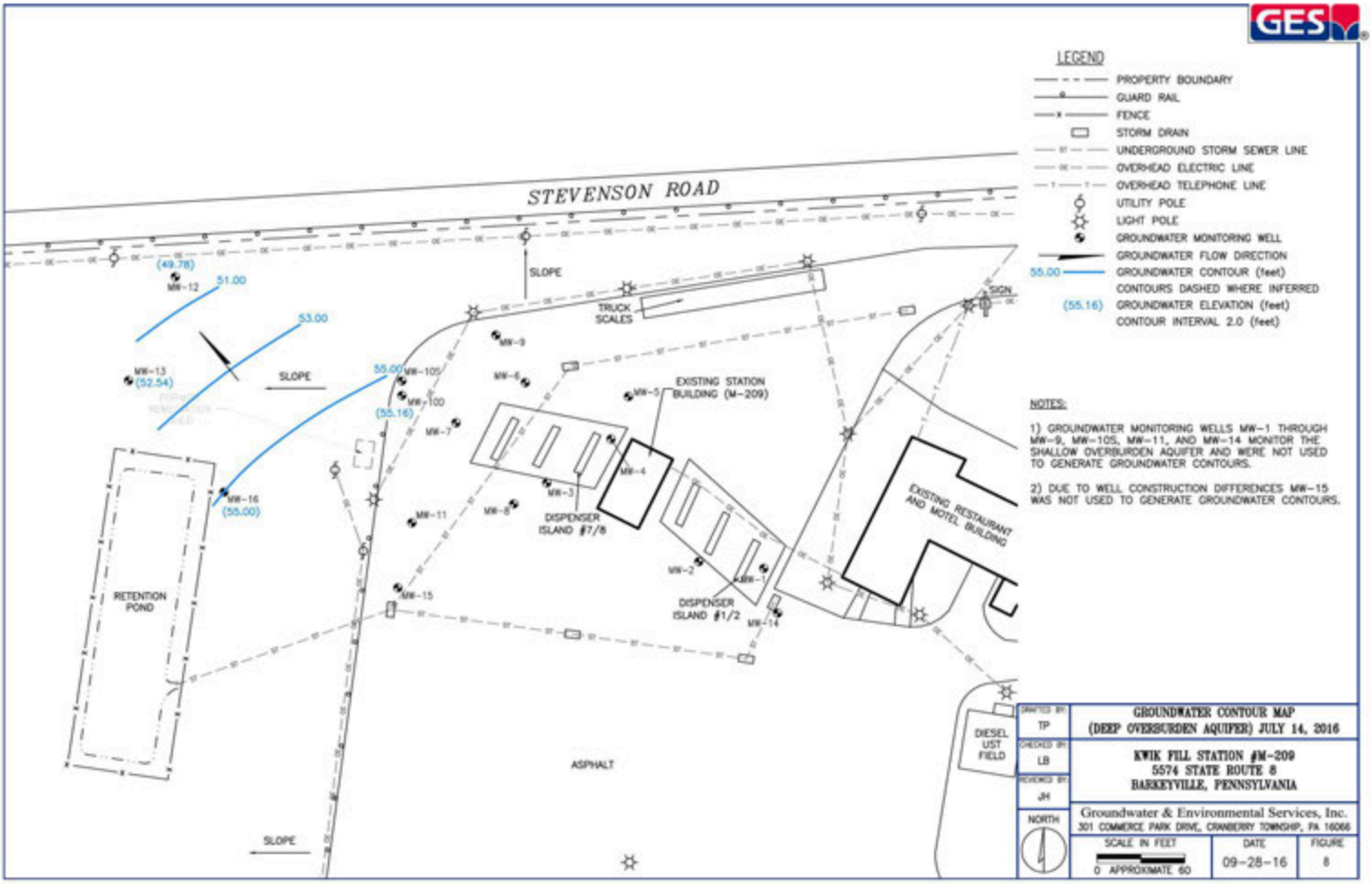
DRAFTED BY: GKS	HEDROCK GEOLOGIC MAP
CHECKED BY: DMC	KWIK FILL STATION #M-209/229 5574 STATE ROUTE 8 BARKEYVILLE, PA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DR, CRANBERRY TOWNSHIP, PA 16066
NORTH	APPROX. SCALE IN FEET: 0 — 2,000
	DATE: 6-15-15
	FIGURE: 5

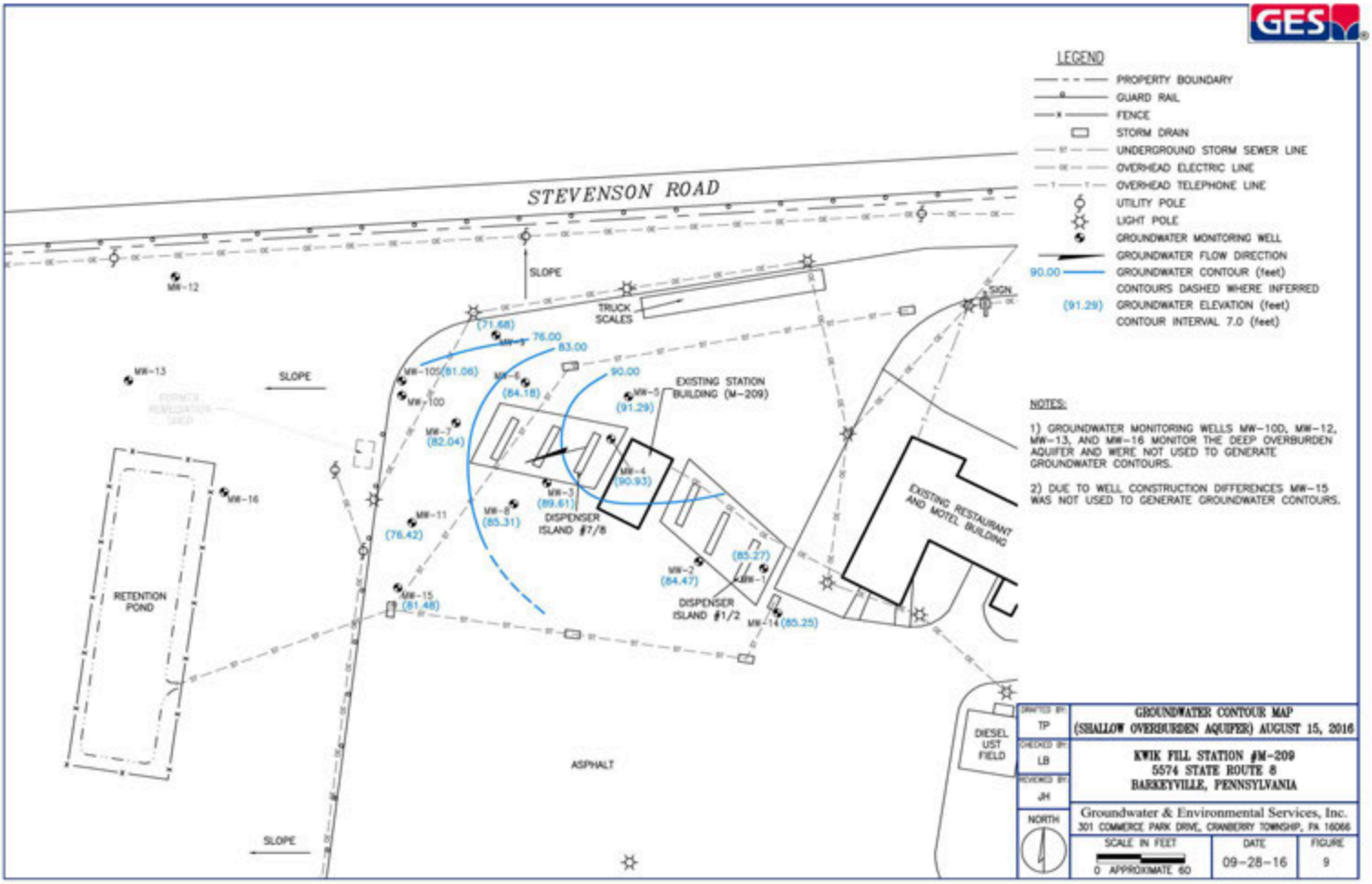


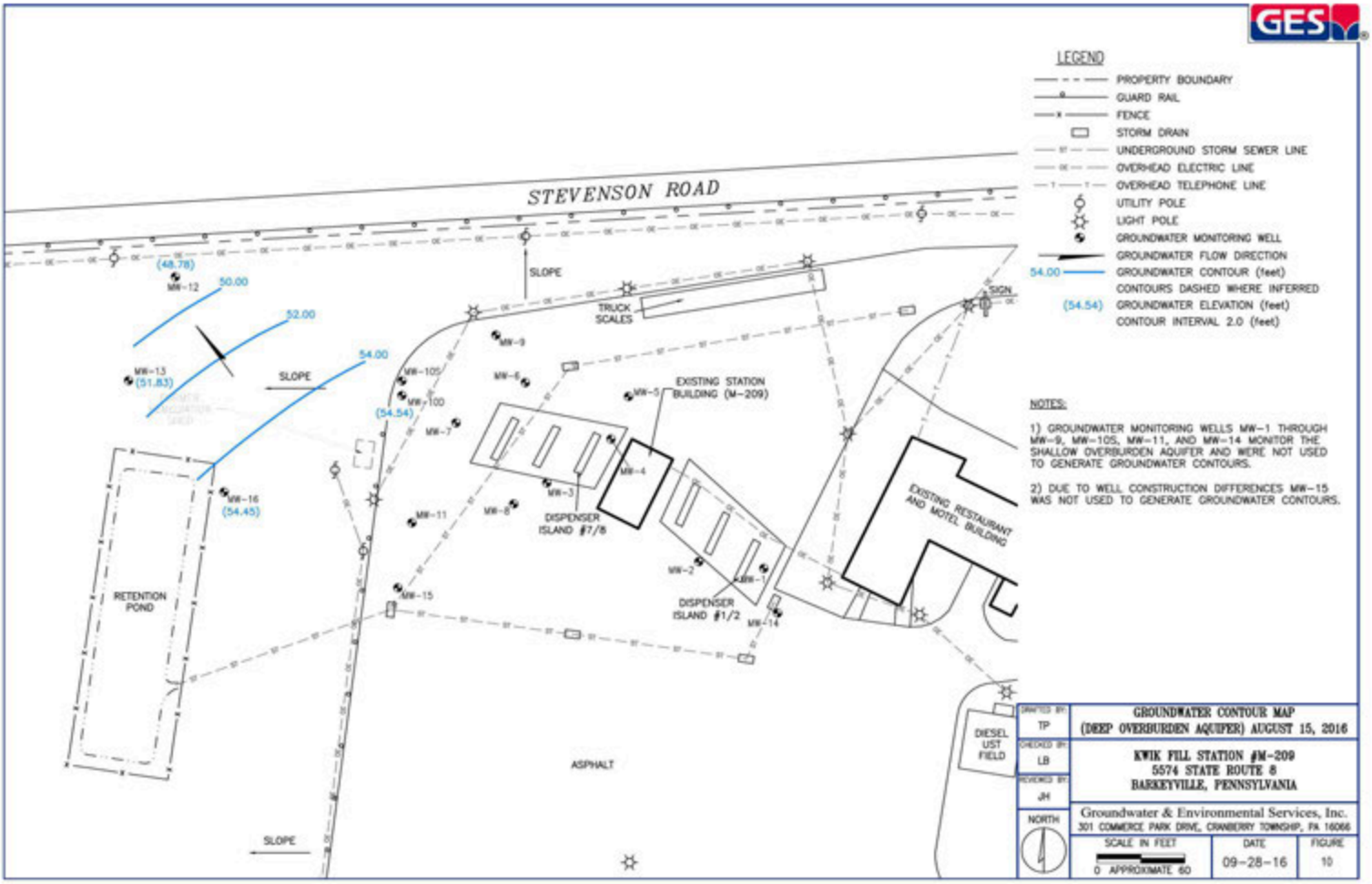
DRAWN BY: TP	CROSS-SECTION LOCATION MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 6A

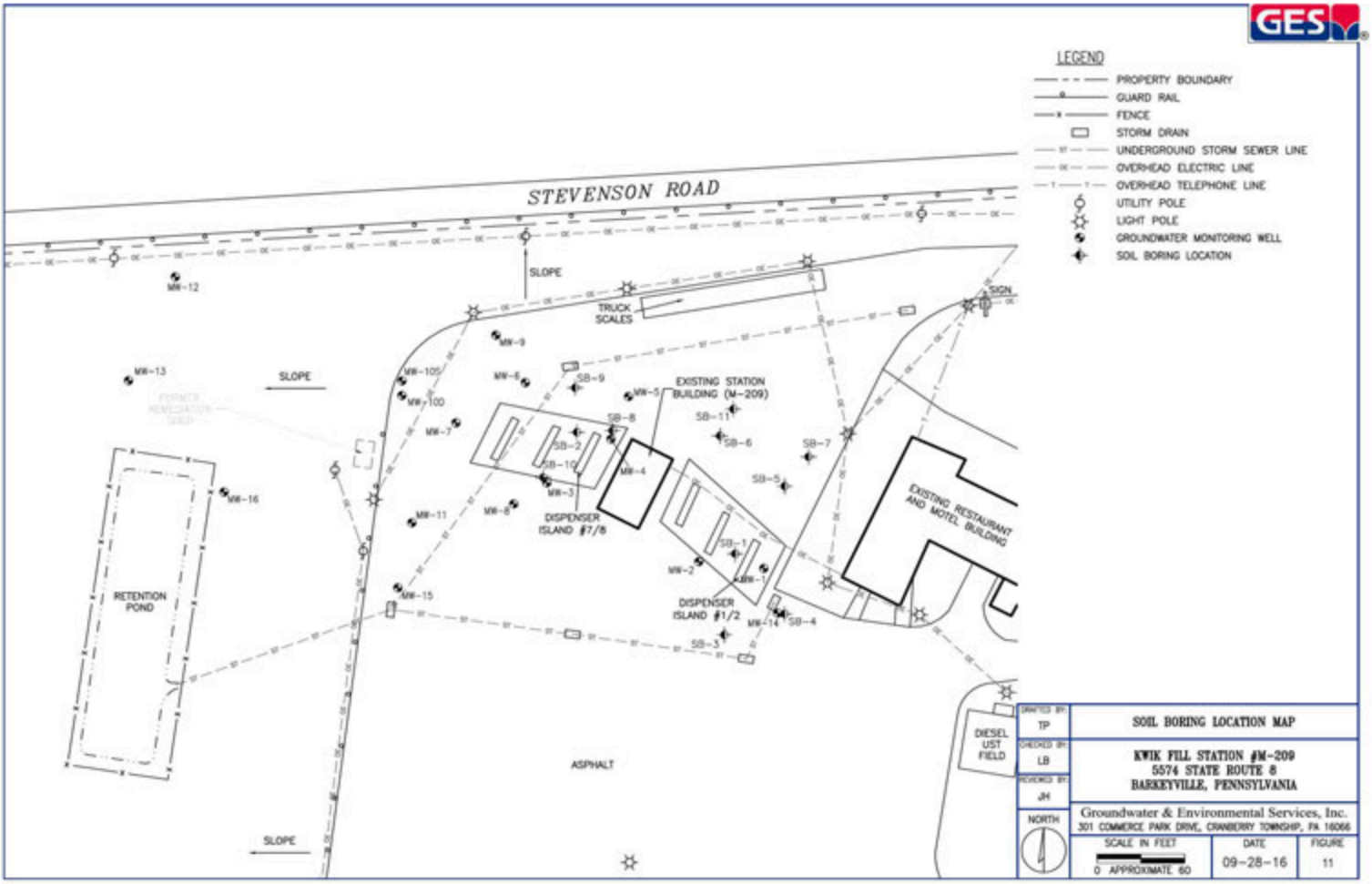

A
A'
B
B'
C
C'
ELEVATION (feet)
HORIZONTAL DISTANCE (feet)
SANDSTONE
LEGEND
CROSS SECTIONS A-A', B-B', AND C-C'
Groundwater & Environmental Services, Inc.


STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
MW-12
MW-13
MW-105 (81.98)
MW-100
MW-9 (70.59)
76.00
82.00
MW-5 (82.83)
88.00
MW-5 (91.08)
EXISTING STATION BUILDING (M-209)
MW-7 (84.04)
MW-4 (91.15)
MW-16
MW-11 (77.08)
MW-8 (85.28)
MW-3 (89.78)
DISPENSER ISLAND #7/8
(85.82)
MW-2 (85.09)
MW-1
DISPENSER ISLAND #1/2
MW-14 (86.00)
MW-15 (81.74)
EXISTING RESTAURANT AND MOTEL BUILDING
RETENTION POND
DIESEL UST FIELD
ASPHALT
SLOPE
SLOPE
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
GROUNDWATER FLOW DIRECTION
88.00 GROUNDWATER CONTOUR (feet)
CONTOURS DASHED WHERE INFERRED
(91.15) GROUNDWATER ELEVATION (feet)
CONTOUR INTERVAL 6.0 (feet)
NOTES:
1) GROUNDWATER MONITORING WELLS MW-10D, MW-12, MW-13, AND MW-16 MONITOR THE DEEP OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.
2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
GROUNDWATER CONTOUR MAP
(SHALLOW OVERBURDEN AQUIFER) JULY 14, 2016
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
7

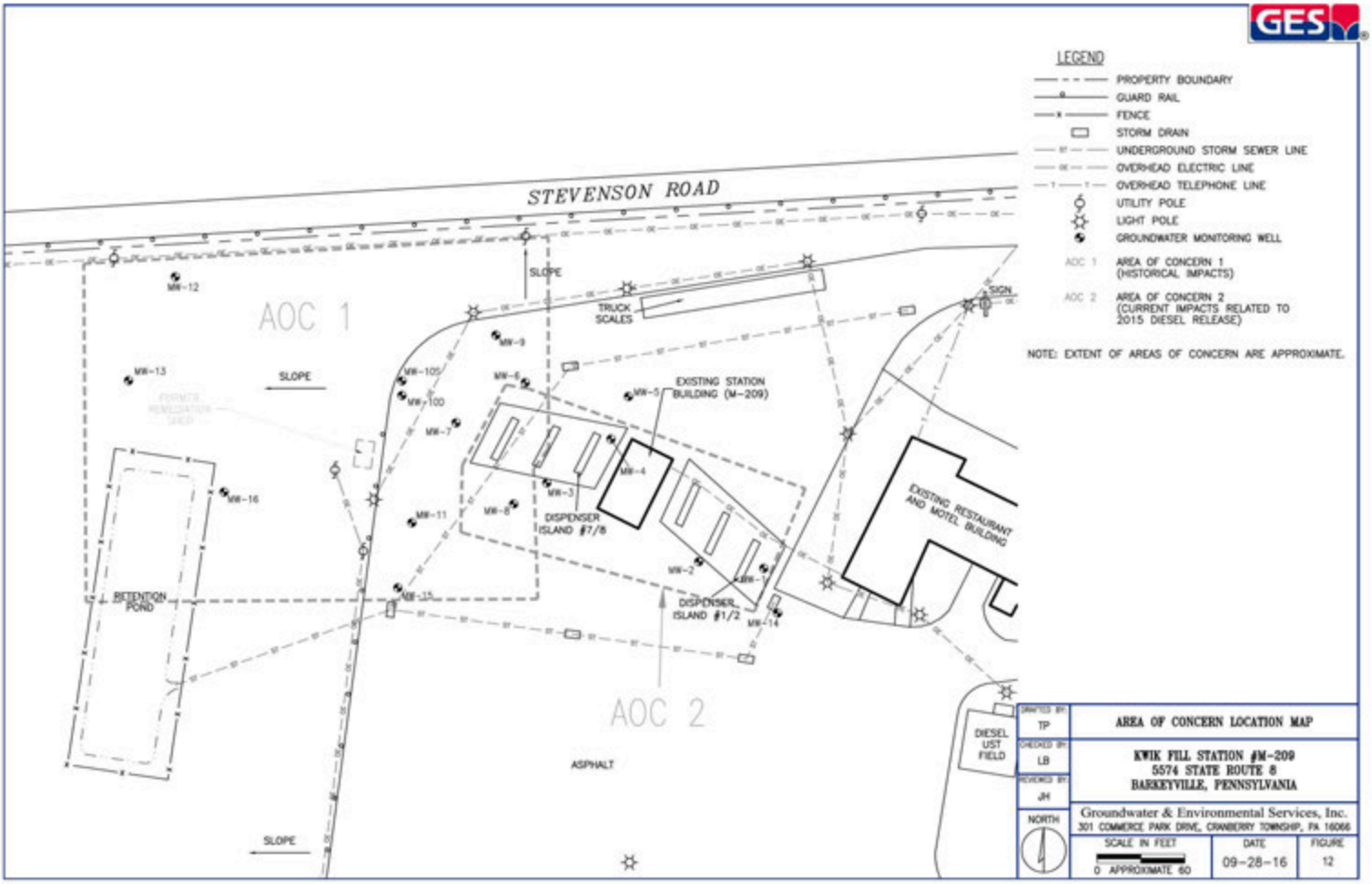

STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
(49.78)
MW-12
51.00
53.00
MW-13
(52.54)
SLOPE
55.00
MW-105
MW-100
(55.16)
MW-9
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-7
MW-4
MW-3
MW-8
DISPENSER ISLAND #7/8
MW-16
(55.00)
MW-11
EXISTING RESTAURANT AND MOTEL BUILDING
MW-2
MW-1
MW-15
DISPENSER ISLAND #1/2
MW-14
RETENTION POND
DIESEL UST FIELD
ASPHALT
SLOPE
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
GROUNDWATER FLOW DIRECTION
55.00 GROUNDWATER CONTOUR (feet)
CONTOURS DASHED WHERE INFERRED
(55.16) GROUNDWATER ELEVATION (feet)
CONTOUR INTERVAL 2.0 (feet)
NOTES:
1) GROUNDWATER MONITORING WELLS MW-1 THROUGH MW-9, MW-10S, MW-11, AND MW-14 MONITOR THE SHALLOW OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.
2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
GROUNDWATER CONTOUR MAP
(DEEP OVERBURDEN AQUIFER) JULY 14, 2016
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
8

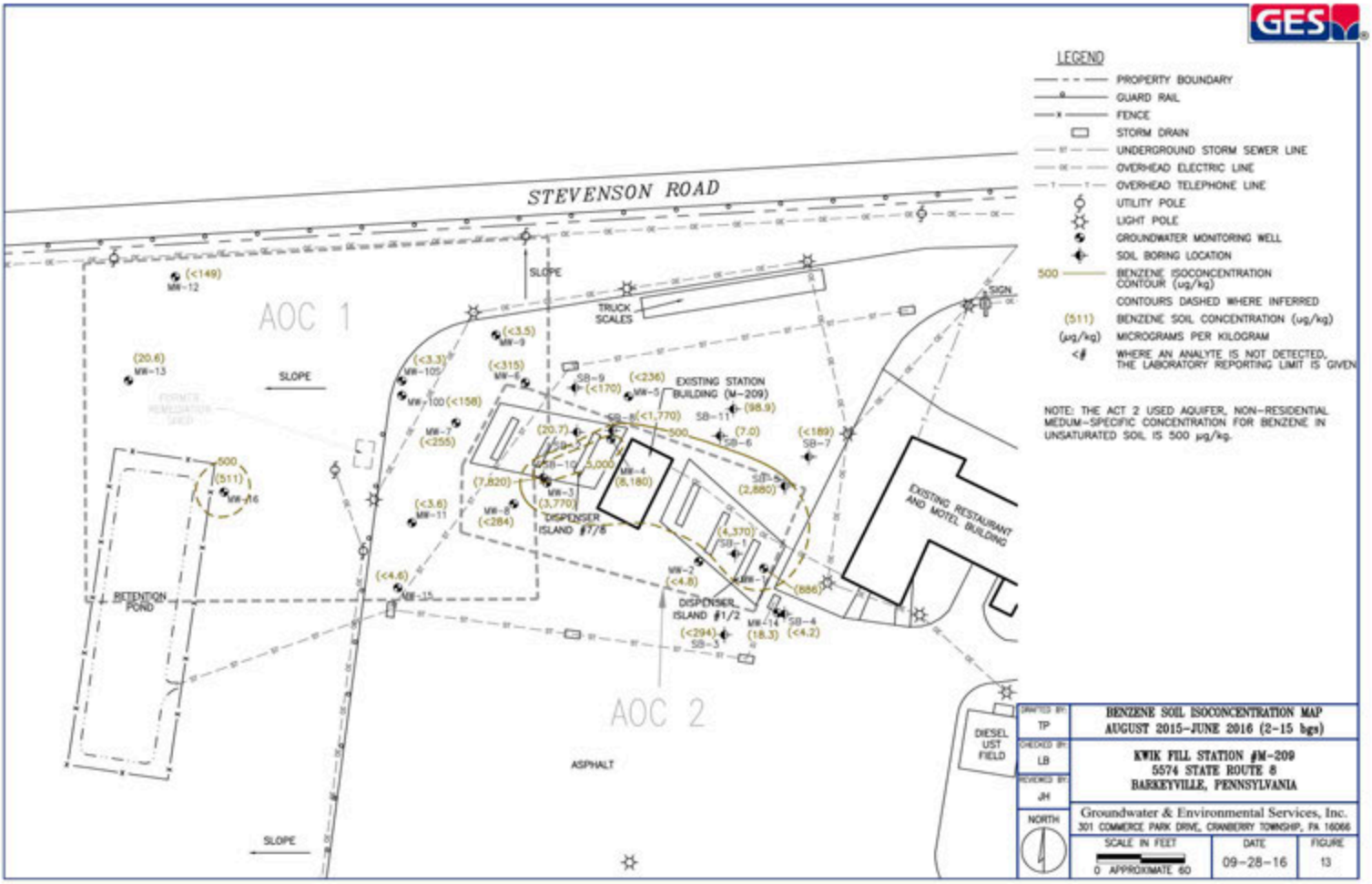

STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
MW-12
MW-13
MW-105 (81.06)
MW-100
MW-7 (82.04)
MW-16
MW-11 (76.42)
MW-15 (81.48)
RETENTION POND
MW-8 (85.31)
MW-3 (89.61)
MW-6 (84.18)
MW-5 (91.29)
MW-4 (90.93)
EXISTING STATION BUILDING (M-209)
DISPENSER ISLAND #7/8
DISPENSER ISLAND #1/2
MW-2 (84.47)
MW-1 (85.27)
MW-14 (85.25)
EXISTING RESTAURANT AND MOTEL BUILDING
DIESEL UST FIELD
ASPHALT
(71.68)
76.00
83.00
90.00
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
GROUNDWATER FLOW DIRECTION
90.00 GROUNDWATER CONTOUR (feet)
CONTOURS DASHED WHERE INFERRED
(91.29) GROUNDWATER ELEVATION (feet)
CONTOUR INTERVAL 7.0 (feet)
NOTES:
1) GROUNDWATER MONITORING WELLS MW-10D, MW-12, MW-13, AND MW-16 MONITOR THE DEEP OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.
2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
GROUNDWATER CONTOUR MAP
(SHALLOW OVERBURDEN AQUIFER) AUGUST 15, 2016
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
9


STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
(48.78)
MW-12
50.00
52.00
54.00
MW-13
(51.83)
SLOPE
MW-105
MW-100
(54.54)
MW-7
MW-6
MW-9
MW-5
EXISTING STATION BUILDING (M-209)
MW-4
MW-3
MW-8
DISPENSER ISLAND #7/8
MW-11
MW-16
(54.45)
RETENTION POND
MW-15
MW-2
MW-1
DISPENSER ISLAND #1/2
MW-14
EXISTING RESTAURANT AND MOTEL BUILDING
DIESEL UST FIELD
ASPHALT
SLOPE
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
GROUNDWATER FLOW DIRECTION
54.00 GROUNDWATER CONTOUR (feet)
CONTOURS DASHED WHERE INFERRED
(54.54) GROUNDWATER ELEVATION (feet)
CONTOUR INTERVAL 2.0 (feet)
NOTES:
1) GROUNDWATER MONITORING WELLS MW-1 THROUGH MW-9, MW-10S, MW-11, AND MW-14 MONITOR THE SHALLOW OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.
2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
GROUNDWATER CONTOUR MAP
(DEEP OVERBURDEN AQUIFER) AUGUST 15, 2016
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
10



DRAWN BY: TP	SOIL BORING LOCATION MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 11


STEVENSON ROAD
AOC 1
AOC 2
SLOPE
TRUCK SCALES
SIGN
EXISTING STATION BUILDING (M-209)
EXISTING RESTAURANT AND MOTEL BUILDING
DISPENSER ISLAND #7/8
DISPENSER ISLAND #1/2
RETENTION POND
DIESEL UST FIELD
ASPHALT
MW-12
MW-13
MW-105
MW-100
MW-9
MW-6
MW-5
MW-7
MW-4
MW-3
MW-8
MW-16
MW-11
MW-15
MW-2
MW-1
MW-14
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
AOC 1 AREA OF CONCERN 1 (HISTORICAL IMPACTS)
AOC 2 AREA OF CONCERN 2 (CURRENT IMPACTS RELATED TO 2015 DIESEL RELEASE)
NOTE: EXTENT OF AREAS OF CONCERN ARE APPROXIMATE.
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
AREA OF CONCERN LOCATION MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
12

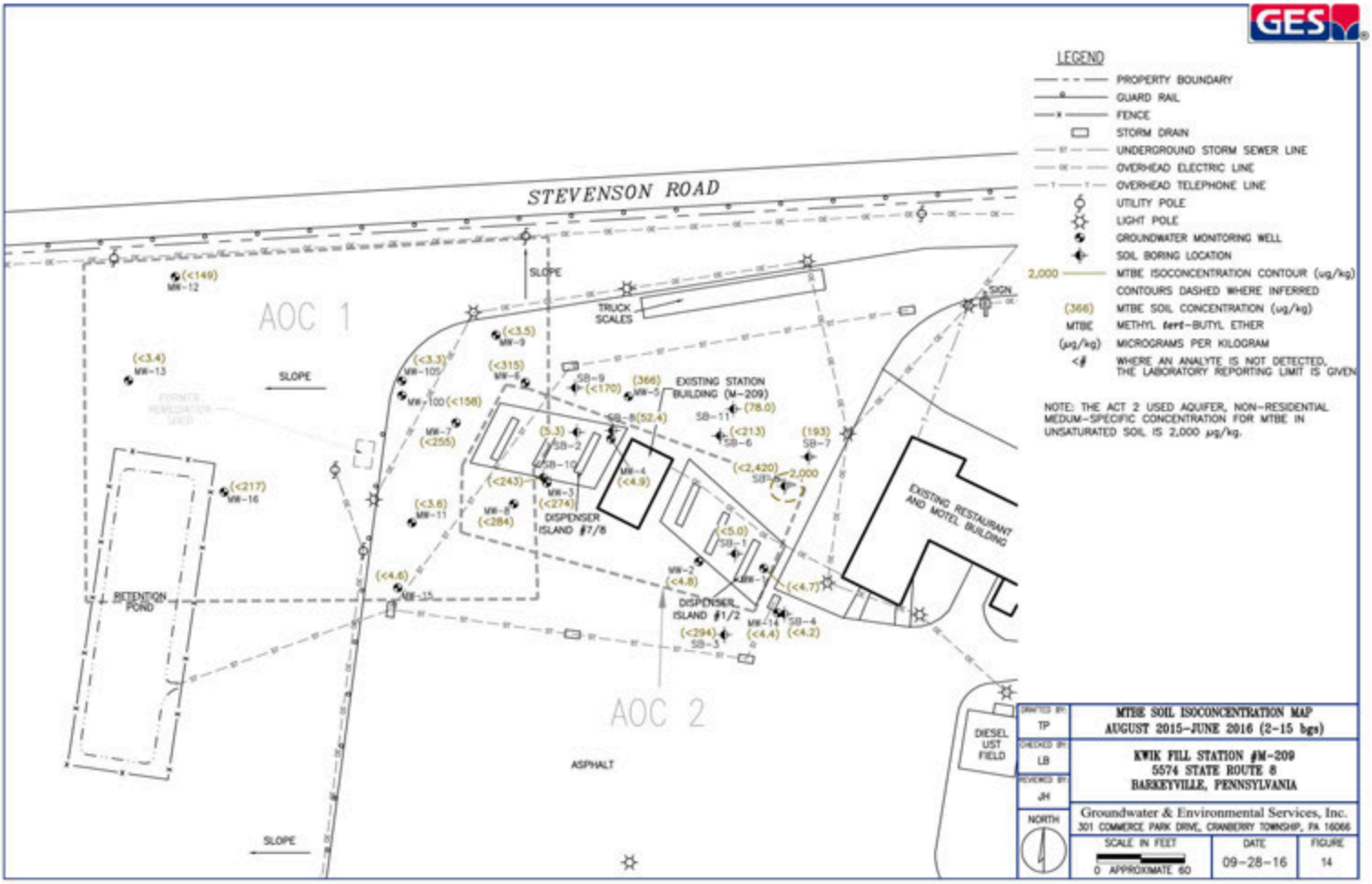


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- SOIL BORING LOCATION
- 500 — BENZENE ISOCONCENTRATION CONTOUR (ug/kg)
- CONTOURS DASHED WHERE INFERRED
- (511) BENZENE SOIL CONCENTRATION (ug/kg)
- (µg/kg) MICROGRAMS PER KILOGRAM
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR BENZENE IN UNSATURATED SOIL IS 500 µg/kg.

DRAWN BY: TP	BENZENE SOIL ISOCONCENTRATION MAP AUGUST 2015-JUNE 2016 (2-15 bgs)
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 13

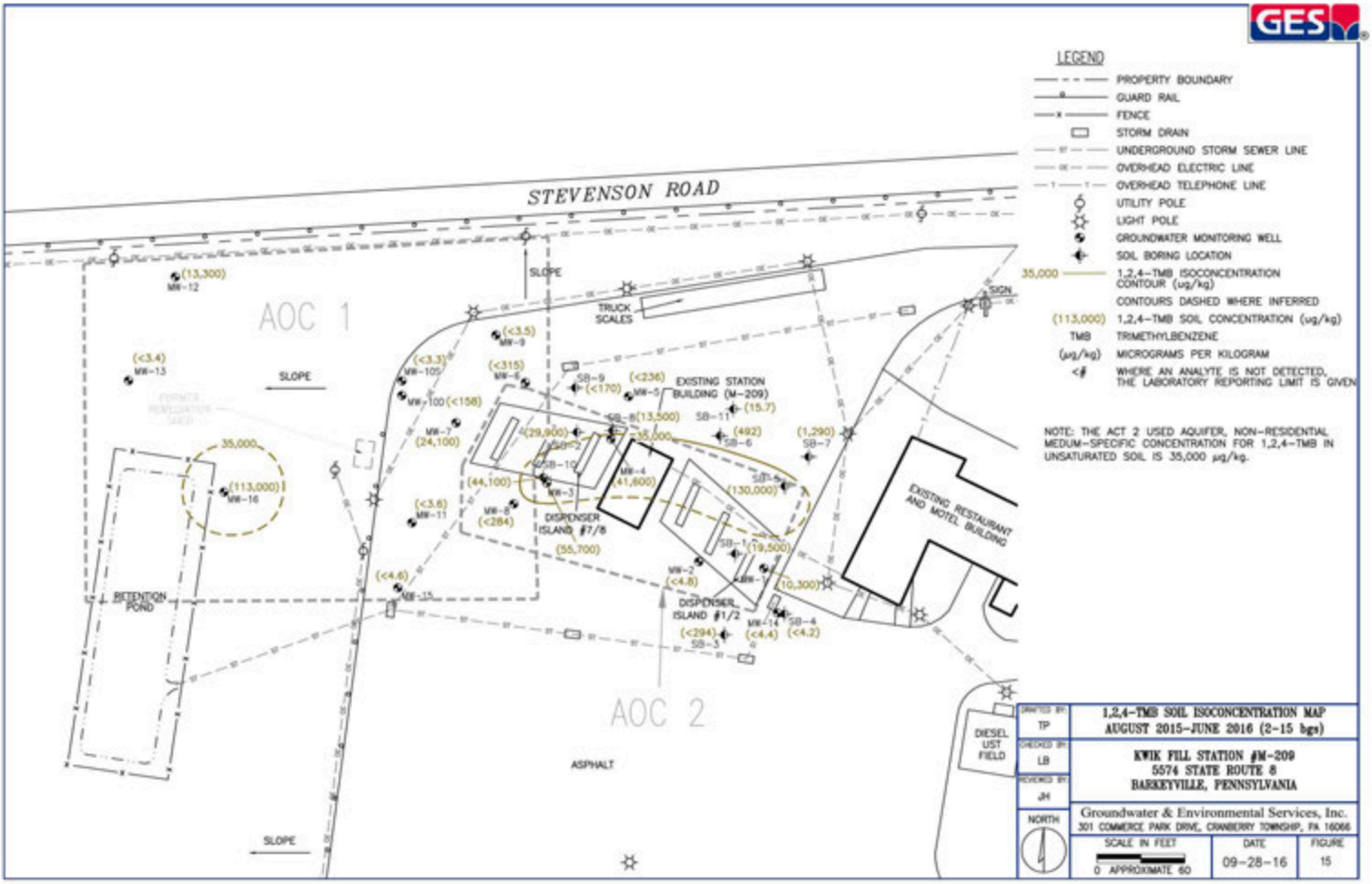


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- SOIL BORING LOCATION
- 2,000 — MTBE ISOCONCENTRATION CONTOUR (ug/kg) CONTOURS DASHED WHERE INFERRED
- (366) MTBE SOIL CONCENTRATION (ug/kg)
- MTBE METHYL tert-BUTYL ETHER
- (µg/kg) MICROGRAMS PER KILOGRAM
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR MTBE IN UNSATURATED SOIL IS 2,000 µg/kg.

DRAWN BY: TP	MTBE SOIL ISOCONCENTRATION MAP AUGUST 2015-JUNE 2016 (2-15 bgs)
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 14

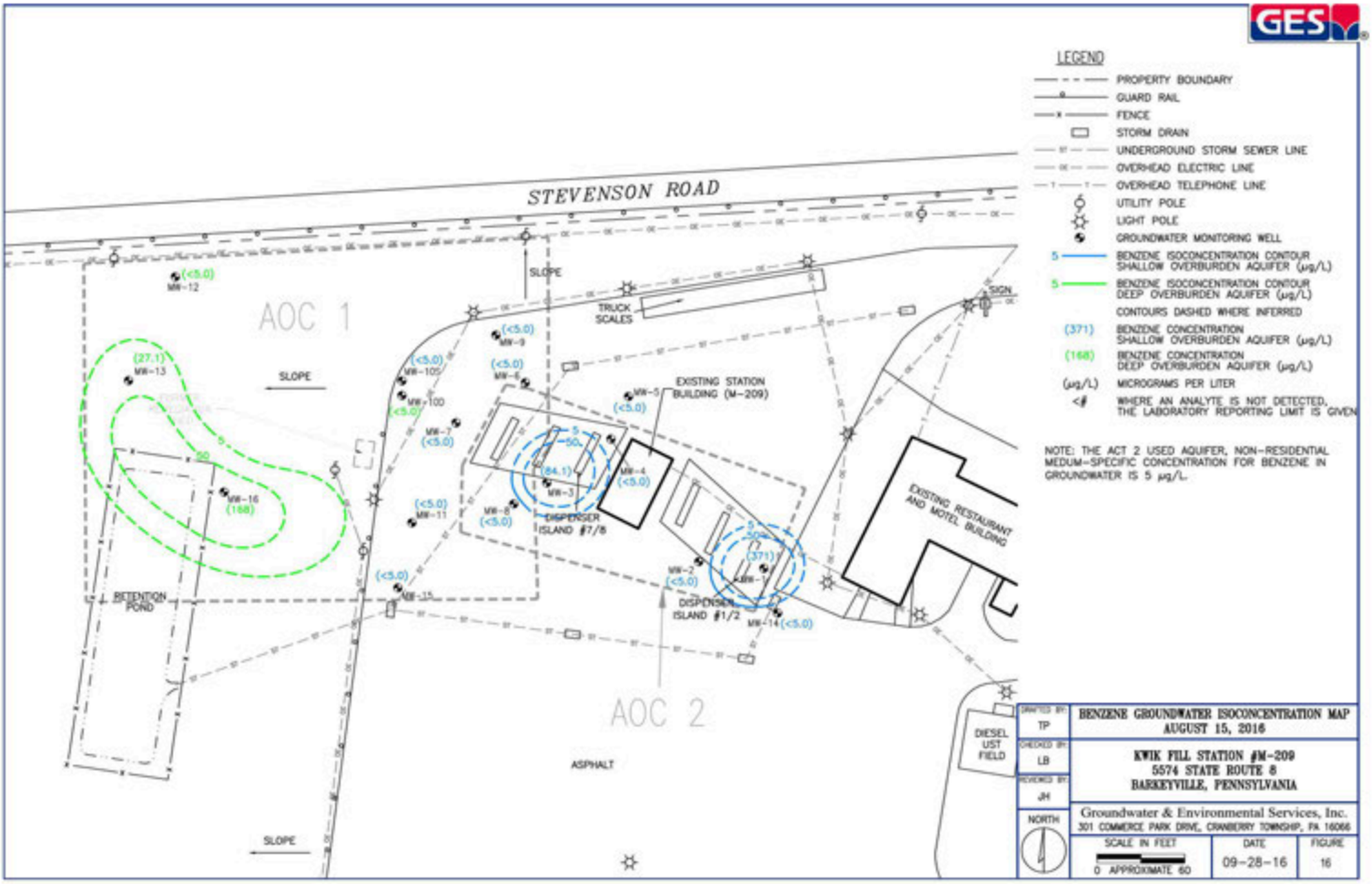


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- SOIL BORING LOCATION
- 35,000 — 1,2,4-TMB ISOCONCENTRATION CONTOUR (ug/kg)
- CONTOURS DASHED WHERE INFERRED
- (113,000) 1,2,4-TMB SOIL CONCENTRATION (ug/kg)
- TMB TRIMETHYLBENZENE
- (µg/kg) MICROGRAMS PER KILOGRAM
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR 1,2,4-TMB IN UNSATURATED SOIL IS 35,000 µg/kg.

DRAWN BY: TP	1,2,4-TMB SOIL ISOCONCENTRATION MAP AUGUST 2015-JUNE 2016 (2-15 bgs)
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 15

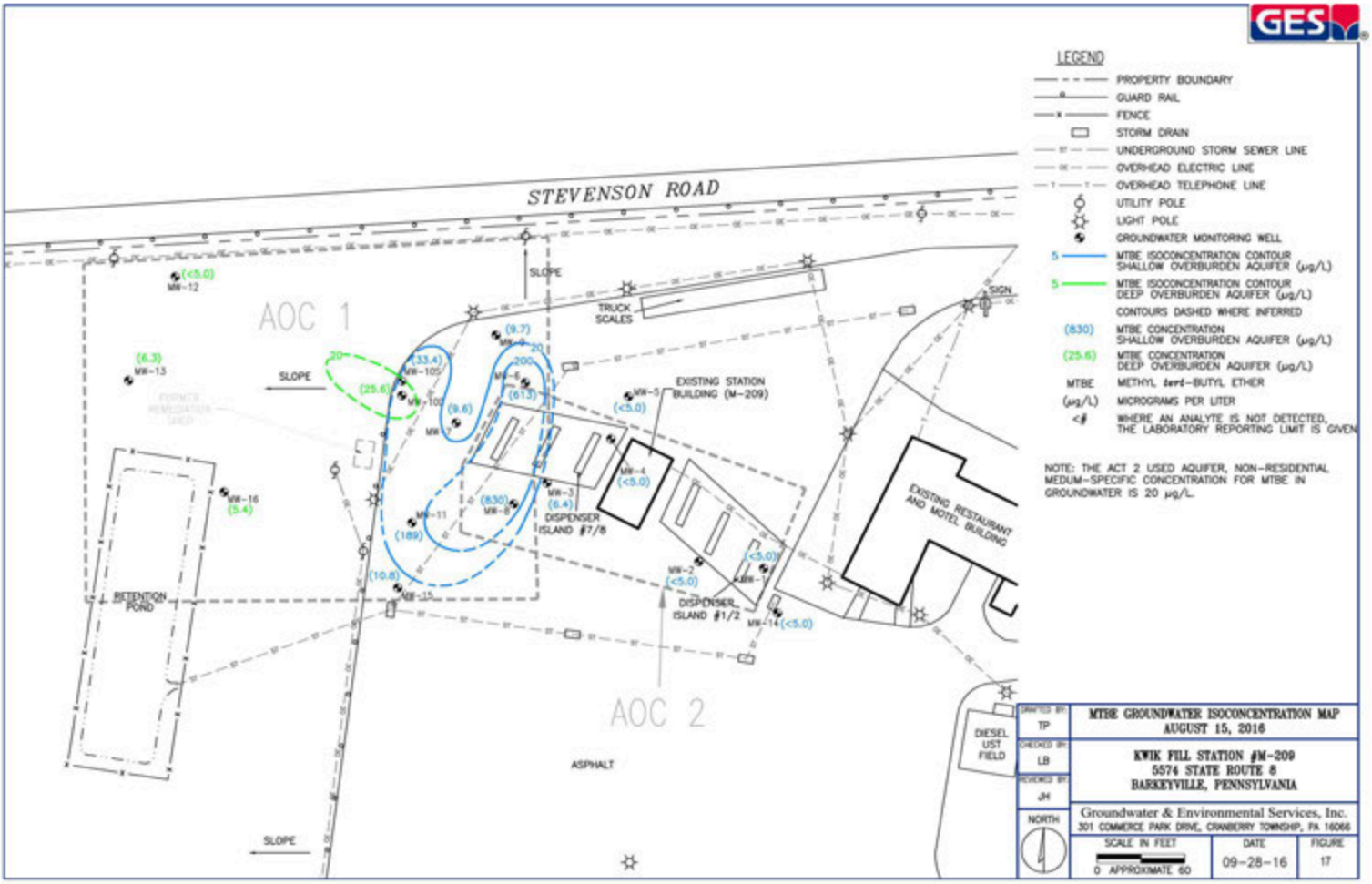


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 5 — BENZENE ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 5 — BENZENE ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (371) BENZENE CONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (168) BENZENE CONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- (µg/L) MICROGRAMS PER LITER
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR BENZENE IN GROUNDWATER IS 5 µg/L.

DRAWN BY: TP	**BENZENE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016**
CHECKED BY: LB	**KWIK FILL STATION #M-209** **5574 STATE ROUTE 8** **BARKEYVILLE, PENNSYLVANIA**
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 16

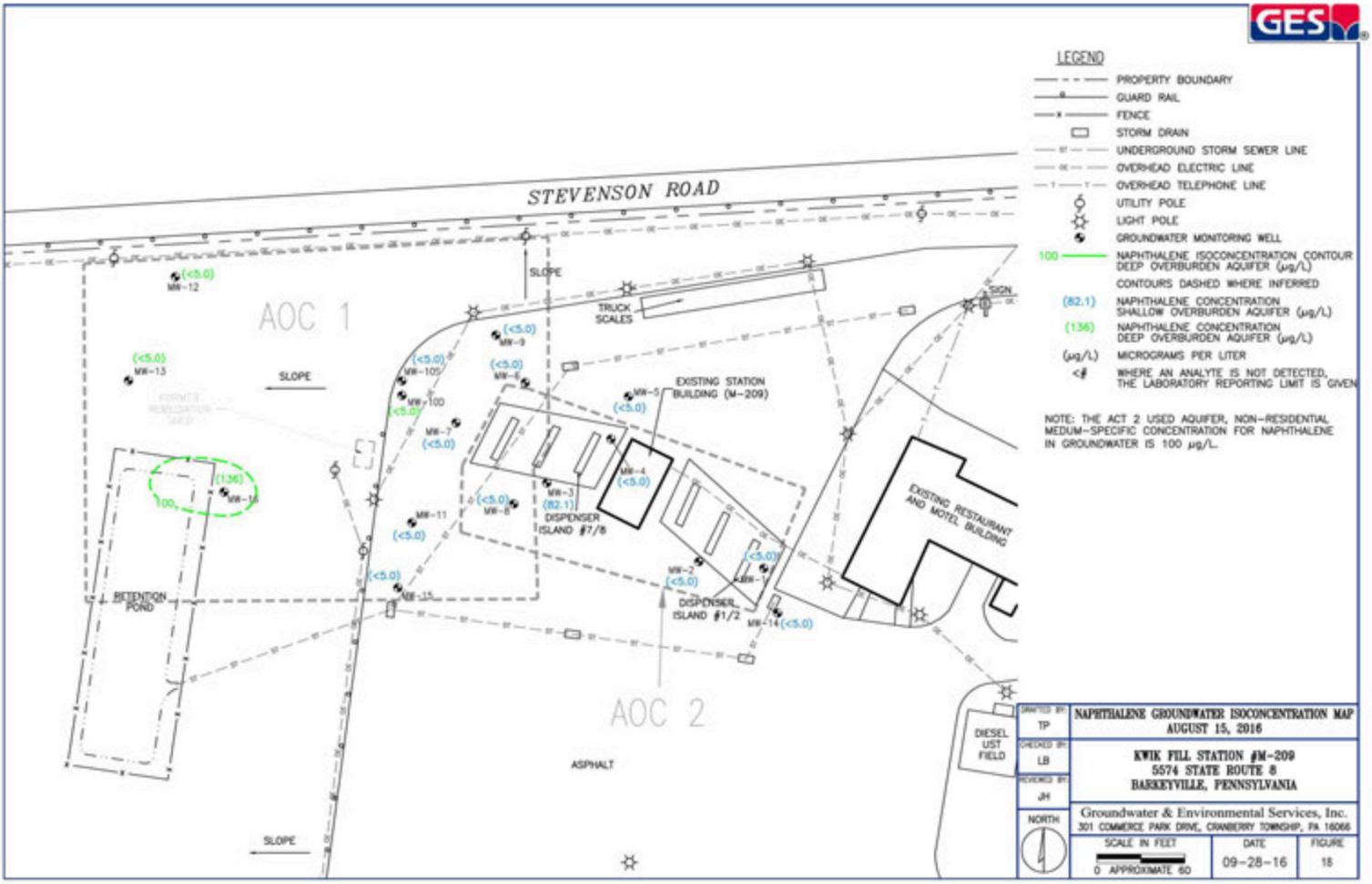


LEGEND

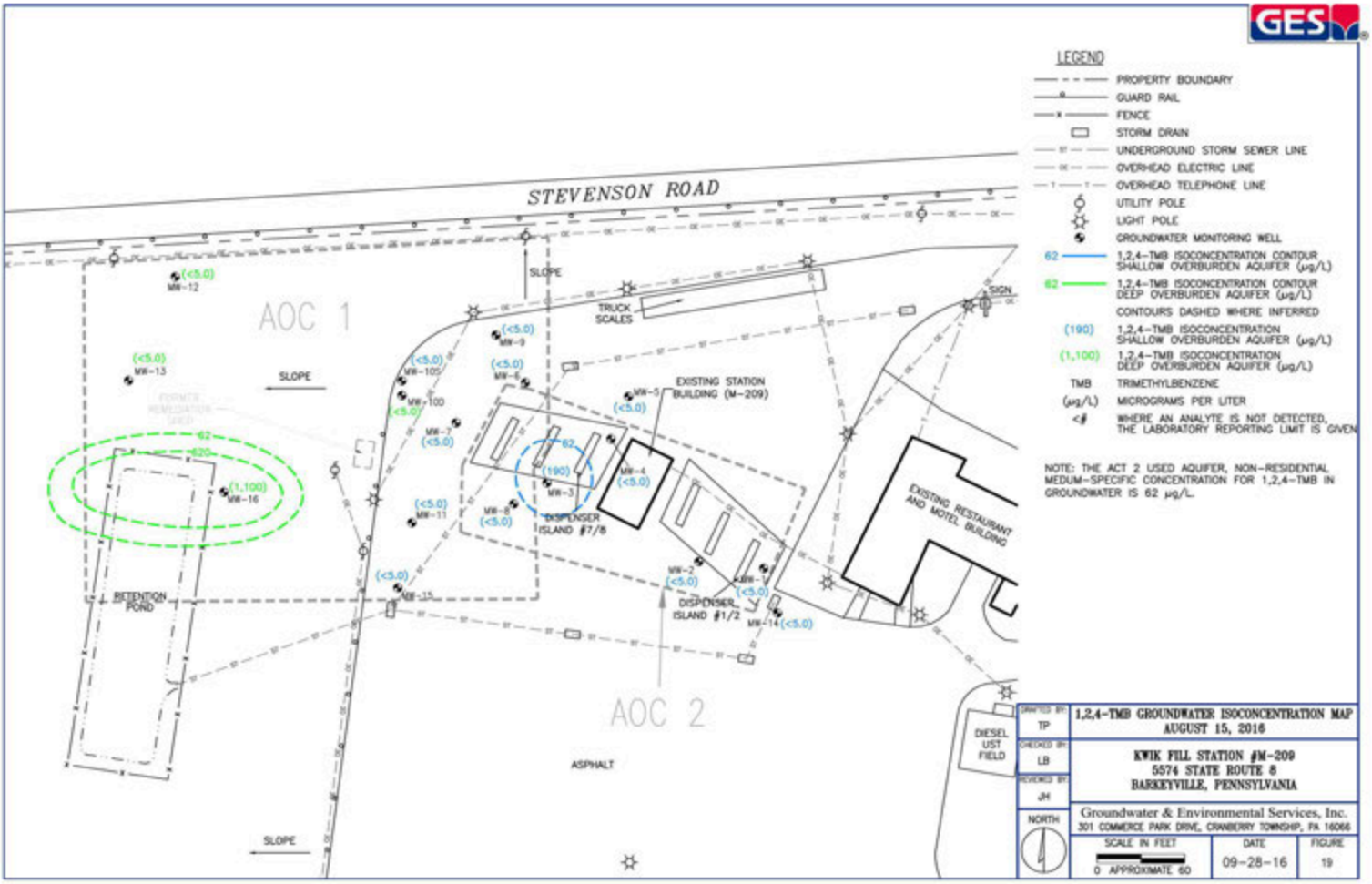
- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 5 — MTBE ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 5 — MTBE ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (830) MTBE CONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (25.6) MTBE CONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- MTBE — METHYL *tert*-BUTYL ETHER
- (µg/L) — MICROGRAMS PER LITER
- <# — WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR MTBE IN GROUNDWATER IS 20 µg/L.

DRAWN BY: TP	**MTBE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016**
CHECKED BY: LB	**KWIK FILL STATION #M-209** **5574 STATE ROUTE 8** **BARKEYVILLE, PENNSYLVANIA**
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 17



DRAWN BY: TP	NAPHTHALENE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET	DATE: 09-28-16
	FIGURE: 18



LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 62 — 1,2,4-TMB ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 62 — 1,2,4-TMB ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (190) 1,2,4-TMB ISOCONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (1,100) 1,2,4-TMB ISOCONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- TMB TRIMETHYLBENZENE
- (µg/L) MICROGRAMS PER LITER
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR 1,2,4-TMB IN GROUNDWATER IS 62 µg/L.

DRAWN BY: TP	1,2,4-TMB GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 19

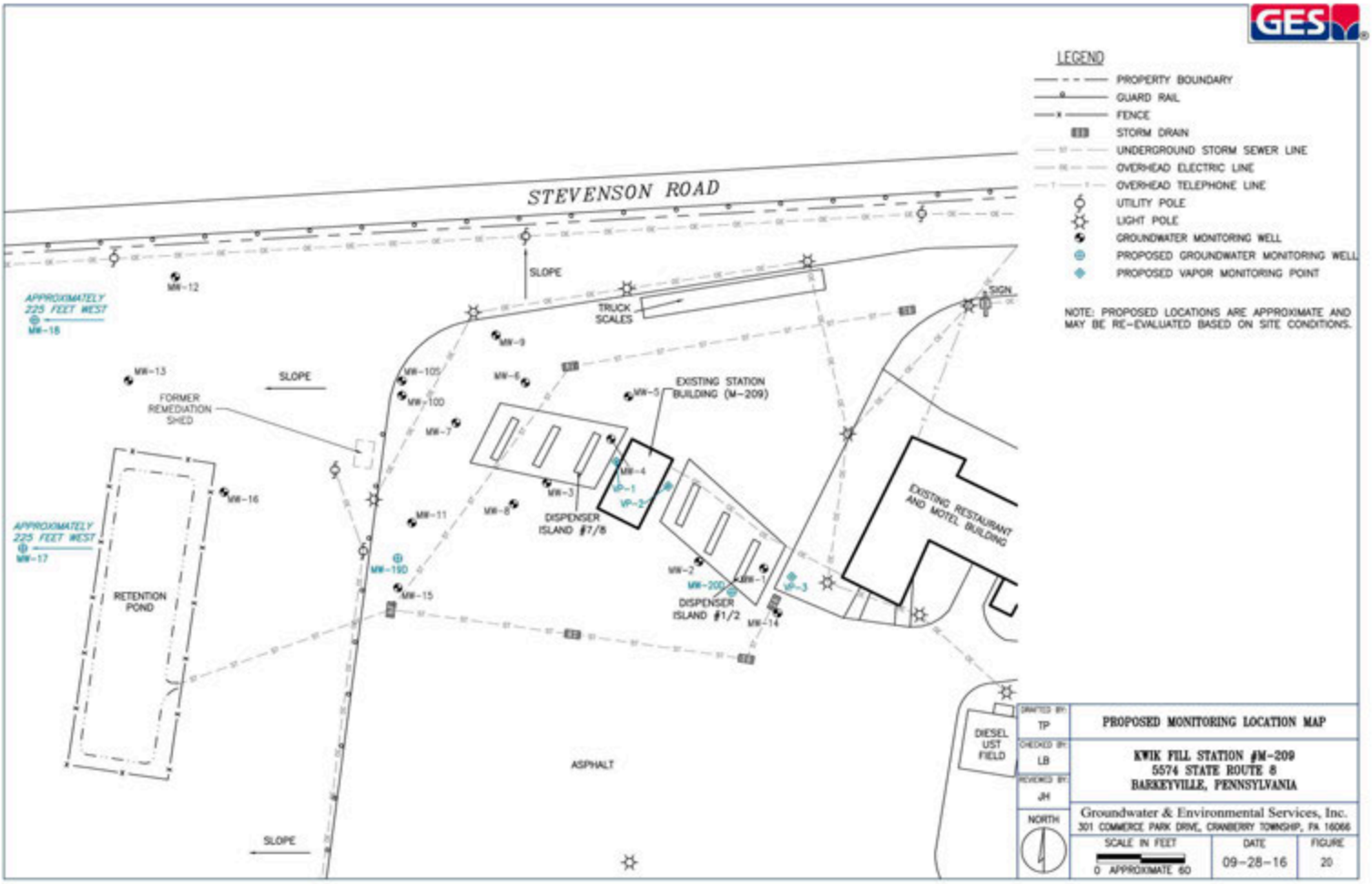

STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
APPROXIMATELY 225 FEET WEST
MW-18
MW-12
MW-13
SLOPE
FORMER REMEDIATION SHED
MW-105
MW-10D
MW-7
MW-9
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-4
VP-1
VP-2
MW-3
MW-8
DISPENSER ISLAND #7/8
EXISTING RESTAURANT AND MOTEL BUILDING
MW-16
APPROXIMATELY 225 FEET WEST
MW-17
MW-11
MW-19D
MW-15
RETENTION POND
MW-2
MW-20D
MW-1
VP-3
DISPENSER ISLAND #1/2
MW-14
DIESEL UST FIELD
ASPHALT
SLOPE
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
PROPOSED GROUNDWATER MONITORING WELL
PROPOSED VAPOR MONITORING POINT
NOTE: PROPOSED LOCATIONS ARE APPROXIMATE AND MAY BE RE-EVALUATED BASED ON SITE CONDITIONS.
DRAFTED BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
PROPOSED MONITORING LOCATION MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
20

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		**5**	**1,000**	**700**	**20**	**3,500**	**100**	**62**	**1,200**
MW-1	10/30/15	100.00	14.15	85.85	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	12/28/15	100.00	12.06	87.94	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	100.00	13.44	86.56	**40.0 M1**	25.0 M1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	100.00	10.83	89.17	**96.4**	53.5	7.9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	100.00	13.58	86.42	**333**	21.1	36.5	< 5.0	5.3	< 5.0	14.7	< 5.0
	07/14/16	100.00	14.18	85.82	**59.7**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	100.00	14.73	85.27	**371**	< 5.0	26.8	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-2	10/30/15	99.18	14.04	85.14	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	12/28/15	99.18	13.28	85.90	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	99.18	14.28	84.90	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	99.18	12.79	86.39	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	99.18	13.64	85.54	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	99.18	14.09	85.09	< 5.0	< 5.0	< 5.0	6.0	< 5.0	< 5.0M1	< 5.0	< 5.0
	08/15/16	99.18	14.71	84.47	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-3	10/30/15	98.83	8.45	90.38	**17.2**	< 5.0	< 5.0	**113**	< 5.0	9.0	24.7	9.9
	12/28/15	98.83	8.59	90.24	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.1	< 5.0
	01/28/16	98.83	9.37	89.46	**58.5**	< 5.0	< 5.0	18.2	< 5.0	< 5.0	6.2	< 5.0
	04/14/16	98.83	8.02	90.81	**227**	48.3	36.6	17.0	< 5.0	25.5	**80.0**	28.8
	05/23/16	98.83	9.10	89.73	**260**	23.7	50.6	8.5	9.2	33.7	**140**	45.0
	07/14/16	98.83	9.05	89.78	**164**	9.0	48.9	6.3	6.4	61.8	**129**	43.5
	08/15/16	98.83	9.22	89.61	**84.1**	10.4	68.7	6.4	8.4	82.1	**190**	59.7
MW-4	10/30/15	98.86	6.63	92.23	**8.3**	< 5.0	14.9	6.7	< 5.0	9.3	< 5.0	< 5.0
	12/28/15	98.86	5.42	93.44	< 5.0	< 5.0	< 5.0	7.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.86	7.11	91.75	< 5.0	< 5.0	< 5.0	8.8	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.86	6.82	92.04	**10.3**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.86	7.60	91.26	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.86	7.71	91.15	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.86	7.93	90.93	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-5	12/28/15	98.60	5.98	92.62	< 5.0	< 5.0	< 5.0	**22.6**	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.60	7.95	90.65	< 5.0	< 5.0	< 5.0	**55.8**	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.60	6.44	92.16	< 5.0	< 5.0	< 5.0	**50.4**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.60	7.41	91.19	< 5.0	< 5.0	< 5.0	18.3	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.60	7.52	91.08	< 5.0	< 5.0	< 5.0	7.3	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.60	7.31	91.29	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		5	1,000	700	20	3,500	100	62	1,200
MW-6	12/28/15	98.29	17.91	80.38	< 5.0	< 5.0	< 5.0	**1,850**	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.29	16.34	81.95	< 5.0	< 5.0	< 5.0	**827**	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.29	15.47	82.82	< 5.0	< 5.0	< 5.0	**598**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.29	15.33	82.96	< 5.0	< 5.0	< 5.0	**484**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.29	15.46	82.83	< 5.0	< 5.0	< 5.0	**550**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.29	14.11	84.18	< 5.0	< 5.0	< 5.0	**613**	< 5.0	< 5.0	< 5.0	< 5.0
MW-7	12/28/15	97.65	15.28	82.37	**5.2**	< 5.0	< 5.0	**262**	< 5.0	< 5.0	5.1	< 5.0
	01/28/16	97.65	14.12	83.53	< 5.0	< 5.0	< 5.0	**70.7**	5.4	< 5.0	15.0	7.3
	04/14/16	97.65	13.66	83.99	< 5.0	< 5.0	8.0	9.6	13.6	< 5.0	**81.4**	< 5.0
	05/23/16	97.65	13.52	84.13	< 5.0	< 5.0	12.3	8.3	12.5	< 5.0	**74.1**	< 5.0
	07/14/16	97.65	13.61	84.04	< 5.0	< 5.0	6.3	7.5	27.5	< 5.0	**212**	< 5.0
	08/15/16	97.65	15.61	82.04	< 5.0	< 5.0	< 5.0	9.6	8.1	< 5.0	34.3	< 5.0
MW-8	12/28/15	98.13	DRY	NA	-	-	-	-	-	-	-	-
	01/28/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	04/14/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	05/23/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	07/14/16	98.13	12.85	85.28	< 5.0	< 5.0	16.1	**633**	< 5.0	8.9	< 5.0	< 5.0
	08/15/16	98.13	12.82	85.31	< 5.0	< 5.0	5.2	**830**	< 5.0	< 5.0	< 5.0	< 5.0
MW-9	04/14/16	99.03	28.16	70.87	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	99.03	28.68	70.35	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	99.03	28.44	70.59	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	99.03	27.35	71.68	< 5.0	< 5.0	< 5.0	9.7	< 5.0	< 5.0	< 5.0	< 5.0
MW-10D	04/14/16	98.85	39.38	59.47	< 5.0	< 5.0	< 5.0	**23.4**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.85	39.49	59.36	< 5.0	< 5.0	< 5.0	15.6	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.85	43.69	55.16	< 5.0	< 5.0	< 5.0	9.1	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.85	44.31	54.54	< 5.0	< 5.0	< 5.0	**25.6**	< 5.0	< 5.0	< 5.0	< 5.0
MW-10S	04/14/16	98.77	16.64	82.13	< 5.0	< 5.0	< 5.0	**146**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.77	16.67	82.10	< 5.0	< 5.0	< 5.0	**78.7**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.77	16.79	81.98	< 5.0	< 5.0	< 5.0	**281**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.77	17.71	81.06	< 5.0	< 5.0	< 5.0	**33.4**	< 5.0	< 5.0	< 5.0	< 5.0
MW-11	04/14/16	97.23	22.25	74.98	< 5.0	< 5.0	< 5.0	**641**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	97.23	20.01	77.22	< 5.0	< 5.0	< 5.0	**390**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	97.23	20.15	77.08	< 5.0	< 5.0	< 5.0	**37.7**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	97.23	20.81	76.42	< 5.0	< 5.0	< 5.0	**189**	< 5.0	< 5.0	< 5.0	< 5.0
MW-12	04/14/16	59.71	9.62	50.09	< 5.0	< 5.0	< 5.0	9.8	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	59.71	9.86	49.85	**6.1**	< 5.0	6.5	< 5.0	13.9	< 5.0	< 5.0	5.3
	07/14/16	59.71	9.93	49.78	**5.6**	< 5.0	< 5.0	< 5.0	25.2	< 5.0	< 5.0	< 5.0
	08/15/16	59.71	10.93	48.78	< 5.0	< 5.0	< 5.0	< 5.0	26.7	< 5.0	< 5.0	< 5.0

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		**5**	**1,000**	**700**	**20**	**3,500**	**100**	**62**	**1,200**
MW-13	04/14/16	60.62	7.74	52.88	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	60.62	8.02	52.60	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	60.62	8.08	52.54	**15.6**	< 5.0	< 5.0	6.4	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	60.62	8.79	51.83	**27.1**	< 5.0	< 5.0	6.3	< 5.0	< 5.0	< 5.0	< 5.0
MW-14	07/14/16	100.20	14.20	86.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	100.20	14.95	85.25	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-15	07/14/16	96.90	15.11	81.79	< 5.0	< 5.0	< 5.0	8.4	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	96.90	15.42	81.48	< 5.0	< 5.0	< 5.0	10.8	< 5.0	< 5.0	< 5.0	< 5.0
MW-16	07/14/16	67.84	12.84	55.00	**226**	176	456	5.6	51.8	**165**	**1,740**	646
	08/15/16	67.84	13.39	54.45	**168**	218	423	5.4	46.5	**136**	**1,100**	329

NOTES

All laboratory results and U/NR MSCs are reported in micrograms per liter.
Elevation and depth to water measurements are reported in feet.
U/R MSC = Used Aquifer/Residential Medium-Specific Concentration
BOLD = Indicates exceedance of applicable Act 2 MSC
<# = Less than laboratory reporting limit of #
Laboratory analytical data qualifiers are referenced above, following the analytical result. Refer to laboratory report appendices for qualifier descriptions.

MTBE = Methyl tert-butyl ether
TMB = Trimethylbenzene

Table 2

WELL CONSTRUCTION SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date Installed	Current Top of Casing Elevation[1] (feet)	Well Diameter (inches)	Total Depth (feet)	Total PVC Screen Length (feet)	Total PVC Riser Length (feet)
MW-1	09/08/15	100.00	4	20	15	5
MW-2	09/08/15	99.18	4	20	15	5
MW-3	09/04/15	98.83	4	20	15	5
MW-4	09/04/15	98.86	4	20	15	5
MW-5	12/01/15	98.60	4	20	15	5
MW-6	12/01/15	98.29	4	20	15	5
MW-7	11/30/15	97.65	4	20	15	5
MW-8	11/30/15	98.13	4	20	15	5
MW-9	02/19/16	99.03	4	30	25	5
MW-10D	02/23/16	98.85	2	40	10	30
MW-10S	02/22/16	98.77	4	25	20	5
MW-11	02/22/16	97.23	4	30	25	5
MW-12	02/18/16	59.71	4	19	15	7
MW-13	02/18/16	60.62	4	15	10	8
MW-14	06/22/16	100.20	4	24	20	4
MW-15	06/22/16	96.90	4	35	20	15
MW-16	06/21/16	67.84	2	20	15	8

NOTES:
PVC - poly-vinyl chloride

1) Top of casing elevations relative to an on-site benchmark.
2) Monitoring wells MW-12, MW-13 and MW-16 were completed above ground surface.

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
MW-1	09/01/15	3-4	422	**886**	3,800	2,060	<4.7	89.0	2,940	10,300	3,210
MW-1	09/01/15	6-7	93.2	37.4	23.0	19.6	<4.2	7.6	19.1	39.8	12.2
MW-1	09/03/15	10-11	10.4	32.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9
MW-2	09/02/15	1-2	12.9	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-2	09/03/15	18-19	5.5	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-3	08/31/15	6-7	>15,000	**3,770**	10,400	12,100	<274	3,570	21,700	**55,700**	17,300
MW-3	09/03/15	8-9	559.7	**2,260**	<232	1,470	<4.4	<4.4	697	2,000	610
MW-3	09/03/15	10-11	449.5	**3,150**	31.2	1,880	<4.8	1,100	114	12,200	43.9
MW-4	08/31/15	7-8	>15,000	**1,750**	9,980	2,710	<4.4	72.2	2,840	6,550	2,070
MW-4	09/03/15	10-11	680.9	**8,180**	20,300	22,600	<4.9	3,580	10,800	**41,600**	11,800
MW-5	11/24/15	3-4	109.4	<230	<230	<230	<230	<230	<230	<230	<230
MW-5	12/01/15	10-11	172.1	<203	<203	<203	<203	<203	<203	<203	<203
MW-5	12/01/15	12-13	8.9	<236	<236	<236	366	<236	<236	<236	<236
MW-6	11/24/15	3-4	4.7	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-6	12/01/15	9-10	12.8	<315	<315	702	<315	<315	<315	<315	<315
MW-6	12/01/15	14-15	1.9	<214	<214	<214	<214	<214	<214	<214	<214
MW-7	11/24/15	4-5	142.5	<233	<233	<233	<233	<233	2,630	1,860	682
MW-7	11/30/15	14-15	365.3	<255	<255	490	<255	881	1,230	24,100	8,990
MW-7	11/30/15	19-20	11.0	<256	<256	<256	356	<256	<256	<256	<256
MW-8	11/25/15	4-5	5.0	<211	<211	<211	<211	<211	<211	<211	<211
MW-8	11/30/15	10-11	324.4	<284	<284	<284	<284	<284	<284	<284	<284
MW-8	11/30/15	18-19	3.9	<248	<248	820	<248	353	999	5,980	2,150
MW-9	02/15/16	4-5	1.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
MW-9	02/18/16	15-17	15.5	<3.2	<3.2	3.6	<3.2	<3.2	4.6	69.9	20.3
MW-9	02/18/16	17-19	3.0	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-10D	02/17/16	4-5	3.8	<158	<158	<158	<158	<158	<158	<158	<158
MW-10D	02/23/16	17-19	69.2	189	262	<173	<173	<173	<173	475	<173
MW-10D	02/23/16	27-29	40.9	<3.7	<3.7	<3.7	581	<3.7	<3.7	<3.7	<3.7
MW-10D	02/23/16	29-31	10.2	<3.3	<3.3	<3.3	219	<3.3	<3.3	<3.3	<3.3
MW-10S	02/17/16	4-5	3.4	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-10S	02/22/16	23-25	40.3	23.6	<3.6	<3.6	928	<3.6	<3.6	<3.6	<3.6
MW-10S	02/22/16	25-27	32.1	36.4	<3.4	<3.4	828	<3.4	<3.4	<3.4	<3.4
MW-11	02/17/16	4-5	2.7	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6
MW-11	02/22/16	17-19	44.2	12.5	<3.1	<3.1	3.0	<3.1	4.5	29.3	3.3
MW-11	02/22/16	23-25	27.6	6.0	<3.6	<3.6	31.6	<3.6	<3.6	<3.6	<3.6

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
MW-12	02/17/16	4-5	0.0	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8
MW-12	02/18/16	9-11	15.3	<3.3	<3.3	7.6	<3.3	6.0	4.9	49.0	9.2
MW-12	02/18/16	11-13	50.0	<149	<149	584	<149	670	754	13,300	4,410
MW-13	02/17/16	3-4	0.0	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4
MW-13	02/17/16	9-11	20.8	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
MW-13	02/17/16	11-13	11.3	20.6	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-14	06/21/16	4-5	1.4	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
MW-14	06/22/16	14-15	3.7	18.3	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4
MW-14	06/22/16	19-20	0.8	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
MW-15	06/20/16	4-5	0.7	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
MW-15	06/22/16	15-16	78.6	<4.5	11.9	28.8	<4.5	9.7	12.5	157	44.5
MW-15	06/22/16	26-27	7.7	8.1	<3.3	<3.3	113	<3.3	<3.3	<3.3	<3.3
MW-16	06/21/16	4-5	54.5	56.0	9.4	71.6	<5.9	31.0	<5.9	36.4	134
MW-16	06/21/16	13-14	512.3	**511**	4,070	21,300	<217	4,750	9,170	**113,000**	39,600
MW-16	06/21/16	17-18	5.8	33.9	68.3	59.6	<4.1	5.5	9.7	98.7	26.6
SB-1	09/02/15	2-3	500	**4,370**	20,200	7,480	<5.0	1,060	5,890	19,500	<5.0
SB-1	09/02/15	5-6	38.1	52.2	15.7	11.3	<4.7	<4.7	10.5	25.0	9.1
SB-1	09/03/15	16-17	6.9	21.5	13.4	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9
SB-2	09/01/15	5-6	296	<270	445	2,760	<270	1,540	15,300	29,900	7,760
SB-2	09/03/15	10-11	54.1	20.7	10.9	7.2	5.3	<5.1	14.6	15.0	5.9
SB-3	11/23/15	3-4	3.8	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
SB-3	12/02/15	7-8	25.2	<294	<294	458	<294	<294	<294	<294	<294
SB-3	12/02/15	13-14	0.1	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
SB-4	11/23/15	3-4	3.8	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
SB-4	12/02/15	19-20	7.8	<222	<222	<222	<222	<222	<222	<222	<222
SB-5	11/24/15	3-4	1,289	**<2,420**	76,000	38,700	**<2,420**	5,350	10,400	**130,000**	46,900
SB-5	12/01/15	6-7	616.6	**2,880**	9,160	14,700	323	1,360	4,710	27,500	8,000
SB-5	12/01/15	12-13	4.0	<227	<227	<227	287	<227	<227	<227	<227
SB-6	11/24/15	4-5	14.9	7.0	<4.5	<4.5	<4.5	<4.5	4.7	<4.5	<4.5
SB-6	12/01/15	9-10	105.1	<213	<213	<213	<213	<213	<213	492	227
SB-6	12/01/15	20-21	5.3	<295	<295	<295	<295	<295	<295	<295	<295
SB-7	02/15/16	3-4	272.9	<189	674	<440	<189	<189	319	1,290	401
SB-7	02/19/16	5-7	28.3	<3.6	<3.6	58.4	<3.6	14.7	12.6	62.1	5.9
SB-7	02/19/16	9-11	16.2	<3.5	<3.5	<3.5	193	<3.5	<3.5	<3.5	<3.5

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
SB-8	02/17/16	5-6	423.5	**<1,770**	<1,770	<1,770	<1,770	<1,770	9,250	13,500	3,690
SB-8	02/19/16	11-13	65.5	<149	<149	<149	<149	<149	<149	985	<149
SB-8	02/19/16	13-14	49.0	39.0	<3.1	<3.1	52.4	<3.1	6.5	36.1	4.6
SB-9	02/17/16	4-5	4.0	<170	<170	<170	<170	<170	<170	<170	<170
SB-9	02/19/16	5-7	6.5	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
SB-9	02/19/16	7-9	4.5	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
SB-10	06/20/16	7-8	533.4	**627**	<243	969	<243	866	5,170	10,800	4,570
SB-10	06/22/16	11-12	472.3	**7,820**	1,460	14,700	<225	3,000	7,270	**44,100**	6,280
SB-10	06/22/16	15-16	3.2	<5.2	<5.2	<5.2	1,250	<5.2	<5.2	<5.2	<5.2
SB-11	06/21/16	3-4	1.5	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
SB-11	06/22/16	5-7	68.5	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	4.6	<4.1
SB-11	06/22/16	11-13	12.7	98.9	<4.9	<4.9	78.0	<4.9	<4.9	15.7	<4.9

NOTES:

BOLD	Indicates exceedance of applicable Act 2 U/NR MSC	PID	photoionization detector
<#	Less than laboratory reporting limit of #	ppm	parts per million
ft	feet below ground surface	MTBE	methyl tert-butyl ether
µg/kg	micrograms per kilogram	TMB	trimethylbenzene

[1] PADEP Act 2 Statewide Health Standard, Used Aquifer (U) /Non-Residential (NR) Medium-Specific Concentration (MSC), 25 PA Code Chapter 250, Rev. 2016.

APPENDIX A

Facility Photographs

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Southwest

Date Taken:

6-11-2015

Description:

View of Kwik Fill diesel station (#M-209) building and dispensers.

Direction of View:

West

Date Taken:

9-8-2015

Description:

View of diesel dispensers #1/2 located east of station building.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

East

Date Taken:

6-11-2015

Description:

View of diesel dispensers #7/8 located immediately west of station building.

Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of diesel UST field.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of on-site Kwik Fill gas station (#M-229) along State Route 8.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of Kwik Fill motel and restaurant between Kwik Fill diesel station (#M-209) and Kwik Fill gas station (#M-229).

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

West

Date Taken:

6-11-2015

Description:

View of former remedial system shed along western parking lot boundary.

Direction of View:

Northwest

Date Taken:

6-11-2015

Description:

View of off-site unnamed pond located approximately 400 feet northwest (downgradient) of the facility.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

South

Date Taken:

6-11-2015

Description:

View of sewage treatment plant located along Stevenson Road.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of residential property east of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

North

Date Taken:

6-11-2015

Description:

View of Barkeyville Travel Center located north of the facility beyond Stevenson Road.

Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of Heath Oil Inc. located east of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

East

Date Taken:

6-11-2015

Description:

View of Gahr's Truck and Tire Service located east of the facility beyond State Route 8.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of vacant commercial building located southeast of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Southwest

Date Taken:

6-11-2015

Description:

View of residential property located south of the facility along State Route 8.

APPENDIX B

Water Well Inventory Report, Local Water Supply Well Documentation & Ordinance Correspondence

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

PA STATE AGENCIES ONLINE SERVICES Search PA go

Tom Wolf, Governor Cindy Adams Dunn, Secretary

PaGWIS Records

Geological Survey

About the Survey
Classroom
Collecting
Economic Resources
Geology of PA
Geologic Hazards
Groundwater
Library
PAMAP
Web-Mapping Application
Publications and Digital Data
GeoLinks
Contact the Survey

Search DCNR go

Find us on Facebook

Map Search

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

Multiple Criteria Map

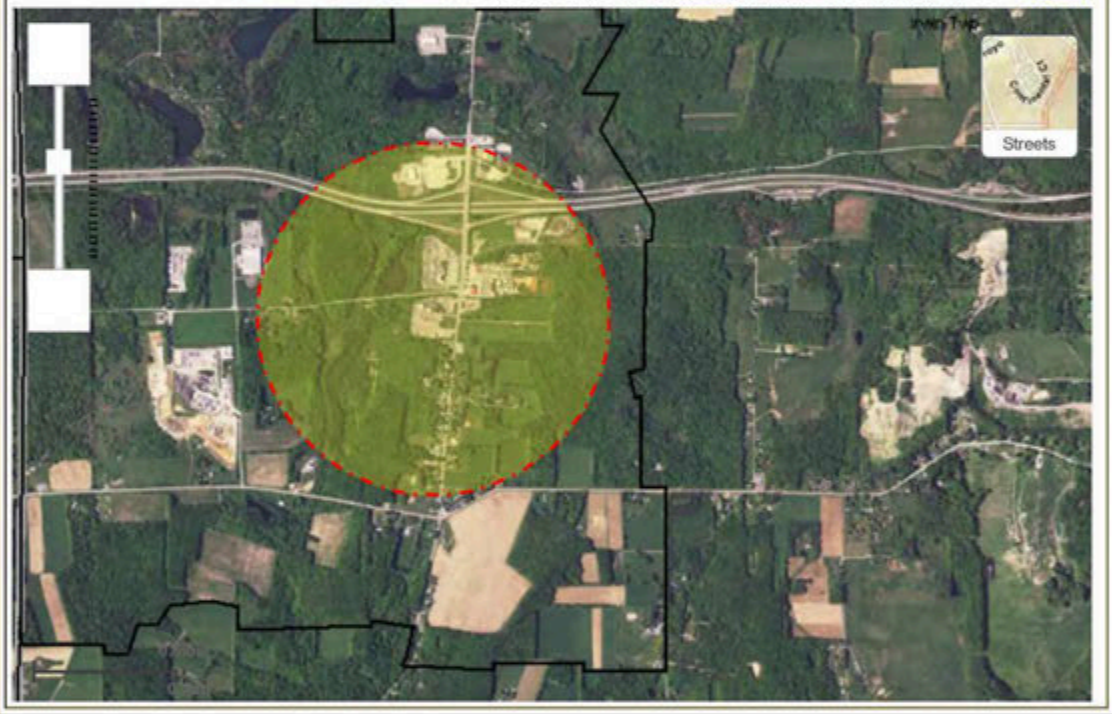
Wells Springs

Data Packages: General Info Site Info Well Construction Hydrogeologic Geologic

ZIP/city/address... Go 40 -79 Jump to Point

41.210, -79.985

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 : 20 Records

View Items Below

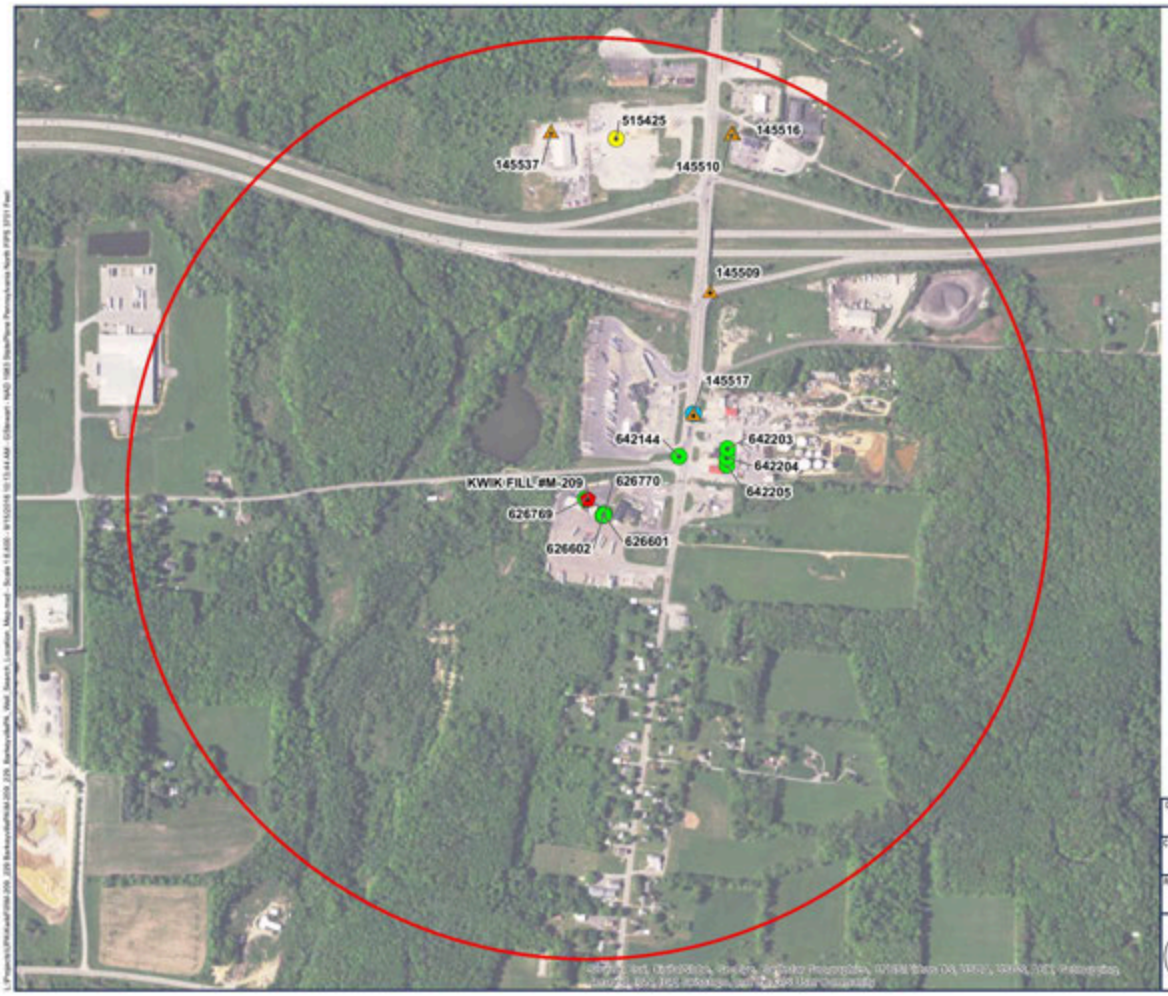
'View Items Below' creates a general list (not data package-specific) that contains links to individual well information. It is based on the search criteria entered. Not all of the records displayed below will necessarily have data corresponding to the data package you have selected.

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 : 14 Records **Click on the column headers to sort the Search Results.**

PA

PA Well ID	Driller	Driller Ref	Date Drilled	Owner	County	Municipality	Image
642204	CRIBBS & ASSOCIATES, INC.	MW-3 BARKEY	11/5/2015	Heath Oil	VENANGO	BARKEYVILLE BORO	
642205	CRIBBS & ASSOCIATES, INC.	MW-4 BARKEY	11/5/2015	Heath Oil	VENANGO	BARKEYVILLE BORO	
642144	CRIBBS & ASSOCIATES, INC.	MW-1 BARKEY	11/5/2015	Heath Oil	VENANGO	BARKEYVILLE BORO	
642203	CRIBBS & ASSOCIATES, INC.	MW-2 BARKEY	11/5/2015	Heath Oil	VENANGO	BARKEYVILLE BORO	
626601	JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES	1508-1081 MW-2	9/8/2015	VPA Kwik Fill	VENANGO	BARKEYVILLE BORO	
626602	JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES	1508-1081 MW-1	9/8/2015	VPA Kwik Fill	VENANGO	BARKEYVILLE BORO	
626769	JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES	1508-1081 MW-4	9/4/2015	VPA Kwik Fill	VENANGO	BARKEYVILLE BORO	
626770	JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES	1508-1081 MW-3	9/4/2015	VPA Kwik Fill	VENANGO	BARKEYVILLE BORO	
515425	LETTERLE & ASSOCIATES, INC	BK MW-6	8/5/2014	Barkeyville Development Corp.	VENANGO		
145537	HARRY BROS INC		4/17/1976	ELLIOTT OIL CO.	VENANGO	IRWIN TWP.	View
145517	HARRY BROS INC		6/5/1969	BEAVER OIL CO.	VENANGO	IRWIN TWP.	View
145516	MORROW DRILLING CO		1/1/1968	TEXACO INC	VENANGO	IRWIN TWP.	View
145510	NORMAN R HASSEL		6/23/1966	TEXACO OIL CO	VENANGO	IRWIN TWP.	View
145509	NORMAN R HASSEL		6/15/1966	HUMBLE OIL CO	VENANGO	IRWIN TWP.	View



LEGEND

KWIK FILL #M-209

PaGWIS WELL TYPES

ABANDONED

MONITORING

UNKNOWN

WITHDRAWAL

146617 PaGWIS WELL IDENTIFICATION

0.5 MILE RADIUS FROM SITE

DRAFTED BY: GKS	PaGWIS WELL SEARCH LOCATION MAP		
CHECKED BY: DMC	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA		
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066		
NORTH	SCALE IN FEET 0 550	DATE 9-15-16	FIGURE B-1

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: **145517** Local Well ID: **X 0136** Local Permit #:

LOCATION INFORMATION

Owner:	**BEAVER OIL CO.**	Original Paper Record Image Available:	**Yes**
Address of Well:	**RD 1, HARRISVILLE**		
County:	**VENANGO**		
Municipality:	**IRWIN TWP.**		
Latitude:	**41.19889**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97472**	Data Reliability:	**LOCATION MAY NOT BE ACCURATE (WWI paper)**
Description of Well Location and Other Notes:	**Well is on east side of Rt. 8, 1000 ft. south of Interstate 80 in Barkeyville.**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**HARRY BROS INC**	License:	**0902**	Driller Well ID:	
Type of Activity:	**New Well**	Date Drilled:	**6/5/1969**	Drilling Method:	**CABLE TOOL**
Well Depth (ft):	**88**	Well Finish:	**UNKNOWN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**88**	**6.25**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**30.83**	**6.25**	**UNKNOWN**			**UNKNOWN**
0	**31**	**6**				

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):	**20**	Yield Measurement Method:	**BAILER**
Water Level when not pumped: (ft below land surface)		Water Level after yield test: (ft below land surface)	

Length of Yield Test (minutes): **60**

Saltwater Zone (ft):

Use of Well: **UNKNOWN**

Use of Water: **DOMESTIC**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**20**	**Clay Hardpan**
20	**44**	**Sandstone and Slate**
44	**88**	**Sandstone**

Depth to Bedrock (ft): **20** Was Well Drilled Into Bedrock? **Yes**

Date Printed: **8/24/2016**

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: **145509** Local Well ID: **X 0127** Local Permit #:

LOCATION INFORMATION

Owner:	**HUMBLE OIL CO**	Original Paper Record Image Available:	**Yes**
Address of Well:	**Harrisville**		
County:	**VENANGO**		
Municipality:	**IRWIN TWP.**		
Latitude:	**41.20083**	Coordinate Method:	
Longitude:	**-79.97444**	Data Reliability:	**LOCATION MAY NOT BE ACCURATE (WWI paper)**
Description of Well Location and Other Notes:	**Intersection at Rts. 8 and I-80**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**NORMAN R HASSEL**	License:	**0963**	Driller Well ID:	
Type of Activity:	**New Well**	Date Drilled:	**6/15/1966**	Drilling Method:	**OTHER/UNKNOWN**
Well Depth (ft):	**68**	Well Finish:	**OPEN HOLE**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**68**	

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**24**	**6**	**UNKNOWN**			**UNKNOWN**
0	**24**	**6**				

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):		Yield Measurement Method:	**BAILER**
Water Level when not pumped: (ft below land surface)	**54**	Water Level after yield test: (ft below land surface)	**58**
		Saltwater Zone (ft):	

Length of Yield Test (minutes):

Use of Well: **WITHDRAWAL** Use of Water: **INDUSTRIAL**

MATERIALS WELL PENETRATES			LEVELS WHERE WATER ENTERS WELL		
Top (ft)	Bottom (ft)	Description	Top (ft)	Bottom (ft)	Yield (GPM)
0	**10**	**Glacial Wash**	**60**		
10	**20**	**Shale**			
20	**24**	**Limestone**			
24	**68**	**Sandstone**			

Depth to Bedrock (ft): **10** Was Well Drilled Into Bedrock? **Yes**

Date Printed: **8/24/2016**

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: **145537** Local Well ID: **X 0770** Local Permit #:

LOCATION INFORMATION

Owner:	**ELLIOTT OIL CO.**	Original Paper Record Image Available:	**Yes**
Address of Well:	**Grove City, Pa 16127**		
County:	**VENANGO**		
Municipality:	**IRWIN TWP.**		
Latitude:	**41.20327**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97784**	Data Reliability:	**LOCATION MAY NOT BE ACCURATE (WWI paper)**
Description of Well Location and Other Notes:	**Well is on NW crossramp of intersection of PA 8 and I-80**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**HARRY BROS INC**	License:	**0902**	Driller Well ID:	
Type of Activity:	**New Well**	Date Drilled:	**4/17/1976**	Drilling Method:	**CABLE TOOL**
Well Depth (ft):	**159**	Well Finish:	**UNKNOWN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**159**	**6.25**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**142**	**6.25**	**UNKNOWN**			**UNKNOWN**
0	**143**	**6**				

WELL LINER

Top (ft)	Bottom (ft)	Diameter (in)	PVC Type
0	**50**	**10**	**Solid**

GROUNDWATER AND GEOLOGICAL INFORMATION

50	**BAILER**

Well Yield (GPM - gal per min):		Yield Measurement Method:	
Water Level when not pumped: (ft below land surface)	**82**	Water Level after yield test: (ft below land surface)	**82**
Length of Yield Test (minutes):	**60**	Saltwater Zone (ft):	
Use of Well:	**WITHDRAWAL**	Use of Water:	**INDUSTRIAL**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**34**	**Hardpan and Clay**
34	**37**	**Coal**
37	**48**	**Shale**
48	**60**	**Limestone**
60	**62**	**Coal**
62	**65**	**Clay**
65	**101**	**Sandstone**
101	**109**	**Coal and Sand**
109	**118**	**White Clay**
118	**121**	**Coal**
121	**140**	**Slate**
140	**159**	**Gray Sandstone**
152	**159**	**Crevice**

Depth to Bedrock (ft): **34** Was Well Drilled Into Bedrock? **Yes**

Date Printed: **8/24/2016**

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: **145510** Local Well ID: **X 0128** Local Permit #:

LOCATION INFORMATION

Owner:	**TEXACO OIL CO**	Original Paper Record Image Available:	**Yes**
Address of Well:	**Rd 1, Harrisville**		
County:	**VENANGO**		
Municipality:	**IRWIN TWP.**		
Latitude:	**41.20331**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97408**	Data Reliability:	**LOCATION MAY NOT BE ACCURATE (WWI paper)**
Description of Well Location and Other Notes:	**Intersection of I-80 and Route 8**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**NORMAN R HASSEL**	License:	**0963**	Driller Well ID:	
Type of Activity:	**New Well**	Date Drilled:	**6/23/1966**	Drilling Method:	**OTHER/UNKNOWN**
Well Depth (ft):	**55**	Well Finish:	**OPEN HOLE**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**55**	

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**22**	**6**	**UNKNOWN**			**UNKNOWN**
0	**25**	**6**				

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):	**4**	Yield Measurement Method:	**OTHER**
Water Level when not pumped: (ft below land surface)	**37**	Water Level after yield test: (ft below land surface)	**48**

Length of Yield Test (minutes):

Saltwater Zone (ft):

Use of Well: **WITHDRAWAL**

Use of Water: **INDUSTRIAL**

MATERIALS WELL PENETRATES			LEVELS WHERE WATER ENTERS WELL		
Top (ft)	Bottom (ft)	Description	Top (ft)	Bottom (ft)	Yield (GPM)
0	**55**	**Sandstone**	**48**		

Depth to Bedrock (ft): **0** Was Well Drilled Into Bedrock? **Yes**

Date Printed: **8/24/2016**

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: **145516** Local Well ID: **X 0135** Local Permit #:

LOCATION INFORMATION

Owner:	**TEXACO INC**	Original Paper Record Image Available:	**Yes**
Address of Well:	**Barkeyville**		
County:	**VENANGO**		
Municipality:	**IRWIN TWP.**		
Latitude:	**41.20331**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97404**	Data Reliability:	**LOCATION MAY NOT BE ACCURATE (WWI paper)**
Description of Well Location and Other Notes:	**Intersection of I-80 and Rt 8**		

WELL CONSTRUCTION INFORMATION

Well Driller:	**MORROW DRILLING CO**	License:	**1084**	Driller Well ID:	
Type of Activity:	**New Well**	Date Drilled:	**1/1/1968**	Drilling Method:	**OTHER/UNKNOWN**
Well Depth (ft):	**85**	Well Finish:	**OPEN HOLE**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**85**	

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**68.67**	**5**	**UNKNOWN**			**NONE**
0	**69**	**5**				

GROUNDWATER AND GEOLOGICAL INFORMATION

Well Yield (GPM - gal per min):		Yield Measurement Method:	**BAILER**
Water Level when not pumped: (ft below land surface)		Water Level after yield test: (ft below land surface)	

Length of Yield Test (minutes): **30**

Saltwater Zone (ft):

Use of Well: **WITHDRAWAL**

Use of Water: **INDUSTRIAL**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**2.5**	**Coal**
2.5	**10**	**Clay**
10	**47**	**Rock**
47	**59**	**Limestone**
59	**85**	**Sandstone**

LEVELS WHERE WATER ENTERS WELL

Top (ft)	Bottom (ft)	Yield (GPM)
47		
80		

Depth to Bedrock (ft): **0** Was Well Drilled Into Bedrock? **Yes**

Date Printed: **8/24/2016**

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: **515425** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**Barkeyville Development Corp.**	Original Paper Record Image Available:	**No**
Address of Well:	**5742 State Route 8 Barkeyville Pa. 16038**		
County:	**VENANGO**		
Municipality:			
Latitude:	**41.20318**	Coordinate Method:	**GPS - Global Positioning System**
Longitude:	**-79.97648**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**LETTERLE & ASSOCIATES, INC**	License:	**4494**	Driller Well ID:	**BK MW-6**
Original Well By:					
Type of Activity:	**Well Abandonment**	Date Drilled:	**8/5/2014**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**PERFORATED OR SLOTTED**		

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:	**ABANDONED**	Use of Water:	
Depth to Bedrock (ft):	Was Well Drilled Into Bedrock?	**Yes**	

Date Printed: **8/24/2016**

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: **642144** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**Heath Oil**	Original Paper Record Image Available:	**No**
Address of Well:	**5591 State Route 8 16038**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19821**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97465**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**CRIBBS & ASSOCIATES, INC.**	License:	**2512**	Driller Well ID:	**MW-1 Barkey**
Type of Activity:	**New Well**	Date Drilled:	**11/5/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**12**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**12**	**6**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**2**	**2**	**PVC OR OTHER PLASTIC**	**0.75**	**1.75**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
2	**12**	**2**	**PERFORATED, POROUS, OR SLOTTED CASING**	**PLASTIC**	**0.01**	**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: **MONITORING**

Use of Water:

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**4**	**Dark Brown Silt, Sand and Gravel**
4	**6**	**Brown and Gray Silty Clay**
6	**8**	**No Recovery**
8	**12**	**Brown Silty Clay with sandstone fragments**

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

Date Printed: **9/15/2016**

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: **642203** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**Heath Oil**	Original Paper Record Image Available:	**No**
Address of Well:	**5613 State Route 8 16038**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19835**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97432**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**CRIBBS & ASSOCIATES, INC.**	License:	**2512**	Driller Well ID:	**MW-2 Barkey**
Type of Activity:	**New Well**	Date Drilled:	**11/5/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**12**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**12**	**6**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**2**	**2**	**PVC OR OTHER PLASTIC**	**0.75**	**1.75**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
0	**2**	**2**	**PERFORATED, POROUS, OR SLOTTED CASING**	**PLASTIC**	**0.01**	**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: **MONITORING**	Use of Water:

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**1**	**Asphalt**
1	**4.3**	**Brown silty sand and gravel**
4.3	**12**	**Brown and gray silty clay**

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

Date Printed: **9/15/2016**

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: **642204** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**Heath Oil**	Original Paper Record Image Available:	**No**
Address of Well:	**5613 State Route 8 16038**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19821**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97432**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**CRIBBS & ASSOCIATES, INC.**	License:	**2512**	Driller Well ID:	**MW-3 Barkey**
Type of Activity:	**New Well**	Date Drilled:	**11/5/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**12**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**12**	**8.25**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**2**	**2**	**PVC OR OTHER PLASTIC**	**0.75**	**1.75**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
2	**12**	**2**	**PERFORATED, POROUS, OR SLOTTED CASING**	**PLASTIC**	**0.01**	**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: **MONITORING**	Use of Water:

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**1**	**Concrete**
1	**4.3**	**Brown silty sand and gravel**
4.3	**12**	**Gray to brown silty clay**

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

Date Printed: **9/15/2016**

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: **642205** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**Heath Oil**	Original Paper Record Image Available:	**No**
Address of Well:	**5591 State Route 8 16038**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19809**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97445**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**CRIBBS & ASSOCIATES, INC.**	License:	**2512**	Driller Well ID:	**MW-4 Barkey**
Type of Activity:	**New Well**	Date Drilled:	**11/5/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**12**	Well Finish:	**SCREEN**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**12**	**8.25**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**2**	**2**	**PVC OR OTHER PLASTIC**	**0.75**	**1.75**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
2	**12**	**2**	**SCREEN**	**PLASTIC**	**0.01**	**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: **MONITORING**

Use of Water:

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**1**	**Asphalt**
1	**4.5**	**Brown silty sand and gravel**
4.5	**12**	**Gray to brown silty clay**

Depth to Bedrock (ft):

Was Well Drilled Into Bedrock? **No**

Date Printed: **9/15/2016**

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: **626601** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**VPA Kwik Fill**	Original Paper Record Image Available:	**No**
Address of Well:	**5574 State Rte 8 16127**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19726**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97654**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES**	License:	**2471**	Driller Well ID:	**1508-1081 MW-2**
Type of Activity:	**New Well**	Date Drilled:	**9/8/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**PERFORATED OR SLOTTED**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**20**	**10.5**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**1**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**20**	**4**	**SCREEN**	**PLASTIC**	**0.1**	**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: **MONITORING**	Use of Water: **UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**5**	**Sandy Clay**
5	**10**	**Silty Clay**
10	**15**	**Tight Clay**
15	**20**	**Tight, fine, sandy clay**

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

Date Printed: **8/24/2016**

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: **626602** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**VPA Kwik Fill**	Original Paper Record Image Available:	**No**
Address of Well:	**5574 State Rte 8 16127**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19725**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97656**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES**	License:	**2471**	Driller Well ID:	**1508-1081 MW-1**
Type of Activity:	**New Well**	Date Drilled:	**9/8/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**PERFORATED OR SLOTTED**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**20**	**10.5**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**1**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**20**	**4**	**SCREEN**	**PLASTIC**	**0.1**	**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: **MONITORING**	Use of Water: **UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**5**	**Sandy Clay**
5	**10**	**Silty Clay**
10	**15**	**Tight Clay**
15	**20**	**Tight, Fine, Sandy Clay**

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

Date Printed: **8/24/2016**

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: **626769** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**VPA Kwik Fill**	Original Paper Record Image Available:	**No**
Address of Well:	**5574 State Rte 8 16127**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19750**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97693**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES**	License:	**2471**	Driller Well ID:	**1508-1081 MW-4**
Type of Activity:	**New Well**	Date Drilled:	**9/4/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**PERFORATED OR SLOTTED**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**20**	**10.5**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**1**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**20**	**4**	**SCREEN**	**PLASTIC**	**0.1**	**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: **MONITORING**	Use of Water: **UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**5**	**Fine, sandy clay with rock fragments**
5	**10**	**Sandy clay with rock fragments**
10	**15**	**Tight, sandy clay**
15	**20**	**Tight, sandy silty clay**

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

Date Printed: **8/24/2016**

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: **626770** Local Well ID: Local Permit #:

LOCATION INFORMATION

Owner:	**VPA Kwik Fill**	Original Paper Record Image Available:	**No**
Address of Well:	**5574 State Rte 8 16127**		
County:	**VENANGO**		
Municipality:	**BARKEYVILLE BORO**		
Latitude:	**41.19728**	Coordinate Method:	**Commercial Street Atlas Program**
Longitude:	**-79.97653**	Data Reliability:	
Description of Well Location and Other Notes:			

WELL CONSTRUCTION INFORMATION

Well Driller:	**JM2 ENVIRONMENTAL INC DBA KODIAK FIELD SERVICES**	License:	**2471**	Driller Well ID:	**1508-1081 MW-3**
Type of Activity:	**New Well**	Date Drilled:	**9/4/2015**	Drilling Method:	**BORED OR AUGERED**
Well Depth (ft):	**20**	Well Finish:	**PERFORATED OR SLOTTED**		

WELL SIZE

Top (ft)	Bottom (ft)	Diameter (in)
0	**20**	**10.5**

CASING

Top (ft)	Bottom (ft)	Diameter (in)	Casing Material	Seal Top	Seal Bottom	Seal Type
0	**5**	**4**	**PVC OR OTHER PLASTIC**	**1**	**3**	**BENTONITE CHIPS OR PELLETS**

SCREEN/SLOT

Top (ft)	Bottom (ft)	Diameter (in)	Type	Material	Size (in)	Packing
5	**20**	**4**	**SCREEN**	**PLASTIC**	**0.1**	**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: **MONITORING**	Use of Water: **UNUSED**

MATERIALS WELL PENETRATES

Top (ft)	Bottom (ft)	Description
0	**5**	**Sandy Clay with Rock fragments**
5	**10**	**Silty brown clay**
10	**15**	**Tight, fine, Sandy Clay**
15	**20**	**Tight, fine, sandy clay**

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

Date Printed: **8/24/2016**

September 14, 2016

Withdrawal Well Locations

FIGURE B-2
eMap Well Search Location Map
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

1:18,056

0 0.15 0.3 0.6 mi
0 0.25 0.5 1 km

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand),

Copyright PA DEP

Groundwater
& Environmental Services, Inc.

301 Commerce Park Drive • Cranberry Township, Pennsylvania 16066 • (800) 267-2549 • fax (866) 902-2187

RECORD OF CONVERSATION (Justin Paul)

Telephone X **Personal** _____ **Other** _____

Contact: Mr. Jeremy Holtz	**Telephone No.: 724-967-2333**
Company/Agency: Barkeyville Municipal Authority	**Date: 9/7/2016**
Project Location: 5574 State Route 8 Barkeyville, PA	**Project Name/No.: UPA M-209 (Diesel)/0704793**

Discussion / Action:

Time: 0930

Justin Paul (GES) contacted the Barkeyville Municipal Authority (Mr. Jeremy Holtz) to determine if the site (Kwik Fill #M-209) was connected to the public water supply. Mr. Holtz informed me water to the site and surrounding areas is provided by the Barkeyville Municipal Authority. He explained the Barkeyville Municipal Authority receives it raw water from groundwater withdrawal wells located at the Barkeyville Borough office near the intersection of State Route 8 and State Route 208, approximately 0.63 miles south (upgradient) of the site. Mr. Holtz confirmed the water is treated before being transmitted to the customers.

Mr. Holtz also informed me the site is within Zone 3 of the Well Protection plan limited land use, facilities and their activities. He told me to contact Mr. William Coursen (Barkeyville Borough Council President) for a copy of the protection plan.

Groundwater
& Environmental Services, Inc.

301 Commerce Park Drive • Cranberry Township, Pennsylvania 16066 • (800) 267-2549 • fax (866) 902-2187

RECORD OF CONVERSATION (Justin Paul)

Telephone X **Personal** _____ **Other** _____

Contact: Mr. William Coursen	**Telephone No.: 814-786-7606**
Company/Agency: Barkeyville Borough Council	**Date: 9/8/2016**
Project Location: 5574 State Route 8 Barkeyville, PA	**Project Name/No.: UPA M-209 (Diesel)/0704793**

Discussion / Action:

Time: 1400

Justin Paul (GES) contacted Mr. William Coursen of the Barkeyville Borough Council to obtain a copy of the Well Protection Plan the site (Kwik Fill #M-209) is within. Mr. Coursen said he would email me a copy of the plan and did so on 9/9/2016.

Mr. Coursen also informed me the Borough has an ordinance in place prohibiting private sources of drinking water and residents within the municipal are required to connect to the public water supply. He said he would email me a copy of the ordinance and did so 9/14/2016.

Do Not Remove from Borough Bldg.

Amendments stapled in back

Updated: 11.22.13 BC

BARKEYVILLE BOROUGH ZONING ORDINANCE

VENANGO COUNTY, PENNSYLVANIA

OFFICIAL COPY

MAY, 1999

Prepared by the

BARKEYVILLE BOROUGH PLANNING COMMISSION

Community Development Consultant

Graney, Grossman, Ray and Associates
Harrisville, Pennsylvania

ARTICLE IV
WELLHEAD PROTECTION (WHP) OVERLAY DISTRICTS

0: Pursuant to 104.9 of this Ordinance (Preservation of Acquifers) and in the interest of otecting public health and safety due to the shallow depth of the well supplying the public ater of the Borough, the following overlay districts are adopted as a part of this dinance. The establishment of these districts is directly related to the hydrogeological port adopted by the Barkeyville Borough Authority in 1995, and entitled Wellhead otection Plan, Barkeyville Borough Municipal Authority. The map contained in this study picting the location of the well, Zone I, Zone II and Zone II, is also hereby adopted as a pplement to the official Zoning Map.

1: Based upon the findings of this plan, the following additional regulations shall apply all lands within the respective zones depicted on the map.

A. The following land uses, facilities and/or activities shall not be permitted in the Zone I Protection Area, as depicted in the Wellhead Protection Plan Map:

Industrial and manufacturing facilities
Hazardous material storage, processing and disposal facilities
Road salt stockpiles
Mining and mineral excavation
Land application of wastewater and waste sludges
Cemeteries
Stormwater detention facilities
Dumps, construction material stockpiles and debris
Junk or salvage yards
Oil and gas drilling

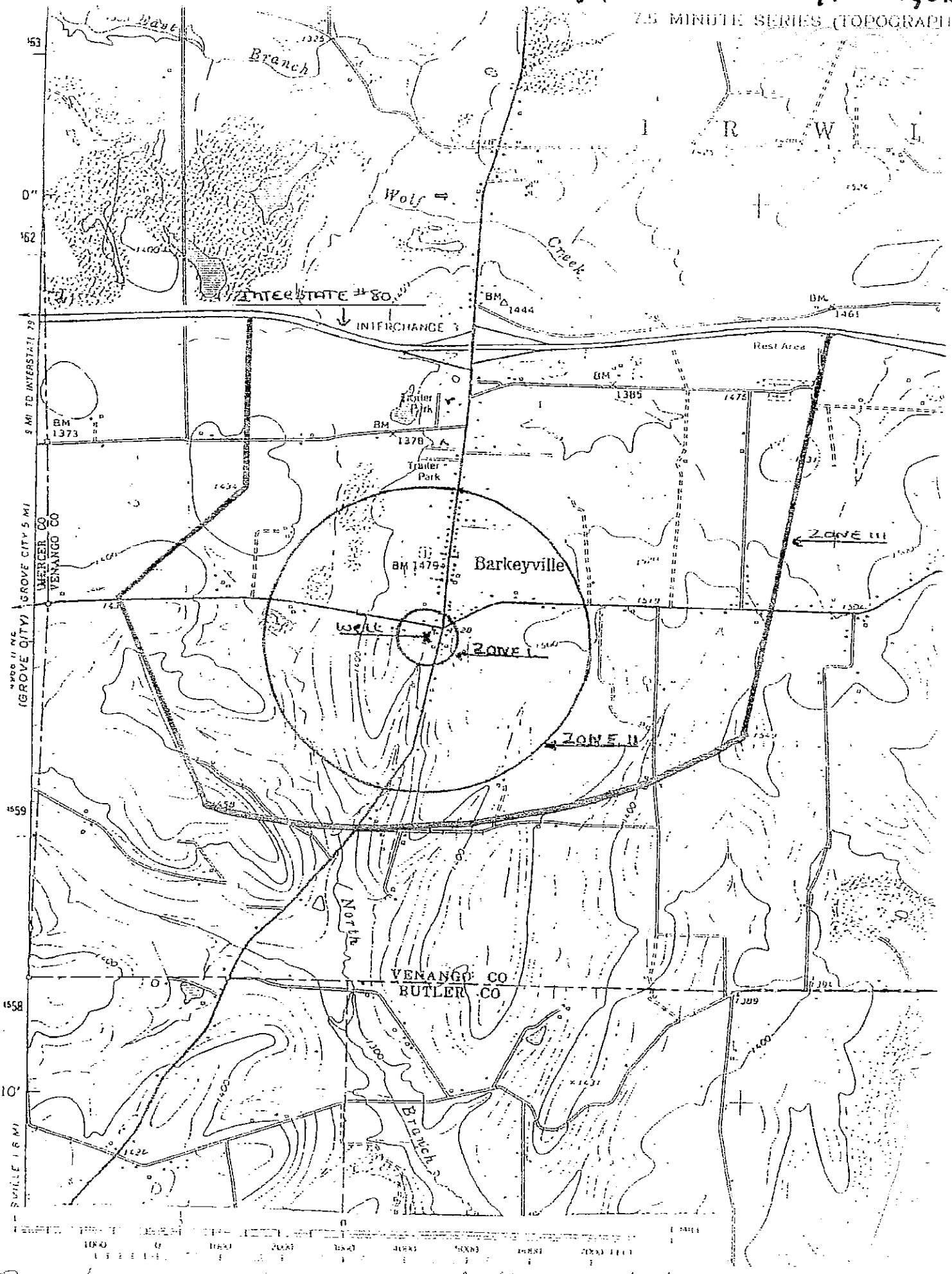
B. The following land uses, facilities and/or shall not be permitted in the Zone II Protection Area, as depicted in the Wellhead Protection Plan Map:

Hazardous material storage, processing and disposal facilities
Road salt stockpiles
Mining and mineral excavation
Land application of wastewater and waste sludges
Cemeteries
Stormwater detention facilities
Dumps, construction material stockpile and debris
Junk or salvage yards
Oil and gas drilling

C. The following land use, facilities and/or activities shall not be permitted in the Zone III Protection Area, as depicted in the Wellhead Protection Plan Map:

Hazardous material storage, processing and disposal facilities
Road salt stockpiles
Land application of wastewater and waste sludges
Dumps, construction material stockpiles and debris
Junk or salvage yards

OFFICIAL COPY (Barkeyville Borough Zoning Ord.



Dwg # 92 1 Oct 26 1993 Wellhead Protection Plan MAP

(1)

BOROUGH OF BARKEYVILLE
VENANGO COUNTY, PENNSYLVANIA

Ordinance No. 81-1

AN ORDINANCE OF THE BOROUGH OF BARKEYVILLE DIRECTING AND REQUIRING THE CONNECTION OF ALL OCCUPIED BUILDINGS WITHIN THE SERVICE AREA OF THE WATER SYSTEM OF THE BARKEYVILLE MUNICIPAL AUTHORITY TO SAID WATER SYSTEM BY ALL PREMISES ACCESSIBLE THERETO: PROHIBITING THE USE OF ALL PRIVATE WELLS AND OTHER SUCH SOURCES OF WATER FOR HUMAN CONSUMPTION ON SUCH PREMISES: PROVIDING FOR THE METHOD OF CONNECTION BETWEEN OCCUPIED BUILDINGS AND SAID WATER SYSTEM AND FOR THE INSPECTION THEREOF: PROVIDING FOR THE ISSUANCE OR PERMITS AND PAYMENT OF CHARGES THEREFOR. AND PROVIDING PENALTIES FOR VIOLATION HEREOF.

BE IT ORDAINED AND ENACTED by the Borough Council of the Borough of Barkeyville, and in compliance with the prior understandings and agreements with the Barkeyville Municipal Authority, it is hereby ordained and enacted by authority of the same under and pursuant to the Act of February 1, 1966, P.L.(1965), No. 581, Section 2461 (53 Purdon's Statutes 47461), as follows:

SECTION 1. Every owner of property in the Borough of Barkeyville whose property presently abuts or will abut upon any portion of the Water System of the Barkeyville Municipal Authority in the future shall connect, at his own cost, the house, building or other structures located on said property with the aforementioned Water System as presently proposed to be constructed and upon completion of construction of any extensions thereof.

SECTION 2. It shall be unlawful for any owner, lessee or occupier of any of the said aforementioned properties abutting upon said Water System as presently proposed to be constructed and after completion of construction of any extensions thereof to employ any means of obtaining or using water on said property other than from said Water System.

the Borough of Barkeyville or the Barkeyville Municipal Authority, as the Agent for the Borough, to notify the owner, lessee or occupier of each structure covered hereunder in writing, either by personal service or registered mail, to connect the same to said Water System as herein provided, within ninety (90) days after receipt of such notice. Any owner, lessee or occupier of a structure who cannot comply with the provisions of this Section as to connection within the ninety (90) day period stipulated above due to causes beyond their control should apply to the Borough Council or said Authority within said ninety (90) day period for a time extension of up to six (6) months in duration. Said application shall be made on a form to be furnished by the Borough Council or said Authority and shall contain a voluntary agreement on the part of the applicant under which the applicant shall agree to commence paying the regular monthly water bill immediately thereafter even though actual connection to said Water System will not be accomplished until some later date within the said six (6) month extension period.

SECTION 4. It shall be unlawful for any person, firm or corporation connected to said Water System to connect with or permit the connection thereto of any other property by any other person, firm or corporation or to interconnect any other source of water supply within the property and said Water System herein mentioned.

SECTION 5. No person, firm or corporation shall make or cause to be made any connection with said Water System until they have fulfilled all of the following conditions:

(a) They shall make application to the Barkeyville Municipal Authority ("Authority"), as the agent for the Borough, upon a permit form to be formulated and supplied by said Authority for permission to connect to the aforementioned Water System. Among other things, the applicant must state the character and use of each structure located on his property.

(b) They shall pay the required applicable Initial Service Charge and/or Tapping Fee as established and imposed by said Authority, at the time of making application for permission to make a connection.

(c) No work shall commence before the payment of the aforesaid Initial Service Charge and/or Tapping Fee and issuance of the aforementioned connection permit.

(d) They shall give the designated Inspector of said Authority at least twenty-four (24) hours' notice of the time when such connection shall be made in order that said Inspector can be present to inspect and approve the work of connection. The Inspector shall signify his approval of the connection by endorsing his name and the date of approval of the aforementioned connection permit in the possession of the permittees.

(e) At the time of inspection of the connection, the owner or owners of the property shall permit the Inspector full and complete access to all water facilities in each building and in and about all parts of the property. No water connection line shall be covered over, or in any way concealed, until after it has been inspected and approved by said Inspector.

SECTION 6. The construction of all connections between the building and said Water System shall be done in accordance with the specifications, plans and procedures contained in the Water System Rules and Regulations of the Barkeyville Municipal Authority, as the same have been or may be from time to time published and amended, copies of which are, or will be, upon adoption by the Authority, maintained on file with the Borough Secretary and the Authority Secretary.

SECTION 7. If the owner or owners of any occupied houses, buildings or structures in the Borough affected by this Ordinance shall neglect or refuse to comply with the provisions of this Ordinance or the written notice as prescribed in Section 3 hereof, the Borough, or said Authority as the agent of the Borough, may perform or

cause to be performed such work and labor and furnish or cause to be furnished such material as may be necessary to comply with the provisions of this Ordinance at the cost and expense of such owner or owners, together with 10% additional thereof on all charges and expenses incidental thereto, which sum shall be collected from said owner or owners for the use of the Borough or said Authority as debts are by law collectible, or the Borough or said Authority may, by its proper officer, accept installment payments as provided by law or file a minicipal claim or lien therefor against said premises as provided by law.

SECTION 8. In addition to any penalty hereinabove prescribed, any person, firm or corporation failing to make the proper connection within the time specified, after receipt of proper notice as provided in Section 3 hereof, shall, upon conviction hereof before a Magistrate pay a fine or penalty of Fifty Dollars ($50.00) for each day in violation hereof, and violating any of the other provisions of this Ordinance, shall pay a fine or penalty of not less than Five Dollars ($5.00) nor more than One Hundred Dollars ($100.00), and, upon default of payment of either thereof, shall be sentenced to undergo an imprisonment of not less than five (5) days nor more than thirty (30) days in the County Jail.

SECTION 9. It is hereby declared as the legislative intent that the invalidity of any section, clause, sentence or provision of this Ordinance shall not affect the validity of any other part of this Ordinance which shall be given effect without such invalid part or parts.

SECTION 10. All ordinances or resolutions or parts or ordinances or resolutions not in accord with this Ordinance are hereby repealed insofar as they conflict with this Ordinance.

(5)

ORDAINED AND ENACTED into law by the Borough Council of the Borough of Barkeyville in lawful session assembled this 4th day of August, 1981.

BOROUGH OF BARKEYVILLE

By _____
President, Borough Council

(BOROUGH SEAL)

Attest:

_____
Borough Secretary

APPROVED this 4th day of August, 1981.

By _____
Mayor

APPENDIX C

Soil Boring Logs and Well Construction Diagrams

MONITORING WELL

ID NO. **MW-1**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **100.40-ft**	TOTAL DEPTH:	**20-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **5-ft**	CASING EL.:	**100.00-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	CONCRETE: GRAY.	CONCRETE		Concrete (0 - 1-ft bgs)
	1-2'	319.3	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (f), GRAY.	FILL		
	2-3'	141	AK	AK				Bentonite Seal (1 - 3-ft bgs)
	3-4'	422	AK	AK	FILL: CLAY, some SILT, ORANGE to BROWN.	CL		PVC Riser (0 - 5-ft bgs)
	4-5'	396.9	AK	AK	CL: CLAY, some SAND (f), trace GRAVEL (f), ORANGE to BROWN, MOIST to SATURATED.			
-5	5-6'	88.6	AK	AK				
	6-7'	93.2	---	42"				
	7-8'	39.6	---					
	8-9'	15.0	---					
	9-10'	3.3	---					
-10	10-11'	10.4	---					Sand Pack (3 - 20-ft bgs)
	11-12'	2.5	---	42"				
	12-13'	4.2	---					
	13-14'	4.4	---					0.020-inch slotted PVC Screen (5 - 20-ft bgs)
	14-15'	5.8	---		CL: CLAY, some SILT, GRAY to GRAY to BROWN, MOIST.			
-15	15-16'	4.1	---					
	16-17'	3.6	---	---				
	17-18'	3.1	---					
	18-19'	3.5	---		CL: CLAY, some SAND (f), ORANGE, MOIST.			
	19-20'	2.8	---					Monitoring Well installed to 20-ft bgs.
-20					Soil boring complete to 20-ft bgs.			

Location:

Northing/Latitude: **41.19720976**

Easting/Longitude: **-79.97653833**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-1

MONITORING WELL

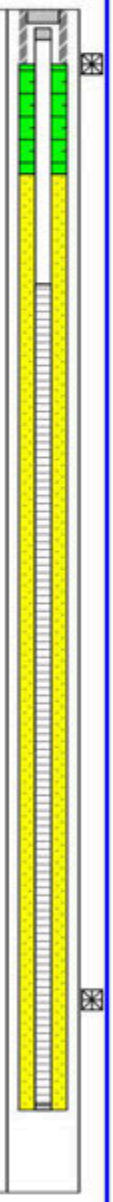
ID NO. **MW-2**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **99.80-ft**	TOTAL DEPTH: **20-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.: **99.18-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	CONCRETE: GRAY.	**CONCRETE**		Concrete (0 - 1-ft bgs)
	1-2'	12.9	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (f), ORANGE/BROWN.	**FILL**		
	2-3'	3.3	AK	AK				Bentonite Seal (1 - 3-ft bgs)
	3-4'	1.2	AK	AK	FILL: SAA, no GRAVEL (f), ORANGE/GRAY.			PVC Riser (0 - 5-ft bgs)
	4-5'	1.9	AK	AK				
-5	5-6'	3.9	AK	AK	CL: CLAY, some SAND (f), trace GRAVEL (f), ORANGE/BROWN.	**CL**		
	6-7'	1.2	---	42"	SW: SAND, trace GRAVEL (f).	**SW**		
	7-8'	3.3	---			**CL**		
	8-9'	2.3	---		CL: CLAY, some SAND (f), ORANGE/BROWN.			
	9-10'	2.7	---		CL: SAA, trace GRAVEL (f).			
-10	10-11'	2.3	---					Sand Pack (3 - 20-ft bgs)
	11-12'	2.2	---	42"	CL: CLAY, some SILT, ORANGE/BROWN.			
	12-13'	2.4	---					
	13-14'	2.3	---					0.020-inch slotted PVC Screen (5 - 20-ft bgs)
	14-15'	1.8	---					
-15	15-16'	1.6	---		CL: CLAY, some SAND (f), ORANGE/GRAY.			
	16-17'	2.9	---	60"				
	17-18'	3.5	---		CL: CLAY, some SILT, GRAY to BROWN, MOIST.			
	18-19'	5.5	---					
	19-20'	3.4	---					Monitoring Well installed to 20-ft bgs.
-20					Soil boring complete to 20-ft bgs.			



Location:

Northing/Latitude: **41.19721327**

Easting/Longitude: **-79.97675393**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-2

MONITORING WELL

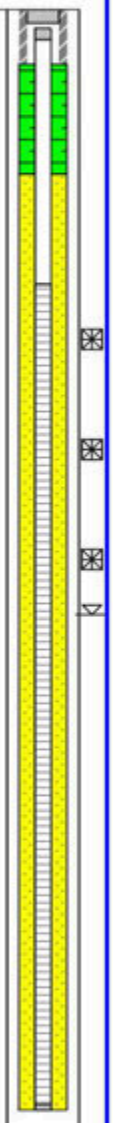
ID NO. **MW-3**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **98.90-ft**	TOTAL DEPTH: **20-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **11-ft**	CASING EL.: **98.83-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	CONCRETE: GRAY.	**CONCRETE**		Concrete (0 - 1-ft bgs)
	1-2'	26.9	AK	AK				
	2-3'	41.3	AK	AK	FILL: CLAY, some SAND, GRAY.	**FILL**		Bentonite Seal (1 - 3-ft bgs)
	3-4'	29.5	AK	AK	FILL: SAA, trace GRAVEL (f).			PVC Riser (0 - 5-ft bgs)
	4-5'	2,761	AK	AK	CL: CLAY, some SAND, ORANGE/BROWN.	**CL**		
-5	5-6'	3,188	AK	AK				
	6-7'	15,000	---	30"	CL: CLAY, some SILT, BROWN.			
	7-8'	9,980	---					
	8-9'	559.7	---					
	9-10'	523.5	---		CL: CLAY, some SAND, GRAY.			
-10	10-11'	440.5	---		CL: SAA, trace GRAVEL (f), GRAY to ORANGE, MOIST to SATURATED.			Sand Pack (3 - 20-ft bgs)
	11-12'	16.7	---	36"				
	12-13'	9.3	---		CL: CLAY, some SAND (f), ORANGE.			
	13-14'	4.8	---					0.020-inch slotted PVC Screen (5 - 20-ft bgs)
	14-15'	4.6	---					
-15	15-16'	9.9	---					
	16-17'	23.1	---	---				
	17-18'	25.7	---		CL: SAA, BROWN/GRAY.			
	18-19'	14.2	---					
	19-20'	6.5	---		CL: CLAY, some SAND (f), little GRAVEL (f), ORANGE.			Monitoring Well installed to 20-ft bgs.
-20					Soil boring complete to 20-ft bgs.			



Location:

Northing/Latitude: **41.1973702**

Easting/Longitude: **-79.97714898**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-3

MONITORING WELL

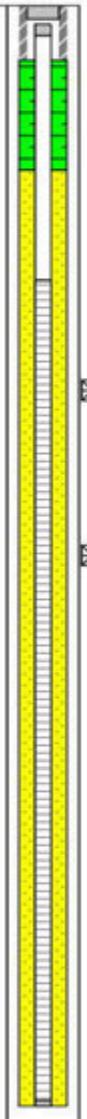
ID NO. **MW-4**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **99.30-ft**	TOTAL DEPTH: **20-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.: **98.86-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	CONCRETE: GRAY.	**CONCRETE**		Concrete (0 - 1-ft bgs)
	1-2'	1,040	AK	AK	FILL: CLAY, some SAND, GRAY.	**FILL**		
	2-3'	86.8	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (f), GRAY.			Bentonite Seal (1 - 3-ft bgs)
	3-4'	2,499	AK	AK				PVC Riser (0 - 5-ft bgs)
	4-5'	2,894	AK	AK	CL: CLAY, some SAND (f), ORANGE/BROWN.	**CL**		
-5	5-6'	11,099	AK	AK				
	6-7'	15,000	---	30"				
	7-8'	15,000	---					
	8-9'	440.0	---		CL: SAA, some SAND (m-c), trace GRAVEL (f).			
	9-10'	620.1	---					
-10	10-11'	680.9	---		CL: CLAY, some SAND, ORANGE/BROWN.			Sand Pack (3 - 20-ft bgs)
	11-12'	362.4	---	42"				
	12-13'	42.7	---		CL: CLAY, ORANGE/GRAY to GRAY.			
	13-14'	10.7	---					0.020-inch slotted PVC Screen (5 - 20-ft bgs)
	14-15'	9.3	---		CL: CLAY, some SAND, GRAY.			
-15	15-16'	70.2	---					
	16-17'	56.4	---	---	CL: CLAY, trace to some SILT, trace to some SAND, ORANGE to GRAY.			
	17-18'	30.1	---					
	18-19'	28.2	---					
	19-20'	28.8	---					Monitoring Well installed to 20-ft bgs.
-20					Soil boring complete to 20-ft bgs.			



Location:

Northing/Latitude: **41.1974627**

Easting/Longitude: **-79.97690937**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-4

MONITORING WELL

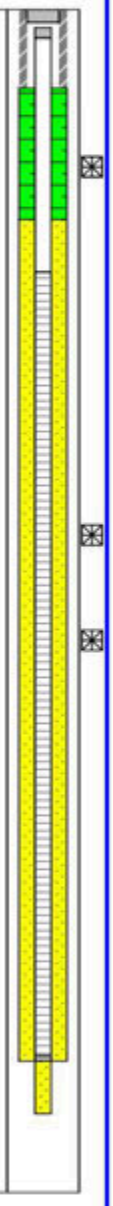
ID NO. **MW-5**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **98.90-ft**	TOTAL DEPTH: **21-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.: **98.60-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-01-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	**ASPHALT**		Concrete (0 - 1.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	7.9	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (angular/round), ORANGE/BROWN to GRAY, MOIST.	**FILL**		Bentonite Seal (1.5 - 4-ft bgs)
	3-4'	109.4	AK	AK				PVC Riser (0 - 5-ft bgs)
	4-5'	6.8	AK	AK				
-5	5-6'	6.8	4.5	24"	FILL: CLAY, some SAND (f), trace COBBLES (sandstone), MOIST to WET.	**CL**		
		3.4	5.9					
	7-9'	9.8	2.4	14"	CL: CLAY with SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN to GRAY, DRY to MOIST.			
		3.7	4.9					
	9-11'	23.5	3.3	16"				
-10		172.1	8.6					Sand Pack (4 - 20-ft bgs)
	11-13'	18.5	2.7	16"				
		8.9	9.7					
	13-15'	23.5	2.3	16"	CL: CLAY, some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN to GRAY, MOIST to WET, 2-in SAND lense (m, red) between 14 - 15-ft.			0.010-inch slotted PVC Screen (5 - 20-ft bgs)
		20.2	5.8					
-15	15-17'	29.8	2.3	18"				
		12.8	8.7					
	17-19'	25.5	2.2	18"				
		20.3	6.7					
	19-21'	44.6	3.4	24"				Monitoring Well installed to 20-ft bgs.
-20		25.4	7.7					
					Soil boring complete to 21-ft bgs.			



Location:

Northing/Latitude: **41.19753363**

Easting/Longitude: **-79.97694772**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-5

MONITORING WELL

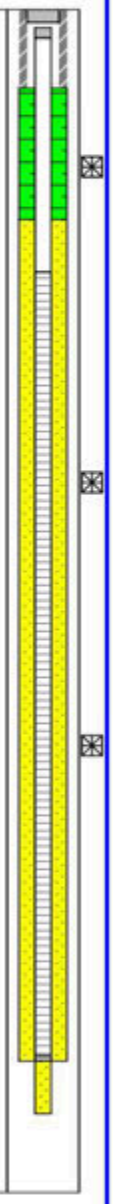
ID NO. **MW-6**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **98.71-ft**	TOTAL DEPTH:	**21-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**98.29-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-01-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	**ASPHALT**		Concrete (0 - 1.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	4.0	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (angular/round), trace to some COBBLES (sandstone), ORANGE to BROWN, MOIST.	**FILL**		Bentonite Seal (1.5 - 4-ft bgs)
	3-4'	4.7	AK	AK				PVC Riser (0 - 5-ft bgs)
	4-5'	3.7	AK	AK				
-5	5-7'	4.5	2.3	10"	CL: CLAY with SILT, some to trace SAND (f), trace GRAVEL (f), BROWN, MOIST.	**CL**		
		2.3	3.5					
	7-9'	1.6	2.4	14"				
		1.4	6.6					
	9-11'	12.8	1.2	10"				
-10		2.2	3.5					Sand Pack (4 - 20-ft bgs)
	11-13'	2.4	3.5	16"	CL: CLAY, some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN, MOIST to WET, 2-in SAND lense (m, gray) near 14-ft.			
		2.9	6.12					
	13-15'	5.2	2.5	10"				0.010-inch slotted PVC Screen (5 - 20-ft bgs)
		1.9	9.7					
-15	15-17'	4.6	2.7	12"				
		2.6	6.7					
	17-19'	6.0	2.4	18"				
		4.3	7.8					
	19-21'	5.8	1.4.	6"				Monitoring Well installed to 20-ft bgs.
-20			4.6					
					Soil boring complete to 21-ft bgs.			



Location:

Northing/Latitude: **41.19755575**

Easting/Longitude: **-79.97721665**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-6

MONITORING WELL

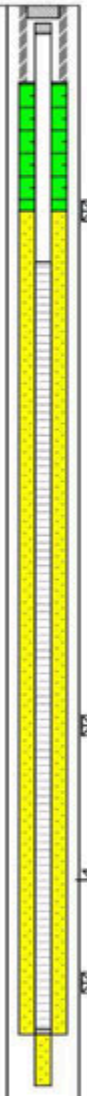
ID NO. **MW-7**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **98.50-ft**	TOTAL DEPTH:	**21-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **17-ft**	CASING EL.:	**97.65-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**11-30-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 1.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	3.0	AK	AK	FILL: SAND (f), trace to some CLAY, trace to some GRAVEL (angular/rounded) and COBBLES, BROWN/ORANGE to GRAY, MOIST.	FILL		Bentonite Seal (1.5 - 4-ft bgs)
	3-4'	4.2	AK	AK				PVC Riser (0 - 5-ft bgs)
	4-5'	142.5	AK	AK				
-5	5-7'	7.0	8.11	14"	CL: CLAY, some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN to GRAY, MOIST.	CL		
		2.3	7.9					
	7-9'	42.3	3.4	12"				
		8.2	6.9					
	9-11'	6.6	3.4	12"				
-10		3.5	6.7					Sand Pack (4 - 20-ft bgs)
	11-13'	5.6	1.1.	6"				
			4.6					
	13-15'	46.7	3.3	12"				0.010-inch slotted PVC Screen (5 - 20-ft bgs)
		365.3	8.8					
-15	15-17'	70.1	1.7	16"	CL: SAA, MOIST to WET.			
		304.5	11.7					
	17-19'	15.0	1.7	22"	CL: SAA, WET to SATURATED, 4-in SAND lense (f-m, gray) between 17 - 18-ft.			
		36.0	9.7					
	19-21'	11.0	2.5	18"	CL: CLAY, some SILT, some SAND (f-m), BROWN to ORANGE, MOIST to SATURATED.			Monitoring Well installed to 20-ft bgs.
-20		19.2	5.7					
					Soil boring complete to 21-ft bgs.			



Location:

Northing/Latitude: **41.19747337**

Easting/Longitude: **-79.97739441**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-7

MONITORING WELL

ID NO. **MW-8**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.:	99.10
ADDRESS:	5574 State Route 8	WATER DEPTH:	NA
JOB NO.	0704793	BOREHOLE DIA.:	11.25-in
TOTAL DEPTH:	21-ft		
CASING EL.:	98.13-ft		
WELL DIA.:	4-in		

Logged By:	LB	Drilling Method:	Hollow Stem Auger
Dates Drilled:	11-30-2015	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 1.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	4.4	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (angular/round), light BROWN to ORANGE/BROWN, MOIST.	FILL		Bentonite Seal (1.5 - 4-ft bgs)
	3-4'	4.2	AK	AK				PVC Riser (0 - 5-ft bgs)
	4-5'	5.0	AK	AK				
-5	5-7'	1.5	7.6	18"	FILL: SAA, trace to some COBBLES (sandstone).	CL		
		0.5	10.8					
	7-9'	10.9	3.6	12"	CL: CLAY. some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN, MOIST, 2-in SAND lense (f-c, gray) between 10 - 11-ft.			
		57.8	9.9					
	9-11'	27.4	1.4	12"				
-10		324.4	10.9					Sand Pack (4 - 20-ft bgs)
	11-13'	175.3	3.5	14"	CL: SAA, BROWN/GRAY, 2-in SAND lense (f-c, gray) between 13 - 15-ft.			
		30.0	11.10					
	13-15'	36.6	7.12	12"				0.010-inch slotted PVC Screen (5 - 20-ft bgs)
		12.5	9.9					
-15	15-17'	30.9	3.5	16"	CL: SAA, BROWN.			
		10.3	9.10					
	17-19'	41.5	3.7	16"				
		3.9	9.12					
	19-21'	35.3	2.5.	4"				Monitoring Well installed to 20-ft bgs.
-20			10.8					
					Soil boring complete to 21-ft bgs.			

Location:

Northing/Latitude: **41.19731717**

Easting/Longitude: **-79.97723907**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-8

MONITORING WELL

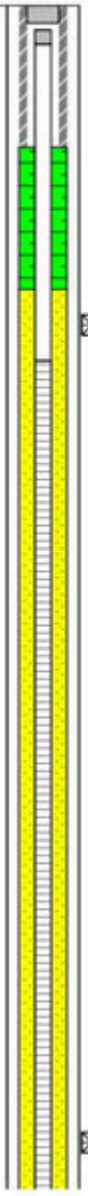
ID NO. **MW-9**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 99.41-ft	TOTAL DEPTH: 31-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: NA	CASING EL.: 99.03-ft
JOB NO.	0704793	BOREHOLE DIA.: 11.25-in	WELL DIA.: 4-in

Logged By:	JP	Drilling Method:	Hollow Stem Auger
Dates Drilled:	2-18-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 2-ft bgs)
	1-2'	2.7	AK	AK	FILL: GRAVEL (weathered shale), some CLAY, some SAND (f-c), BROWN, MOIST.	FILL		
	2-3'	1.7	AK	AK				Bentonite Seal (2 - 4-ft bgs)
	3-4'	3.4	AK	AK	FILL: CLAY (soft to stiff), some SAND (f-c). trace to some GRAVEL (weathered shale), brick fragments, BROWN, MOIST.			
	4-5'	1.5	AK	AK				PVC Riser (0 - 5-ft bgs)
-5	5-7'	8.8	9.7 7.8	3"	FILL: GRAVEL (weathered sandstone), trace SAND (f-c), trace CLAY (soft), BROWN, MOIST.			
	7-9'	4.4	2.4 8.6	5"	CL: CLAY (soft), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN/ORANGE, MOIST.	CL		
	9-11'	7.0	1.4 6.13	7"	SC: SAND (f-c), some CLAY (soft), tracel GRAVEL (weathered sandstone), ORANGE/BROWN, WET to MOIST.	SC		
-10								Sand Pack (4 - 30-ft bgs)
	11-13'	NA	1.3 4.6	1"				
	13-15'	7.8	2.4 7.10	6"				0.020-inch slotted PVC Screen (5 - 30-ft bgs)
-15	15-17'	15.5	2.10 12.10	3"	GC: GRAVEL (weathered sandstone), trace SAND, trace CLAY, BROWN, MOIST.	GC		



Location:

Northing/Latitude: 41.19764734
Easting/Longitude: -79.97729626
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-9

MONITORING WELL ID NO. **MW-9**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.41-ft**	TOTAL DEPTH:	**31-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**99.03-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-18-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	17-19'	3.0	1.3 8.8	6"	CL: CLAY, some SAND, trace GRAVEL, BROWN, MOIST to WET.	CL		
	19-21'	4.4	4.4 5.7	3"	GC: GRAVEL (weathered sandstone), trace SAND, trace CLAY, BROWN, MOIST.	GC		
-20	21-23'	3.0	1.3 4.7	12"	CL: CLAY, some SAND, trace GRAVEL, BROWN, MOIST.	CL		
					CL: SAA, GRAY.			
	23-25'	6.7	2.3 7.10	6"	CL: SAA, BROWN.			
-25	25-27'	2.7	1.2 3.5	12"	CL: SAA, WET.			
	27-29'	2.5	2.2 4.6	18"	CL: SAA, BROWN to ORANGE, MOIST to WET.			
	29-31'	1.8	1.2 4.8	15"				Monitoring Well installed to 30-ft bgs.
-30					Soil boring complete to 31-ft bgs.			

Location:

Northing/Latitude: **41.19764734**
Easting/Longitude: **-79.97729626**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-9

MONITORING WELL

ID NO. **MW-10D**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.:	99.19-ft
ADDRESS:	5574 State Route 8	WATER DEPTH:	NA
JOB NO.	0704793	BOREHOLE DIA.:	8.25-in
TOTAL DEPTH:	45-ft		
CASING EL.:	98.85-ft		
WELL DIA.:	2-in		

Logged By:	JP	Drilling Method:	Hollow Stem Auger
Dates Drilled:	2-23-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 2-ft bgs)
	1-2'	1.9	AK	AK	FILL: GRAVEL (weathered sandstone), some SAND (f-c), trace CLAY (stiff), BROWN/ORANGE, MOIST.	FILL		
	2-3'	2.7	AK	AK				Bentonite Seal (2 - 28-ft bgs)
	3-4'	4.0	AK	AK				
	4-5'	3.8	AK	AK				
-5	5-7'	1.2	1.3 4.10	6"	FILL: CLAY (stiff), trace to some GRAVEL (SAA), trace SAND (f-c), BROWN/ORANGE, MOIST.	CL		PVC Riser (0 - 30-ft bgs)
	7-9'	2.7	1.3 4.5	7"	CL: CLAY (stiff), some to trace SAND (f-c), some to trace GRAVEL (weathered sandstone), BROWN to BROWN/GRAY, MOIST to WET.			
-10	9-11'	2.6	2.2 3.6	13"				
	11-13'	2.2	2.6 7.10	8"				
	13-15'	8.4	1.7 7.9	9"				
-15	15-17'	6.8	1.4 4.6	7"				
	17-19'	69.2	3.5 6.5	5"				
	19-21'	16.8	6.5 6.5	12"				
-20	21-23'	7.8	4.4 6.6	7"				
	23-25'	17.6	2.10 23.10	4"				

Location:

Northing/Latitude: **41.19752444**

Easting/Longitude: **-79.97753647**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-10D

MONITORING WELL

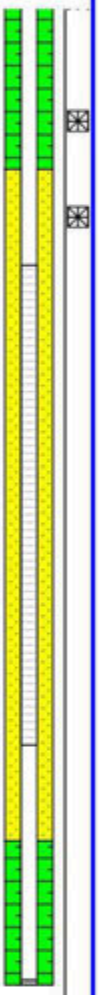
ID NO. **MW-10D**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.19-ft**	TOTAL DEPTH:	**45-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**98.85-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **8.25-in**	WELL DIA.:	**2-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-23-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
-25	25-27'	17.1	2.5 5.9	5"				
	27-29'	40.9	1.4 11.11	9"				
	29-31'	10.2	2.3 4.7	12"				
-30	31-33'	9.5	2.6 11.16	13"	CL: SAA, ORANGE/BROWN to BROWN.			Sand Pack (28 - 42-ft bgs)
	33-35'	3.1	1.8 15.10	11"				
-35	35-37'	4.6	2.6 9.13	8"				0.020-inch slotted PVC Screen (30 - 40-ft bgs)
	37-39'	3.3	4.21 11.10	4"				
	39-41'	3.8	4.23 20.43	20"				
-40	41-43'	3.7	4.50/6	6"	SANDSTONE: weathered, BROWN, MOIST to WET.	**SANDSTONE**		PVC Riser (40 - 45-ft bgs) Bentonite Seal (42 - 45-ft bgs)
	43-45'	3.1	50/2	4"				
-45					Soil boring complete to 45-ft bgs.			Monitoring Well installed to 45-ft bgs.



Location:

Northing/Latitude: **41.19752444**
Easting/Longitude: **-79.97753647**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-10D

MONITORING WELL

ID NO. **MW-10S**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.:	99.35-ft
ADDRESS:	5574 State Route 8	WATER DEPTH:	19-ft
JOB NO.	0704793	BOREHOLE DIA.:	11.25-in
TOTAL DEPTH:	27-ft		
CASING EL.:	98.77-ft		
WELL DIA.:	4-in		

Logged By:	JP	Drilling Method:	Hollow Stem Auger
Dates Drilled:	2-22-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 2-ft bgs)
	1-2'	1.9	AK	AK	FILL: CLAY (stiff), some GRAVEL (weathered sandstone), trace SAND (f-c), BROWN, MOIST.	FILL		
	2-3'	2.5	AK	AK				Bentonite Seal (2 - 4-ft bgs)
	3-4'	1.9	AK	AK	FILL: SAA, trace GRAVEL, MOIST to WET.			PVC Riser (0 - 5-ft bgs)
	4-5'	3.4	AK	AK	FILL: SAA, some SAND (f-c), MOIST.			
-5	5-7'	9.6	3.5 3.5	5"	FILL: GRAVEL (weathered sandstone), some CLAY (stiff), trace SAND (f-c), BROWN, MOIST.			
	7-9'	7.8	2.3 4.5	11"	CL: CLAY (stiff), some GRAVEL, trace SAND, BROWN, MOIST.	CL		
	9-11'	12.5	1.2 6.7	6"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL, BROWN, MOIST to WET.			
-10								Sand Pack (4 - 25-ft bgs)
	11-13'	10.8	1.3 7.7	7"				
	13-15'	15.3	3.2 2.5	3"				0.020-inch slotted PVC Screen (5 - 25-ft bgs)
-15	15-17'	24.8	1.3 5.15	6"				

Location:

Northing/Latitude: **41.1975536**

Easting/Longitude: **-79.9775073**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-10S

MONITORING WELL

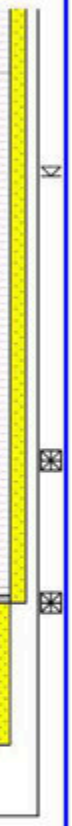
ID NO. **MW-10S**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.35-ft**	TOTAL DEPTH:	**27-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **19-ft**	CASING EL.:	**98.77-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	17-19'	25.1	2.6 12.15	7"				
	19-21'	30.3	2.5 9.7	5"	CL: CLAY (stiff), some GRAVEL, trace SAND (f-c), BROWN, SATURATED.			
-20	21-23'	32.1	2.3 5.8	7"	CL: SAA, MOIST to WET.			
	23-25'	40.3	1.3 8.12	4"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL, BROWN, MOIST to WET.			Monitoring Well installed to 25-ft bgs.
-25	25-27'	32.1	1.6 8.5	6"				
					Soil boring complete to 27-ft bgs.			



Location:

Northing/Latitude: **41.1975536**

Easting/Longitude: **-79.9775073**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-10S

MONITORING WELL

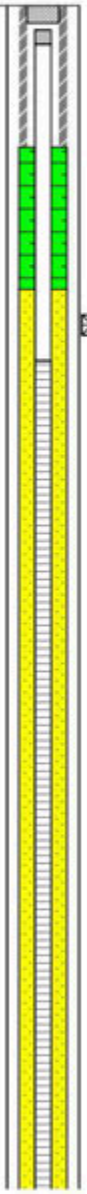
ID NO. **MW-11**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **97.95-ft**	TOTAL DEPTH: **31-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **17-ft**	CASING EL.: **97.23-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	**ASPHALT**		Concrete (0 - 2-ft bgs)
	1-2'	1.9	AK	AK	FILL: CLAY (stiff), trace to some GRAVEL (weathered sandstone), trace SAND (f-c), BROWN, MOIST.	**FILL**		
	2-3'	1.7	AK	AK				Bentonite Seal (2 - 4-ft bgs)
	3-4'	3.1	AK	AK	FILL: SAND (f-c), some GRAVEL (weathered sandstone), trace CLAY, BROWN-ORANGE, MOIST.			
	4-5'	2.7	AK	AK				PVC Riser (0 - 5-ft bgs)
-5	5-7'	2.8	6.7 10.10	7"	FILL: GRAVEL (weathered sandstone), some to trace SAND (f-c), trace to some CLAY, BROWN, MOIST.			
	7-9'	7.8	1.3 5.5	6"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN, MOIST.	**CL**		
	9-11'	15.9	2.5 7.10	5"				
-10								Sand Pack (4 - 30-ft bgs)
	11-13'	8.4	1.3 2.7	9"				
	13-15'	25.1	4.13 7.8	7"	CL: SAA, some GRAVEL (weathered sandstone), trace SAND.			0.020-inch slotted PVC Screen (5 - 30-ft bgs)
-15	15-17'	12.1	1.5 8.9	6"	GC: GRAVEL (weathered sandstone), some CLAY, some SAND, BROWN, MOIST.	**GC**		



Location:

Northing/Latitude: **41.19727517**

Easting/Longitude: **-79.97750204**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-11

MONITORING WELL

ID NO. **MW-11**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **97.95-ft**	TOTAL DEPTH:	**31-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **17-ft**	CASING EL.:	**97.23-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	17-19'	44.2	2.7 7.9	8"	CL: CLAY (stiff), some GRAVEL (weathered sandstone), trace SAND (f-c), BROWN, SATURATED.	CL		
	19-21'	18.0	1.3 5.9	7"	CL: SAA, MOIST.			
-20	21-23'	17.7	2.5. 8.10	1"				
	23-25'	27.6	2.8 8.10	8"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN, MOIST.			
-25	25-27'	11.1	WT.2 10.8	6"				
	27-29'	19.5	1.3 5.4	5"				
	29-31'	15.3	1.1 2.4	9"	CL: SAA, MOIST-WET.			
-30					Soil boring complete to 31-ft bgs.			Monitoring Well installed to 30-ft bgs.

Location:

Northing/Latitude: **41.19727517**

Easting/Longitude: **-79.97750204**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-11

MONITORING WELL

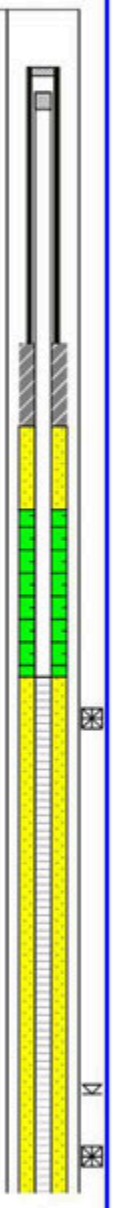
ID NO. **MW-12**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 57.71-ft	TOTAL DEPTH: 19-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: 9-ft	CASING EL.: 59.71-ft
JOB NO.	0704793	BOREHOLE DIA.: 11.25-in	WELL DIA.: 4-in

Logged By:	JP	Drilling Method:	Hollow Stem Auger
Dates Drilled:	2-18-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	HA	HA	TOPSOIL: CLAY (soft), some SAND (f-c), BROWN, MOIST.	TOPSOIL	Constructed as a stick-up well with 3-ft of protective steel casing.	6" Steel casing (-3.3 - 1.7-ft bgs)
	1-2'	0.0	HA	HA				PVC Riser (-3 - 4-ft bgs)
	2-3'	0.0	HA	HA	SC: SAND (f-c), some CLAY (soft), BROWN, MOIST to WET.	SC		Concrete (0 - 1-ft bgs)
	3-4'	0.0	HA	HA				Sand Pack (1 - 2-ft bgs)
	4-5'	0.0	HA	HA	CL: CLAY (soft), some SAND (f-c), BROWN, MOIST to WET.	CL		Bentonite Seal (2 - 4-ft bgs)
-5	5-7'	1.4	4.11 6.10	5"	CL: CLAY (soft), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN, MOIST to WET.			0.020-inch slotted PVC Screen (4 - 19-ft bgs)
	7-9'	1.1	7.7 8.10	3"	CL: SAA, some GRAVEL (weathered sandstone), WET.			Sand Pack (4 - 19-ft bgs)
	9-11'	15.3	4.9 7.8	3"	GC: GRAVEL (weathered sandstone), trace SAND (f-c), trace CLAY, BROWN, SATURATED.	GC		
-10								



Location:

Northing/Latitude: 41.19774568
Easting/Longitude: -79.97813329
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

HA = hand auger, bgs = below ground surface, ft= feet, in= inch,
SAA= same as above, --- = not available, NA = not applicable
WT = weight of hammer, (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-12

MONITORING WELL

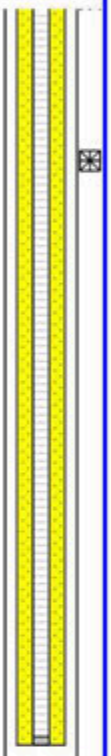
ID NO. **MW-12**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **57.71-ft**	TOTAL DEPTH: **19-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **9-ft**	CASING EL.: **59.71-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.: **4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-18-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	11-13'	50.0	WT.2 4.12	12"	CL: CLAY (soft), some GRAVEL (weathered sandstone), some SAND (f-c), BROWN, SATURATED.	**CL**		
	13-15'	5.5	2.4 6.6	6"	GC: GRAVEL (weathered sandstone), trace SAND (f-c), trace CLAY, BROWN, SATURATED.	**GC**		
-15	15-17'	6.5	6.6 5.7	5"				
	17-19'	NA	4.4 6.50/5	3"				
					Soil boring complete to 19-ft bgs.		Auger refusal at 19-ft bgs, encountered sandstone bedrock.	Monitoring Well installed to 19-ft bgs.
-20								



Location:

Northing/Latitude: **41.19774568**
Easting/Longitude: **-79.97813329**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

HA = hand auger, bgs = below ground surface, ft= feet, in= inch,
SAA= same as above, --- = not available, NA = not applicable
WT = weight of hammer, (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-12

MONITORING WELL

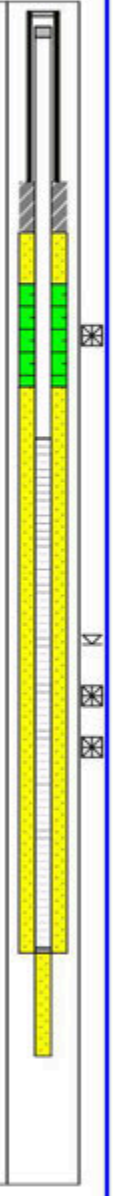
ID NO. **MW-13**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **57.62-ft**	TOTAL DEPTH:	**17-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **9-ft**	CASING EL.:	**60.62-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**2-17-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	HA	HA	TOPSOIL: CLAY (soft), some SAND (f-c), BROWN, MOIST to WET.	TOPSOIL	Constructed as a stick-up well with 3-ft of protective steel casing.	6" Steel casing (-3.3 - 1.7-ft bgs) PVC Riser (-3 - 5-ft bgs) Concrete (0 - 1-ft bgs) Sand Pack (1 - 2-ft bgs) Bentonite Seal (2 - 4-ft bgs)
	1-2'	0.0	HA	HA				
	2-3'	0.0	HA	HA	SC: SAND (f-c), some CLAY (soft), BROWN, MOIST to WET.	SC		
	3-4'	0.0	HA	HA				
	4-5'	0.0	HA	HA	CL: CLAY (soft), some SAND (f-c), BROWN, very WET.	CL		
-5	5-7'	2.9	2.2 2.3	19"	CL: SAA, trace GRAVEL (weathered sandstone).			0.020-inch slotted PVC Screen (5 - 15-ft bgs) Sand Pack (4 - 15-ft bgs)
	7-9'	1.8	1.2 2.3	21"				
	9-11'	20.8	2.2 1.1	10"	CL: CLAY (soft), trace SAND, BROWN/GRAY, SATURATED.			
-10	11-13'	11.3	3.3 3.1	6"				
	13-15'	7.9	WT. 50/4	6"	CL: CLAY (soft), some SAND, trace GRAVEL, ORANGE/BROWN, SATURATED.			
-15	15-17'	---	15. 50/1	3"	SC: SAND, some CLAY, trace GRAVEL (weathered sandstone), ORANGE/BROWN, SATURATED.	SC		Monitoring Well installed to 15-ft bgs.
					Soil boring complete to 17-ft bgs.			



Location:

Northing/Latitude: **41.19753966**

Easting/Longitude: **-79.97824787**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

HA = hand auger, bgs = below ground surface, ft= feet, in= inch,
SAA= same as above, --- = not available, NA = not applicable
WT = weight of hammer, (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-13

MONITORING WELL

ID NO. **MW-14**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.:	100.60-ft	TOTAL DEPTH:	26-ft
ADDRESS:	5574 State Route 8	WATER DEPTH:	NA	CASING EL.:	100.20-ft
JOB NO.	0704793	BOREHOLE DIA.:	11.25-in	WELL DIA.:	4-in

Logged By:	LB	Drilling Method:	Hollow Stem Auger
Dates Drilled:	6-22-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 1-ft bgs)
	1-2'	0.2	AK	AK	FILL: GRAVEL (f), some SAND (f-c), trace to some CLAY, BROWN, MOIST.	FILL		Bentonite Seal (1 - 3-ft bgs)
	2-3'	0.9	AK	AK				
	3-4'	0.9	AK	AK				PVC Riser (0 - 4-ft bgs)
	4-5'	1.4	AK	AK				
-5	5-6'	0.1	AK	AK				
	6-7'	0.2	AK	AK	FILL: SAA, WET.			
	7-8'	0.2	AK	AK	CL: CLAY, some GRAVEL (f), some SAND (f-c), BROWN/GRAY, WET.	CL		
	8-10'	1.5	1.10	20"	CL: CLAY (soft), some GRAVEL (f), trace SAND (f-c), BROWN, MOIST to WET.			
			10.12					
		1.7						
-10	10-12'	0.9	10.10	24"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (f), BROWN, MOIST.			Sand Pack (3 - 24-ft bgs)
			9.16					
		1.3						
	12-14'	1.3	2.4	20"				
			9.10					
		1.8						0.020-inch slotted PVC Screen (4 - 24-ft bgs)
	14-16'	3.7	1.4	18"	CL: SAA, some GRAVEL (f), BROWN/BLACK			
			6.6					
-15		1.5						

Location:

Northing/Latitude: 41.19712793
Easting/Longitude: -79.97655079
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-14

MONITORING WELL ID NO. **MW-14**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **100.60-ft**	TOTAL DEPTH:	**26-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**100.20-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**6-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	16-18'	1.1	1.1 1.7	18"	CL: CLAY (soft), trace SAND (f-m), trace GRAVEL (f), BROWN/GRAY, MOIST to WET.			
		1.2						
	18-20'	0.5	1.10 14.19	18"	CL: CLAY (stiff), trace SAND (f-m), trace GRAVEL (f), BROWN/GRAY, MOIST.			
		0.8						
-20	20-22'	2.1	2.6 14.14	12"				
	22-24'	2.1	4.5 8.15	24"	CL: CLAY (soft), trace SAND (f-m), trace GRAVEL (f), BROWN, WET.			
		1.4			CL: CLAY (stiff), trace SAND (f-m), trace GRAVEL (f), BROWN, MOIST.			Monitoring Well installed to 24-ft bgs.
	24-26'	1.6	50/5	6"				
-25					CL: CLAY (soft), trace SAND (f-m), trace GRAVEL (f), BROWN, WET.			
					Soil boring complete to 26-ft bgs.			

Location:

Northing/Latitude: **41.19712793**
Easting/Longitude: **-79.97655079**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-14

MONITORING WELL

ID NO. **MW-15**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **97.40-ft**	TOTAL DEPTH:	**37-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**96.90-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **6.25-in**	WELL DIA.:	**4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**6-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 1-ft bgs)
	1-2'	1.0	AK	AK	FILL: GRAVEL (f-c), trace CLAY, trace SAND (f-c), BROWN, DRY to MOIST.	FILL		
	2-3'	1.0	AK	AK				PVC Riser (0 - 15-ft bgs)
	3-4'	1.4	AK	AK	FILL: SAA, some COBBLES.			
	4-5'	0.7	AK	AK	FILL: CLAY, some GRAVEL (f), some SAND (f-c), BROWN, MOIST.			Bentonite Seal (1 - 14-ft bgs)
-5	5-7'	94.3	4.5 3.2	8"	FILL: GRAVEL (f), some CLAY, trace SAND (f-c), BROWN, DRY to MOIST.			
	7-9'	30.4	1.1 2.3	22"	CL: CLAY (soft), some SAND (f-m), trace GRAVEL (f), BROWN, MOIST.	CL		
		3.7						
	9-11'	46.8	7.6 6.6	10"	CL: SAA, some GRAVEL.			
-10	11-13'	40.5	4.10 14.9	10"	GC: GRAVEL (f), some CLAY (stiff), some SAND (f-c), BROWN, DRY to MOIST.	GC		
	13-15'	23.9	6.11 9.8	12"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (f), BROWN, MOIST.	CL		
-15	15-17'	78.6	9.15 10.14	20"				Sand Pack (14 - 35-ft bgs)
		11.0						
	17-19'	25.4	3.8 7.10	8"	CL: SAA, some GRAVEL (f), BROWN to GRAY.			0.020-inch slotted PVC Screen (15 - 35-ft bgs)

Location:

Northing/Latitude: **41.19714688**

Easting/Longitude: **-79.97751618**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch
SAA= same as above, --- = not available, NA = not applicable
(f-c)= fine to coarse, (f-m)= fine to medium, (f)= fine

Symbol Key:

Lab Sample Location
Apparent Water Level

MW-15

MONITORING WELL

ID NO. **MW-15**

Groundwater and Environmental Services, Inc.

PROJECT:	**Kwik Fill # M-209**	SURFACE ELEV.: **97.40-ft**	TOTAL DEPTH: **37-ft**
ADDRESS:	**5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.: **96.90-ft**
JOB NO.	**0704793**	BOREHOLE DIA.: **6.25-in**	WELL DIA.: **4-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**6-22-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Recovery	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
-20	19-21'	9.4	3.9 12.12	6"	CL: CLAY (stiff), trace SAND (f-c), trace GRAVEL (f), BROWN, MOIST.			
	21-23'	29.5 13.4	2.5 6.10	18"				
	23-25'	18.7	2.4 6.10	8"				
-25	25-27'	33.4 7.7	3.7 7.10	16"	CL: SAA, some SAND (f-c).			
	27-29'	16.7 9.9	1.4 8.8	24"	CL: SAA, no GRAVEL.			
	29-31'	33.5 10.0	1.14 18.17	24"				
-30	31-33'	10.1	6.20 10.12	8"				
	33-35'	21.1 3.2	1.5 7.12	18"	CL: CLAY (soft), some SAND (f-c), BROWN, MOIST.			
-35	35-37'	11.3 4.1	1.5 9.11	18"				Monitoring Well installed to 35-ft bgs.
					Soil boring complete to 37-ft bgs.			

Location:

Northing/Latitude: **41.19714688**

Easting/Longitude: **-79.97751618**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = Air Knife, bgs = below ground surface, ft= feet, in= inch
SAA= same as above, --- = not available, NA = not applicable
(f-c)= fine to coarse, (f-m)= fine to medium, (f)= fine

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-15

MONITORING WELL

ID NO. **MW-16**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **64.84-ft**	TOTAL DEPTH:	**21-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**67.84-ft**
JOB NO. **0704793**	BOREHOLE DIA.: **8.25-in**	WELL DIA.:	**2-in**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**6-21-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.4	HA	HA	TOPSOIL: CLAY, some GRAVEL (f-c), some SAND (f-c), BROWN/ORANGE, DRY to MOIST.	TOPSOIL	Constructed as a stick-up well with 3-ft of protective steel casing.	6" Steel Casing (-3.3 - 1.7-ft bgs)
	1-2'	1.2	HA	HA				Sand pack inside steel casing (-3 - 0-ft bgs)
	2-3'	25.5	HA	HA		CL		Concrete (0 - 2-ft bgs)
	3-4'	11.3	HA	HA				Bentonite Seal (2 - 3-ft bgs)
	4-5'	54.5	HA	HA	CL: CLAY (stiff), some SAND (f-c), trace to some GRAVEL (f-c), BROWN/GRAY, DRY to MOIST, roots/organics present.			PVC Riser (-3 - 5-ft bgs)
-5	5-7'	834.3	2.3 5.10	12"				0.020-inch slotted PVC Screen (5 - 20-ft bgs)
	7-9'	62.4	4.8 10.7	12"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (f), BROWN to ORANGE/BROWN, MOIST.			Sand Pack (3 - 20-ft bgs)
	9-11'	26.8 111.1	1.4 5.5	16"				
-10	11-13'	312.8 418.2	1.2 6.12	24"	CL: SAA, soft CLAY.			
	13-15'	512.3 412.9	7.8 7.7	16"				
-15	15-17'	43.9	2.3. 8.6	6"	CL: CLAY, some SAND (f-m), trace GRAVEL (f), BROWN, MOIST to WET.			
	17-19'	5.8 11.6	1.3 5.12	24"				
-20	19-21'	38.9	2.4 4.7	4"				Monitoring Well installed to 20-ft bgs.
					Soil boring complete to 21-ft bgs.			

Location:

Northing/Latitude: **41.19732555**

Easting/Longitude: **-79.97800224**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

HA = hand auger, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

MW-16

SOIL BORING

ID NO. **SB-1**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **100.10-ft**	TOTAL DEPTH:	**20-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **6-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	CONCRETE: GRAY.	**CONCRETE**		Concrete (0 - 1-ft bgs)
	1-2'	455	AK	AK	FILL: CLAY, some SAND, trace GRAVEL (f), GRAY.	**FILL**		
	2-3'	500	AK	AK	FILL: SAA, BROWN to ORANGE/BROWN.			Bentonite Seal (1 - 20-ft bgs)
	3-4'	411.2	AK	AK				
	4-5'	43.0	AK	AK				
-5	5-6'	38.1	AK	AK	CL: CLAY, some SAND (f), trace to some GRAVEL, ORANGE, SATURATED.	**CL**		
	6-7'	9.2	---	36"				
	7-8'	6.2	---		CL: CLAY, some SAND (f), ORANGE/BROWN.			
	8-9'	3.6	---		CL: SAA, trace GRAVEL (f).			
	9-10'	2.4	---					
-10	10-11'	2.3	---					
	11-16'	6.0	---	18"	CL: SAA, ORANGE/GRAY.			
-15	16-17'	6.9	---	60"	CL: CLAY, some SILT, GRAY.			
	17-18'	4.2	---		CL: SAA, BROWN, MOIST to WET.			
	18-19'	3.4	---					
	19-20'	2.7	---					
-20					Soil boring complete to 20-ft bgs.			

Location:

Northing/Latitude: **41.1972454**

Easting/Longitude: **-79.97664849**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-1

SOIL BORING

ID NO. **SB-2**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.00-ft**	TOTAL DEPTH:	**20-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **7-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**TN**	Drilling Method:	**Direct push**
Dates Drilled:	**9-03-2015**	Sampling Method:	**Macro-core (5-ft)**
Drilling Company:	**Kodiak Field Services**	Soil Class. System:	**USCS**
Drill Rig Type:	**Geoprobe 7822DT**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	CONCRETE: GRAY.	**CONCRETE**		Concrete (0 - 1-ft bgs)
	1-2'	221	AK	AK				
	2-3'	35.3	AK	AK	FILL: CLAY, some SAND, trace GRAVEL (f), GRAY to ORANGE/BROWN.	**FILL**		Bentonite Seal (1 - 20-ft bgs)
	3-4'	15.9	AK	AK				
	4-5'	11.9	AK	AK	CL: CLAY, some SAND (f), ORANGE/BROWN, SATURATED at 7-ft.	**CL**		
-5	5-6'	296	AK	AK				
	6-7'	73.6	---	30"				
	7-8'	293.2	---					
	8-9'	35.7	---		CL: SAA, trace GRAVEL (f), MOIST.			
	9-10'	20.4	---		CL: CLAY, some SILT, GRAY, MOIST.			
-10	10-11'	54.1	---					
	11-12'	16.4	---	---				
	12-13'	14.3	---		CL: CLAY, some SAND (f), BROWN.			
	13-14'	7.6	---					
	14-15'	3.5	---		CL: SAA, trace GRAVEL (f).			
-15	15-16'	4.1	---		CL: CLAY, some SAND, ORANGE/BROWN to ORANGE/GRAY.			
	16-17'	12.1	---	---				
	17-18'	10.3	---					
	18-19'	9.2	---		CL: SAA, some SAND (f), ORANGE.			
	19-20'	22.1	---					
-20					Soil boring complete to 20-ft bgs.			

Location:

Northing/Latitude: **41.19752393**

Easting/Longitude: **-79.97704843**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-2

SOIL BORING

ID NO. **SB-3**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.50-ft**	TOTAL DEPTH:	**20-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **19-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**TN**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-02-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	**ASPHALT**		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	3.4	AK	AK	FILL: CLAY, trace to some SAND (f), trace GRAVEL (angular/rounded), BROWN to ORANGE/BROWN, MOIST.	**FILL**		Bentonite Seal (0.5 - 21-ft bgs)
	3-4'	3.8	AK	AK				
	4-5'	2.7	AK	AK				
-5	5-7'	0.0	9.12	24"	CL: CLAY, some SAND (f-c), ORANGE/BROWN to GRAY.	**CL**		
		14.6	11.8					
	7-9'	25.2	3.9	24"	CL: CLAY, some SILT, GRAY/ORANGE.			
		1.2	11.8					
	9-11'	0.8	12.8	12"	CL: CLAY, some SAND (m-c), trace GRAVEL (sandstone fragments), ORANGE/BROWN.			
-10		0.8	8.12					
	11-13'	4.1	1.3	24"	CL: CLAY, some SILT, ORANGE/BROWN.			
		1.2	8.11		CL: CLAY, some SAND (f-c), ORANGE/BROWN.			
	13-15'	0.1	7.6	12"				
		0.2	6.8					
-15	15-17'	0.2	2.6	24"				
		0.1	7.9					
	17-19'	0.2	2.9	24"	CL: CLAY, some SILT, ORANGE/BROWN.			
		1.1	6.7		CL: SAA, BROWN, MOIST to SATURATED.			
	19-20'	2.5	2.2	24"				
-20					Soil boring complete to 20-ft bgs.			

Location:

Northing/Latitude: **41.19707091**

Easting/Longitude: **-79.97668273**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-3

SOIL BORING

ID NO. **SB-4**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **100.60-ft**	TOTAL DEPTH:	**20-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **5-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-02-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	0.0	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	2.5	AK	AK	FILL: GRAVEL (subangular to rounded), trace SAND, COBBLES (asphalt), light ORANGE/BROWN, MOIST.	FILL		Bentonite Seal (0.5 - 20-ft bgs)
	2-3'	2.8	AK	AK				
	3-4'	3.8	AK	AK				
	4-5'	3.3	AK	AK				
-5	5-6'	1.0	AK	AK	FILL: SAA, trace to some CLAY, light BROWN to ORANGE/BROWN and BLACK, MOIST to SATURATED.	CL		
	6-7'	2.1	AK	AK				
	7-8'	1.4	AK	AK	CL: CLAY, some GRAVEL, trace to some SAND, ORANGE/BROWN to GRAY, SATURATED.			
	8-10'	2.8 3.0	6.6 6.8	20"				
-10	10-12'	1.9	10.7. 6.8	8"	CL: CLAY, some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN, MOIST to SATURATED, 2-in SAND lense (m) between 11 - 12-ft.			
	12-14'	3.2 3.9	2.4 9.10	18"				
	14-16'	4.9 6.0	1.3 7.8	24"	CL: SAA, BROWN/BLACK, roots present.			
-15	16-18'	4.2 6.5	1.2 2.3	22"	CL: SAA, BROWN to GRAY, MOIST to WET.			
	18-20'	7.3 7.8	5.17 11.13	24"	CL: SAA, MOIST.			
-20					Soil boring complete to 20-ft bgs.			

Location:

Northing/Latitude: **41.19712433**

Easting/Longitude: **-79.97653644**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-4

SOIL BORING

ID NO. **SB-5**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **101.00-ft**	TOTAL DEPTH:	**21-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-01-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	---	AK	AK				
	2-3'	42.4	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (angular/round), ORANGE/BROWN to BROWN, MOIST.	FILL		Bentonite Seal (0.5 - 21-ft bgs)
	3-4'	1289	AK	AK				
	4-5'	827.8	AK	AK	FILL: SAA, trace COBBLES (sandstone), MOIST to WET.			
-5	5-7'	136.9	10.12	12"		CL		
		616.6	7.10		CL: CLAY with SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN to BROWN/GRAY, MOIST.			
	7-9'	601.3	7.12	18"				
		35.1	8.6					
	9-11'	5.4	1.3	22"	CL: SAA, BROWN.			
-10		6.0	5.7					
	11-13'	8.7	2.4	18"				
		4.0	7.9					
	13-15'	6.8	3.4	18"				
		7.0	7.8					
-15	15-17'	14.4	3.10	12"				
		4.3	7.5					
	17-19'	8.7	2.2	12"	CL: SAA, BROWN to GRAY/BLACK, MOIST to WET.			
		7.9	3.8					
	19-21'	23.8	2.2.	6"				
-20			2.1					
					Soil boring complete to 21-ft bgs.			

Location:

Northing/Latitude: **41.19736574**
Easting/Longitude: **-79.97653569**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

SB-5

SOIL BORING

ID NO. **SB-6**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.90-ft**	TOTAL DEPTH:	**21-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **NA**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**LB**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**12-01-2015**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	---	AK	AK	FILL: CLAY, some SAND (f), trace GRAVEL (angular/round), ORANGE to BROWN, MOIST.	FILL		Bentonite Seal (0.5 - 21-ft bgs)
	2-3'	5.4	AK	AK				
	3-4'	7.9	AK	AK				
	4-5'	14.9	AK	AK	FILL: SAA, trace COBBLES (sandstone).			
-5	5-6'	70.0	2.5	12"	CL: CLAY with SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN, DRY to MOIST.	CL		
		42.1	11.10					
	7-9'	85.3	1.8	22"				
		84.6	6.6					
	9-11'	105.1	4.7	12"	CL: SAA, GRAY, MOIST to WET.			
-10		16.0	9.9					
	11-13'	21.8	1.5	18"	CL: CLAY, some SILT, some to trace SAND (f-c), trace GRAVEL (f), BROWN, MOIST.			
		22.4	6.7					
	13-15'	25.0	4.8	14"				
		12.8	8.10					
-15	15-17'	23.9	3.4	14"	CL: SAA, BROWN to GRAY.			
		7.3	8.12					
	17-19'	26.8	2.15	24"				
		13.1	11.5					
	19-21'	52.2	1.3	20"				
-20		5.3	5.7					
					Soil boring complete to 21-ft bgs.			

Location:

Northing/Latitude: **41.19748393**

Easting/Longitude: **-79.97672725**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-6

SOIL BORING

ID NO. **SB-7**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **101.49-ft**	TOTAL DEPTH:	**17-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **7-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**02-19-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPAHLT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	0.8	AK	AK	FILL: CLAY (soft), some SAND (f-c), BROWN/ORANGE, MOIST.	FILL		
	2-3'	2.0	AK	AK				Bentonite Seal (0.5 - 17-ft bgs)
	3-4'	272.9	AK	AK	FILL: SAA, trace to some GRAVEL (weathered sandstone).			
	4-5'	48.7	AK	AK				
-5	5-7'	28.3	4.6 6.9	13"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN to GRAY, MOIST.	CL		
	7-9'	5.8	3.11 8.7	15"	CL: SAA, WET to SATURATED.			
	9-11'	16.2	2.4 6.8	13"	CL: SAA, MOIST to WET.			
-10	11-13'	5.8	2.8 6.8	7"				
	13-15'	9.5	1.7 7.10	6"				
-15	15-17'	17.8	1.5 4.4	8"	CL: SAA, dark BROWN.			
					Soil boring complete to 17-ft bgs.			

Location:

Northing/Latitude: **41.19742426**

Easting/Longitude: **-79.97647538**

Horizontal Datum: **NA**

Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA= not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-7

SOIL BORING

ID NO. **SB-8**

Groundwater and Environmental Services, Inc.

PROJECT: **Kwik Fill # M-209**	SURFACE ELEV.: **99.11-ft**	TOTAL DEPTH:	**17-ft**
ADDRESS: **5574 State Route 8**	WATER DEPTH: **11-ft**	CASING EL.:	**NA**
JOB NO. **0704793**	BOREHOLE DIA.: **11.25-in**	WELL DIA.:	**NA**

Logged By:	**JP**	Drilling Method:	**Hollow Stem Auger**
Dates Drilled:	**02-19-2016**	Sampling Method:	**Split-spoon (2-ft)**
Drilling Company:	**H.A.D., Inc.**	Soil Class. System:	**USCS**
Drill Rig Type:	**CME-55**	Field Screening:	**PID 10.6 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	NA	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	169.7	AK	AK	FILL: CLAY (stiff), some GRAVEL (weathered sandstone), trace SAND, BROWN/GRAY, MOIST.	FILL		
	2-3'	315.2	AK	AK				Bentonite Seal (0.5 - 17-ft bgs)
	3-4'	390.9	AK	AK	CL: CLAY (soft), some SAND, trace GRAVEL (weathered sandstone), BROWN, MOIST.	CL		
-5	4-5'	380.7	AK	AK				
	5-6'	423.5	AK	AK				
	6-7'	312.3	AK	AK	CL: CLAY (stiff), trace GRAVEL (weathered sandstone), trace SAND (f-c), BROWN, MOIST.			
	7-8'	115.8	AK	AK				
					NA: Shelby Tube Collected 9 - 11-ft bgs.	NA		
-10								
	11-13'	65.5	2.4 4.5	3"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), GRAY, SATURATED.	CL		
	13-15'	49.0 25.3	1.5 6.9	8"	CL: CLAY, some GRAVEL (weathered sandstone), trace SAND, ORANGE/BROWN, MOIST to WET.			
-15	15-17'	22.8	2.4 6.8	6"	CL: CLAY (stiff), some SAND, trace GRAVEL (weathered sandstone), BROWN/ORANGE to GRAY, MOIST to WET.			
					Soil boring complete to 17-ft bgs.			

Location:

Northing/Latitude: **41.19746927**
Easting/Longitude: **-79.97703017**
Horizontal Datum: **NA**
Vertical Datum: **NA**

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

SB-8

SOIL BORING

ID NO. **SB-9**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 98.49-ft	TOTAL DEPTH: 17-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: NA	CASING EL.: NA
JOB NO.	0704793	BOREHOLE DIA.: 11.25-in	WELL DIA.: NA

Logged By:	JP	Drilling Method:	Hollow Stem Auger
Dates Drilled:	02-19-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	---	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Asphalt Patch (0 - 0.5-ft bgs)
	1-2'	2.2	AK	AK	FILL: GRAVEL (weathered sandstone), some CLAY (stiff), trace SAND (f-c), BROWN to ORANGE, MOIST.	FILL		
	2-3'	2.8	AK	AK				Bentonite Seal (0.5 - 17-ft bgs)
	3-4'	5.5	AK	AK				
	4-5'	4.0	AK	AK	FILL: CLAY (stiff), some GRAVEL (weathered sandstone), trace SAND (f-c), BROWN, MOIST.			
-5	5-7'	6.5	6.3 4.5	9"	FILL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN, MOIST.	CL		
	7-9'	4.5	2.4 4.6	2"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), BROWN, MOIST to WET.			
	9-11'	7.0	1.4 6.15	6"				
-10					CL: SAA, organic material.			
	11-13'	8.4	3.14 7.11	4"				
	13-15'	5.5	2.7 6.7	3"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (weathered sandstone), ORANGE to BROWN, MOIST to WET.			
-15	15-17'	0.0	2.4 4.7	4"				
					Soil boring complete to 17-ft bgs.			

Location:

Northing/Latitude: 41.19756176
Easting/Longitude: -79.9770986
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

SB-9

SOIL BORING

ID NO. **SB-10**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 98.90-ft	TOTAL DEPTH: 22-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: NA	CASING EL.: NA
JOB NO.	0704793	BOREHOLE DIA.: 4.25	WELL DIA.: NA

Logged By:	LB	Drilling Method:	Hollow Stem Auger
Dates Drilled:	06-22-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1.5'	---	AK	AK	CONCRETE: GRAY.	CONCRETE		Cement (0 - 0.5-ft bgs)
	1.5-2'	0.7	AK	AK	FILL: CLAY, some to trace GRAVEL (f), some SAND (f-c), ORANGE/BROWN to GRAY, MOIST.	FILL		Bentonite Seal (0.5 - 22-ft bgs)
	2-3'	0.1	AK	AK				
	3-4'	30.3	AK	AK				
	4-5'	15.7	AK	AK	CL: CLAY, some SAND (f-c), trace GRAVEL (f), BROWN/GRAY, MOIST.	CL		
-5	5-6'	140.1	AK	AK	CL: SAA, some COBBLES.			
	6-7'	335.8	AK	AK				
	7-8'	533.4	AK	AK				
	8-10'	396.9	6.3 4.12	12"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (f), BROWN/GRAY, MOIST.			
-10	10-12'	223.2	10.8 7.10	18"	CL: SAA, soft CLAY.			
		472.3			GC: GRAVEL (f), some CLAY (stiff), trace SAND (f-c), GRAY/BROWN, MOIST.	GC		
	12-14'	28.4	1.8 8.10	12"	CL: CLAY (stiff), some GRAVEL (f), trace SAND (f-c), BROWN/GRAY, MOIST.	CL		

Location:

Northing/Latitude: 41.19737077
Easting/Longitude: -79.97716349
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location
Apparent Water Level

SB-10

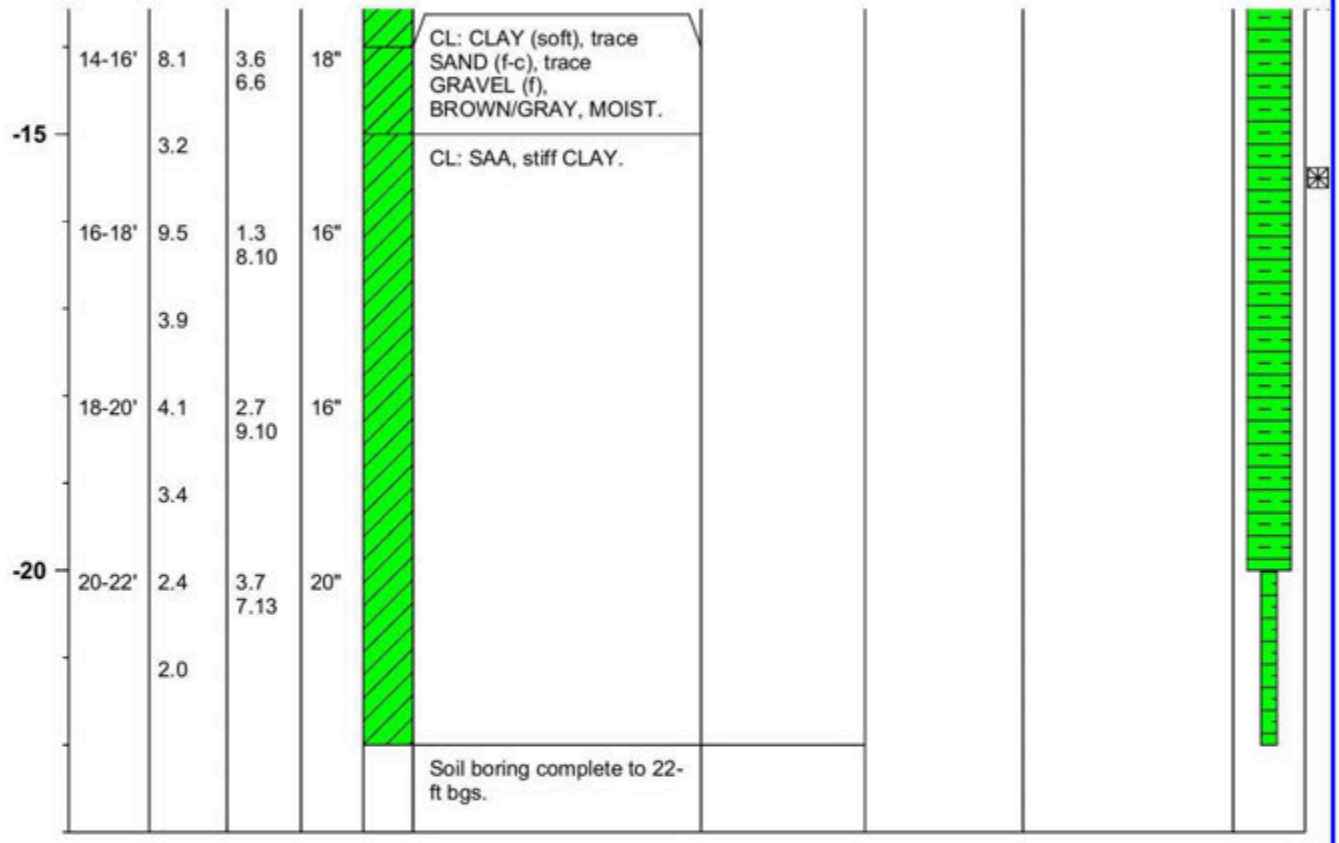
SOIL BORING ID NO. **SB-10**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 98.90-ft	TOTAL DEPTH: 22-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: NA	CASING EL.: NA
JOB NO.	0704793	BOREHOLE DIA.: 4.25	WELL DIA.: NA

Logged By:	LB	Drilling Method:	Hollow Stem Auger
Dates Drilled:	06-22-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
	14-16'	8.1	3.6 6.6	18"	CL: CLAY (soft), trace SAND (f-c), trace GRAVEL (f), BROWN/GRAY, MOIST.			
-15		3.2			CL: SAA, stiff CLAY.			
	16-18'	9.5	1.3 8.10	16"				
		3.9						
	18-20'	4.1	2.7 9.10	16"				
		3.4						
-20	20-22'	2.4	3.7 7.13	20"				
		2.0			Soil boring complete to 22-ft bgs.			



Location:

Northing/Latitude: 41.19737077

Easting/Longitude: -79.97716349

Horizontal Datum: NA

Vertical Datum: NA

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

Symbol Key:

Lab Sample Location

Apparent Water Level

SB-10

SOIL BORING

ID NO. **SB-11**

Groundwater and Environmental Services, Inc.

PROJECT:	Kwik Fill # M-209	SURFACE ELEV.: 99.90-ft	TOTAL DEPTH: 21-ft
ADDRESS:	5574 State Route 8	WATER DEPTH: NA	CASING EL.: NA
JOB NO.	0704793	BOREHOLE DIA.: 8.25-in	WELL DIA.: NA

Logged By:	LB	Drilling Method:	Hollow Stem Auger
Dates Drilled:	06-22-2016	Sampling Method:	Split-spoon (2-ft)
Drilling Company:	H.A.D., Inc.	Soil Class. System:	USCS
Drill Rig Type:	CME-55	Field Screening:	PID 10.6 eV Lamp (ppm)

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS
0	0-1'	NA	AK	AK	ASPHALT: with GRAVEL sub-base.	ASPHALT		Concrete (0 - 1-ft bgs)
	1-2'	1.2	AK	AK	FILL: CLAY, some to trace GRAVEL (f-c), trace SAND (f-c), BROWN, MOIST.	FILL		Bentonite Seal (1 - 21-ft bgs)
	2-3'	1.4	AK	AK				
	3-4'	1.5	AK	AK				
	4-5'	1.4	AK	AK				
-5	5-7'	68.5	6.5 11.12	12"	CL: CLAY (stiff), some to trace SAND (f-c), BROWN, MOIST.	CL		
	7-9'	14.4	1.6 13.11	12"				
	9-11'	16.3	2.4 5.7	12"				
-10	11-13'	12.7	2.4 8.14	10"	CL: CLAY (soft), some SAND (f-c), trace GRAVEL (f), BROWN, MOIST.			
	13-15'	17.4	2.6 7.7	12"				
-15	15-17'	5.2 5.8	2.6 7.7	16"	CL: CLAY (stiff), some SAND (f-c), trace GRAVEL (f), BROWN/GRAY, MOIST.			
	17-19'	2.4 2.6	1.7 15.12	24"	CL: SAA, BLACK/GRAY.			
	19-21'	6.0 1.5	2.5 8.11	24"	CL: CLAY (soft), trace SAND (f-c), trace GRAVEL (f), BROWN/GRAY, MOIST.			
-20					Soil boring complete to 21-ft bgs.			

Location:

Northing/Latitude: 41.19749981
Easting/Longitude: -79.97668826
Horizontal Datum: NA
Vertical Datum: NA

General Comments:

AK = air knife, bgs = below ground surface, ft= feet, in= inch, SAA= same as above, --- = not available, NA = not applicable (f)= fine, (c)= coarse, (m)= medium

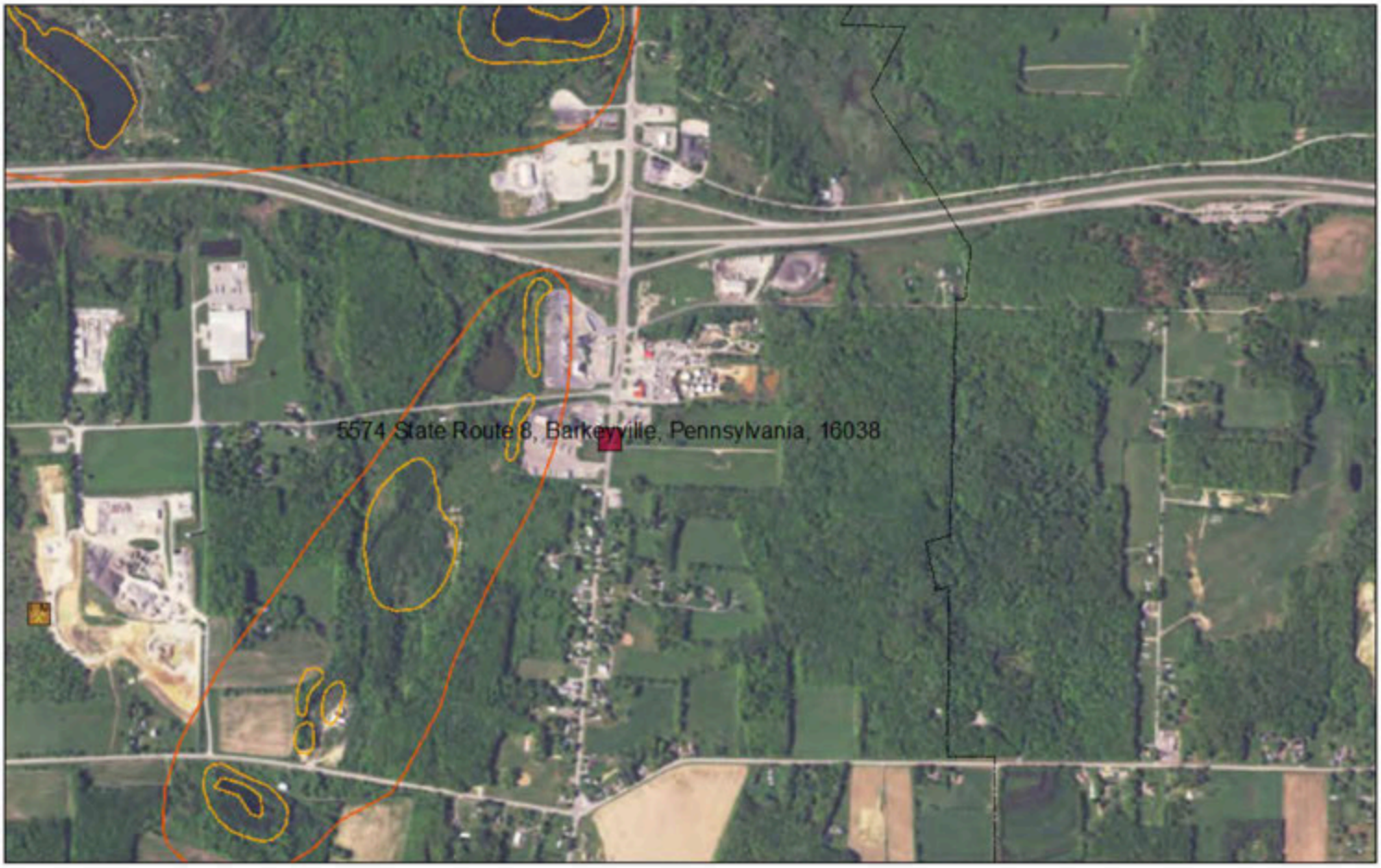
Symbol Key:

Lab Sample Location
Apparent Water Level

SB-11

APPENDIX D

PADEP eMap PA Documentation



September 14, 2016

Surface Mine - IMMO

AML Inventory Site

AML Polygon Feature

County Boundaries

FIGURE D-1
eMap Mining Locations
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

1:18,056

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand),

Copyright PA DEP

APPENDIX E

Sampling and Analysis and Quality Assurance Project Plan

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

2.0 PROJECT PLANNING AND PROJECT DEFINITION 2-3

2.1 Lines of authority and responsibility 2-3
2.2 Project/Task Organization and Responsibility 2-3
2.3 Contractor and Subcontractor Identification 2-4
2.4 Special Training/Certification 2-4
2.5 Project Objectives 2-5
2.6 Data Quality Objectives 2-6

3.0 SAMPLING PROCEDURES 3-1

3.1 Soil Sampling 3-1
3.1.1 Sample Logging 3-1
3.1.2 Sampling Equipment 3-1
3.1.3 Soil Sampling Procedures 3-2
3.1.4 Soil Sampling Analysis 3-3
3.2 Groundwater Sampling 3-3
3.2.1 Well Inspection and Preparation 3-3
3.2.2 Well Measurements 3-3
3.2.3 Groundwater Sampling Procedures 3-4
3.2.4 Sample Acquisition and Transfer 3-5
3.2.5 Groundwater Sampling Analysis 3-5
3.3 Soil Gas Sampling 3-6
3.3.1 Soil Gas Monitoring Point Installation and Construction 3-6
3.3.2 Soil Gas Sample Collection and Analysis 3-6
3.4 Remedial Sampling 3-7
3.4.1 Groundwater Sample Acquisition and Transfer 3-7
3.4.2 Groundwater Sampling Analysis 3-7
3.4.3 Vapor Sample Acquisition and Transfer 3-7
3.4.4 Vapor Sampling Analysis 3-7

4.0 SAMPLE PRESERVATION AND HANDLING 4-1

4.1 Sample Containers 4-1
4.2 Sample Identification and Labeling 4-1
4.3 Sample Holding Times 4-2
4.4 Sample Transport and Delivery 4-2

5.0 SAMPLE ANALYSIS 5-1

6.0 DECONTAMINATION PROCEDURES 6-1

6.1 Electronic Water Level Indicator, Multi-parameter Meters 6-1
6.2 Non-Dedicated Sampling Equipment: Pumps, Scoops, Trowels, etc. 6-1

7.0 INVESTIGATION DERIVED WASTE 7-1

7.1 Soil Waste 7-1
7.2 Groundwater Waste 7-1

8.0 DOCUMENTATION 8-1

8.1 Field Sampling Data Sheets and Field Logbooks 8-1
8.2 Chain-of-Custody Record 8-1

9.0 QUALITY ASSURANCE/QUALITY CONTROL 9-1

9.1 Field Quality Assurance/Quality Control 9-1
9.2 Trip Blanks and Field Duplicates 9-1
9.3 Laboratory Quality Assurance/Quality Control 9-1
9.3.1 Internal Laboratory QC Checks 9-1

10.0 DATA MANAGEMENT 10-1

10.1 Documentation and Records Administration 10-1
10.2 Data Processing 10-2

11.0 ASSESSMENT AND OVERSIGHT 11-1

11.1 Assessment and Response Actions 11-1
11.1.1 Field Audits 11-1
11.1.2 Laboratory Procedures 11-1
11.2 Response Actions 11-2
11.2.1 Field Response Actions 11-2
11.2.2 Laboratory Response Actions 11-2

12.0 DATA REVIEW 12-1

12.1 Verification 12-1
12.2 Validation 12-1
12.2.1 Field Data Validation 12-1
12.2.2 Laboratory Data Validation 12-2
12.2.3 Independent Data Validation 12-2
12.3 Usability Assessment 12-2

TABLES

Table 1 Definitions and Laboratory Measurements of QC Elements
Table 2 Volume of Water in 1-Foot Section of Well Casing
Table 3 Sample Methods, Containers, Preservatives and Holding Times
Table 4 Analytical Requirements

APPENDICES

A Site-Specific Health and Safety Plan
B Example Forms

1.0 INTRODUCTION

The following *Sampling and Analysis Plan/Quality Assurance Project Plan* (SAP/QAPP) discusses the methods and procedures that will be used for the screening and collection of representative samples of environmental media for analysis at Leaking Underground Storage Tank (LUST) sites in Pennsylvania. Quality control and quality assurance procedures are also specified. The SAP/QAPP was developed in accordance with the requirements specified in Pennsylvania (PA) Code Chapter 245, *Administration of the Storage Tank and Spill Prevention Program* [Chapter 245.310(a)(25) and 245.311(a)(2)] and Pennsylvania's Land Recycling Program (Act 2) and Act 2 *Technical Guidance Manual* (253-0300-100/May 4, 2002). This site-specific SAP/QAPP will be utilized, as appropriate, for sampling and analysis of environmental media at the former United Refining Company of Pennsylvania (UPA) Kwik Fill Station #M-209 located at 5574 State Route 8, Barkeyville, Pennsylvania (site).

The purpose of establishing a written protocol for sampling and analysis is to ensure that data generated are representative of site conditions and that Data Quality Objectives (DQOs) are met. The SAP/QAPP discussed in the following sections contains acceptable procedures for sample collection, sample preservation and handling, analytical procedures and quality assurance/quality control (QA/QC) requirements and identifies procedures to determine if DQOs have been met.

Investigation derived waste management protocols and a site specific Health and Safety Plan (HASP) are also included with this SAP/QAPP.

2.0 PROJECT PLANNING AND PROJECT DEFINITION

2.1 Lines of authority and responsibility

During site investigation activities, soil, groundwater, and/or vapor samples are collected by Groundwater and Environmental Services, Inc. (GES) personnel under the direction of a Pennsylvania Licensed Professional Geologist (PG). The GES PG and the GES Project Manager (PM) and/or Case Manager (CM) are responsible for directing all site activities including, but not limited to, scheduling, coordinating field personnel and laboratory, managing daily activities, and receiving and verifying the data. The GES Field Supervisor is responsible for implementing the site-specific work plan, and is thoroughly familiar with the plan and sampling requirements. The Field Supervisor is required to collect samples in accordance with procedures specified in this SAP, properly package samples for transfer to the laboratory, complete chain-of-custody documentation, and ensure that all documentation regarding the sampling event is properly recorded.

2.2 Project/Task Organization and Responsibility

The following table summarizes the general responsibilities of key personnel involved with this project.

Personnel	*Responsibilities*
Professional Geologist	• Supports work plan development; • Ensures proper work plan execution; • Prepares, reviews and approves conceptual site models and regulatory deliverables involving interpretation of geologic and hydrogeologic data; • Liaison with client and Pennsylvania Department of Environmental Protection (PADEP).
Project Manager/Case Manager	• Develops and executes the work plan and schedule; • Coordinates with the Health and Safety Officer (HSO) and Quality Assurance Officer (QAO); • Ensures field activities are implemented in accordance with the site-specific HASP and SAP/QAPP; • Liaison with client and PADEP; • Reviews and evaluates site characterization data for conceptual site model development; and • Prepares and reviews regulatory deliverables.
Field Supervisor	• Ensures field work is completed in accordance with the HASP and SAP/QAPP; • Coordinates sampling activities with the PG/PM/CM; • Schedules analytical services with the laboratory and secures bottleware; • Supervises sample collection and provides for proper documentation, handling and chain-of-custody; • Maintains field data sheets and the field log book; • Ensures compliance with Standard Operating Procedures (SOPs); and, • Prepares draft copies of reports.
Project Manager Assistant (PMA)	• Supports PG/PM/CM; • Maintains the project file and project database; • Finalizes work products for distribution; • Distributes work products; and, • Assists with administrative duties.

Personnel	*Responsibilities*
Health and Safety Officer	• Supports PG/PM/CM with implementation of the HASP and general health and safety program; • Point of contact for health and safety matters; and, • Verifies compliance with the HASP and general health and safety program; and, • Maintains health and safety records.
Quality Assurance/Quality Control Officer	• Supports the PG/PM/CM with implementation of and compliance with all QA/QC protocols; • Prepares and implements the QAPP; • Implements the QC project plans; • Monitors QC compliance; • Documents non-conforming activities; • Administers corrective action; and • Maintains QC documentation;
Laboratory Manager	• Supports the PG/PM/CM with preparation and implementation of analytical programs; • Serves as liaison between the laboratory and project personnel; • Serves as the collection point for laboratory non-conformances; and • Reports non-conformances and changes on laboratory activities to the PG/PM/CM and project QA/QC officer.
Laboratory Quality Assurance Officer	• Supports the project QA/QC officer; • Independent of the laboratory analyst; • Conducts laboratory performance and system audits on a regular basis; • Monitors adherence to laboratory QA objectives as stated in the laboratory's Quality Assurance Manual; • Writing, maintaining, implementing and reviewing laboratory SOPs; • Follows up on corrective actions to ensure problem resolved.

2.3 Contractor and Subcontractor Identification

Contractors and/or subcontractors scheduled to complete any part of the work plan tasks are certified to complete such tasks as appropriate. GES is the contractor on this project. As the contractor it is the responsibility to procure subcontractors that are capable and suitable to complete the tasks associated with the characterization and remediation of this site. Part of the procurement process is to ensure that subcontractors have the necessary certifications.

The specific subcontractors to complete characterization and remediation shall be in compliance with all local, state and federal regulations at the time of performing the scope of work.

2.4 Special Training/Certification

GES personnel engaged in on-site activities have the training necessary to perform each of the prescribed tasks. Standard Operating Procedures (SOPs) referenced in this document provide guidance on conducting specific tasks, and are available upon request.

All GES employees assigned to this project have successfully completed 40-hour initial HAZWOPER training consistent with the requirements of 29 CFR 1910.120(e)(3)(i). All workers on this site including managers and supervisors receive annual HAZWOPER refresher training consistent with the requirements of 29 CFR 1910.120(e)(8). Subcontractor personnel are required to conform to the

appropriate training as outlined in this SAP/QAPP. Documentation of training will be confirmed by and retained by GES.

All field activities are conducted in accordance with the site-specific HASP, included as **Appendix A** (Site-Specific Health and Safety Plan). GES employees assigned to this project review and sign-off that they have reviewed the HASP before initiating field activities. The HASP includes specific procedures that must be followed to protect the health and safety of the worker during performance of this project. Familiarity with the following guidance documents and standards is required prior to engaging in on-site activities:

- Occupational Safety & Health Administration (OSHA) Hazardous Waste and Emergency Response Standard (OSHA 29 CFR1910.120);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985) (NIOSH/OSHA/USCG/EPA);
- Respiratory Protection (EPA Order 1440.1); and,
- Health and Safety Requirements for Employees Engaged in Field Activities (EPA Order 1440.3).

GES conducts a planning/kickoff meeting prior to implementing field tasks for the purpose of reviewing the work plan, including the HASP and SAP/QAPP, review assignments with staff, review sampling procedures and answer any questions that may arise.

2.5 Project Objectives

The objectives of the project are to:

- Evaluate current soil and groundwater quality across the site;
- Determine groundwater depth, gradient and flow direction;
- Assess the potential for vapor intrusion from volatile organic compound (VOC);
- Develop a site-specific conceptual site model;
- Evaluate remedial options and perform remedial feasibility testing, as appropriate;
- Remediate impacts identified during site characterization and conceptual site model development; and,
- Demonstrate attainment of an Act 2 standard.

To accomplish these objectives, GES will:

- Advance soil borings, install groundwater monitoring wells and install vapor monitoring points (as necessary);
- Collect, screen and analyze samples to characterize and delineate impacts to environmental media;
- Evaluate site data and develop a current conceptual site model;
- Complete a vapor intrusion assessment;
- Complete feasibility testing to evaluate potentially applicable remedial technologies;
- Develop an appropriate remedial action plan based on conceptual site model review, remedial options review and evaluation of remedial feasibility testing data; and,
- Implement the remedial action plan.

Specific procedures for conducting these tasks are described in **Section 3.0**.

2.6 Data Quality Objectives

DQOs are qualitative and quantitative statements to ensure that data of known and appropriate quality are obtained during sampling and analysis activities. Both field and laboratory measurements will be collected to achieve the project objectives. Field data will be acquired using SOPs as specified in the following section to ensure consistency of approach and data collection requirements.

Analytical data collected and analyzed in conformance with the DQO process described in this SAP/QAPP are used to assess the uncertainty associated with decisions related to the site. DQOs for analytical measurements are generally defined in terms of six indicator parameters: precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS). **Table 1** (Definitions and Laboratory Measurements of QC Elements) defines the PARCCS parameters and identifies the methods that are used to qualify and/or quantify these parameters.

3.0 SAMPLING PROCEDURES

3.1 Soil Sampling

Prior to initiation of field activities, the PM will obtain all necessary permits, utility clearances, and site access.

The field supervisor is required to review the location of utility mark outs along with site specific information obtained from the PG/PM/CM, such as active utility service connections/lines to the on-site building or other visible indications of recent subsurface work (e.g., pavement scars). Additionally, calibration of the photoionization detector (PID) used to screen soil samples for relative presence of volatile organic compounds occurs upgradient of the site, to gain background readings prior to initiating the subsurface investigation.

Soil borings are advanced using direct push or hollow stem auger along with spilt spoon sampling equipment. Prior to initiating soil boring advancement, each boring is pre-cleared to minimize the potential for encountering underground utilities. Soil borings are advanced in intervals of two or five feet. Each soil core retrieved is segregated and screened with a PID. One grab soil sample is generally collected at each boring location at either the interval that exhibits the greatest PID response above background, directly above the water table interface or at the soil/bedrock interface.

Note: If pea gravel is encountered, drilling activities cease until the location can be verified with the PG/PM/CM.

3.1.1 Sample Logging

Following sample recovery, each section is visually examined and logged in the field by the GES field supervisor. The following information is recorded on the boring log:

- Boring number;
- Boring location;
- Total depth;
- Sample interval(s);
- Sample recovery/sample interval ratio;
- Sample description;
- Blow counts (as necessary); and,
- PID screening results.

The sample lithology is described according to the Unified Soil Classification System (USCS), and evidence of contamination is noted.

Field logs will be transcribed to an electronic boring log (e.g., using LogPlot) for project reporting or general presentation purposes. An example electronic boring log is provided in **Appendix B** (Example Forms).

3.1.2 Sampling Equipment

The following equipment is required, at a minimum, for soil sampling:

- Plastic sealable sample bags;
- PID; and,

- Sample bottleware.

3.1.3 Soil Sampling Procedures

Representative soil samples are collected continuously at an interval of two or five feet to advance the boring and collect soil samples. Continuous soil cores are obtained at each location for lithologic evaluation, field screening with a PID utilizing a 10.6 electron volt (eV) lamp and sampling. As each core is retrieved, the soil sample is segregated into three parts; 1) field scanned with a PID; 2) potential laboratory submittal; and, 3) lithologic description using the USCS.

- The PID is operated to yield "total organic vapor" in parts per million (ppm) and typically calibrated using a 100 ppm isobutylene calibration gas. PID instruments must be operated with a 10.6 eV lamp source. Operation, maintenance and calibration is performed in accordance with the manufacturer's specifications;

- Soil samples that potentially may be submitted for laboratory analysis will be placed on ice in a sample container immediately after collection. Samples chosen for VOC analysis will be collected in accordance with EPA Method 5035 as follows:

    - For low concentration samples (0.5 to 200 microgram per kilogram [ug/kg] of contaminants or when leaded gasoline parameters are required analytes):
        - Place the soil sample into a sample vial that contains a preservative compound; or,
        - Collect the soil sample in an air-tight apparatus to eliminate contaminant loss due to volatilization. Soil from this type of sampler must be transferred to a soil vial containing preservative as soon as possible or analyzed within 48 hours of sample collection.

    - For samples with high concentrations of VOCs, one of the three following methods may be used to collect a sample:
        - Place soil into a soil sample vial containing appropriate preservative;
        - Collect soil sample in an Encore sampler. Soil from this type of sampler must be transferred to a soil vial containing preservative as soon as possible, or analyzed within 48 hours of sample collection; or,
        - Collect sample without preservation. The sample container must be filled as much as possible to avoid volatilization. Sampling without preservation should only be done when it is not possible to sample with preservatives or when an Encore sampler cannot be used.

- Sample jars are labeled with the following minimum information:

    - Site name;
    - Date and time of sample collection;
    - Sample ID; and,
    - Initials of sampler;

- Place sample jars on ice in a cooler.

- Repeat above procedure for each boring interval. Decontaminate sampling equipment as discussed in **Section 6.0** if non-dedicated sampling equipment is used.

3.1.4 Soil Sampling Analysis

Analysis of soil samples will be consistent with the standards promulgated under the 25 PA Code Chapter 245/250. Specifically, samples will be analyzed for the March 2008 PADEP short list of diesel fuel constituents including:

- Benzene
- Toluene
- Ethylbenzene
- Methyl tert-butyl ether (MTBE)
- Naphthalene
- Isopropylbenzene (Cumene)
- 1,2,4-Trimethyl benzene
- 1,3,5-Trimethyl benzene

Samples will be preserved, placed on ice and transported under proper chain-of-custody to a PA-certified and properly accredited laboratory for analysis via EPA Method 8260B.

3.2 Groundwater Sampling

The sampling procedures described in the following sections are used to collect representative groundwater samples.

3.2.1 Well Inspection and Preparation

Upon arrival at the site, each monitoring well and protective casing are inspected prior to opening to determine if the monitoring well has been tampered with or damaged. The monitoring well cap and lock are also inspected. Cracks in the casing and/or surface cement would be noted, as well as soil washouts and depressions around the casing. Before taking measurements, weeds and debris are removed from around the well, as necessary. Observations regarding the condition of the well will be recorded in the field log book/field sheet.

3.2.2 Well Measurements

Measurement of Static Water Levels

Prior to collecting groundwater samples, static water level elevations are measured at the specified monitoring wells. Static water level elevations are recorded to the nearest hundredth of a foot (0.01), referenced to the surveyed top of casing elevation, using an electronic interface probe.

The interface probe is decontaminated between each monitoring well to minimize potential cross-contamination. Decontamination procedures are discussed in **Section 6.0**.

Well Depth

The total depths of the specified monitoring wells are periodically measured with the water level meter to determine if siltation has occurred. The total depth of each monitoring well is recorded in the field logbook. The depth of standing water in the monitoring well is then determined by subtracting the static water level elevation from the total depth of the monitoring well.

Detection of Separate Phase Liquids

The presence of non-aqueous phase liquids (NAPL) on the top or bottom of the water column in each monitoring well is determined utilizing an interface probe and/or a transparent bailer. An interface probe

is capable of detecting the presence of light (LNAPL) and/or dense (DNAPL) phase liquids and water. If an interface probe is used, the probe is lowered slowly into the well. The probe registers when it encounters LNAPL. After passing through the LNAPL layer, the probe will register again when it intercepts water. The difference between these two depths is the LNAPL thickness. If a DNAPL layer is present at the bottom of the water column, the probe will register its presence with a different tone.

If a transparent bailer is utilized for detection or confirmation of the presence of LNAPL, the bailer will be long enough so that the top of the bailer is above the air/free liquid hydrocarbon interface when the check valve is below the light phase/water interface. A sample will then be extracted, and the hydrocarbon thickness measured directly using the bailer.

Should measureable NAPL be encountered during collection of well measurements, appropriate corrective actions will be initiated in accordance with the requirements of PA Code §245.306.

3.2.3 Groundwater Sampling Procedures

Groundwater samples will be collected from the specified wells in accordance with the following procedures.

Sampling Equipment

The following equipment will be required for well purging and sample collection:

- Safety equipment/personal protective equipment (PPE) (e.g., task specific gloves, safety toed shoes, eye protection, traffic control, etc.);
- Stainless steel and/or dedicated bottom-loading polyvinyl chloride (PVC) bailers;
- Interface probe;
- Other field parameter measuring equipment, as appropriate (e.g., multi-parameter [pH, conductivity, temperature] meter, peristaltic pump, PID);
- Submersible pump/tubing (optional);
- Sample containers;
- Decontamination equipment; and
- Paper towels.

Monitoring wells will be purged using either a submersible pump or a dedicated bailer. Monitoring wells are sampled with dedicated bailers and dedicated bailing cord.

Well Purging

In order to remove stagnant water from the monitoring wells, a minimum of three well volumes is purged from each monitoring well prior to sampling. The volume of standing water in the well is calculated in the field using the following formula:

$$V = H \times F$$

where:

V = 1 well volume
H = height of standing water in the well (feet)
F = factor for calculating the volume of water in a 1-foot section of casing (gals)

Table 2 (Volume of Water in 1-Foot Section of Well Casing) provides the F-factor for various size monitoring well casings. The volume of water to be purged from each monitoring well is determined by multiplying the calculated volume, V, by 3.

If a submersible pump is used to purge the wells, the pump will be inserted into the well and set two to three feet above the bottom of the monitoring well. After three well volumes have been removed, the pump will be extracted. If three volumes cannot be evacuated, the monitoring well will be purged dry. Exact volumes of water purged from each monitoring well are recorded in the field log book/field sheet.

Management of Purged Water

Purge water management is discussed in **Section 6.0**.

Well Sampling

One groundwater sample is collected from each monitoring well using dedicated, disposable bailers attached to dedicated bailing cord. Upgradient monitoring well will be sampled first followed by the downgradient monitoring wells to minimize the potential for cross contamination. Monitoring wells that are purged dry will be sampled as soon as sufficient water is available for sampling.

The bailer is slowly lowered into the water column to minimize agitation and aeration. Bailers will not be dropped into the well in a manner that results in excessive agitation of the water column. The bailer is submerged to a depth necessary for filling and will be removed from the well slowly.

3.2.4 Sample Acquisition and Transfer

Groundwater samples will be carefully removed from the well and transferred directly to laboratory supplied sample containers filled with appropriate preservatives. Samples will be transferred to the appropriate container in a manner that minimizes agitation and aeration.

Samples for VOC analysis will be placed into 40-milliliter (ml) vials until a meniscus is formed. The vials will then be capped with a fluorocarbon-lined cap. Sampling personnel will check the vials to ensure that there are no air bubbles in the vials. If any bubbles are present, the sample will be discarded and retaken.

3.2.5 Groundwater Sampling Analysis

Analysis of groundwater samples will be consistent with the standards promulgated under the 25 PA Code Chapter 245/250. Specifically, samples will be analyzed for the March 2008 PADEP short list of diesel constituents including:

- Benzene
- Toluene
- Ethylbenzene
- MTBE
- Naphthalene
- Isopropylbenzene (Cumene)
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene

Samples will be preserved, placed on ice and transported under proper chain-of-custody to a PA-certified and properly accredited laboratory for analysis via EPA Method 8260B.

3.3 Soil Gas Sampling

The objectives of soil gas sampling are to evaluate the potential for vapor intrusion of certain volatile or semi-volatile COCs associated with soil, groundwater or NAPL sources at the site into existing or potential future inhabited buildings. To accomplish this, soil gas monitoring points would be installed at the site near source areas, preferential pathways and/or potential receptors. Soil gas samples would then be collected from the points. Additional vapor intrusion screening and investigation would be completed as necessary.

3.3.1 Soil Gas Monitoring Point Installation and Construction

Soil gas monitoring points would be installed at the site at locations that are proximal to the suspected source area and the potential on-site receptors. Prior to installing the soil gas points, the boreholes will be cleared of utilities using an air knife. If necessary for delineation or modeling of impacts, the soil gas points will be installed as nested points to establish vertical soil gas profiles. Depths of nested soil gas points will be determined in the field and will be determined based on results of PID screening, as applicable.

Each location will be installed with a stainless steel mesh screen point or similar PVC point and brought to the surface with sufficient high density, Teflon-lined poly-ethylene tubing. Tubing from each soil gas point will be sealed off near the surface with a stop-cock to avoid ambient air flow into the point and finished at grade within an 8-inch diameter flush-mount roadbox.

3.3.2 Soil Gas Sample Collection and Analysis

Soil gas samples will be collected from the soil gas monitoring points utilizing laboratory supplied 1-liter or 6-liter Summa® canisters with 30-minute flow regulators. A personal air pump will be used to purge the appropriate soil gas volume from the monitoring point and VOC concentrations will be monitored throughout purging. Purge volume calculations and PID observations will be documented on a field sampling log sheet. Following purging, a Summa® canister will be used to draw a representative soil gas sample from each location at the appropriate regulated flow rate.

The Summa® canisters will be sealed and submitted via chain of custody to a PA-certified and properly accredited laboratory for analysis of the old (pre-March 2008) short list of unleaded gasoline constituents via EPA Method TO-15.

3.4 Remedial Sampling

The objectives of remedial sampling are to evaluate contaminant mass removal and the effects of tested technologies during feasibility testing or mass removal and general remedial action progress during implementation of the *Remedial Action Plan* (RAP). To accomplish this for the remedial action phase of this project, groundwater and vapor samples will be collected during feasibility testing and RAP implementation. Groundwater and vapor sampling location and frequency will be determined following selection of a remedial technology.

3.4.1 Groundwater Sample Acquisition and Transfer

Groundwater samples will be transferred directly to laboratory supplied sample containers filled with appropriate preservatives. Samples will be transferred to the appropriate container in a manner that minimizes agitation and aeration.

Samples for VOC analysis will be placed into 40-ml vials until a meniscus is formed. The vials will then be capped with a fluorocarbon-lined cap. Sampling personnel will check the vials to ensure that there are no air bubbles in the vials. If any bubbles are present, the sample will be discarded and retaken.

3.4.2 Groundwater Sampling Analysis

Groundwater samples will be analyzed for the March 2008 PADEP short list of diesel constituents including:

- Benzene
- Toluene
- Ethylbenzene
- MTBE
- Naphthalene
- Isopropylbenzene (Cumene)
- 1,2,4-Trimethyl benzene
- 1,3,5-Trimethyl benzene

Samples will be preserved, placed on ice and transported under proper chain-of-custody to a PA-certified and properly accredited laboratory for analysis via EPA Method 8260B.

3.4.3 Vapor Sample Acquisition and Transfer

Vapor samples will be drawn into laboratory supplied 1-liter Tedlar bags. The Tedlar bags will be sealed, labeled and submitted via chain of custody to a PA-certified and properly accredited laboratory for analysis.

3.4.4 Vapor Sampling Analysis

The Tedlar bag samples do not require preservation. Samples will be properly packed, custody sealed and shipped in a sample cooler to the analytical laboratory for analysis of the following:

- Benzene
- Toluene
- Ethylbenzene
- Methyl tert-butyl ether (MTBE)
- Naphthalene
- Isopropylbenzene (Cumene)

- 1,2,4-Trimethyl benzene (1,3,4-Trimethyl benzene)
- 1,3,5-Trimethyl benzene
- Total hydrocarbons (C_4-C_{10})

Vapor samples collected during remedial action activities will be analyzed via EPA Method 18.

4.0 SAMPLE PRESERVATION AND HANDLING

The primary goal of the sampling program is to obtain samples that are representative of actual site conditions. Since the chemical constituents of a sample may be altered by variation in temperature, length of time the sample is stored prior to analysis, use of improper preservatives or sample containers, etc., the following methods have been selected to ensure that the samples are properly preserved and handled from the time of sample collection to analysis. The selected methods are taken from recommended procedures found in EPA's *Test Methods for Evaluating Solid Waste (SW846),* 3rd Edition, current revision, EPA's *Methods for Chemical Analysis of Water and Wastes,* EPA-600/4-79-020, and EPA's *Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Method TO-15*, EPA/625/R-96/010b, and other available guidance documents.

4.1 Sample Containers

Soil and groundwater samples will be transferred directly to laboratory provided sample containers that have been prepared with appropriate preservatives by the laboratory. The laboratory supplied sample bottles are packed in insulated coolers prior to transport to the site or to the GES office. Filled sample containers will be returned to the cooler, placed on ice to maintain a sample temperature of approximately 2-6 degrees Celsius (°C), and returned to the laboratory for analysis within specified holding times. Soil gas, sub-slab vapor and indoor air samples will be collected via laboratory supplied Summa® canisters pre-set to the appropriate negative pressure by the laboratory. Vapor samples for remedial action progress and carbon consumption monitoring are collected using laboratory supplied tedlar bags. All canister and bag samples will be returned to the laboratory at ambient temperature within specified holding times. **Table 3** (Sample Method, Containers, Preservatives and Holding Times) summarizes the type of preservative, container requirements, and sample holding times for the various media and analyses.

4.2 Sample Identification and Labeling

Samples will be appropriately marked for identification at the time of sample collection. The label attached to the sample container will include, as appropriate, the following items:

- Project name;
- Sample Identification Number;
- Sample Collector's Name;
- Date and Time of Collection;
- Sample Location (e.g. well number, boring, depth or sample interval, and field coordinates);
- Parameters requested for analysis; and
- Chemical preservatives used.

Specific information for each sample is documented in the field logbook and on a chain-of-custody form. The sample identifications are correlated in the logbook and on the chain-of-custody by sample designation, sampling date, time, and location. The analytical parameters for which the sample is to be analyzed and the respective number of sample bottles are indicated on the chain-of-custody sheet.

4.3 Sample Holding Times

Sample holding times conform to those recommended in SW846 and air Method TO-15 and Method 18. **Table 3** identifies the type of sample container, preservative, and holding time requirements for the sampling program.

4.4 Sample Transport and Delivery

Samples are properly packaged for delivery, shipment or courier pickup/delivery to the laboratory. Samples requiring temperature preservation are shipped in iced coolers to ensure that the samples are maintained at the proper temperature following collection and during transport to the laboratory. Shipping containers are secured with packing tape and custody seals are applied to ensure samples are not tampered with during shipment or courier delivery to the laboratory.

5.0 SAMPLE ANALYSIS

Soil, groundwater and soil gas samples collected during site characterization activities will be analyzed for the March 2008 PADEP short list of diesel constituents. **Table 4** (Analytical Requirements) summarizes the list of parameters and analytical methodology to be used for this project.

6.0 DECONTAMINATION PROCEDURES

6.1 Electronic Water Level Indicator, Multi-parameter Meters

The electronic water level indicator and multi-parameter meter probes are decontaminated between sampling locations by thoroughly rinsing the portion of the equipment that comes into contact with the media with Alconox and deionized water.

6.2 Non-Dedicated Sampling Equipment: Pumps, Scoops, Trowels, etc.

The GES Field Supervisor is responsible for ensuring that non-dedicated sampling equipment is pre-cleaned for transportation to the site. The following minimum field decontamination procedures will be followed for either the initial decontamination of non-dedicated equipment or for field decontamination of non-dedicated equipment that comes into direct contact with soil and groundwater samples:

1) Wash with non-phosphate detergent (Alconox) and potable water;
2) Rinse with potable water;
3) Double rinse with distilled/deionized water (ASTM Type II or equivalent);
4) Air-dry thoroughly before using; and,
5) Wrap with inert material if the equipment will not be used immediately.

7.0 INVESTIGATION DERIVED WASTE

All reasonable efforts will be made to characterize investigation derived waste (IDW) consistent with the scope and purpose of the investigation and to minimize the generation of IDW. During implementation of corrective action at the facility, IDW will be field screened and segregated to the extent practicable for obvious or potential petroleum hydrocarbon impacts. Screened waste media will then be further classified and managed according to the apparent waste characteristics.

7.1 Soil Waste

Soil waste generated during site investigation activities (e.g., air knife, soil borings, well installation, soil gas point installation) will initially be placed into 55-gallon steel drums. Upon receipt and review of disposal characterization data from the laboratory, transportation and disposal of the soil waste will be managed consistent with its disposal characterization profile (i.e., non-hazardous or hazardous). All wastes will be tracked from the point of generation through pick-up, transportation and proper disposal. Tracking documentation will be maintained.

7.2 Groundwater Waste

Groundwater waste generated during site investigation and/or monitoring activities (e.g., well development, pump testing, well purging prior to sample collection) will initially be containerized until the waste is characterized for proper transportation and disposal. Upon receipt and review of disposal characterization data from the laboratory, transportation and disposal of the groundwater waste will be managed consistent with its disposal characterization profile (i.e., non-hazardous or hazardous).

Purge water

Management of purge water specifically from groundwater sampling activities will be handled in general accordance with PADEP regional guidance and consistent with Section 6.3.5 and Table 3, "Suggested Procedure for the Management of Purge Water from Groundwater Sampling" (Table 3) of the *Groundwater Monitoring Guidance Manual*, PADEP, 383-3000-001, December 1, 2001, and available PADEP regional-specific guidance. Based on available PADEP Northwest Regional Office guidance, the following groundwater sampling purge water management protocols will be implemented for this site:

Uncharacterized purge water

Purged groundwater that is not characterized will be containerized pending receipt and review of laboratory analytical data. Containers with purge water comingled from multiple wells should use the highest concentration seen in any one of the wells from which the comingled water was produced, unless the comingled purge water itself is sampled.

Characterized purge water - **no** laboratory analytical detections

Purged groundwater that has been characterized (i.e., analytical data received and reviewed) and had no petroleum hydrocarbon constituent detections above minimum laboratory reporting limits will be managed as uncontaminated groundwater.

Characterized purge water - **with** laboratory analytical detections, but **no** U/R MSC exceedances

Purged groundwater that has been characterized with petroleum hydrocarbon constituent detections above minimum laboratory reporting limits (i.e., contaminated groundwater) but below U/R MSCs will be managed using one or more of the following options:

1) Convey directly into an on-site groundwater treatment system;
2) Transport to an appropriate off-site treatment facility;
3) Discharge to the ground surface in an area where, based on the type and concentration of the constituent and the volume of discharge, the discharge will not impact a surface water body or otherwise cause environmental harm; and
4) Other methods approved by PADEP.

Characterized purge water - **with** laboratory analytical detections **above** U/R MSC

Purged groundwater that has been characterized with petroleum hydrocarbon constituent detections above U/R MSCs will be managed using one or more of the following options:

1) Convey directly into an on-site groundwater treatment system;
2) Convey directly to PADOT-approved drums and transport to an appropriate off-site treatment facility;
3) Discharge (up to 20 gallons per well following activated carbon treatment) to the ground surface of the site in a controlled manner for re-infiltration after treatment with portable carbon adsorption units designed and operated to remove the petroleum constituents to levels below U/R MSCs according to the following:
    a. Re-infiltration may occur only within an on-site area of groundwater impacts exceeding Act 2 U/R MSCs;
    b. Placement on-site should not create runoff that will enter surface waters, wetlands, storm drainage or other water conveyances to surface water;
    c. All constituents should be capable of being treated by carbon adsorption;
    d. Carbon adsorption units should be designed to provide adequate contact time for the amount of carbon at the expected levels of raw water impacts to reach U/R MSCs;
    e. A sample should be collected to demonstrate the unit has functioned as intended. Samples should be collected at the beginning and end of the carbon treatment cycle;
    f. Purge water should contain no free product; and
4) Other methods approved by PADEP.

Utilization of no-purge (e.g., HydraSleeve, Snap-Sampler) groundwater sampling methodology may be considered during the remedial action phase of the project in order to avoid purge water generation and management requirements.

Water Extracted during Remedial Action

Petroleum-impacted groundwater recovered during remedial feasibility testing and/or implementation of remedial action activities will be disposed/discharged, as necessary, based on the selected remedial approach.

8.0 DOCUMENTATION

The management of samples from the point of collection to the point of analysis is carefully controlled. Samples will be collected by the GES Field Supervisor using the sampling protocol discussed in the previous sections. Chain-of-custody sheets will be completed by the GES Field Supervisor at the time of sample collection and placed into the sample coolers for transport to the laboratory.

8.1 Field Sampling Data Sheets and Field Logbooks

Field sampling data sheets are maintained to document procedures for all sampling events. The following minimum information is recorded in the field log book, as appropriate:

- Sample location;
- Sample matrix;
- Sample identification;
- Sampling time;
- Measured field parameters;
- Sample appearance;
- Field analysis data and method(s);
- Field observations on sampling event;
- Name of collector(s);
- Climactic conditions including air temperature; and,
- Problems encountered and any deviations made from established sampling protocol.

Sampling personnel are required to sign and date the field logbook at the end of each day.

8.2 Chain-of-Custody Record

Chain-of-custody documentation is maintained for each sample in order to document sample possession from the time of collection to final laboratory testing. Sampling personnel will record the following information on the chain-of-custody form:

- Sample number;
- Signature of sample collector(s);
- Date and time of collection;
- Sample type (e.g. soil and/or groundwater);
- Well identification;
- Number of containers;
- Parameters requested for analysis;
- Signature of person(s) involved in the chain of possession; and,
- Inclusive dates for time of possession.

If samples are returned to GES for a scheduled laboratory courier pick-up, a custody seal is applied to the cooler and a completed chain-of-custody record is placed in a sealable plastic sleeve on top of each cooler prior to pickup. The chain-of-custody is reviewed and signed by the laboratory courier, and the courier pickup is documented via a sample tracking sheet maintained by GES. Upon delivery of samples to the laboratory, the contents of each cooler are checked against the chain-of-custody record. A sample receiving representative at the laboratory signs the chain-of-custody form to acknowledge transfer of

custody of the samples. Any discrepancies between the custody record and the cooler contents are reported immediately to the PM/CM. A representative chain-of-custody record form is presented in **Appendix B** (Example Forms).

All original field data sheets and chain-of-custody forms are maintained in the project file.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

9.1 Field Quality Assurance/Quality Control

To ensure that the sampling program is being implemented appropriately, a QA/QC project plan has been developed. Results of the QA/QC program are used to evaluate the effectiveness of the sampling protocols. Sampling procedures include specific steps to ensure proper documentation of all pre-field activities such as equipment preparation and cleaning, calibrations, container storage, and preparation.

9.2 Trip Blanks and Field Duplicates

Trip blanks originate at the analytical laboratory and are utilized each day that groundwater samples are collected for VOC analysis. A minimum of one trip blank sample is used and included in each shipping container that contains VOC samples. The containers are filled prior to sampling, carried to the field, and submitted to the analytical laboratory for potential analysis. Trip blank samples are handled identically to actual samples. If erroneous results are reported for monitoring well samples, the trip blank will be analyzed to determine if cross contamination occurred during sample shipment.

Duplicate samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. Field duplicate samples are collected from the same location, at the same time, and in the same manner as the first and placed into appropriate containers.

Field duplicate samples will typically be collected for, at a minimum, soil, groundwater, soil gas and indoor air samples at a frequency of one per twenty samples per matrix or fraction thereof, or one per sampling event. Each duplicate sample is analyzed for the same suite of parameters as the first sample. The relative percent difference will be calculated from the duplicate analysis for the particular parameters of interest. Should the relative percent difference be excessive for the media analyzed and method used, other quality control parameters will be evaluated to determine whether the duplicates or the entire set may need to be reanalyzed or qualified.

9.3 Laboratory Quality Assurance/Quality Control

Quality control checks are performed continually by the laboratory to confirm that the quality assurance objectives for measurement data in terms of precision, accuracy, and completeness are being met. The analytical laboratory's Quality Assurance Manual (QAM) discusses the laboratory's internal quality control program, including the frequencies and types of QC checks performed to confirm that the laboratory analyses' QA objectives are being met. The specific quality control procedures are detailed in the laboratory's quality control procedures and are based upon EPA methods guidance.

9.3.1 Internal Laboratory QC Checks

The QC check frequencies and requirements specified in the following sections is a general description only. The laboratory will follow the internal QC checks specified in the laboratory's QAM for each analysis type employed. However, these QC checks must meet, at a minimum, the requirements specified in the respective EPA analytical methods.

The following internal laboratory QC checks are performed for most analyses, whenever applicable, to ensure the measurement systems are under control:

- Laboratory control samples;

- Initial and continuing calibrations;
- Preparation/method blanks;
- Matrix spike and matrix spike duplicate (organic) or matrix spike and laboratory duplicate (inorganic) analysis;
- Surrogate spike standard performance evaluation (for organic analyses only); and,
- Calibration check compounds and reagent blanks (for organic analyses only).

Additional internal laboratory QC checks are typically performed for most analyses, as required by the associated analytical method. Only the most common QC checks are generally described below.

Laboratory Control Samples

The laboratory control sample (LCS) is used to evaluate the performance of the entire analytical system including preparation and analysis. It consists of a matrix similar to the associated samples that is known to be free of the target analytes that is then spiked with known concentrations of the target analytes. The LCS is evaluated against the method default or laboratory-derived acceptance criteria, with details of the acceptance criteria specified in the laboratory QAM. The LCS will typically be analyzed at a minimum frequency of one every twenty samples or a minimum frequency of one per preparation batch, with exact frequencies and methods specified in the laboratory QAM.

Initial and Continuing Calibration

Each measurement system must be calibrated immediately prior to use and be shown to maintain the calibration throughout the course of the analysis. For the organic parameter methods, all target compounds will be checked during initial and continuing calibrations. Calibration procedures and frequencies are discussed for the various analysis types in the laboratory QAM. An initial calibration will be performed prior to analysis of site samples. Continuing calibrations will typically be analyzed at a minimum frequency of one every ten samples.

Preparation/Method Blanks

A preparation or method blank is run with each batch of samples received for analysis. Compound or analyte responses observed in the blank at levels above the reportable detection limit are reviewed for possible laboratory contamination. If high blank values are observed, laboratory glassware and reagents may need to be checked for contamination and the analysis of future samples halted until the system can be brought under control. A high blank value is typically defined as a value greater than the method detection limit. A preparation and/or method blank will be prepared at a frequency of one per 20 samples or one per day, whichever is greater.

Matrix Spike and Duplicate (Or Matrix Spike Duplicate) Analysis

For all analyses where matrix spiking is possible, 1 in 20 samples is analyzed as matrix spikes and matrix spike duplicates (MSD for organic analyses only) or 1 in 20 samples is analyzed as matrix spikes and duplicates (for inorganic analyses). The percent recovery for spiked samples is calculated and compared to the accuracy criteria specified in the QAM for the associated analytical method. The relative percent difference (RPD) of replicate spikes or replicate analytical results are calculated using the following equation:

$$\%RPD = 100 \times 2[X_1-X_2)/(X_1+X_2)]^1$$

---

1 *Data Quality Objectives for Remedial Response Activities*, EPA/540/G-87/003, March 1987.

where X_1 and X_2 are reported concentrations for each duplicate sample and subtracted differences represent absolute values. The objective for precision is to meet or exceed the precisions demonstrated for similar samples and shall be within the established control limits for the methods.

Surrogate Spike Standard Performance Evaluation

Surrogate standards are defined as non-priority pollutant compounds used to monitor the percent recovery efficiencies of the analytical procedures on a sample-by-sample basis. Surrogate standard determinations are performed on all samples and blanks for organic analyses. All samples are fortified with surrogate spiking compounds before purging or extraction to monitor the preparation and analysis of samples.

Surrogate compounds and recovery levels for the associated analyses are presented in the laboratory QAM (surrogate recovery limits are method- and media-specific and are specified in the method or are calculated annually by the analytical laboratory as described in the analytical method). When the surrogate recovery level is outside of the control limits on the initial analysis, the laboratory must take the following actions for all organic analyses for samples from the site:

- Check calculations to assure there are no errors, check internal standard and surrogate spiking solutions for degradation or contamination and check instrument performance; and
- Recalculate or reinject/repurge the sample or re-extract and reanalyze the sample.

Calibration Check Compounds and Reagent Blanks

These calibration check compounds and reagent blanks are analyzed periodically throughout the course of the analysis, depending on the required analysis. The exact frequencies and methods of use are presented in the laboratory QAM.

10.0 DATA MANAGEMENT

The primary objective is to maintain the security and integrity of project specific data from initial acquisition through final archiving, while providing team members with access to information. Project specific information, such as background and historical data, field data, analytical data, accounting information and reports, are maintained on a local area network (LAN). Historical data, field data and analytical data are also maintained on a secure, hosted database server. Each team member involved in acquiring data is responsible for recording the original computer records and making these records available to the project team in the required format.

10.1 Documentation and Records Administration

Information associated with the project will be retained in the project file. These files will include the following:

- Project work plans;
- Field records (field log books, field data sheets, copies of field logbook pages);
- Chains-of-custody;
- Laboratory analytical reports;
- Test data;
- Numerical calculations;
- Reports and other transmittals;
- Copies of work requisitions, notices to proceed, and contracts;
- Correspondence including incoming and outgoing letters, memoranda, records of conversation;
- Photographs;
- Reference materials; and,
- Figures.

Field data, such as survey information, geologic logs, well construction diagrams, and field notes, are recorded directly in the field or recorded via computer (e.g. pump test data, feasibility test data, and geophysical test data). To achieve these objectives for accurate, secure, and complete data, field data are downloaded into the project file on the LAN and the secure, hosted server as soon as practical. The data file is stored in "read only" format, and all further processing is done on working copies made from the master file. The secure, hosted database incorporates a record auditing system denoting when and by whom a record was created. Only system administrators can edit existing values. If corrections are made to a record, the team member initiating the change and the administrator who implements the change record the historical value and reason for change within the database.

Paper and/or electronic copies of field notes are maintained in a secure project file by the project's administrator. These files are named and stored in accordance with a hierarchal structure. If corrections are made to an original file, the team member initiating the change is responsible for informing the project data manager who documents the correction in the original master file, initials the original paperwork, and retains a copy. All versions of master files are labeled and saved. Members of the project team that generate these records are required to provide the records to the designated project PMA. The PMA will check that incoming records have proper identification for filing, are legible, and are in suitable condition for filing.

10.2 Data Processing

GES processes data using duplicate copies of master files to ensure that processing is conducted with secure methods that do not compromise the integrity of the data throughout the processing sequence. Field data is initially processed into a common format for import into processing, display and database programs. Data is then imported to analysis and display programs to produce graphical displays. The project team is responsible for verifying results. The LAN is backed up onto the wide area network (WAN) daily.

Field data and analytical data are provided in electronic data deliverable (EDD) formats for upload into the secure, hosted database. These EDD formats utilize reference values, business rules and user certificates to automatically check and verify that data submitted is valid and that the user is approved to submit data to the project. Approved laboratory consultants submit an EDD directly to the hosted database at the time of hard copy report delivery. The designated PMA monitors submittals to the secure, hosted database and reviews all EDDs to ensure successful upload.

Field data is processed as soon as practical to allow for ongoing data evaluation that may result in corrections and/or additions to the work plan. Maps, figures and tables are provided to the project team for verification. The project team is responsible for notifying the data manager regarding erroneous or inconsistent results, and corrections are appropriately handled as described above. Final data processing results, such as graphical displays, database files, spreadsheets and AutoCADD files, are saved to the project file as final files.

11.0 ASSESSMENT AND OVERSIGHT

11.1 Assessment and Response Actions

Assessments are designed to determine whether the SAP/QAPP is being implemented as approved, to increase confidence in the information obtained, and to determine whether the information may be used for its intended purpose. Planned and documented performance and system audits will be periodically conducted for this and/or similar sites to verify compliance with project specific QA requirements. These audits will consist of, as appropriate, an evaluation of QA/QC procedures, the effectiveness of the QA/QC implementation, an evaluation of work areas and activities, and a review of project documentation. The following sections describe the field audit process.

11.1.1 Field Audits

Field Methods

The PG and/or PM is responsible for ensuring that all field investigations are performed in accordance with the requirements and specifications outlined in this QAPP. As part of the field QA/QC program, the PM will conduct at least one field performance audit during each year. The field performance audit will involve reviewing field procedures, such as gauging, purging and sampling, for conformance with standard operating procedures. Field performance audits will be scheduled early enough in an activity so that corrections can be made, as necessary. During the audit and upon its completion, the auditor(s) will discuss the findings with the individuals audited and discuss and agree on corrective actions.

Scheduled audits may be supplemented by additional audits for one or more of the following reasons:

- when significant changes are made in the QAPP; or
- when it is necessary to verify that a corrective action has been implemented.

The PM and QAO are responsible for reviewing all data obtained in the field as they are generated by the Field Team for accuracy and clarity to ensure their reproducibility after completion of field activities.

Field QC Audits

The analytical results of the field blanks and replicate samples are indirect audits of the level of performance of field activities. If significant inconsistencies occur in the evaluation of these field QC samples, corrective actions may be required.

11.1.2 Laboratory Procedures

During all investigations/studies, instrument and method performance and data validity are monitored by the laboratory performing the analysis. The laboratory calibrates its instruments and documents the calibration data. Laboratory personnel continuously monitor the performance of instruments to ensure that performance data fall within acceptable limits. If instrument performance or data fall outside acceptable limits, or when any condition is noted that has an adverse affect on data quality, then the laboratory implements appropriate corrective actions. Example situations that require corrective action include the following:

- Protocols defined by the project specific QAPP have not been followed;
- Identified data acceptance standards are not obtained;

- Equipment is not calibrated properly or in proper working order;
- Sample and test results are not completely traceable;
- QC requirements have not been met; or,
- Performance or system audits identify issues of concern.

11.2 Response Actions

11.2.1 Field Response Actions

Response action are required when a problem arises that impedes the progress of the investigation as detailed in the project plans, or when field or analytical data are not within the objectives specified in the QAPP. Corrective actions include those actions taken to correct the problem. These corrective actions are documented in the project file. Prior to implementing any actions that deviate from the approved procedures contained in the SAP/QAPP, the PG and/or PM must be notified.

11.2.2 Laboratory Response Actions

The laboratory QAO is responsible for initiating and approving response actions. The corrective actions may include one or more of the following:

- Re-calibration or standardization of instruments;
- Acquiring new standards;
- Repairing equipment; and/or,
- Re-analyzing samples or repeating portions of work.

12.0 DATA REVIEW

Data review is the process of examining and reviewing the data to ensure that the data generated are statistically sound and of known and documented quality to meet project objectives. The data review process generally includes verification, validation and a usability assessment. Verification and validation apply to field sampling activities as well as to laboratory analytical data. Validation assesses not only compliance with method, procedure and contract requirements, but also compliance with QAPP specific requirements. The usability assessment determines whether the data meet project objectives.

12.1 Verification

Field and laboratory data will be reviewed for completeness before the data review process continues. The verification process begins during sampling activities as follows.

Chain-of-custody forms will be reviewed internally upon their completion and verified against packed sample coolers by the sampling personnel. A copy of the chain-of-custody will be given to the PG and/or PM/CM for review. The PG and/or PM/CM returns the chain-of-custody to the PMA for filing.

Laboratory analytical results are to be e-mailed to the PMA, PM/CM and PG. The PG and/or PM/CM checks the analytical results against the chain-of-custody to ensure all sample results are received for the samples and parameters requested.

The complete laboratory analytical package is to be provided to GES as an electronic data deliverable and as a paper copy and/or in electronic PDF format. When the paper copy is received, the PM/CM will verify that all data have been received as requested. The PM/CM will also check the narrative report to determine if the laboratory had issues/problems with the analyses. The PM/CM will notify the PG of narratives indicating data problems/deficiencies. The PM/CM will notify the PMA the laboratory report is ready for filing, database upload and tabulation.

12.2 Validation

Data are typically validated by the laboratory and field personnel. During field operations, field measurements are validated at the time of collection by the PM or Field Supervisor, if delegated by the Project Manager. Laboratory analytical results are validated by the Laboratory Manager or the analyst who is the specific analytical task leader.

12.2.1 Field Data Validation

All field data are reviewed during the time of collection. If the PG/PM/CM or (if delegated) Field Supervisor is performing the initial review, a designee will do the secondary review. Otherwise, the PG/PM/CM or Field Supervisor will perform the secondary review. In reviewing the field data, care will be taken to ensure correct codes, units, sample locations, as well as other pertinent information are included in the field logbooks, records, and chains-of-custody. Any inconsistencies discovered will be resolved immediately, if possible. Corrections to field data sheets or field logbooks will be removed by placing a single line through the entry, initialing and dating the correction. If information is added without a correction being necessary that entry will be initialed and dated to indicate that it was not entered at the original time of data entry. Entries should never be "whited out" or made in pencil.

Additionally, the Field Supervisor will be responsible for ensuring that accurate and correct data and representative samples are obtained by following field investigation procedures as they are described in

the work plan to achieve work objectives. It is important that the PM/CM or Field Supervisor makes sure the field team adheres to each scope of work and follows QA/QC protocols as outlined in this document including, for example, the proper calibration of instruments, sampling according to standard operating procedures, and collection of sufficient sample volumes and field QC samples.

12.2.2 Laboratory Data Validation

The individual Laboratory Department Manager validates all laboratory data, prior to its reporting, that originates from his or her section. Example QA/QC measures that are typically used include the following:

- A standard curve is prepared prior to sample analysis;
- The standard regression coefficient is within the acceptable range;
- Standard reference materials are analyzed at the proper frequencies and acceptable results are obtained;
- The reagent blanks are analyzed at the proper frequency;
- Precision requirements of this plan are met;
- Accuracy requirements of this plan are met;
- Completeness requirements of this plan are met;
- Samples are analyzed within the proper sample holding times;
- All calculations are verified as correct;
- Proper units are reported; and,
- The proper methodologies were used.

In addition to this review of analytical results and project specific precision, accuracy, and completeness requirements, the Laboratory Department Manager should perform unannounced audits of report forms and other data sheets as well as regular reviews of instrument logs, performance test results, and analysts' performance. When any review of analytical results or internal QA/QC checks indicates problems, immediate corrective actions should be taken and all data collected since the previously approved QC audits should be reviewed for validity. Specific laboratory procedures for validation of the analytical data generated are described in the laboratory QAM.

Once the data have been validated internally by the laboratory, all of the results are entered electronically or automatically into the laboratory's data management system where they are stored prior to reporting. When all analyses are completed for data storage, the Laboratory Director (or his/her designee) will issue a final data report including a descriptive case narrative. He or she will then issue the final report and electronic data deliverable to the data user. All applicable QC data should be included with the final report.

12.2.3 Independent Data Validation

Independent data validation will be completed for this project only if deemed appropriate and necessary to meet established DQOs.

12.3 Usability Assessment

The usability assessment is completed on data of known and documented quality, i.e., verified and validated data. The assessment evaluates the performance criteria (data quality indicators) specified in **Section 2.0** as well as field performance measurements to determine if that data meet project quality objectives.

Table 1

DEFINITIONS and LABORATORY MEASUREMENTS OF QC ELEMENTS

United Refining Company Of Pennsylvania
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

QC Element	Definition	Laboratory Measures
Precision	Measures the reproducibility of measurements under a given set of conditions. Analytical precision is monitored through analysis of matrix spike duplicates and field duplicate samples. Field duplicates are also evaluated by calculating the RPDs between field duplicate sample results. However, evaluations of field duplicate RPDs are used as advisory determinations since numerous factors in sampling and analysis may cause variances between field duplicate results.	Precision is expressed as the relative percent difference (%RPD): $\%RPD = 100 \times [X_1-X_2]/((X_1+X_2)/2)]$
Accuracy	Accuracy describes the closeness of agreement between an observed value and an accepted value that is accepted as the true value. Accuracy is typically evaluated using spikes (laboratory control samples, surrogate spikes and matrix spikes) and blanks (trip, field and method), or any other standard subjected to the entire analytical process.	Accuracy is usually presented as percent bias or percent recovery. Percent bias is a standardized average error. Percent recovery provides the same information as percent bias. Percent recovery (%R) is calculated as follows: %R = (observed value/surrogate value) x 100
Representativeness	Representativeness is a qualitative measurement that describes how well the analytical data characterizes a release area or area of concern under investigation as part of an environmental site assessment. Factors influencing representativeness include: the selection of appropriate analytical procedures, the sampling plan, and the procedures and protocols used to collect, preserve and transport the samples.	Representativeness is determined by comparing the quality control data for these samples against other quality control data for similar samples analyzed at the same time.
Comparability	Comparability refers to the equivalency of two sets of data. This goal is achieved through the use of standard or similar techniques to collect and analyze representative samples. Comparable data sets must contain the same variables of interest and must possess values that can be converted to a common unit of measurement.	Comparability is a quantitative parameter that is dependent upon other data quality elements. For example, if the detection limits for a target analyte were significantly different for two different methods, the two methods would not be comparable.
Completeness	Completeness is the percentage of measurements made that are deemed valid measurements. The completeness goal is to generate the maximum amount possible of usable data (i.e. 100% usable data). Data is considered usable unless qualified as "R," rejected, as will be presented in the usability report. Completeness is evaluated in two ways: 1) by comparing the number of samples actually collected to the expected number of samples to be collected; and, 2) by comparing the number of valid analyses received from the laboratory to the number of actual samples collected. The results of any Level IV analyses to be performed will typically be used for the project and as such will have a minimum completeness of 95 percent for both evaluations of completeness.	The results of any Level IV analyses to be performed will typically be used for the project and as such will have a minimum completeness of 95 percent for both evaluations of completeness.
Sensitivity	Sensitivity is the ability of the method or instrument to detect the target analytes at the level of interest. The quantitation limit (QL) is the minimum concentration of an analyte that can be routinely identified and quantified above the method detection limit (MDL) by a laboratory. A laboratory MDL is a statistically derived detection limit that represents a 99% confidence that the reported signal is different from a blank sample. Frequently the QLs for specific samples are adjusted for dilutions, changes to sample volume/size, etc. These QLs are referred to as the laboratory Reporting Limits (RLs).	Sensitivity is measured by calculating the percent recovery of the analytes at the QL. This parameters is lab specific.

Table 2

VOLUME OF WATER IN 1-FOOT SECTION OF WELL CASING

United Refining Company of Pennsylvania
Former Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Casing Diameter (inches)	**F[1] (gallons)**
1.5	0.09
2	0.16
3	0.37
4	0.65
6	1.47

[1]F is the volume in gallons in a 1-foot section of the well and is computed using:

$$F = 3.14(D/2)^2 \times 7.48 \text{ gal/ft}^3$$

Where D = the inside diameter of the well casing in feet.

Table 3

SAMPLE METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

United Refining Company of Pennsylvania
Former Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Medium	Method	Container/ Sample Size	Preservation	Holding Times
Aqueous Samples	5030B/8260B	3 x 40 mL vials w/ Teflon-lined septum caps	Cool to 4°C and adjust pH < 2 with HCl.	14 days
Solid Samples	5035/8260B [1,2]	Low Concentration Soil Samples: 2 x 40 mL glass vials containing a clean magnetic stirring bar w/ Teflon-lined septum caps, OR an Encore sampler	Collect %.0 +/- 0.5 g of sample in a glass vial preserved w/ 1 g of sodium bisulfate and 5 mL of organic free reagent water. If samples are markedly larger or smaller than 5 g, adjust the preservative amount by 0.2 g for each 1 g of sample, OR use an Encore sampler	14 days. Soil collected and stored in the Encore sampler must be transferred to a sample container with the appropriate preservative, as soon as possible, or analyzed within 48 hours of collection.
Vapor (soil gas, sub-slab, indoor air)	Method TO-15	1 x 6-L or 1 x 1-L Summa® canister with 30-minute flow controller	Ambient temperature	30 days (following receipt at the analytical laboratory)
Vapor (feasibility testing and remedial samples)	Method 18	1-L Tedlar bag	None	Not available

[1]Each type of soil sample will require one additional soil sample that is not preserved for moisture determination. Use at least a 40-mL glass vial with Teflon-lined cap.

[2]Documentation of the sampling option used must accompany the laboratory results.

Notes:
L = liter
mL = milliliter
g = grams
°C = degrees Celsius
HCL = hydrochloric acid

Table 4

ANALYTICAL REQUIREMENTS

United Refining Company of Pennsylvania
Former Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

SOIL PARAMETERS	
Analyte	***Analytical Method***
Benzene Toluene Ethylbenzene Cumene MTBE Naphthalene 1,2,4-Trimethyl benzene 1,3,5-Trimethyl benzene Benzene	EPA Method 5035/ 8260B
WATER PARAMETERS	
Analyte	***Analytical Method***
Benzene Toluene Ethylbenzene Cumene MTBE Naphthalene 1,2,4-Trimethyl benzene (1,3,4-Trimethyl benzene) 1,3,5-Trimethyl benzene	EPA Method 5030B/ 8260B or 524.2
VAPOR PARAMETERS	
Analyte	***Analytical Method***
Benzene Toluene Ethylbenzene Cumene MTBE Naphthalene 1,2,4-Trimethyl benzene (1,3,4-Trimethyl benzene) 1,3,5-Trimethyl benzene Total hydrocarbons (C_4-C_{10})	EPA Method TO-15 (soil gas, sub-slab, indoor air) EPA Method 18 (remedial samples)

Notes:
MTBE = Methyl tert-butyl ether

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.

SITE-SPECIFIC HEALTH AND SAFETY PLAN
FOR

Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA 16038

EMERGENCY PHONE NUMBERS

Local Police 911

Local Fire 911

Local Rescue 911

Local Hospital Name, Number & Address
Grove City Medical Center
631 North Broad Street Ext
Grove City, PA
724/450-7000

Directions to Hospital (map attached)
Head towards Pittsburgh Road (Rt 8) on Pine Street
Turn Left onto Pittsburgh Road (PA-8)
Turn Left and take ramp onto I-80 West towards Sharon
Take exit #24/PA-173 Grove City/Sandy Lake
Turn Left onto Sandy Lake Road (PA-173)
Hospital is on N Broad St Ext (PA-173

National Response Center (NRC): 1-800-424-8802
The NRC should be contacted in the event of a significant chemical release. Once notified, the NRC will activate a federal response to the spill. *Please confirm with the client and project manager to determine if the spill should be reported.*

Poison Control Center: 1-800-222-1222
The Poison Control Center should be contacted in the event of accidental poisoning. They will provide information on immediate treatment for the poisoning.

Nearest Telephone: Office: 800/267-2549 Cell:

Groundwater & Environmental Services, Inc.

Jack Vasalani — Site Supervisor
724/709-1778 — Cell Phone:

Thomas M. Baylis — Vice President of Corporate Health and Safety
610-587-1124 — Cell Phone:

Client Representative

Scott Wonsettler _____ Telephone Number 814/726-4863 _____

State Agency Representative

_____ Telephone Number _____

DO NOT TRANSPORT SERIOUSLY INJURED
CALL LOCAL RESCUE

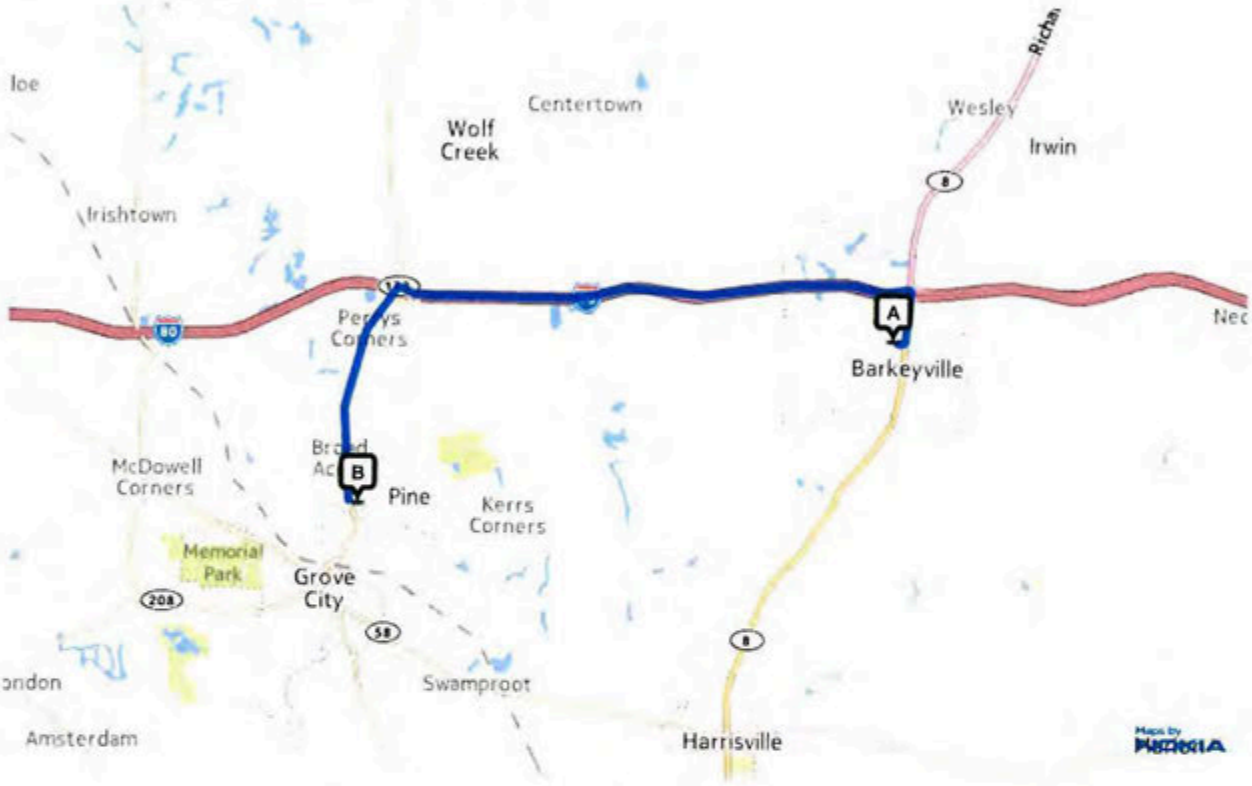
HOSPITAL ROUTE MAPS

YAHOO! MAPS

A 5574 State Route 8, Barkeyville, PA 16038-3324

B 631 N Broad St Ext, Grove City, PA 16127-4603

Total Distance: **8.18 miles**— Total Time: **10 mins**



A 5574 State Route 8, Barkeyville, PA 16038-3324

1.		Head toward **Pittsburgh Rd (PA-8)** on **Pine St**.	Go for 374 ft.
2.	↰	Turn **left** onto **Pittsburgh Rd (PA-8)**.	Go for 0.5 mi.
3.	↑	Turn **left** and take ramp onto **I-80 W** toward **Sharon**.	Go for 4.9 mi.
4.	↱	Take exit **#24/PA-173/Grove City/Sandy Lake**.	Go for 0.3 mi.
5.	↰	Turn **left** onto **Sandy Lake Rd (PA-173)**.	Go for 2.3 mi.
6.		Your destination on **N Broad St Ext (PA-173)** is on the **right**. **The trip takes 8.2 mi and 10 mins.**	

B 631 N Broad St Ext, Grove City, PA 16127-4603

TABLE OF CONTENTS

Section		Page No.
EMERGENCY PHONE NUMBERS		Cover Page
1.0	INTRODUCTION	1
1.1	APPROVALS	1
1.2	SITE BACKGROUND	1
1.3	SCOPE OF WORK	1
2.0	PROJECT ORGANIZATION AND RESPONSIBILITIES	2
3.0	OSHA TRAINING REQUIREMENTS	2
3.1	GENERAL TRAINING REQUIREMENTS	2
3.2	PRE-ENTRY MEETING	2
3.3	FIRST AID/CPR TRAINING	3
4.0	MEDICAL SURVEILLANCE REQUIREMENTS	3
4.1	GENERAL MEDICAL SURVEILLANCE REQUIREMENTS	3
4.2	DRUG AND ALCOHOL COMPLIANCE	3
4.3	ACCIDENT / INCIDENT MEDICAL SURVEILLANCE	3
5.0	HAZARD ASSESSMENT	4
5.1	CHEMICAL HAZARDS	4
5.2	PHYSICAL HAZARDS	5
5.3	RADIOLOGICAL HAZARDS	9
6.0	SITE CONTROL MEASURES	9
6.1	SITE ZONES	9
6.2	COMMUNICATIONS	10
7.0	PERSONAL PROTECTIVE EQUIPMENT	11
7.1	GENERAL	11
7.2	LEVEL D PROTECTION	11
7.3	MODIFIED LEVEL C PROTECTION	11
7.4	LEVEL C PROTECTION	11
7.5	LEVEL A AND B PROTECTION	12
8.0	DECONTAMINATION	12

8.1 GENERAL 12

9.0 EMERGENCY ACTION PLAN 13
9.1 PERSONAL INJURY WITHIN THE EXCLUSION ZONE 13
9.2 PERSONAL INJURY WITHIN THE DECONTAMINATION ZONE 14
9.3 PERSONAL INJURY WITHIN THE SUPPORT ZONE 14
9.4 FIRE/EXPLOSION 15
9.5 PERSONAL PROTECTION EQUIPMENT FAILURE 15
9.6 EQUIPMENT FAILURE 16

10.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES 16
10.1 WORK PERMITS 16
10.2 GENERAL SITE RULES 16
10.3 ADDITIONAL STANDARD OPERATORING SAFETY PROCEDURES 18

EXPOSURE MONITORING PROGRAM 21
REAL-TIME MONITORING 21
ACTION LEVELS 21

FIGURES

Figure 1	Route to Local Hospital Map

LIST OF ATTACHMENTS

Attachment A	Site Maps
Attachment B	Exposure Monitoring Program for the Contaminants of Concern
Attachment C	Material Safety Data Sheets
Attachment D	Job Safety Analysis Sheets and Daily Site Safety Checklists
Attachment E	Pre-entry Meeting Notes
Attachment F	Sign-off Sheet
Attachment G	Incident/Injury Case Management
Attachment H	Site Specific Decontamination Plan

1.0 INTRODUCTION

1.1 APPROVALS

Prepared By: Joan Amodeo (Employee - title) Date: 05/2016

Reviewed by: Joseph Hinkle (Employee - Project Manager) Date: 05/2016

Approved By: Joseph Hinkle Date: 05/2016

1.2 SITE BACKGROUND

Project Name: Kwik Fill Station #M-209 Barkeyville

Site Address: 5574 Route 8, Barkeyville, PA

Nearest Intersection: Between Stevenson Road and Log Cemetery Road

Township/Municipality: Grove City

County: Venango

Additional Site Information:

1.3 SCOPE OF WORK

Task 1 - Site Visit

Task 2 - Groundwater Monitoring

Task 3 - Remedial System O&M

Task 4 - Well Installation

Task 5 - Soil Sampling

Task 6 - Vac HIT Event

Task 7 - Waste Management

Task 8 - Well Repairs

Task 9 -

Task 10 -

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

Responsibility	Name	Task Description
Project Manager	_____	Oversee and coordinate all budget and technical aspects for the project
Local Health & Safety Officer	_____	Coordinate all health and safety operations for the project site
Site Supervisor	GES Personnel	Oversee and coordinate all health and safety aspects from the project site

3.0 OSHA TRAINING REQUIREMENTS

3.1 GENERAL TRAINING REQUIREMENTS

All personnel performing activities covered by this plan must be trained in accordance with the requirements of 29 CFR 1910.120(e). The Project Manager will verify and document that all GES personnel meet the applicable training requirements prior to the start of site work, including:

- OSHA 1910.120 initial 40-hour training
- OSHA annual eight-hour refresher training within the last year
- OSHA eight-hour supervisory training for on-site managers and supervisors and GES requirements
- At least one GES employee will have American Red Cross (or equivalent) first aid and CPR training, and will be present on-site at all times

Documentation for training certification will be maintained by the Local HSO.

Subcontractors chosen to perform well drilling, excavation, materials disposal, utility installation in trenches, and any other site activities where the potential exists for contact with contaminants must provide written documentation of HAZWOPER training, for each of his employees who will be involved in activities at this site, before the start of work.

3.2 PRE-ENTRY MEETING

A Pre-entry meeting reviewing the Site Specific Health and Safety Plan for all proposed work location personnel shall be held and documented in this HASP and in the site log.

This meeting shall be prior to the commencement of any on-site work activities. A site-specific briefing is provided to all site visitors who enter this site beyond the site entry point. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

3.3 FIRST AID/CPR TRAINING

At least one member of the GES staff assigned to the project will have American Red Cross (or equivalent) First Aid and cardiopulmonary resuscitation (CPR) training. At least one trained individual will be present on-site at all times. The Local HSO will maintain all training documentation.

4.0 MEDICAL SURVEILLANCE REQUIREMENTS

4.1 GENERAL MEDICAL SURVEILLANCE REQUIREMENTS

All personnel performing activities requiring the use of an air-purifying respirator covered by this plan must be active participants in an ongoing medical monitoring program in accordance with the requirements of 29 CFR 1910.120(f). Subcontractors chosen to perform selected site activities must provide written documentation of such, for each employee who will be involved in activities at this site, before the start of work.

4.2 DRUG AND ALCOHOL COMPLIANCE

All personnel performing activities covered by this plan must have had a negative drug and alcohol screen performed within the last 12 months.

4.3 ACCIDENT / INCIDENT MEDICAL SURVEILLANCE

As a follow-up to a work-related injury, all employees are entitled and encouraged to seek medical attention. All accidents and potential exposures must be reported **immediately** to the Local HSO, who will coordinate with CHSSE to arrange for appropriate medical attention. Depending on the type of incident, it may be critical to perform tests within 24 to 48 hours. *Failure to report an injury or incident immediately will result in disciplinary action.* The *GES Incident/Injury Case Management Procedure* can be found in **Attachment G**.

Events surrounding near-miss accidents/injuries will be recorded in the daily log and documented in accordance with the GES Incident Reporting Procedures.

5.0 HAZARD ASSESSMENT

Job Safety Analyses (JSAs) are required for all appropriate site activities. Each JSA must identify and quantify the health and safety hazards associated with each task and site operation, and to evaluate risks to workers. Using this information, appropriate control methods are selected to mitigate or (preferably) eliminate the identified risks.

5.1 CHEMICAL HAZARDS

5.1.1 Contaminant Characterization and Potential Routes of Exposure

The main routes of exposure for field personnel include:

- Inhalation of contaminant vapors;
- Inhalation of contaminated particulate matter;
- Ingestion of contaminated material; or
- Dermal absorption of contaminated material.
- Injection of contaminated material

Site personnel can reduce their exposure potential by:

- Using the proper PPE;
- Practicing contamination avoidance;
- Following proper decontamination procedures; and
- Observing good personnel hygiene.

5.1.2 General Chemical Data

In order to protect site personnel from the hazards associated with site contaminants of concern found during projects at GES Sites, an Exposure Monitoring Program will be implemented to control potential chemical exposures. **Attachment B** contains this program along with data tables on the contaminants of concern. These tables provide information on each contaminant's characteristics, such as routes of exposure, health hazards, ionization potentials, exposure limits, etc. All hazardous chemicals brought on-site by GES personnel or its subcontractors will be managed in accordance with 29 CFR 1910.1200 and the GES Hazard Communication Program. This will include: proper labeling, an inventory list of all hazardous materials brought onsite, and a copy of each chemical's Material Safety Data Sheet (MSDS) will be maintained on-site. **Attachment C** contains MSDSs of hazardous substances generally used by GES personnel.

5.2 PHYSICAL HAZARDS

A variety of physical hazards may be present, but these hazards are similar to those associated with any field project.

5.2.1 Slips/Trips/Falls/Cuts

* Utilize proper housekeeping practices, such as removal of debris and tools from the work area to keep the area clear of trip hazards.
* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.
* Replace manhole covers securely to prevent tripping and vehicle accidents.
* Use hose cutters when cutting piping.
* Walkways and work spaces will be kept clear of cords, hoses, pipes, etc. that cause trip hazards.
* If trip hazards cannot be removed from the work area, they shall be taped down and cones shall be placed to identify the hazard.

5.2.2 Excessive Noise

* Use hearing protection during loud mechanical operations such as drilling, Geoprobing and excavating operations, inside a remedial shed when equipment is operating loudly or in other high decibel situations in accordance with the *GES Hearing Protection Policy*.

5.2.3 Airborne Particulate (ears, eyes, nose, mouth, inhalation)

* Eye protection is to be worn at all times on site.
* Respiratory protection is to be worn when site activities cause excessive particulates, such as performing carbon change-outs.

5.2.4 On-site Traffic

* Safety vest shall be worn and safety cones placed around the worksite as specified in the GES *Traffic Control Procedures*.
* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

5.2.5 Ladder Safety

* Ladders must be inspected prior to use. Any damaged ladder will be discarded immediately.
* Painted ladders are forbidden.
* Never stand on the top step of the ladder.
* Extension ladders must extend 36" beyond work area.

* Pitch ladders at a 4:1 ratio.
* Extension and straight ladders must be tied off.
* Fall protection must be worn when working at heights six (6) feet or more above ground.

5.2.6 Air Compressor

* Eye protection is to be worn at all times on site.
* Hot steam will burn skin upon contact.
* Use proper pressure relief valves before performing O&M on an air compressor.

5.2.7 Electrical

* Inspect all electrical equipment and extension cords prior to use.
* All electrical circuits and equipment must be grounded in accordance with the NEC regulations.
* Spark producing equipment is not to be used in operating remedial system sheds.
* Lockout/Tagout procedures will be in effect if equipment is to be repaired. Refer to the GES *Lockout Tagout Procedures* for full details.
* Use three-pronged plugs and heavy-duty extension cords.
* A GFCI is required when using an extension cord.
* Workers must not have wet hands or be standing in water while plugging/unplugging energized equipment.
* **Plugs and receptacles will be kept out of water (unless they are approved for submersion).**

5.2.8 Power Tools

* Equipment will be inspected for defects prior to use.
* Eye protection is to be worn at all times on site.
* Employees using tools that may subject their hands to an injury, such as cuts, abrasions, punctures, or burns will wear protective gloves.
* Loose or frayed clothing, dangling jewelry, or loose long hair will not be worn when working with power tools.
* A GFCI will be used with all power tool operations.
* Shielding or guarding will be in effect if applicable.

5.2.9 Back Strain

* Utilize proper lifting procedures when loading and unloading heavy equipment.
* Bend down at the knees rather than bending the back.
* Use a mechanical lifting device or a lifting aid such as hand carts, drum dollies or lift gates when lifting heavy objects.

5.2.10 Site Security

* Do not permit anyone who is not properly trained and outfitted with the appropriate PPE to enter the Exclusion or Contamination Reduction Zones (this includes GES personnel, clients, etc.)
* Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.
* On sites where it is believed that security is an issue, two employees will be used for all field work. The "buddy-system" will be in place and the two employees will be in constant communication and within each others line of sight. There will be a cellular phone available to call 911 if a violent condition presents itself.
* When acts of violence occur or when an employee(s) feels that they are being placed in a threatening position they must immediately leave the site.
* All potential acts of violence or threats by non-GES personnel must be immediately reported to the Site Operations Manager and the Local Health and Safety Officer. The situation will be discussed to determine future action on the site in question.
* If any GES employee notices suspicious persons or activities in a GES office or in the vicinity of a work area, he or she should immediately report the observation to his or her supervisor or Site Operations Manager.

5.2.11 Biological Hazards (insects, snakes, poisonous plants and animals)

* Do not touch or contact poisonous plants, such as poison ivy/poison oak.
* If available, apply an over-the-counter barrier cream, such as Ivy Block® to prevent contact with plant oils.
* Wash hands and arms immediately with soap and water if skin contacts the plants.
* Wear long pants with socks pulled over legs to prevent skin contact with plants and insects.
* Inspect yourself carefully for insects or ticks after being outdoors.
* Spray any wasp/hornet nests with an insect repellant from a safe distance recommended by the product's manufacturer.
* **Do not antagonize snakes or wild animals.**

5.2.12 Heat Stress

* Know and recognize the signs and symptoms of heat-related illnesses, as follows:
  Heat cramps
  Heat exhaustion:
    Cool, moist, pale, or flushed skin
    Headache
    Nausea

Dizziness, weakness and exhaustion

Heat stroke:

Red, hot, dry, skin
Changes in consciousness
Rapid, weak pulse
Rapid, shallow breathing

* Adjust work schedules to provide time intervals for intake of juices, juice products and water in an area free from contamination.

5.2.13 Cold Stress

* Know and recognize the signs and symptoms of cold-related illnesses, as follows:

Frostbite:

Lack of feeling in the affected area
Skin that appears waxy, is cold to the touch or is discolored (flushed, white, yellow or blue)

Hypothermia:

Shivering
Numbness
Glassy stare
Apathy
Loss of consciousness

* Have appropriate clothing available and dress in layers to protect against cold weather.
* Adjust work schedules to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather.

5.2.14 Confined Space (CS) Entry

* Confined Space Entry is prohibited unless authorized by the project manager or local health and safety officer.
* The *GES Confined Space Entry Requirements* must be followed, including but not limited to air monitoring, presence of attendant and permit completion.

5.2.15 Fall Hazards

* OSHA-approved man-lifts and ladders will be used for access to elevated locations.
* Employees must wear a safety belt with a lanyard attached to the boom or basket when working from a man-lift.
* If the elevated location is inaccessible by a man-lift, CHSSE shall be contacted to determine the appropriate fall protection.
* Complete details are found in the *GES Fall Protection* Program.

5.2.16 Hot Work

* A hot work permit will be completed prior to the start of the work.
* The Site Supervisor will conduct a safety briefing on hot work rules and procedures, and all hot work participants will sign the permit.
* Hot work will not be performed if there is a possibility of an explosive atmosphere or an oxygen-enriched atmosphere.
* The Site Supervisor will designate a person for fire watch duty, who will have access to a properly rated fire extinguisher and will remain on-duty for one-half hour after the hot work is complete.
* All hot work equipment will be inspected daily, prior to use. If the equipment is found to be defective, it will be removed from the site, or tagged with a "Do Not Use" sign until it is repaired.
* All welding and cutting personnel will be trained in the safe operation of their equipment.
* Refer to the GES *Hot Work Requirement Policy* for complete details.

5.3 RADIOLOGICAL HAZARDS

If site-specific potential radiological information becomes available, the hazards will be addressed in an addendum to the HASP. Ionizing Radiation action levels can be found in **Attachment B, Table 2.**

6.0 SITE CONTROL MEASURES

6.1 SITE ZONES

A controlled work area should be established in the immediate vicinity of the site activities covered by this plan. Only those persons who can comply with the requirements of this plan should be allowed into this area during any work activities, which may result in exposure to the hazards associated with the specific task being performed. The work site should be marked off with at least the following items from the GES Traffic Control Procedures: Four (4) traffic cones with flags reaching 70 inches in combined height, caution tape, two (2) work area signs or barricades at the site entrances and a flashing amber light on the company vehicle.

When activities involve invasive activities on sites in which the Project Manager, Local HSO or the CHS have determined the area to be highly-contaminated, a three-zone system will be used to control the potential spread of contamination.

These zones are characterized by the presence or absence of chemical and biological hazards and the activities contained within them.

Zone boundaries should be clearly marked at all times and the flow of personnel among the zones must be controlled. The site should be monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean areas. Whenever boundaries are adjusted, zone markings must also be changed and workers immediately notified of the change.
For the purpose of this plan, the following definition of terms is provided:

Exclusion Zone - The immediate area of the work activity to be performed or an area fully enclosing the hazards present. Personnel and equipment will enter and exit the Exclusion Zone from the designated access points in the Contamination Reduction Zone (CRZ).

Contamination Reduction Zone - The transition area between the contaminated and uncontaminated area. Based on monitoring results, the CRZ boundaries may be adjusted to ensure that the Support Zone remains uncontaminated. Workers and equipment exit the Exclusion Zone through the designated access point(s) into the CRZ. Workers and equipment are then decontaminated in the CRZ, according to the procedures specified in the Decontamination section of this HASP. Workers and equipment then exit the CRZ into the Support Zone through the designated access points.

If necessary, emergency decontamination procedures are implemented. Emergency decontamination procedures are described in **Section 9.2** of this HASP and in **Attachment H** (if necessary).

Support Zone - The Support Zone is the clean area of the site, beyond the outer boundary of the CRZ. There should be no contamination in this zone. Administrative, clerical, and other support functions are based in the Support Zone.

Air and surface monitoring are conducted in the Support Zone as needed to ensure that it remains uncontaminated. If contamination is detected, zone boundaries are adjusted until corrective action is taken and monitoring results indicate that this zone is again uncontaminated.

6.2 COMMUNICATIONS

Emergency numbers are listed on the cover of this HASP. Work will not be conducted on-site without access to a telephone, site personnel will be informed of its location. If a telephone is not available on site, a cell phone will be made available for emergency use.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 GENERAL

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices, and PPE are used to protect employees.

The level of protection worn by site personnel will be enforced by the Site Supervisor. Levels of protection may be upgraded or downgraded at the discretion of the Local HSO, or CHS, based on real-time air monitoring data and prior site experience. Any changes in the level of protection will be documented. Levels of protection less than those designated in this HASP must first be approved by the Corporate HSSE Department.

7.2 LEVEL D PROTECTION

Level D PPE provides minimal protection against chemical hazards. A respirator is not required. Level D PPE includes:

- Cotton coveralls or long pants and a shirt with sleeves
- Reflective safety vest or hi-visibility shirt.
- Safety glasses
- Steel-toe/steel-shank work boots
- Work gloves
- Hearing protection (as required by task)
- Hard Hat (as required by task)
- Chemical resistant gloves (as required by task)

7.3 MODIFIED LEVEL C PROTECTION

Modified Level C PPE includes the items listed in Section 7.2 above, and the following items:

- Full-face APR or Half-face APR respirator equipped with the appropriate chemical cartridges

7.4 LEVEL C PROTECTION

Level C PPE provides a higher level of respiratory and skin protection against chemical hazards than Level D. Level C PPE includes the items listed in Section 7.2 above, and the following items:

- Poly-coated Tyvek (yellow) or Saranex® (shiny white)
- Steel-toe/steel-shank work boots and chemical resistant over-boots, or chemical resistant steel-toe/steel shank boots
- Chemical resistant inner gloves
- Chemical resistant outer gloves
- Seal arm, leg, and zipper joints with tape, as required
- Half-face or full-face, air-purifying respirator equipped with appropriate cartridges

7.5 LEVEL A AND B PROTECTION

Level A PPE should be worn when the highest level of respiratory and skin protection is needed, or if the contaminants of concern are unknown. Level B PPE should be worn when the highest level of respiratory protection is required, but a lesser level of skin protection is needed. The tasks covered under this HASP do not require the use of Level A or B PPE.

Separate Health and Safety Plans will be developed for Level A/Level B investigations and for Emergency Responses, which may involve the use of Level A and/or Level B health and safety measures.

8.0 DECONTAMINATION

8.1 GENERAL

At a minimum, the procedures outlined below shall be followed for decontamination:

- Remove gross contamination from tools, respirator, monitoring equipment, boots, etc., prior to leaving the "exclusion zone", using paper towels, handi-wipes, etc.
- Completely decontaminate soiled equipment in the Contamination Reduction Zone using detergent and water and dispose of all cleaning materials as follows.

    1. Due to the small quantity of waste generated during decontamination, it is allowable in most states to dispose of lightly contaminated materials in the site dumpster. It is important, however, to ensure that there is no chance of vapor generation or fluid leaking from the dumpster. At no time are materials containing free product to be disposed of in this manner. In this case, arrangements must be made for use of labeled drums and proper disposal.

2. All decontamination materials including protective sheeting, rags, sorbents, disposable personal protective equipment, and decontamination fluids should be carefully screened with a Photo-ionization Detector (PID) prior to disposal to determine relative levels of contamination.

3. Lightly contaminated decontamination fluids should either be treated via the site treatment system prior to discharge or disposed of via the sanitary sewer system. Highly contaminated decontamination fluids must be stored in labeled drums and proper disposal arrangements must be made.

Note: All Federal, State, County and/or City requirements regarding disposal must be complied with. Below - document specific requirements.

- Dispose of contaminated gloves, Tyvek suits, used cartridges, paper towels, etc., by placing in a plastic bag and discarding in accordance with applicable standards.
- Wash hands and face thoroughly with soap and water before lunch or coffee breaks, and as soon as practical after finishing work for the day.
- Particular care should be taken to protect any skin injuries. If open wounds exist on hands or forearms, handling chemicals should be restricted or eliminated.
- Shower as soon as possible.
- A site-specific decontamination plan (if required) is located in **Attachment H**.

9.0 EMERGENCY ACTION PLAN

9.1 PERSONAL INJURY WITHIN THE EXCLUSION ZONE

Site operations shall be temporarily halted and all site personnel shall assemble in the Contamination Reduction Zone. The Site Supervisor shall evaluate the nature of the injury and, if indicated by the hazards present on site, the injured person shall be decontaminated to the extent possible prior to movement to the Support Zone.

Contact shall be made for an ambulance and with the designated medical facility (if required). An individual certified in Standard First Aid and Adult CPR may choose to initiate the appropriate first aid. No persons shall reenter the Exclusion Zone until:

a. The conditions resulting in the emergency have been corrected;
b The hazards have been reassessed;
c The Site Safety Plan has been reviewed; and
d. Site personnel have been briefed on any changes in the Site Safety Plan.

9.2 PERSONAL INJURY WITHIN THE DECONTAMINATION ZONE

The Site Supervisor shall evaluate the nature of the injury and, if indicated by the hazards present on site, the injured person shall be decontaminated to the extent possible prior to movement to the Support Zone.

Contact shall be made for an ambulance and with the designated medical facility (if required). An individual certified in Standard First Aid and Adult CPR may choose to initiate the appropriate first aid.

If the injury increases risk to other site workers, all site personnel shall move to the Contamination Reduction Zone and site activities will stop until the risks can be assessed and either removed or minimized.

9.3 PERSONAL INJURY WITHIN THE SUPPORT ZONE

The Site Supervisor will assess the nature of the injury and determine if the cause of injury or loss of the injured person will affect continuation of site operations. If the injury will not affect the safety or performance of other site workers, operations may continue, with the person certified in first aid initiating the appropriate first aid and necessary follow up as stated above.

If the injury increases risk to other site workers, all site personnel shall move to the Contamination Reduction Zone and site activities will stop until the risks can be assessed and either removed or minimized.

9.4 FIRE/EXPLOSION

If a fire is observed in the incipient phase (i.e., when it begins) and if the site personnel witnessing the fire feel secure in attempting to control the fire, the individual can attempt to extinguish the fire by using the onsite fire extinguisher. The fire extinguisher should be a 10 or 20 pound (lb) dry chemical, Class A, B, and C extinguisher and is adequate for paper and wood based products (A), flammable and combustible liquids (B), and electrical (C) type fires.

If there is no fire extinguisher available or if site personnel do not feel secure in attempting to extinguish the fire, site personnel shall perform the following:

- Secure the site, if possible.
- Evacuate the area using the nearest safe pathway from the area.
- Proceed to the nearest phone and call 911 and provide the emergency operator all required information. This will activate the emergency response system.

If more than one individual is on the site team, the individual activating the evacuation plan shall verbally communicate to the other site personnel that there is an emergency condition and that they should evacuate from the work area. If contact cannot be made verbally with the other site personnel, any of the following systems can be used as long as the system is audible above background noise. The system can be the site vehicle horn, a whistle, an air horn, or other acceptable device. The system used for initiating an evacuation from the site shall be discussed during the tailgate meeting with the other site personnel prior to beginning the workday. The system that is decided upon shall be documented in the site logbook.

If an explosion or other unsafe condition occurs that the site supervisor had determined will place the other site personnel at risk, then the evacuation system described above should be activated immediately.

9.5 PERSONAL PROTECTIVE EQUIPMENT FAILURE

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor that person and his/her buddy, if applicable,

shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

9.6 EQUIPMENT FAILURE

If any other equipment on site fails to operate properly, the Site Supervisor shall be notified and then determine the effect of this failure on continuing operations. If the failure will affect the safety of personnel, all personnel shall leave the Exclusion Zone until the situation is evaluated and appropriate actions are taken.

10.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

10.1 WORK PERMITS

Work permits will be required for Confined Space Entry, and Hot Work. These permits must be obtained from the Local Health and Safety Officer prior to site work.

10.2 GENERAL SITE RULES

The following general site rules apply to all personnel while on the site:

- Before daily site operations begin, the daily site safety checklist will be completed, the subcontractor's training documentation will be reviewed (as required by section 3 of this plan), and a pre-entry briefing will be held to review the site's health and safety plan concerns and emergency procedures. This meeting will be registered in this Health and Safety Plan. Attendance will be documented.

- One site worker will be assigned to keep the daily log for all health and safety-specific site activities, unless otherwise specified.

- All personnel will wear steel-toe safety boots. Hard hats will be worn when working near heavy equipment (drill rigs, excavating equipment, etc.), when individuals are working overhead, when required in the Job Safety Analysis (JSA), or when required by the client.

- Eye protection and high visibility clothing/reflective safety vests will be

worn at all times while on site.

- Possession of alcohol or illegal substances on the job site or consumption during hours of site operations is strictly prohibited.

- Food and/or beverages are not permitted in the site's Exclusion or Contamination Reduction Zones. Food and/or beverages will be permitted in the Support Zone, if proper decontamination procedures are being followed.

- Smoking is not permitted on site. Chewing tobacco, snuff, application of cosmetics and/or lip balm is not permitted in the site's Exclusion or Contamination Reduction Zones.

- A change in level of protection will be based on air monitoring equipment readings taken in the breathing zone.

- Field personnel will use air monitoring equipment and not their nose to determine site contamination (i.e., sniffing sampled soils or water in jars, confined spaces, open bore holes or trenches, etc.). Odors detected during the course of standard operating procedures, however, should be noted in the daily log.

- Field personnel should not stand with their head directly over a well when it is being opened.

- First Aid Kit(s) and Fire Extinguisher(s) will be available in all company vehicles and/or within 50 feet of the working area.

Note: Hot work activities require that a person onsite shall act as a fire watch with a Class A, B, C dry chemical extinguisher within 10 feet of the activity, and all necessary work requirements are satisfied.

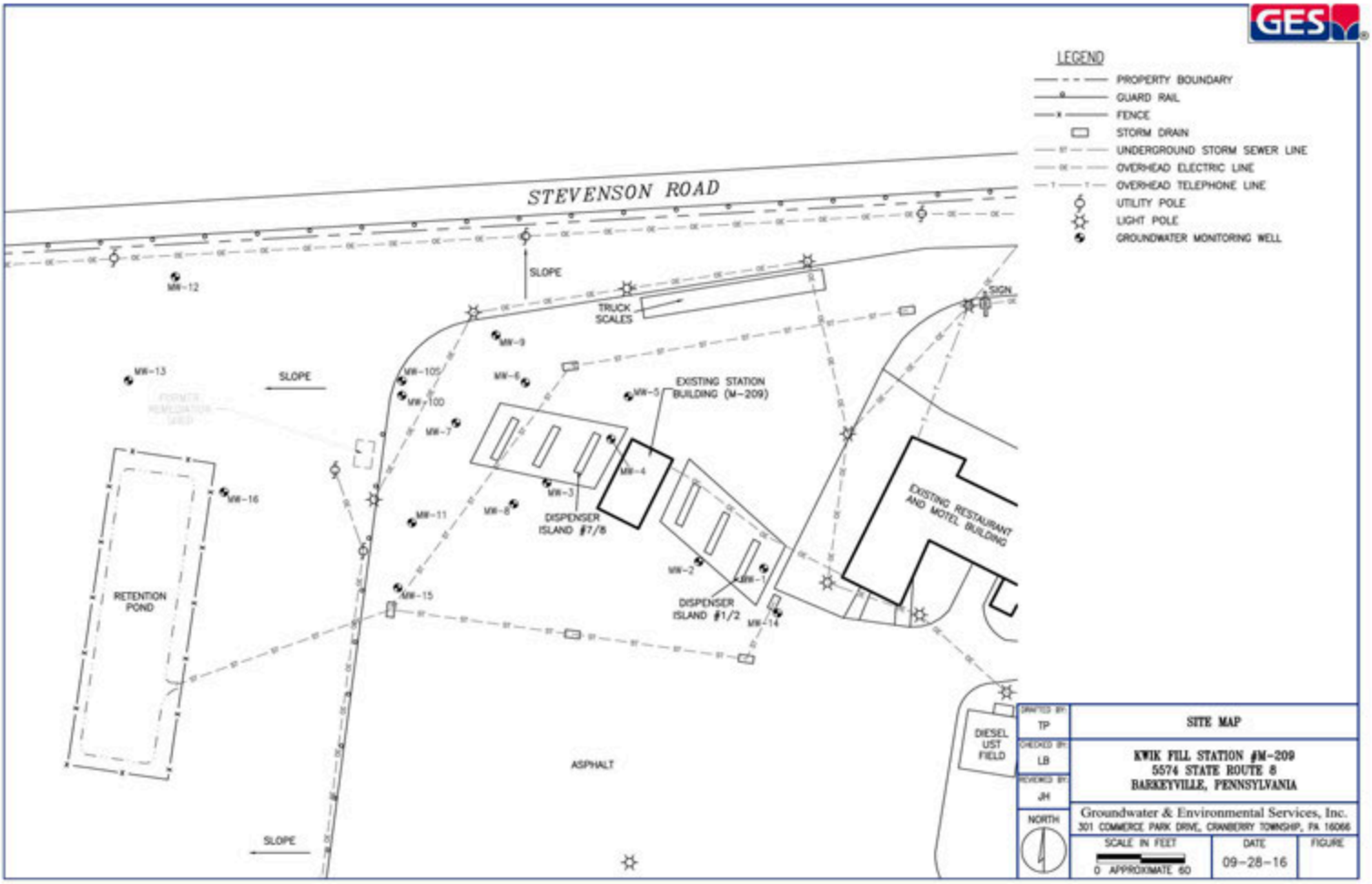
Any revisions to the final Site-Specific Health and Safety Plan must be reviewed by the Project/Case Manager and approved by the Local Health and Safety Officer or a Principal Hydrogeologist, at a minimum.

10.3 ADDITIONAL STANDARD OPERATING SAFETY PROCEDURES

See Attachments.

ATTACHMENT A

SITE MAPS


LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
MW-12
MW-13
MW-105
MW-100
MW-9
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-7
MW-4
MW-3
MW-8
DISPENSER ISLAND #7/8
MW-16
MW-11
RETENTION POND
MW-15
MW-2
MW-1
DISPENSER ISLAND #1/2
MW-14
EXISTING RESTAURANT AND MOTEL BUILDING
DIESEL UST FIELD
ASPHALT
SLOPE
SLOPE
DRAWN BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
SITE MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE

ATTACHMENT B

EXPOSURE MONITORING PROGRAM
FOR THE CONTAMINANTS OF CONCERN

REAL-TIME MONITORING

Photo-ionization Detector (PID): Real-time monitoring for volatile organic compounds (VOCs) will be conducted using a photo-ionization detector (PID). The PID will be used to monitor employee breathing zones during all invasive activities. **Table 1** lists PID action levels and response requirements

Combustible Gas Indicator/Oxygen Level Meter: Real-time monitoring for combustible gases and oxygen levels will be conducted using a Combustible Gas Indicator (CGI)/Oxygen Level Meter. The CGI will test for the presence of combustible gases by continuously monitoring the lower explosive limit (LEL) of organic vapors. The CGI will be used to monitor the LEL prior to, and during, Confined Space (CS) entries and during work near an excavation in contaminated soil. The Oxygen Level Meter will detect an oxygen-deficient or oxygen-enriched atmosphere, and will be used prior to, and during, all CS entry activities. If ionizing radiation is suspected at a site, a Geiger counter will be used to measure exposure under guidance of a Health Physicist. **Table 2** lists CGI, Oxygen Level Meter, and ionizing radiation action levels and response requirements.

Depending on the Contaminants of Concern, other forms of real-time monitoring equipment may be required to quantify chemical hazards and protect workers from exposure. These may include, but are not limited to bio-aerosol monitors, detector tubes, dust monitors, etc.

- Calibration of Real-Time Monitoring Equipment: Monitoring and calibration protocols will be performed in accordance with the manufacturer's guidelines. Calibration will be performed, at a minimum, prior to each day's use.

- Calibration logs will be maintained by the Local HSO.

ACTION LEVELS

Tables 1 and 2 list the action levels and response requirements for a PID and CGI/Oxygen Level Meter. Changing levels of protection, upgrading respiratory protection, or changing work practices is based on maintaining the upper limit of the action level for approximately 10 minutes sustained in the breathing zone (i.e., a non-transient reading) or at the discretion of the Site Supervisor. If changes in protection levels are required, the Site Supervisor will first notify the Local HSO or the CHS to determine if administrative or engineering controls can be implemented to mitigate or eliminate the hazard.

Table 1 provides action levels that must be complied with when petroleum products such as gasoline are the known site contaminants. If the site contains other potential site contaminants, appropriate action levels must be determined based on established chemical exposure limits and monitoring instrument response factors.

TABLE 1 OVM ACTION LEVELS	
Meter Response (Breathing Zone)	**Action Required**
PID response <5 units above background	No respiratory protection required (i.e., Level D)
PID response >5 units above background (Bkgd) and < 50 units above Bkgd.	Stop work. Investigate the cause of elevated VOC measurements. Contact the Project Manager or office and determine if administrative or engineering controls can be implemented to mitigate or eliminate the elevated readings. If not medically qualified to wear respiratory protection, leave work zone. If the elevated readings cannot be reduced below 5 units above background or eliminated, and if medically qualified, fit tested and trained to wear respiratory protection, then upgrade to Modified Level C, half-face respiratory protection.
PID response >50 units and < 250 units above Bkgd.	Stop work. Investigate the cause of elevated VOC measurements. Contact the Project Manager or office and determine if administrative or engineering controls can be implemented to mitigate or eliminate the elevated readings. If not medically qualified to wear respiratory protection, leave work zone. If the elevated readings cannot be reduced below 5 units above background or eliminated, and if medically qualified, fit tested and trained to wear respiratory protection, then upgrade to Modified Level C, full-face respiratory protection.
PID response > 250 above Bkgd.	Retreat from site*

*Note 1: If a retreat becomes necessary, the Local HSO, CHSSE or Regional Engineering will be consulted in regard to adding mechanical ventilation or possible changes in work practices. Work will not resume until appropriate corrective measures are implemented.

*Note 2: Because direct reading instruments cannot indicate or are not compound specific, concentrations shown on the instruments shall be related to units above background and not parts per million (ppm).

TABLE 2 CGI/O2/RADIATION LEVEL ACTION LEVELS	
Meter Response	Action
CGI response < 10 % LEL	Continue normal operations.
CGI response > 10 % and <20 % LEL	Eliminate all sources of ignition from the work area; implement continuous monitoring. However if work is being done in a confined space, retreat from work area.*
CGI response > 20 % LEL	Discontinue operations; allow to vent; retreat from work area.*
Oxygen level < 19.5%	Retreat from work area.*
Oxygen level > 23.5%	Retreat from work area.*
3X background to <2 mR/hr	Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible source(s) radiation present. Continue investigation with caution. Perform thorough monitoring. **Consult with a health physicist**.
>2mR/hr	Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of a health physicist

*Note 1: If a retreat becomes necessary, the Local HSO, CHSSE or Regional Engineering will be consulted in regard to adding mechanical ventilation or possible changes in work practices. Work will not resume until appropriate corrective measures are implemented.

TABLE 3 RETAIL PETROLEUM MATERIALS OF CONCERN					
Contaminant	**OSHA TWA (ppm)**	**ACGIH TLV (ppm)**	**Hazards**	**Entry Routes**	**IP**
Benzene	1	10	1,2,4,5,6,9	Inh, Abs, Ing, Con	9.24
Xylene	100	100	1,2,3,4,5,6,7,10	Inh, Abs, Ing, Con	8.56
Ethylbenzene	100	100	1,2,3,10	Inh, Ing, Con	8.76
Toluene	200	50	1,2,3,4,5,7,10	Inh, Abs, Ing, Con	8.82

TWA = Time Weighted Average in parts per million (ppm)
C = Ceiling
IP = Ionization Potential

1 = irritant to skin
2 = irritant to eyes
3 = irritant to respiratory system
4 = may cause headache
5 = may cause dizziness, lightheadedness
6 = may cause nausea and vomiting
7 = may cause liver and kidney damage
8 = irritant to GI tract
9 = carcinogen/possible carcinogen
10 = may cause damage to CNS

TABLE 4
*INORGANIC GASES AND VAPORS OF CONCERN

Contaminant	OSHA TWA (ppm)	ACGIH TLV (ppm)	Hazards	Entry Routes	IP

TWA = Time Weighted Average in parts per million (ppm)
C = Ceiling
IP = Ionization Potential

1 = irritant to skin	6 = may cause nausea and vomiting
2 = irritant to eyes	7 = may cause liver and kidney damage
3 = irritant to respiratory system	8 = irritant to GI tract
4 = may cause headache	9 = carcinogen/possible carcinogen
5 = may cause dizziness, lightheadedness	10 = may cause damage to CNS

*Notes: Consult standard reference manuals for air concentration/toxicity data. Action level depends on PEL/REL/TLV.
These Action Levels, if not defined by regulation, is some percent (usually 50%) of the applicable PEL/REL/TLV. That number must also be adjusted to account for instrument response factors.

ATTACHMENT C

SITE MATERIAL SAFETY DATA SHEETS (MSDS)

GASOLINE, CONVENTIONAL UNLEADED WITH ETHANOL

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations
Revision Date: 07/29/2015 Date of issue: 07/15/2015 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: GASOLINE, CONVENTIONAL UNLEADED WITH ETHANOL

Formula: Hydrocarbon Mixture

Chemical Name: Gasoline

Synonyms: Gasoline, Regular E10 (87), Gasoline, Plus E10 (89) , Gasoline, Super Premium E10 (93)

1.2. Intended Use of the Product

Use of the substance/mixture: Motor Fuel; Spark Ignition Engine Fuel.

1.3. Name, Address, and Telephone of the Responsible Party

Company

United Refining Company
15 Bradley Street, P.O.Box 780
Warren, PA 16365
Phone: (814) 723-1500
www.urc.com

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: (800) 424-9300

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Flam. Liq. 1	H224
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Muta. 1B	H340
Carc. 1A	H350
Repr. 2	H361
STOT SE 3	H336
STOT RE 1	H372
Asp. Tox. 1	H304
Aquatic Acute 1	H400
Aquatic Chronic 2	H411

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H224 - Extremely flammable liquid and vapor.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
H340 - May cause genetic defects.
H350 - May cause cancer.
H361 - Suspected of damaging fertility or the unborn child.
H372 - Causes damage to organs through prolonged or repeated exposure (central nervous system, hearing organs).
H400 - Very toxic to aquatic life.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.

P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, and lighting equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P310 - If swallowed: Immediately call a poison center or doctor.
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P312 - Call a poison center or doctor if you feel unwell.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P331 - Do NOT induce vomiting.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P362 - Take off contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P235 - Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Flammable vapors can accumulate in head space of closed systems. Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 – Toxicological Information. A significant portion of the mixture consists of a substance capable of producing an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Gasoline, motor fuel	(CAS No) 86290-81-5	70 - 100	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Muta. 1B, H340 Carc. 1B, H350 Repr. 2, H361 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
Contains	**Product Identifier**	**%**	**Classification (GHS-US)**
Toluene	(CAS No) 108-88-3	0.1 - 30	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361 STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 3, H412
Xylenes (o-, m-, p- isomers)	(CAS No) 1330-20-7	0.1 - 25	Flam. Liq. 3, H226 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation:vapor), H332 Skin Irrit. 2, H315 Asp. Tox. 1, H304 Aquatic Acute 1, H400
3-Methylpentane	(CAS No) 96-14-0	0.1 - 20	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
Pentane	(CAS No) 109-66-0	0.1 - 15	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Octane	(CAS No) 111-65-9	0.1 - 15	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Ethyl alcohol	(CAS No) 64-17-5	0.1 - 10	Flam. Liq. 2, H225 Eye Irrit. 2A, H319
Butane	(CAS No) 106-97-8	0.1 - 10	Simple Asphy, H380 Flam. Gas 1, H220 Liquefied gas, H280

Benzene, 1,2,4-trimethyl-	(CAS No) 95-63-6	0.1 - 5	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:vapor), H332 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Hexane	(CAS No) 110-54-3	0.1 - 5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361 STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
n-Heptane	(CAS No) 142-82-5	0.1 - 5	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Benzene	(CAS No) 71-43-2	0.1 - 4.9	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 3, H412
Ethylbenzene	(CAS No) 100-41-4	0.1 - 3	Flam. Liq. 2, H225 Acute Tox. 4 (Inhalation:vapor), H332 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 3, H412
Cyclohexane	(CAS No) 110-82-7	0.1 - 3	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid Measures After Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures After Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

First-aid Measures After Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

First-aid Measures After Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: Causes serious eye irritation. Causes skin irritation. May cause drowsiness and dizziness. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. May be fatal if swallowed and enters airways.

Symptoms/Injuries After Inhalation: High concentrations may cause central nervous system depression such as dizziness, vomiting, numbness, drowsiness, headache, and similar narcotic symptoms.

Symptoms/Injuries After Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Symptoms/Injuries After Eye Contact: Contact causes severe irritation with redness and swelling of the conjunctiva.

Symptoms/Injuries After Ingestion: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO_2). Water may be ineffective but water should be used to keep fire-exposed container cool.

Unsuitable Extinguishing Media: Do not use a heavy water stream. A heavy water stream may spread burning liquid.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Extremely flammable liquid and vapor.

Explosion Hazard: May form flammable or explosive vapor-air mixture.

Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions closed containers may rupture or explode.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Use special care to avoid static electric charges. Do not breathe vapor, mist or spray. Do not handle until all safety precautions have been read and understood.

6.1.1. For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Stop leak if safe to do so.

6.1.2. For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Eliminate ignition sources.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Absorb and/or contain spill with inert material. Do not take up in combustible material such as: saw dust or cellulosic material. Use only non-sparking tools.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Hot organic chemical vapors or mists are susceptible to spontaneous combustion when mixed with air, ignition may occur below auto ignition temperature. Ignition temperatures will decrease with increasing vapor volumes, vapor air contact time, and pressure changes. Ignition may occur at elevated-temperature process conditions, especially under a vacuum.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Take precautionary measures against static discharge. Use only non-sparking tools. Avoid contact with eyes, skin and clothing. Do not breathe mist/vapors/spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes, on skin, or on clothing.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Take action to prevent static discharges. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating, and lighting equipment.

Storage Conditions: Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store in a well-ventilated place. Keep container tightly closed. Keep in fireproof place.

Incompatible Products: Strong acids, strong bases, strong oxidizers.

Storage Area: Protect from high temperatures.

7.3. Specific End Use(s)

Motor Fuel; Spark Ignition Engine Fuel.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Gasoline, motor fuel (86290-81-5)		
USA ACGIH	ACGIH TWA (ppm)	300 ppm
USA ACGIH	ACGIH STEL (ppm)	500 ppm
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
Toluene (108-88-3)		
USA ACGIH	ACGIH TWA (ppm)	20 ppm
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (mg/m³)	375 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	100 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	560 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	150 ppm
USA IDLH	US IDLH (ppm)	500 ppm
USA OSHA	OSHA PEL (TWA) (ppm)	200 ppm
USA OSHA	OSHA PEL (Ceiling) (ppm)	300 ppm
Benzene (71-43-2)		
USA ACGIH	ACGIH TWA (ppm)	0.5 ppm
USA ACGIH	ACGIH STEL (ppm)	2.5 ppm
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Confirmed Human Carcinogen
USA NIOSH	NIOSH REL (TWA) (ppm)	0.1 ppm
USA NIOSH	NIOSH REL (STEL) (ppm)	1 ppm
USA IDLH	US IDLH (ppm)	500 ppm
USA OSHA	OSHA PEL (TWA) (ppm)	10 ppm 1 ppm
USA OSHA	OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
USA OSHA	OSHA PEL (Ceiling) (ppm)	25 ppm
Ethyl alcohol (64-17-5)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans

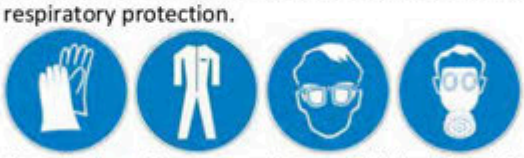
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1900 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (ppm)	3300 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	1900 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Xylenes (o-, m-, p- isomers) (1330-20-7)		
USA ACGIH	ACGIH TWA (ppm)	100 ppm
USA ACGIH	ACGIH STEL (ppm)	150 ppm
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA OSHA	OSHA PEL (TWA) (mg/m³)	435 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	100 ppm
Benzene, 1,2,4-trimethyl- (95-63-6)		
USA NIOSH	NIOSH REL (TWA) (mg/m³)	125 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm
Hexane (110-54-3)		
USA ACGIH	ACGIH TWA (ppm)	50 ppm
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route
USA NIOSH	NIOSH REL (TWA) (mg/m³)	180 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	50 ppm
USA IDLH	US IDLH (ppm)	1100 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	1800 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	500 ppm
Ethylbenzene (100-41-4)		
USA ACGIH	ACGIH TWA (ppm)	20 ppm
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
USA NIOSH	NIOSH REL (TWA) (mg/m³)	435 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	100 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	545 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	125 ppm
USA IDLH	US IDLH (ppm)	800 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	435 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	100 ppm
Butane (106-97-8)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1900 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Pentane (109-66-0)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	350 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	120 ppm
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	1800 mg/m³
USA NIOSH	NIOSH REL (ceiling) (ppm)	610 ppm
USA IDLH	US IDLH (ppm)	1500 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	2950 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
n-Heptane (142-82-5)		
USA ACGIH	ACGIH TWA (ppm)	400 ppm
USA ACGIH	ACGIH STEL (ppm)	500 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	350 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	85 ppm
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	1800 mg/m³
USA NIOSH	NIOSH REL (ceiling) (ppm)	440 ppm
USA IDLH	US IDLH (ppm)	750 ppm

USA OSHA	OSHA PEL (TWA) (mg/m³)	2000 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	500 ppm
Octane (111-65-9)		
USA ACGIH	ACGIH TWA (ppm)	300 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	350 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	75 ppm
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	1800 mg/m³
USA NIOSH	NIOSH REL (ceiling) (ppm)	385 ppm
USA IDLH	US IDLH (ppm)	1000 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	2350 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	500 ppm
Cyclohexane (110-82-7)		
USA ACGIH	ACGIH TWA (ppm)	100 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1050 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	300 ppm
USA IDLH	US IDLH (ppm)	1300 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	1050 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	300 ppm

8.2. Exposure Controls

Appropriate Engineering Controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment.

Personal Protective Equipment : Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



Materials for Protective Clothing : Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

Hand Protection : Wear protective gloves.

Eye Protection : Chemical safety goggles.

Skin and Body Protection : Wear suitable protective clothing.

Respiratory Protection : If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Environmental Exposure Controls : Do not allow the product to be released into the environment.

Consumer Exposure Controls : Do not eat, drink or smoke during use. Use only outdoors or in a well-ventilated area.

Other Information : When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State : Liquid

Appearance : Pale Green to Clear Liquid

Odor : Characteristic odor recognized at 10 ppm

Odor Threshold : No data available

pH : No data available

Evaporation Rate : No data available

Melting Point : No data available

Freezing Point : No data available

Boiling Point	: 70 - 437 °F (21.11 - 225 °C)
Flash Point	: -45 °F (-42.78 °C)
Auto-ignition Temperature	: 495 °F (257.22 °C)
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: 7 - 15 @ 100 °F (38 °C)
Relative Vapor Density at 20 °C	: No data available
Vapor Density	: 3 - 4
Specific Gravity	: 0.70 - 0.76
Solubility	: Water: < 0.1 % (Except any Ethanol portion which is highly soluble in water)
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: < 1 cSt @ 100 °F (38 °C)
Lower Flammable Limit	: 1.4 %
Upper Flammable Limit	: 7.6 %

9.2. Other Information

VOC content : 32 % @ 100 °F (38 °C)

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

10.2. Chemical Stability: Extremely flammable liquid and vapor. May form flammable or explosive vapor-air mixture.

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4. Conditions to Avoid: Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

10.5. Incompatible Materials: Strong acids, strong bases, strong oxidizers.

10.6. Hazardous Decomposition Products: Thermal decomposition generates: Carbon oxides (CO, CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects

Acute Toxicity: Not classified

Gasoline, motor fuel (86290-81-5)	
LD50 Oral Rat	92 g/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	> 5.2 mg/l/4h
Toluene (108-88-3)	
LD50 Oral Rat	5580 mg/kg
LD50 Dermal Rabbit	12000 mg/kg
LC50 Inhalation Rat	12.5 mg/l/4h
ATE (Vapors)	25.70 mg/l/4h
Benzene (71-43-2)	
LD50 Oral Rat	3306 mg/kg
LD50 Dermal Rabbit	> 8200 mg/kg
LC50 Inhalation Rat	44.66 mg/l/4h
Ethyl alcohol (64-17-5)	
LD50 Oral Rat	10470 mg/kg
LD50 Dermal Rat	20 ml/kg
LC50 Inhalation Rat	124.7 mg/l/4h
Xylenes (o-, m-, p- isomers) (1330-20-7)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 4350 mg/kg
LC50 Inhalation Rat	29.08 mg/l/4h
LC50 Inhalation Rat	6247 ppm/4h (species: Sprague-Dawley)
ATE (Dermal)	1,100.00 mg/kg body weight
ATE (Vapors)	11.00 mg/l/4h

Benzene, 1,2,4-trimethyl- (95-63-6)	
LD50 Oral Rat	6000 mg/kg
LD50 Dermal Rabbit	> 3160 mg/kg
LC50 Inhalation Rat	18 g/m³ (Exposure time: 4 h)
ATE (Vapors)	10.80 mg/l/4h
ATE (Dust/Mist)	18.00 mg/l/4h

Hexane (110-54-3)	
LD50 Oral Rat	25 g/kg
LD50 Dermal Rabbit	3000 mg/kg
LC50 Inhalation Rat	48000 ppm/4h

Ethylbenzene (100-41-4)	
LD50 Oral Rat	3500 mg/kg
LD50 Dermal Rabbit	15400 mg/kg
LC50 Inhalation Rat	17.2 mg/l/4h (Exposure time: 4 h)

Butane (106-97-8)	
LC50 Inhalation Rat	30957 mg/m³ (Exposure time: 4 h)

Pentane (109-66-0)	
LD50 Dermal Rabbit	3000 mg/kg
LC50 Inhalation Rat	364 g/m³ (Exposure time: 4 h)

n-Heptane (142-82-5)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	3000 mg/kg
LC50 Inhalation Rat	103 g/m³ (Exposure time: 4 h)

Octane (111-65-9)	
LC50 Inhalation Rat	118 g/m³ (Exposure time: 4 h)

Cyclohexane (110-82-7)	
LD50 Oral Rat	12705 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	13.9 mg/l/4h

Skin Corrosion/Irritation: Causes skin irritation.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: May cause genetic defects.

Carcinogenicity: May cause cancer.

Gasoline, motor fuel (86290-81-5)	
IARC group	2B
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

Toluene (108-88-3)	
IARC group	3

Benzene (71-43-2)	
IARC group	1
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity, Known Human Carcinogens.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
OSHA Specifically Regulated Carcinogen List	In OSHA Specifically Regulated Carcinogen list.

Ethyl alcohol (64-17-5)	
IARC group	1
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

Xylenes (o-, m-, p- isomers) (1330-20-7)	
IARC group	3

Ethylbenzene (100-41-4)	
IARC group	2B
National Toxicology Program (NTP) Status	Evidence of Carcinogenicity.
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

Reproductive Toxicity: Suspected of damaging fertility or the unborn child.
Specific Target Organ Toxicity (Single Exposure): May cause drowsiness or dizziness.
Specific Target Organ Toxicity (Repeated Exposure): Causes damage to organs through prolonged or repeated exposure.
Aspiration Hazard: May be fatal if swallowed and enters airways.
Symptoms/Injuries After Inhalation: High concentrations may cause central nervous system depression such as dizziness, vomiting, numbness, drowsiness, headache, and similar narcotic symptoms.
Symptoms/Injuries After Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.
Symptoms/Injuries After Eye Contact: Contact causes severe irritation with redness and swelling of the conjunctiva.
Symptoms/Injuries After Ingestion: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.
Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Toluene (108-88-3)	
LC50 Fish 1	15.22 (15.22 - 19.05) mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	5.46 (5.46 - 9.83) mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	12.6 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 2	11.5 mg/l (Exposure time: 48 h - Species: Daphnia magna)
NOEC chronic crustacea	0.74 mg/l (Ceriodaphnia dubia)
Benzene (71-43-2)	
LC50 Fish 1	10.7 - 14.7 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	8.76 - 15.6 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	5.3 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
EC50 Daphnia 2	10 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Ethyl alcohol (64-17-5)	
EC50 Daphnia 1	9268 - 14221 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	> 100 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
ErC50 (algae)	1000 mg/l
Xylenes (o-, m-, p- isomers) (1330-20-7)	
LC50 Fish 1	3.3 mg/l
EC50 Daphnia 1	3.82 mg/l (Exposure time: 48 h - Species: water flea)
LC 50 Fish 2	2.661 (2.661 - 4.093) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	0.6 mg/l (Exposure time: 48 h - Species: Gammarus lacustris)
NOEC chronic crustacea	1.17
Benzene, 1,2,4-trimethyl- (95-63-6)	
LC50 Fish 1	7.19 (7.19 - 8.28) mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	6.14 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Hexane (110-54-3)	
LC50 Fish 1	2.1 - 2.98 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	3.88 mg/l
Ethylbenzene (100-41-4)	
LC50 Fish 1	11.0 - 18.0 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	1.8 - 2.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	4.2 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [semi-static])
Pentane (109-66-0)	
LC50 Fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)

n-Heptane (142-82-5)	
LC50 Fish 1	375.0 mg/l (Exposure time: 96 h - Species: Cichlid fish)
EC50 Daphnia 1	0.1 mg/l
Octane (111-65-9)	
EC50 Daphnia 1	0.38 mg/l (Exposure time: 48 h - Species: water flea)
Cyclohexane (110-82-7)	
LC50 Fish 1	3.96 - 5.18 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	0.9 mg/l
LC 50 Fish 2	23.03 - 42.07 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])

12.2. Persistence and Degradability

GASOLINE, CONVENTIONAL UNLEADED WITH ETHANOL	
Persistence and Degradability	May cause long-term adverse effects in the environment.
Ethyl alcohol (64-17-5)	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

GASOLINE, CONVENTIONAL UNLEADED WITH ETHANOL	
Bioaccumulative Potential	Not established.
Toluene (108-88-3)	
Log Pow	2.65
Benzene (71-43-2)	
BCF fish 1	3.5 - 4.4
Log Pow	1.83
Ethyl alcohol (64-17-5)	
Log Pow	-0.32
Bioaccumulative Potential	Not established.
Xylenes (o-, m-, p- isomers) (1330-20-7)	
BCF fish 1	0.6 (0.6 - 15)
Log Pow	2.77 - 3.15
Benzene, 1,2,4-trimethyl- (95-63-6)	
Log Pow	3.63
Ethylbenzene (100-41-4)	
BCF fish 1	15
Log Pow	3.118
Butane (106-97-8)	
Log Pow	2.89
Pentane (109-66-0)	
Log Pow	3.39
n-Heptane (142-82-5)	
Log Pow	4.66
Octane (111-65-9)	
Log Pow	5.18
Cyclohexane (110-82-7)	
Log Pow	3.44

12.4. Mobility in Soil

No additional information available

12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

Ecology – Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : GASOLINE includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol
Hazard Class : 3
Identification Number : UN1203
Label Codes : 3
Packing Group : II
Marine Pollutant : Marine pollutant
ERG Number : 128

14.2. In Accordance with IMDG

Proper Shipping Name : GASOLINE
Hazard Class : 3
Identification Number : UN1203
Packing Group : II
Label Codes : 3
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-E
Marine Pollutant : Marine pollutant

14.3. In Accordance with IATA

Proper Shipping Name : GASOLINE
Packing Group : II
Identification Number : UN1203
Hazard Class : 3
Label Codes : 3
ERG Code (IATA) : 3H

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

GASOLINE, CONVENTIONAL UNLEADED WITH ETHANOL	
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
Toluene (108-88-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 313 - Emission Reporting	1.0 %
Benzene (71-43-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	10 lb
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
SARA Section 313 - Emission Reporting	0.1 %
Ethyl alcohol (64-17-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Xylenes (o-, m-, p- isomers) **(1330-20-7)**	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of	100 lb

Lists)	
SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard Fire hazard Immediate (acute) health hazard
SARA Section 313 - Emission Reporting	1.0 %

Benzene, 1,2,4-trimethyl- (95-63-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %

Hexane (110-54-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %

Ethylbenzene (100-41-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 313 - Emission Reporting	0.1 %

Butane (106-97-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Pentane (109-66-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

n-Heptane (142-82-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

Octane (111-65-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Cyclohexane (110-82-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.
SARA Section 313 - Emission Reporting	1.0 %

3-Methylpentane (96-14-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2 US State Regulations

Toluene (108-88-3)	
U.S. - California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to the State of California to cause birth defects.
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	WARNING: This product contains chemicals known to the State of California to cause (Female) reproductive harm.

Benzene (71-43-2)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.
U.S. - California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to the State of California to cause birth defects.
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	WARNING: This product contains chemicals known to the State of California to cause (Male) reproductive harm.

Ethyl alcohol (64-17-5)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of

	California to cause cancer.
U.S. - California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to the State of California to cause birth defects.
Ethylbenzene (100-41-4)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.

Gasoline, motor fuel (86290-81-5)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Toluene (108-88-3)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Benzene (71-43-2)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) List

Ethyl alcohol (64-17-5)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Xylenes (o-, m-, p- isomers) (1330-20-7)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Benzene, 1,2,4-trimethyl- (95-63-6)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Hexane (110-54-3)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Ethylbenzene (100-41-4)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

Butane (106-97-8)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Pentane (109-66-0)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

n-Heptane (142-82-5)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List

U.S. - Pennsylvania - RTK (Right to Know) List
Octane (111-65-9)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
Cyclohexane (110-82-7)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List
3-Methylpentane (96-14-0)
U.S. - Massachusetts - Right To Know List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 07/29/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal) Category 4
Acute Tox. 4 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1A	Carcinogenicity Category 1A
Carc. 1B	Carcinogenicity Category 1B
Carc. 2	Carcinogenicity Category 2
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 2	Flammable liquids Category 2
Flam. Liq. 3	Flammable liquids Category 3
Liquefied gas	Gases under pressure Liquefied gas
Muta. 1B	Germ cell mutagenicity Category 1B
Repr. 2	Reproductive toxicity Category 2
Simple Asphy	Simple Asphyxiant
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H225	Highly flammable liquid and vapor
H226	Flammable liquid and vapor
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H312	Harmful in contact with skin
H315	Causes skin irritation

H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
H380	May displace oxygen and cause rapid suffocation
H400	Very toxic to aquatic life
H401	Toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)

Safety Data Sheet
Gasoline, Conventional Unleaded

SDS Revision Date: **05/12/2015**

1. Identification

1.1. Product identifier

Product Identity	Gasoline, Conventional Unleaded
Alternate Names	Gasoline, Regular (87) Gasoline, Plus (89) Gasoline, Super Premium (93)

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	See Technical Data Sheet.
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name	United Refining Company 15 Bradley Street P.O. Box 780 Warren, PA 16365
Emergency	
CHEMTREC (USA)	(800) 424-9300
Customer Service: United Refining Company	(814) 723-1500

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Flam. Liq. 2;H225	Highly Flammable liquid and vapor.
Skin Irrit. 3;H316	Causes mild skin irritation. (Not adopted by US OSHA)
Eye Irrit. 2;H319	Causes serious eye irritation.
Muta. 1B;H340	May cause genetic defects.
Carc. 1A;H350	May cause cancer.
STOT RE 1;H372	Causes damage to organs through prolonged or repeated exposure. Specific Target Organs: (Not Available)
Asp. Tox. 1;H304	May be fatal if swallowed and enters airways.

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

Danger

H225 Highly flammable liquid and vapor.

H304 May be fatal if swallowed and enters airways.

H316 Causes mild skin irritation.

H319 Causes serious eye irritation.

H340 May cause genetic defects.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

[Prevention]:

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P235 Keep cool.

P240 Ground / bond container and receiving equipment.

P241 Use explosion-proof electrical / ventilating / light / equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe mist / vapors / spray.

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves / eye protection / face protection.

[Response]:

P301+310 IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.

P303+361+353 IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P308+313 IF exposed or concerned: Get medical advice / attention.

P314 Get Medical advice / attention if you feel unwell.

P331 Do NOT induce vomiting.

P332+313 If skin irritation occurs: Get medical advice / attention.

P337+313 If eye irritation persists: Get medical advice / attention.

P370+378 In case of fire: Use extinguishing media listed in section 5 of SDS for extinction.

[Storage]:

P403+233 Store in a well ventilated place. Keep container tightly closed.

P405 Store locked up.

[Disposal]:

P501 Dispose of contents / container in accordance with local / national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Gasoline **CAS Number: 0008006-61-9**	**75 - 100**	**Asp. Tox. 1;H304**	**[1][2]**
Benzene **CAS Number: 0000071-43-2**	**1.0 - 10**	**Flam. Liq. 2;H225** **Carc. 1A;H350** **Muta. 1B;H340** **STOT RE 1;H372** **Asp. Tox. 1;H304** **Eye Irrit. 2;H319** **Skin Irrit. 2;H315**	**[1][2]**

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.
[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.
*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eyes Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

Skin Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

Ingestion Do not induce vomiting - aspiration hazard. Contact physician immediately. If spontaneous vomiting occurs, monitor breathing.

4.2. Most important symptoms and effects, both acute and delayed

Overview **EYE:** Slight to moderate irritation.
SKIN: Defatting with drying skin.
INHALATION: Moderate risk of vapor intoxication. Major risk in enclosed spaces with poor ventilation. Euphoria, lung irritation, headache, convulsions, coma, cyanosis.
INGESTION: Burning of mouth and upper GI tract, vomiting, diarrhea, general depression, respiratory depression, coma.

CHRONIC EFFECTS: Benzene has been classified as a bone marrow toxin. Studies of unleaded gasoline vapors indicate that it is a carcinogenic to laboratory animals.
OTHER EFFECTS: Pre-existing dermatosis aggravation.
Reproductive or genetic defect hazard. Exposure to solvent vapor concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage. See section 2 for further details.

Inhalation	May be fatal if swallowed and enters airways.
Eyes	Causes serious eye irritation.
Skin	Causes mild skin irritation.

5. Fire-fighting measures

5.1. Extinguishing media

Foam, CO2, Dry Chemical Extinguishers, or water spray.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: Toxic carbon monoxide and carbon dioxide.
Keep away from heat / sparks / open flames / hot surfaces - No smoking.
Keep cool.
Ground / bond container and receiving equipment.
Use explosion-proof electrical / ventilating / light / equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe mist / vapors / spray.
Do not get in eyes, on skin, or on clothing.

5.3. Advice for fire-fighters

Wear bunker gear, self-contained breathing apparatus, and use appropriate fire fighting techniques.

ERG Guide No. 128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Remove sources of ignition. Contain the product using sand, earth, or sorbent material. Recover all free liquid. Provide adequate ventilation and personal protective equipment for recovery team. Keep product out of surface water, drains, and sewers. Free empty containers of gas.

7. Handling and storage

7.1. Precautions for safe handling

Store in accordance with the National Fire Protection Association's publication NFPA 30, Flammable and Combustible Liquids Code. 29 CFR 1910.106 applies to the handling, storage, and use of flammable and combustible liquids.

See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Avoid skin contact, ingestion and vapor inhalation. Store and use in well ventilated area away from ignition sources. Ground and bond containers to prevent static sparks. Do not eat, drink, or smoke in areas of use or storage.

Incompatible materials: Avoid sources of ignition and oxidizers.

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000071-43-2	Benzene	OSHA	[1910.1028] TWA 1 ppm STEL 5 ppm
		ACGIH	TWA: 0.5 ppm STEL: 2.5 ppm Skin, A1, 1
		NIOSH	TWA 0.1 ppm ST 1 ppm
		Supplier	No Established Limit
0008006-61-9	Gasoline	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	Ca
		Supplier	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000071-43-2	Benzene	OSHA	Select Carcinogen: Yes
		NTP	Known: Yes; Suspected: No
		IARC	Group 1: Yes; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0008006-61-9	Gasoline	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory Ventilation may be used to reduce airborne concentrations. If ventilation cannot reduce airborne concentrations below acceptable limits, appropriate respiratory protection should be used. Use NIOSH or MSHA approved respiratory protective equipment when airborne exposure limits are exceeded.

Eyes Glasses, Goggles or Full Face Shield. Have eye baths readily available. Do not wear contact lenses.

Skin Wear body covering garments to prevent prolonged or repeated direct dermal exposure. Remove soaked clothing since it presents a fire hazard. Launder before use. Wear neoprene or rubber gloves.

Engineering Controls Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.

Other Work Practices Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Pale Green to Clear Liquid
Odor	Characteristic
Odor threshold	10 Not Measured
pH	Not Measured
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	70 to 437°F
Flash Point	-45°F (ASTM D-92)
Evaporation rate (Ether = 1)	Less than Ether
Flammability (solid, gas)	Not Applicable

Upper/lower flammability or explosive limits	**Lower Explosive Limit:** 1.4 **Upper Explosive Limit:** 7.6
Vapor pressure (Pa)	7.1 to 15.0 psi @100°F
Vapor Density	3.0 to 4.0
Specific Gravity	0.70 to 0.76
Solubility in Water	Less than 0.1%
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	495°F
Decomposition temperature	Not Measured
Viscosity (cSt)	<1 CST @100°F
VOC Content	32% @100°F

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Stable under normal circumstances.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Avoid sources of ignition and areas with inadequate ventilation.

10.5. Incompatible materials

Avoid sources of ignition and oxidizers.

10.6. Hazardous decomposition products

Toxic carbon monoxide and carbon dioxide.

11. Toxicological information

Acute toxicity

Exposure to solvent vapor concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Gasoline - (8006-61-9)	No data available	No data available	No data available	No data available	No data available
Benzene - (71-43-2)	2,990.00, Rat - Category: 5	8,263.00, Rabbit - Category: NA	44.70, Rat - Category: NA	No data available	No data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Classification	Category	Hazard Description
Acute toxicity (oral)	---	Not Applicable
Acute toxicity (dermal)	---	Not Applicable
Acute toxicity (inhalation)	---	Not Applicable
Skin corrosion/irritation	3	Causes mild skin irritation. (Not adopted by US OSHA)
Serious eye damage/irritation	2	Causes serious eye irritation.
Respiratory sensitization	---	Not Applicable
Skin sensitization	---	Not Applicable
Germ cell mutagenicity	1B	May cause genetic defects.
Carcinogenicity	1A	May cause cancer.
Reproductive toxicity	---	Not Applicable
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	1	Causes damage to organs through prolonged or repeated exposure.
Aspiration hazard	1	May be fatal if swallowed and enters airways.

12. Ecological information

12.1. Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and GHS and is not classified as dangerous for the environment, but contains substance(s) dangerous for the environment. See section 3 for details

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish,	48 hr EC50 crustacea,	ErC50 algae,

	mg/l	mg/l	mg/l
Gasoline - (8006-61-9)	Not Available	Not Available	Not Available
Benzene - (71-43-2)	5.90, Oncorhynchus mykiss	9.20, Daphnia magna	29.00 (72 hr), Pseudokirchneriella subcapitata

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods

This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in federal regulations; however it could be hazardous if it is considered toxic, corrosive, ignitable, or reactive according to federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed or comes in contact with a hazardous waste. If such contact or mixing may have occurred, check 40 CFR 261 to determine whether it is a hazardous waste. If it is considered hazardous, regulations 40 CFR 262, 263 and 264 apply. The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable federal, state, and local regulations.

14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	UN1203	UN1203	UN1203
14.2. UN proper shipping name	UN1203, Gasoline 3, II	Gasoline	Gasoline
14.3. Transport hazard class(es)	**DOT Hazard Class:** 3	**IMDG:** 3 **Sub Class:** Not Applicable	**Air Class:** 3

14.4. Packing group	II	II	II

14.5. Environmental hazards

IMDG Marine Pollutant: No

14.6. Special precautions for user

No further information

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

Toxic Substance Control Act (TSCA) All components of this material are either listed or exempt from listing on the TSCA Inventory.

WHMIS Classification B2 D2A

US EPA Tier II Hazards

Fire: Yes
Sudden Release of Pressure: No
Reactive: No
Immediate (Acute): Yes
Delayed (Chronic): Yes

EPCRA 311/312 Chemicals and RQs (lbs):

Benzene (10.00)

EPCRA 302 Extremely Hazardous:
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Toxic Chemicals:

Benzene

Proposition 65 - Carcinogens (>0.0%):

Benzene

Proposition 65 - Developmental Toxins (>0.0%):

Benzene

Proposition 65 - Female Repro Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Male Repro Toxins (>0.0%):

Benzene

New Jersey RTK Substances (>1%):

Benzene

Gasoline

Pennsylvania RTK Substances (>1%):

Benzene

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H225 Highly flammable liquid and vapor.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H340 May cause genetic defects.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

End of Document

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

Revision Date: 07/16/2015 Date of issue: 07/16/2015 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED

Chemical Name: Petroleum Hydrocarbon

Chemical Family: Petroleum Hydrocarbon

Synonyms:

AWDS - #2D – Undyed, Premium Diesel
Enhanced Diesel, Undyed
All-Weather Diesel Supreme, Undyed
All-Weather B2 Diesel Supreme, Undyed
All-Weather B5 Diesel Supreme, Undyed
ULSD, Winterized at Rochester, Undyed

1.2. Intended Use of the Product

Diesel Fuel Oil.

1.3. Name, Address, and Telephone of the Responsible Party

Company

United Refining Company
15 Bradley Street, P.O.Box 780
Warren, PA 16365
Phone: (814) 723-1500
www.urc.com

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: (800) 424-9300

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Flam. Liq. 3	H226
Acute Tox. 4 (Inhalation:dust,mist)	H332
Skin Irrit. 2	H315
Muta. 1B	H340
Carc. 1B	H350
Repr. 2	H361
STOT RE 2	H373
Asp. Tox. 1	H304
Aquatic Acute 3	H402
Aquatic Chronic 2	H411

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H226 - Flammable liquid and vapor.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.

H340 - May cause genetic defects.
H350 - May cause cancer.
H361 - Suspected of damaging fertility or the unborn child.
H373 - May cause damage to organs (thymus, liver) through prolonged or repeated exposure.
H402 - Harmful to aquatic life.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, and lighting equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P310 - If swallowed: Immediately call a poison center or doctor.
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P312 - Call a poison center or doctor if you feel unwell.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P331 - Do NOT induce vomiting.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P362 - Take off contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
P391 - Collect spillage.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, provincial, territorial and international regulations.
P403+P233+P235 - Store in a well-ventilated place. Keep container tightly closed. Keep cool.

2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Flammable vapors can accumulate in head space of closed systems. A significant portion of the mixture consists of a substance capable of producing an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death.

2.4. Unknown Acute Toxicity (GHS-US) No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Fuels, diesel, no. 2	(CAS No) 68476-34-6	>= 95	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Carc. 2, H351

			STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411
Soybean oil, methyl ester	(CAS No) 67784-80-9	<= 5	Not classified
Solvent naphtha, petroleum, light aromatic	(CAS No) 64742-95-6	< 0.1, 0.1 - 1, 1 -5	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Muta. 1B, H340 Carc. 1B, H350 Repr. 2, H361 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Solvent naphtha, petroleum, heavy aromatic	(CAS No) 64742-94-5	< 0.1, 0.1 - 1, 1 -5	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Carc. 2, H351 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200].

*More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary, due to varying composition.

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Causes skin irritation. Harmful if inhaled. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. May be fatal if swallowed and enters airways.

Inhalation: Inhalation is likely to cause adverse health effects including but not limited to: irritation, difficulty breathing, and unconsciousness.

Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Eye Contact: May cause slight irritation to eyes.

Ingestion: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO_2). Water may be ineffective but water should be used to keep fire-exposed container cool.

Unsuitable Extinguishing Media: Do not use a heavy water stream. A heavy water stream may spread burning liquid.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Flammable liquid and vapor.

Explosion Hazard: May form flammable or explosive vapor-air mixture.

Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions closed containers may rupture or explode.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO_2). Sulfur oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Use special care to avoid static electric charges. Do not breathe vapor, mist or spray. Avoid all contact with skin, eyes, or clothing.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Stop leak if safe to do so.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Eliminate ignition sources.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions. Ventilate area.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Absorb and/or contain spill with inert material. Do not take up in combustible material such as: saw dust or cellulosic material. Use only non-sparking tools.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Hot organic chemical vapors or mists are susceptible to spontaneous combustion when mixed with air, ignition may occur below auto ignition temperature. Ignition temperatures will decrease with increasing vapor volumes, vapor air contact time, and pressure changes. Ignition may occur at elevated-temperature process conditions, especially under a vacuum. Handle in accordance with standard industrial practices, and ensure appropriate ventilation.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Take precautionary measures against static discharge. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Do not breathe mist/vapors/spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes, on skin, or on clothing.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Take action to prevent static discharges. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating, and lighting equipment.

Storage Conditions: Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store in a well-ventilated place. Keep container tightly closed. Keep in fireproof place.

Incompatible Materials: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

Diesel Fuel Oil.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Fuels, diesel, no. 2 (68476-34-6)		
USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans
Alberta	OEL TWA (mg/m³)	100 mg/m³
British Columbia	OEL TWA (mg/m³)	100 mg/m³ (aerosol, inhalable, and vapor)
Manitoba	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Newfoundland & Labrador	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Nova Scotia	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Ontario	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Prince Edward Island	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Saskatchewan	OEL STEL (mg/m³)	150 mg/m³ (vapor)
Saskatchewan	OEL TWA (mg/m³)	100 mg/m³ (vapor)

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Gas detectors should be used when toxic gases may be released.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

Hand Protection: Wear protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink or smoke during use.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Florescent Green / Yellow
Odor	:	Mild Petroleum Odor
Odor Threshold	:	Not available
pH	:	Not available
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	340 - 675 °F (171.11 - 357.22 °C)
Flash Point	:	125 °F (51.67 °C)
Auto-ignition Temperature	:	494 °F (256.67 °C)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	0.6 %
Upper Flammable Limit	:	7.5 %
Vapor Pressure	:	< 5 mm Hg
Relative Vapor Density at 20 °C	:	Not available
Relative Density	:	Not available
Specific gravity / density	:	> 1 (Air = 1)
Specific Gravity	:	< 0.876
Solubility	:	Water: < 0.1 %
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	1.9 - 4.1 cSt @ 104 ° F (40 °C)
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact
Explosion Data – Sensitivity to Static Discharge	:	Static discharge could act as an ignition source
VOC content	:	> 99 %

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

10.2. Chemical Stability: Flammable liquid and vapor. May form flammable or explosive vapor-air mixture.

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4. Conditions to Avoid: Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

10.5. Incompatible Materials: Strong acids, strong bases, strong oxidizers.

10.6. Hazardous Decomposition Products: Thermal decomposition generates : Carbon oxides (CO, CO_2). Sulfur dioxide. Sulfur oxides are toxic.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Inhalation:dust,mist: Harmful if inhaled.

LD50 and LC50 Data:

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED	
ATE US (dust, mist)	3.67 mg/l/4h

Skin Corrosion/Irritation: Causes skin irritation.

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: May cause genetic defects.

Teratogenicity: May cause birth defects.

Carcinogenicity: May cause cancer.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs (thymus, liver) through prolonged or repeated exposure.

Reproductive Toxicity: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: May be fatal if swallowed and enters airways.

Symptoms/Injuries After Inhalation: Inhalation is likely to cause adverse health effects including but not limited to: irritation, difficulty breathing, and unconsciousness.

Symptoms/Injuries After Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Symptoms/Injuries After Eye Contact: May cause slight irritation to eyes.

Symptoms/Injuries After Ingestion: The major health threat of ingestion occurs from the danger of aspiration(breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Fuels, diesel, no. 2 (68476-34-6)	
LD50 Oral Rat	18.7 - 24.9 ml/kg
LD50 Dermal Rabbit	> 4300 mg/kg
ATE US (dust, mist)	3.60 mg/l/4h
Solvent naphtha, petroleum, light aromatic (64742-95-6)	
LD50 Oral Rat	8400 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	3400 ppm/4h
Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2 ml/kg
LC50 Inhalation Rat	> 590 mg/m³ (Exposure time: 4 h)

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Harmful to aquatic life. Toxic to aquatic life with long lasting effects.

Fuels, diesel, no. 2 (68476-34-6)	
LC50 Fish 1	57 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
Solvent naphtha, petroleum, light aromatic (64742-95-6)	
LC50 Fish 1	9.22 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	6.14 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
LC50 Fish 1	19 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 1	0.95 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	2.34 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)

12.2. Persistence and Degradability

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED	
Persistence and Degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative Potential

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED	
Bioaccumulative Potential	Not established.
Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
BCF Fish 1	61 - 159

Log Pow	2.9 - 6.1

12.4. Mobility in Soil
Not available

12.5. Other Adverse Effects
Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, provincial, territorial and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

Ecology – Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT
Proper Shipping Name : DIESEL FUEL
Hazard Class : 3
Identification Number : UN1202
Label Codes : 3
Packing Group : III
Marine Pollutant : Marine pollutant
ERG Number : 128

14.2. In Accordance with IMDG
Proper Shipping Name : DIESEL FUEL
Hazard Class : 3
Identification Number : UN1202
Packing Group : III
Label Codes : 3
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-E
Marine pollutant : Marine pollutant

14.3. In Accordance with IATA
Proper Shipping Name : DIESEL FUEL
Packing Group : III
Identification Number : UN1202
Hazard Class : 3
Label Codes : 3
ERG Code (IATA) : 3L

14.4. In Accordance with TDG
Proper Shipping Name : DIESEL FUEL
Packing Group : III
Hazard Class : 3
Identification Number : UN1202
Label Codes : 3
Marine Pollutant (TDG) : Marine pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED	
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard

Fuels, diesel, no. 2 (68476-34-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Soybean oil, methyl ester (67784-80-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Solvent naphtha, petroleum, light aromatic (64742-95-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Solvent naphtha, petroleum, heavy aromatic (64742-94-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Neither this product nor its chemical components appear on any US state lists.

15.3. Canadian Regulations

ULTRA LOW SULFUR ALL-WEATHER DIESEL SUPREME, UNDYED	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

Fuels, diesel, no. 2 (68476-34-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 3 - Combustible Liquid Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Soybean oil, methyl ester (67784-80-9)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Solvent naphtha, petroleum, light aromatic (64742-95-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class B Division 2 - Flammable Liquid

Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 07/16/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2

Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1B	Carcinogenicity Category 1B
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 3	Flammable liquids Category 3
Muta. 1B	Germ cell mutagenicity Category 1B
Repr. 2	Reproductive toxicity Category 2
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H224	Extremely flammable liquid and vapor
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H332	Harmful if inhaled
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H401	Toxic to aquatic life
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects

Party Responsible for the Preparation of This Document

United Refining Company
15 Bradley Street, P.O.Box 780
Warren, PA 16365
Phone: (814) 723-1500
www.urc.com

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

NA GHS SDS

ULTRA LOW SULFUR DIESEL, UNDYED

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

Revision Date: 07/16/2015 Date of issue: 07/16/2015 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: ULTRA LOW SULFUR DIESEL, UNDYED

Chemical Name: Petroleum Hydrocarbon

Chemical Family: Petroleum Hydrocarbon

Synonyms:

On Road Ultra Low Sulfur Diesel

ULSD, Undyed

ULSD B2, Undyed

ULSD B5, Undyed

ULSD, Rochester, Undyed

1.2. Intended Use of the Product

Diesel Fuel Oil.

1.3. Name, Address, and Telephone of the Responsible Party

Company

United Refining Company

15 Bradley Street, P.O.Box 780

Warren, PA 16365

Phone: (814) 723-1500

www.urc.com

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: (800) 424-9300

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Flam. Liq. 3	H226
Acute Tox. 4 (Inhalation:dust,mist)	H332
Skin Irrit. 2	H315
Muta. 1B	H340
Carc. 1B	H350
Repr. 2	H361
STOT RE 2	H373
Asp. Tox. 1	H304
Aquatic Acute 3	H402
Aquatic Chronic 2	H411

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H226 - Flammable liquid and vapor.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.
H340 - May cause genetic defects.

H350 - May cause cancer.
H361 - Suspected of damaging fertility or the unborn child.
H373 - May cause damage to organs (thymus, liver) through prolonged or repeated exposure.
H402 - Harmful to aquatic life.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, ventilating, and lighting equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P310 - If swallowed: Immediately call a poison center or doctor.
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P312 - Call a poison center or doctor if you feel unwell.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P331 - Do NOT induce vomiting.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P362 - Take off contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
P391 - Collect spillage.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.
P403+P233+P235 - Store in a well-ventilated place. Keep container tightly closed. Keep cool.

2.3. Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Flammable vapors can accumulate in head space of closed systems. A significant portion of the mixture consists of a substance capable of producing an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death.

2.4. Unknown Acute Toxicity (GHS-US) No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Fuels, diesel, no. 2	(CAS No) 68476-34-6	>= 95	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:dust,mist), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373

			Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411
Soybean oil, methyl ester	(CAS No) 67784-80-9	<= 5	Not classified
Solvent naphtha, petroleum, light aromatic	(CAS No) 64742-95-6	< 0.1, 0.1 - 1, 1 -5	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Muta. 1B, H340 Carc. 1B, H350 Repr. 2, H361 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
Solvent naphtha, petroleum, heavy aromatic	(CAS No) 64742-94-5	< 0.1, 0.1 - 1, 1 -5	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Carc. 2, H351 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200].

*More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary, due to varying composition.

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Causes skin irritation. Harmful if inhaled. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. May be fatal if swallowed and enters airways.

Inhalation: Inhalation is likely to cause adverse health effects including but not limited to: irritation, difficulty breathing, and unconsciousness.

Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Eye Contact: May cause slight irritation to eyes.

Ingestion: The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO_2). Water may be ineffective but water should be used to keep fire-exposed container cool.

Unsuitable Extinguishing Media: Do not use a heavy water stream. A heavy water stream may spread burning liquid.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Flammable liquid and vapor.

Explosion Hazard: May form flammable or explosive vapor-air mixture.

Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions closed containers may rupture or explode.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO_2). Sulfur oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Use special care to avoid static electric charges. Do not breathe vapor, mist or spray. Avoid all contact with skin, eyes, or clothing.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Stop leak if safe to do so.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Eliminate ignition sources.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions. Ventilate area.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Absorb and/or contain spill with inert material. Do not take up in combustible material such as: saw dust or cellulosic material. Use only non-sparking tools.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable. Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Hot organic chemical vapors or mists are susceptible to spontaneous combustion when mixed with air, ignition may occur below auto ignition temperature. Ignition temperatures will decrease with increasing vapor volumes, vapor air contact time, and pressure changes. Ignition may occur at elevated-temperature process conditions, especially under a vacuum. Handle in accordance with standard industrial practices, and ensure appropriate ventilation.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Take precautionary measures against static discharge. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Do not breathe mist/vapors/spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes, on skin, or on clothing. Do NOT breathe (vapor, mist, spray). Avoid contact with skin, eyes and clothing.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Take action to prevent static discharges. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating, and lighting equipment.

Storage Conditions: Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Store in a well-ventilated place. Keep container tightly closed. Keep in fireproof place.

Incompatible Materials: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

Diesel Fuel Oil.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Fuels, diesel, no. 2 (68476-34-6)		
USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin - potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans
Alberta	OEL TWA (mg/m³)	100 mg/m³
British Columbia	OEL TWA (mg/m³)	100 mg/m³ (aerosol, inhalable, and vapor)
Manitoba	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Newfoundland & Labrador	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Nova Scotia	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Ontario	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Prince Edward Island	OEL TWA (mg/m³)	100 mg/m³ (inhalable fraction and vapor)
Saskatchewan	OEL STEL (mg/m³)	150 mg/m³ (vapor)
Saskatchewan	OEL TWA (mg/m³)	100 mg/m³ (vapor)

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Gas detectors should be used when toxic gases may be released.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

Hand Protection: Wear protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink or smoke during use.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Yellow
Odor	:	Mild Petroleum Odor
Odor Threshold	:	Not available
pH	:	Not available
Evaporation Rate	:	Not available
Melting Point	:	Not available
Freezing Point	:	Not available
Boiling Point	:	340 - 675 °F (171.11 - 357.22 °C)
Flash Point	:	125 °F (51.67 °C)
Auto-ignition Temperature	:	494 °F (256.67 °C)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	0.6 %
Upper Flammable Limit	:	7.5 %
Vapor Pressure	:	< 5 mm Hg
Relative Vapor Density at 20 °C	:	Not available
Relative Density	:	Not available
Specific gravity / density	:	> 1 (Air = 1)
Specific Gravity	:	< 0.876
Solubility	:	Water: < 0.1 %
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	1.9 - 4.1 cSt @ 104 ° F (40 °C)
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact
Explosion Data – Sensitivity to Static Discharge	:	Static discharge could act as an ignition source
VOC content	:	> 99 %

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Reacts violently with strong oxidizers. Increased risk of fire or explosion.

10.2. Chemical Stability: Flammable liquid and vapor. May form flammable or explosive vapor-air mixture.

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

10.4. Conditions to Avoid: Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

10.5. Incompatible Materials: Strong acids, strong bases, strong oxidizers.

10.6. Hazardous Decomposition Products: Thermal decomposition generates : Carbon oxides (CO, CO_2). Sulfur dioxide. Sulfur oxides are toxic.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Inhalation:dust,mist: Harmful if inhaled.

LD50 and LC50 Data:

ULTRA LOW SULFUR DIESEL, UNDYED	
ATE US (dust, mist)	3.67 mg/l/4h

Skin Corrosion/Irritation: Causes skin irritation.

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: May cause genetic defects.

Teratogenicity: May cause birth defects.

Carcinogenicity: May cause cancer.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs (thymus, liver) through prolonged or repeated exposure.

Reproductive Toxicity: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: May be fatal if swallowed and enters airways.

Symptoms/Injuries After Inhalation: Inhalation is likely to cause adverse health effects including but not limited to: irritation, difficulty breathing, and unconsciousness.

Symptoms/Injuries After Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Symptoms/Injuries After Eye Contact: May cause slight irritation to eyes.

Symptoms/Injuries After Ingestion: The major health threat of ingestion occurs from the danger of aspiration(breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Chronic Symptoms: May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Fuels, diesel, no. 2 (68476-34-6)	
LD50 Oral Rat	18.7 - 24.9 ml/kg
LD50 Dermal Rabbit	> 4300 mg/kg
ATE US (dust, mist)	3.60 mg/l/4h
Solvent naphtha, petroleum, light aromatic (64742-95-6)	
LD50 Oral Rat	8400 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat	3400 ppm/4h
Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2 ml/kg
LC50 Inhalation Rat	> 590 mg/m³ (Exposure time: 4 h)

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Harmful to aquatic life. Toxic to aquatic life with long lasting effects.

Fuels, diesel, no. 2 (68476-34-6)	
LC50 Fish 1	57 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
Solvent naphtha, petroleum, light aromatic (64742-95-6)	
LC50 Fish 1	9.22 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	6.14 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
LC50 Fish 1	19 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 1	0.95 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	2.34 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)

12.2. Persistence and Degradability

ULTRA LOW SULFUR DIESEL, UNDYED	
Persistence and Degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative Potential

ULTRA LOW SULFUR DIESEL, UNDYED	
Bioaccumulative Potential	Not established.

Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
BCF Fish 1	61 - 159
Log Pow	2.9 - 6.1

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

Ecology – Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : DIESEL FUEL
Hazard Class : 3
Identification Number : UN1202
Label Codes : 3
Packing Group : III
Marine Pollutant : Marine pollutant
ERG Number : 128

14.2. In Accordance with IMDG

Proper Shipping Name : DIESEL FUEL
Hazard Class : 3
Identification Number : UN1202
Packing Group : III
Label Codes : 3
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-E
Marine pollutant : Marine pollutant

14.3. In Accordance with IATA

Proper Shipping Name : DIESEL FUEL
Packing Group : III
Identification Number : UN1202
Hazard Class : 3
Label Codes : 3
ERG Code (IATA) : 3L

14.4. In Accordance with TDG

Proper Shipping Name : DIESEL FUEL
Packing Group : III
Hazard Class : 3
Identification Number : UN1202
Label Codes : 3
Marine Pollutant (TDG) : Marine pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

ULTRA LOW SULFUR DIESEL, UNDYED	
SARA Section 311/312 Hazard Classes	Fire hazard

	Immediate (acute) health hazard Delayed (chronic) health hazard

Fuels, diesel, no. 2 (68476-34-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Soybean oil, methyl ester (67784-80-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Solvent naphtha, petroleum, light aromatic (64742-95-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Solvent naphtha, petroleum, heavy aromatic (64742-94-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Neither this product nor its chemical components appear on any US state lists.

15.3. Canadian Regulations

ULTRA LOW SULFUR DIESEL, UNDYED	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

Fuels, diesel, no. 2 (68476-34-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 3 - Combustible Liquid Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Soybean oil, methyl ester (67784-80-9)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Solvent naphtha, petroleum, light aromatic (64742-95-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class B Division 2 - Flammable Liquid

Solvent naphtha, petroleum, heavy aromatic (64742-94-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 2 - Flammable Liquid Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 07/16/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2

Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 1B	Carcinogenicity Category 1B
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 1	Flammable liquids Category 1
Flam. Liq. 3	Flammable liquids Category 3
Muta. 1B	Germ cell mutagenicity Category 1B
Repr. 2	Reproductive toxicity Category 2
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H224	Extremely flammable liquid and vapor
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H332	Harmful if inhaled
H336	May cause drowsiness or dizziness
H340	May cause genetic defects
H350	May cause cancer
H351	Suspected of causing cancer
H361	Suspected of damaging fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H401	Toxic to aquatic life
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects

Party Responsible for the Preparation of This Document

United Refining Company
15 Bradley Street, P.O.Box 780
Warren, PA 16365
Phone: (814) 723-1500
www.urc.com

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

NA GHS SDS

ATTACHMENT D

JOB SAFETY ANALYSIS SHEETS AND DAILY SITE SAFETY CHECKLISTS

GES DAILY SITE SAFETY CHECKLIST

Site Name: _____
Address: _____
_____
_____

Individual's Name: _____ Date: _____

Task and date of entry: _____ _____
_____ _____
_____ _____
_____ _____
_____

This checklist is to be completed on a daily basis. The date should be noted in the space provided. The employee completing the checklist should verify that each item is correct and initial in the last space provided.

	Date:					
1.	Proper training certificates have been obtained from all onsite personnel.					
2.	The site-specific HASP has been reviewed and signed by GES employees and GES-hired subcontractors.					
3.	The daily site-safety meeting has been conducted.					
4.	Applicable JSAs are onsite, reviewed by staff to ensure all tasks/jobs are covered, and site specific JSA modifications occur when needed.					
5.	Fire extinguishers are available for use and are fully charged.					
6.	A fully-stocked first aid kit & eye wash bottle is readily available.					
7.	Any potential tripping hazards have been removed from site.					
8.	All vessels containing flammable or corrosive material are properly labeled.					
9.	Proper personal protective equipment is being used for present conditions.					
10.	Equipment onsite is checked and in safe working order.					
11.	Safety cones and flags or barricades have been utilized to mark out work area along with all required signage (No Smoking, No Trespassing, Work Area...).					
12.	No person onsite has the appearance of being under the influence of motor skill altering substances.					
13.	All workers onsite are clothed in an appropriate manner (highly visible clothing, no tank tops, muscle shirts or shorts).					
14.	Electrical power-operated tools shall be properly grounded and used with a Ground-Fault Circuit Interrupter (GFCI).					
15.	All required permits (GES and/or client) are completed by an authorized individual.					
16.	When working alone, has a phone call been placed to the PM to discuss site conditions, review the Scope of Work, LPS requirements, and coordinate communications for the day? Note: The frequency/ amount of additional calls from the field should be established during the PM's discussion with the individual. A call must always occur prior to leaving the site.					
17.	Prior to leaving the site for the day, the GES site supervisor has conducted a meeting with onsite staff to review worker conditions (possible injuries), JSA revisions, discuss possible Near Losses/ Losses, and activities scheduled for the next day.					
18.	All health and safety concerns have been communicated to the Local Health and Safety Officer and Project Manager					

I verify and initial that the above information is correct by initialing in the boxes to the right:

ATTACHMENT E

PRE-ENTRY MEETING NOTES

PRE-ENTRY MEETING NOTES/ATTENDANCE (Include date, length of meeting, names of personnel in attendance, topics of discussion, comments and concerns, etc.)

ATTACHMENT F

SIGN OFF SHEET

SITE SAFETY AND HEALTH PLAN COMPLIANCE AGREEMENT

All project personnel, including visitors, must follow the requirements of this Site Safety Plan. In order to document individual agreement with this requirement, all personnel must complete this "Site Safety and Health Plan Compliance Agreement." These agreements will be kept in this Site Safety Plan and will become part of the permanent project record upon completion of site activities.

By signing below, I have read the Site Health and Safety Plan (HASP), or I have been verbally advised of its contents. I understand, and I agree to comply with all of its provisions. I understand that I could be prohibited from working on the project, and I may be subject to disciplinary actions for violating any of the health and safety requirements specified in the HASP.

NAME	SIGNATURE	DATE	(TIME IN/OUT)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			

ATTACHMENT G

INCIDENT/INJURY CASE MANAGEMENT

ALL accidents, injuries, property damages, or releases (Loss or Near Loss) shall be reported to GES' on-site supervisor *ASAP but no later than the end of the shift.*

Injury Case Management is a collaborative process which:

- Helps ensure prompt, adequate, and appropriate medical care is provided
- Assesses, plans, implements, coordinates, monitors, and evaluates options
- Can minimize the impact of an impairment (resulting from potentially work-related injury or illness)
- Preserves as much as practicable the individual's functional capacity.

Medical injuries or emergencies within each field location will be managed by the following method:

- If an injury or medical condition occurs that cannot be treated by providing basic first aid to the individual, the GES PM and Site Operations Manager are notified by the GES Oversight person.
- Onsite, individuals who are certified in cardiopulmonary resuscitation (CPR)/First Aid will be requested to respond to the individual's location.
- Following this evaluation the GES VP, HSSE and client program manager, must be contacted regarding the individual's condition and injury management approach onsite and offsite.

Following an assessment of the individual's condition, if responding GES personnel feel that outside medical response personnel (emergency care) are necessary:

- The 911 emergency response system will be activated, if necessary.
- Provide the 911 emergency operator all of the information that is requested.
- The injured individual (GES or subcontractor employee) will be accompanied by other GES staff (i.e., PM, LHSO, Site Supervisor) so that desired injury management information will be communicated to the attending physician.

If an individual requires medical treatment *beyond basic first aid*, but the initial assessment determines that the individual does not require emergency care, then:

- The PM, Site Operations Manager, and CHSSE will be contacted PRIOR to leaving the site.
- The individual will be scheduled for an appointment at the occupational clinic near each office.
- If the injured individual is a subcontractor, then the individual will be directed to visit an occupational clinic established by the subcontracting company.
- If there is no clinic established, the individual will be scheduled at a GES clinic.

The individual will be accompanied to their examination by the GES LHSO or other GES or subcontractor management staff. Desired injury management information will be communicated to the attending physician that will include but not be limited to:

- Any required or alternative medication (over the counter medication)
- Any workplace restrictions versus lost time are discussed with the attending physician.
- The GES VP, HSSE will also contact the attending physician regarding the examination, diagnosis and the GES injury management approach.

ATTACHMENT H

SITE-SPECIFIC DECONTAMINATION PLAN

DECONTAMINATION PLAN

1. Personnel Decontamination

   Section 7 lists the specific levels of protection required. Consistent with the levels of protection required, step by step procedures for personnel decontamination for each Level of Protection are attached.

2. Levels of Protection Required for Decontamination Personnel

   The levels of protection required for personnel assisting with decontamination will be:
   ☐ Level B ☐ Level C ☐ Level D

   Modifications include: ☐

3. Disposition of Decontamination Wastes

   (Provide a description of daily, weekly, and end of project waste disposition including identification of storage area, hauler, and final disposal site if applicable.)

   ☐

4. Equipment Decontamination

   A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

   ☐

5. Sampling Equipment Decontamination

   Sampling equipment will be decontaminated in accordance with the following procedure:

   ☐

LEVEL C DECONTAMINATION PROCEDURES (if required)

[Check indicated Functions or add steps as necessary]:

STEP	FUNCTION	DESCRIPTION OF PROCESS, SOLUTION AND CONTAINER
☐	Segregated equipment drop	_____
☐	Boot cover and glove wash	_____
☐	Boot cover and glove rinse	_____
☐	Tape removal - outer glove/boot	_____
☐	Boot cover removal	_____
☐	Outer glove removal	_____
----------	HOT-LINE ----------	
☐	Suit/safety boot wash	_____
☐	Suit/boot/glove rinse	_____
☐	Safety boot removal	_____
☐	Suit Removal	_____
☐	Inner glove wash	_____
☐	Inner glove rinse	_____
☐	Face piece removal	_____
☐	Inner glove removal	_____
☐	Inner clothing removal	_____
----------	CRC/SAFE ZONE BOUNDARY ----------	
☐	Field wash	_____
☐	Redress	_____

MONITOR WELL

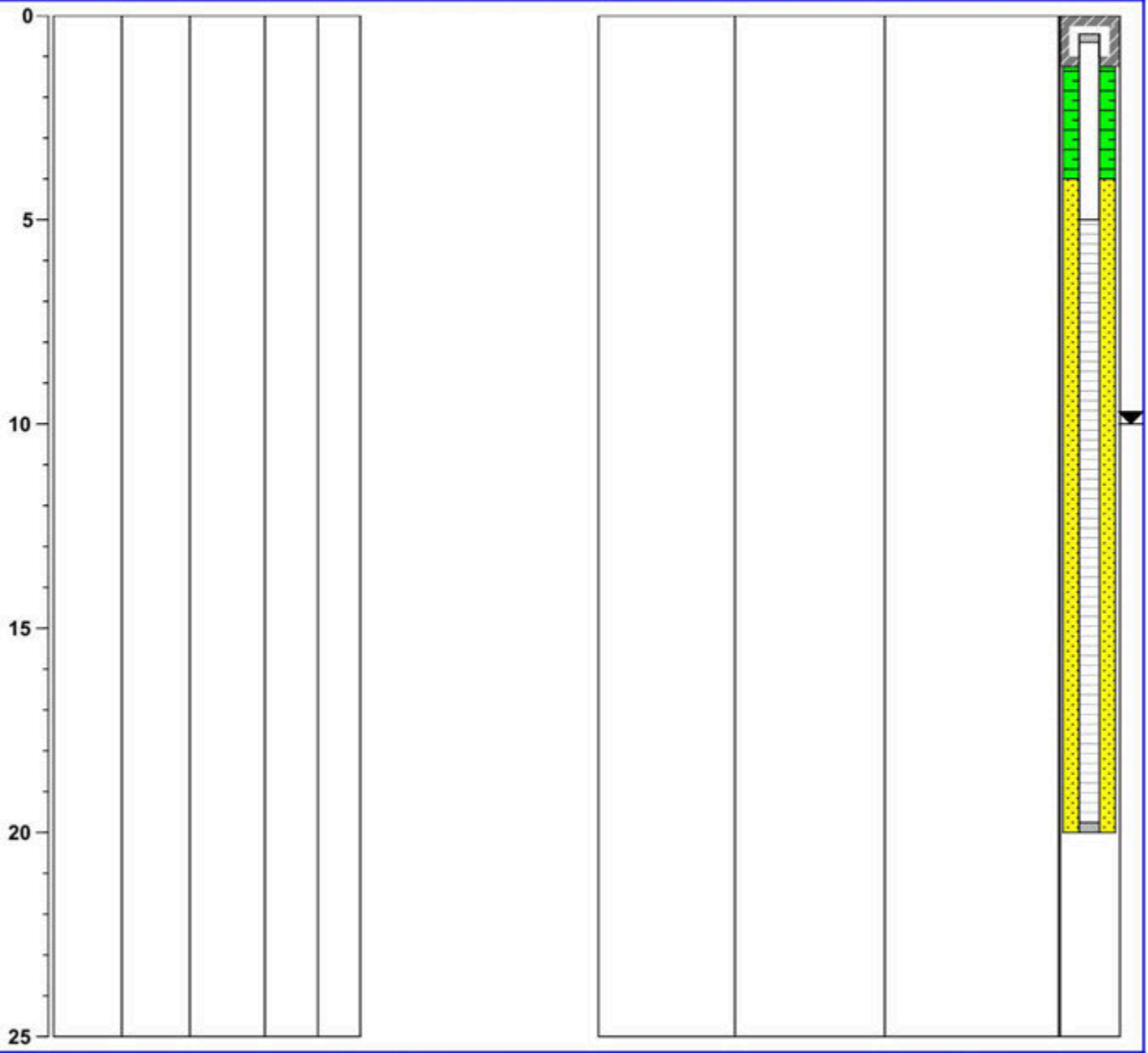
ID NO. **MW-1**

Groundwater and Environmental Services, Inc.

PROJECT:	SURFACE ELEV.:	TOTAL DEPTH:
ADDRESS:	WATER DEPTH:	CASING EL.:
JOB NO.	BOREHOLE DIA.:	WELL DIA.:

Logged By:	Drilling Method:
Dates Drilled:	Sampling Method:
Drilling Company:	Soil Class. System: **USCS**
Drill Rig Type:	Field Screening: **PID 10.9 eV Lamp (ppm)**

Depth (feet)	Sample Interval	Field Screen	Blow Counts	Rec-overy	SAMPLE LITHOLOGY	Stratigraphy	Comments	COMPLETION DETAILS



Location:

Northing/Latitude: **NA**

Easting/Longitude: **NA**

Horizontal Datum: **NA**

Vertical Datum:

General Comments:

Symbol Key:

Apparent Water Level

Lab Sample Location

Pace Analytical®

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of 921492

Section A
Required Client Information:

Company	
Address	
Email To:	
Phone	Fax
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ Other_____

SITE LOCATION ☐GA ☐IL ☐IN ☐MI ☐MN ☐NC ☐OH ☐SC ☐WI ☐OTHER_____

Section D
Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / ,-)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITION

	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

SEE REVERSE SIDE FOR INSTRUCTIONS

ORIGINAL

Instructions for completing Chain of Custody (COC)

1. **Section A and B:** Complete all Client information at top of sheet: company name, address, phone, fax, contact (the person to contact if there are questions, and who will receive the final report.), e-mail address (if available), PO#, Project Name and/or Project Number as you would like to see it appear on the report.

2. **Section C:** Invoice Information: Billing information is included in this section. This information should include the name and address of the person reeeiving the invoice.

3. Quote Reference should be completed if a quotation was provided by Pace Analytical. The Project Manager, and Profile No. will be completed by Pace Analytical Services.

4. **Site Location:** A separate COC must be filled out for each day of sample collection. Record the two letter postal code for the US state in which the samples were collected.

5. **Regulatory Agency:** List the program that is guiding the work to ensure proper regulations are followed.

6. **Section D:** Complete a Sample Description in the "SAMPLE ID" section as you would like it to appear on the laboratory report. The following information should also be included: the sample matrix, sample type (G (grab) or C (composite). When collecting a composite, the start time and end time should be documented in the respective boxes. The collection time for a grab (G) sample should be entered in the boxes marked 'Composite End/Grab'), Sample temp at collection (if required by state), the total number of containers, and preservative used.

7. Mark if the sample was filtered in the field by marking Y or N in 'Filtered' row by the Analysis requested.

8. Requested Analysis: List the required analysis and methods on the lines provided and place a check in the column for the samples requiring the analysis. Additional comments should be referenced in the bottom left hand corner or include attachments for extended lists of parameters.

9. The sampler should print their name in the space provided and sign their name followed by the date of the sampling event at the bottom of the COC in the spaces designated for 'SAMPLER NAME AND SIGNATURE'.

10. When relinquishing custody of the samples to a representative of the laboratory or other organization, indicate the Item Numbers of those samples being transferred; sign relinquished by, date and time, and include your affiliation.

***Important Note:**

Standard Turnaround Time is 2 Weeks/10 business days. Results will be delivered by end of business on the date due unless other arrangements have been made with your project manager.

Special Project Requirements such as Low Level Detection Limits or level of QC reported must be included on the chain of custody in the Additional Comments section.

APPENDIX F

Soil Laboratory Analytical Reports, 2015 and 2016

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

September 21, 2015

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on September 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-4 (7-8') **Lab ID: 30158556001** Collected: 08/31/15 13:30 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**1750**	ug/kg	225	50		09/14/15 12:32	71-43-2	M5
Ethylbenzene	**2710**	ug/kg	225	50		09/14/15 12:32	100-41-4	M5
Isopropylbenzene (Cumene)	**72.2**	ug/kg	4.4	1		09/11/15 14:42	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.4	1		09/11/15 14:42	1634-04-4	M5
Naphthalene	**2840**	ug/kg	225	50		09/14/15 12:32	91-20-3	M5
Toluene	**9980**	ug/kg	225	50		09/14/15 12:32	108-88-3	M5
1,2,4-Trimethylbenzene	**6550**	ug/kg	225	50		09/14/15 12:32	95-63-6	M5
1,3,5-Trimethylbenzene	**2070**	ug/kg	225	50		09/14/15 12:32	108-67-8	M5
Surrogates								
Toluene-d8 (S)	91	%	73-124	1		09/11/15 14:42	2037-26-5	M5
4-Bromofluorobenzene (S)	86	%	71-124	1		09/11/15 14:42	460-00-4	M5
1,2-Dichloroethane-d4 (S)	106	%	83-138	1		09/11/15 14:42	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.5**	%	0.10	1		09/15/15 14:49		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-3 (6-7') **Lab ID: 30158556002** Collected: 08/31/15 16:45 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**3770**	ug/kg	274	50		09/14/15 15:01	71-43-2	L1
Ethylbenzene	**12100**	ug/kg	274	50		09/14/15 15:01	100-41-4	
Isopropylbenzene (Cumene)	**3570**	ug/kg	274	50		09/14/15 15:01	98-82-8	
Methyl-tert-butyl ether	ND	ug/kg	274	50		09/14/15 15:01	1634-04-4	
Naphthalene	**21700**	ug/kg	274	50		09/14/15 15:01	91-20-3	
Toluene	**10400**	ug/kg	274	50		09/14/15 15:01	108-88-3	
1,2,4-Trimethylbenzene	**55700**	ug/kg	5480	1000		09/14/15 15:27	95-63-6	
1,3,5-Trimethylbenzene	**17300**	ug/kg	5480	1000		09/14/15 15:27	108-67-8	
Surrogates								
Toluene-d8 (S)	95	%	73-124	50		09/14/15 15:01	2037-26-5	
4-Bromofluorobenzene (S)	93	%	71-124	50		09/14/15 15:01	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	83-138	50		09/14/15 15:01	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**21.5**	%	0.10	1		09/15/15 14:51		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-2 (5-6') **Lab ID: 30158556003** Collected: 09/01/15 11:20 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/kg	270	50		09/14/15 14:31	71-43-2	L3
Ethylbenzene	**2760**	ug/kg	270	50		09/14/15 14:31	100-41-4	
Isopropylbenzene (Cumene)	**1540**	ug/kg	270	50		09/14/15 14:31	98-82-8	
Methyl-tert-butyl ether	ND	ug/kg	270	50		09/14/15 14:31	1634-04-4	
Naphthalene	**15300**	ug/kg	270	50		09/14/15 14:31	91-20-3	
Toluene	**445**	ug/kg	270	50		09/14/15 14:31	108-88-3	
1,2,4-Trimethylbenzene	**29900**	ug/kg	2700	500		09/15/15 12:15	95-63-6	
1,3,5-Trimethylbenzene	**7760**	ug/kg	270	50		09/14/15 14:31	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	73-124	50		09/14/15 14:31	2037-26-5	
4-Bromofluorobenzene (S)	95	%	71-124	50		09/14/15 14:31	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	83-138	50		09/14/15 14:31	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**14.6**	%	0.10	1		09/15/15 14:53		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-1 (3-4') **Lab ID: 30158556004** Collected: 09/01/15 15:20 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**886**	ug/kg	229	50		09/15/15 12:42	71-43-2	M5
Ethylbenzene	**2060**	ug/kg	229	50		09/14/15 13:25	100-41-4	M5
Isopropylbenzene (Cumene)	**89.0**	ug/kg	4.7	1		09/11/15 16:01	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.7	1		09/11/15 16:01	1634-04-4	M5
Naphthalene	**2940**	ug/kg	229	50		09/14/15 13:25	91-20-3	M5
Toluene	**3800**	ug/kg	229	50		09/14/15 13:25	108-88-3	M5
1,2,4-Trimethylbenzene	**10300**	ug/kg	229	50		09/14/15 13:25	95-63-6	M5
1,3,5-Trimethylbenzene	**3210**	ug/kg	229	50		09/14/15 13:25	108-67-8	M5
Surrogates								
Toluene-d8 (S)	86	%	73-124	1		09/11/15 16:01	2037-26-5	M5
4-Bromofluorobenzene (S)	90	%	71-124	1		09/11/15 16:01	460-00-4	M5
1,2-Dichloroethane-d4 (S)	155	%	83-138	1		09/11/15 16:01	17060-07-0	M5,S2
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**13.0**	%	0.10	1		09/15/15 14:54		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-1 (6-7') **Lab ID: 30158556005** Collected: 09/01/15 15:30 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**37.4**	ug/kg	4.2	1		09/11/15 16:28	71-43-2	M5
Ethylbenzene	**19.6**	ug/kg	4.2	1		09/11/15 16:28	100-41-4	M5
Isopropylbenzene (Cumene)	**7.6**	ug/kg	4.2	1		09/11/15 16:28	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.2	1		09/11/15 16:28	1634-04-4	M5
Naphthalene	**19.1**	ug/kg	4.2	1		09/11/15 16:28	91-20-3	M5
Toluene	**23.0**	ug/kg	4.2	1		09/11/15 16:28	108-88-3	M5
1,2,4-Trimethylbenzene	**39.8**	ug/kg	4.2	1		09/11/15 16:28	95-63-6	M5
1,3,5-Trimethylbenzene	**12.2**	ug/kg	4.2	1		09/11/15 16:28	108-67-8	M5
Surrogates								
Toluene-d8 (S)	95	%	73-124	1		09/11/15 16:28	2037-26-5	M5
4-Bromofluorobenzene (S)	95	%	71-124	1		09/11/15 16:28	460-00-4	M5
1,2-Dichloroethane-d4 (S)	108	%	83-138	1		09/11/15 16:28	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**15.1**	%	0.10	1		09/15/15 14:55		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-2 (1-2) **Lab ID: 30158556006** Collected: 09/02/15 11:30 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/kg	4.8	1		09/11/15 16:54	71-43-2	M5
Ethylbenzene	ND	ug/kg	4.8	1		09/11/15 16:54	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	4.8	1		09/11/15 16:54	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.8	1		09/11/15 16:54	1634-04-4	M5
Naphthalene	ND	ug/kg	4.8	1		09/11/15 16:54	91-20-3	M5
Toluene	ND	ug/kg	4.8	1		09/11/15 16:54	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/kg	4.8	1		09/11/15 16:54	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/kg	4.8	1		09/11/15 16:54	108-67-8	M5
Surrogates								
Toluene-d8 (S)	109	%	73-124	1		09/11/15 16:54	2037-26-5	M5
4-Bromofluorobenzene (S)	104	%	71-124	1		09/11/15 16:54	460-00-4	M5
1,2-Dichloroethane-d4 (S)	110	%	83-138	1		09/11/15 16:54	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.4**	%	0.10	1		09/15/15 14:57		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-1 (2-3') **Lab ID: 30158556007** Collected: 09/02/15 15:20 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**4370**	ug/kg	263	50		09/14/15 13:51	71-43-2	M5
Ethylbenzene	**7480**	ug/kg	263	50		09/14/15 13:51	100-41-4	M5
Isopropylbenzene (Cumene)	**1060**	ug/kg	263	50		09/14/15 13:51	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	5.0	1		09/11/15 17:21	1634-04-4	M5
Naphthalene	**5890**	ug/kg	263	50		09/14/15 13:51	91-20-3	M5
Toluene	**20200**	ug/kg	263	50		09/14/15 13:51	108-88-3	M5
1,2,4-Trimethylbenzene	**19500**	ug/kg	263	50		09/14/15 13:51	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/kg	5.0	1		09/11/15 17:21	108-67-8	M5
Surrogates								
Toluene-d8 (S)	127	%	73-124	1		09/11/15 17:21	2037-26-5	M5,S2
4-Bromofluorobenzene (S)	81	%	71-124	1		09/11/15 17:21	460-00-4	M5
1,2-Dichloroethane-d4 (S)	187	%	83-138	1		09/11/15 17:21	17060-07-0	M5,S2
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**9.8**	%	0.10	1		09/15/15 14:58		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-1 (5-6') **Lab ID: 30158556008** Collected: 09/02/15 15:30 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**52.2**	ug/kg	4.7	1		09/11/15 17:47	71-43-2	M5
Ethylbenzene	**11.3**	ug/kg	4.7	1		09/11/15 17:47	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	4.7	1		09/11/15 17:47	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.7	1		09/11/15 17:47	1634-04-4	M5
Naphthalene	**10.5**	ug/kg	4.7	1		09/11/15 17:47	91-20-3	M5
Toluene	**15.7**	ug/kg	4.7	1		09/11/15 17:47	108-88-3	M5
1,2,4-Trimethylbenzene	**25.0**	ug/kg	4.7	1		09/11/15 17:47	95-63-6	M5
1,3,5-Trimethylbenzene	**9.1**	ug/kg	4.7	1		09/11/15 17:47	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	73-124	1		09/11/15 17:47	2037-26-5	M5
4-Bromofluorobenzene (S)	97	%	71-124	1		09/11/15 17:47	460-00-4	M5
1,2-Dichloroethane-d4 (S)	114	%	83-138	1		09/11/15 17:47	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**21.2**	%	0.10	1		09/15/15 15:01		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-4 (10-11') **Lab ID: 30158556009** Collected: 09/03/15 10:20 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**8180**	ug/kg	227	50		09/15/15 13:09	71-43-2	M5
Ethylbenzene	**22600**	ug/kg	4530	1000		09/14/15 12:45	100-41-4	M5
Isopropylbenzene (Cumene)	**3580**	ug/kg	227	50		09/14/15 12:18	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.9	1		09/11/15 18:13	1634-04-4	M5
Naphthalene	**10800**	ug/kg	227	50		09/14/15 12:18	91-20-3	M5
Toluene	**20300**	ug/kg	4530	1000		09/14/15 12:45	108-88-3	M5
1,2,4-Trimethylbenzene	**41600**	ug/kg	4530	1000		09/14/15 12:45	95-63-6	M5
1,3,5-Trimethylbenzene	**11800**	ug/kg	4530	1000		09/14/15 12:45	108-67-8	M5
Surrogates								
Toluene-d8 (S)	114	%	73-124	1		09/11/15 18:13	2037-26-5	M5
4-Bromofluorobenzene (S)	81	%	71-124	1		09/11/15 18:13	460-00-4	M5
1,2-Dichloroethane-d4 (S)	134	%	83-138	1		09/11/15 18:13	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**8.7**	%	0.10	1		09/15/15 15:02		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-3 (10-11') **Lab ID: 30158556010** Collected: 09/03/15 11:00 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**3150**	ug/kg	222	50		09/15/15 13:35	71-43-2	M5
Ethylbenzene	**1880**	ug/kg	222	50		09/14/15 13:11	100-41-4	M5
Isopropylbenzene (Cumene)	**1100**	ug/kg	222	50		09/14/15 13:11	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.8	1		09/11/15 18:40	1634-04-4	M5
Naphthalene	**114**	ug/kg	4.8	1		09/11/15 18:40	91-20-3	M5
Toluene	**31.2**	ug/kg	4.8	1		09/11/15 18:40	108-88-3	M5
1,2,4-Trimethylbenzene	**12200**	ug/kg	222	50		09/14/15 13:11	95-63-6	M5
1,3,5-Trimethylbenzene	**43.9**	ug/kg	4.8	1		09/11/15 18:40	108-67-8	M5
Surrogates								
Toluene-d8 (S)	93	%	73-124	1		09/11/15 18:40	2037-26-5	M5
4-Bromofluorobenzene (S)	77	%	71-124	1		09/11/15 18:40	460-00-4	M5
1,2-Dichloroethane-d4 (S)	125	%	83-138	1		09/11/15 18:40	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.4**	%	0.10	1		09/15/15 15:04		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-3 (8-9) **Lab ID: 30158556011** Collected: 09/03/15 11:00 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.
Comments: • Client sample ID on container did not match COC; client was notified.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**2260**	ug/kg	232	50		09/15/15 14:02	71-43-2	M5
Ethylbenzene	**1470**	ug/kg	232	50		09/14/15 13:38	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	4.4	1		09/11/15 19:06	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.4	1		09/11/15 19:06	1634-04-4	M5
Naphthalene	**697**	ug/kg	232	50		09/14/15 13:38	91-20-3	M5
Toluene	ND	ug/kg	232	50		09/14/15 13:38	108-88-3	M5
1,2,4-Trimethylbenzene	**2000**	ug/kg	232	50		09/14/15 13:38	95-63-6	M5
1,3,5-Trimethylbenzene	**610**	ug/kg	232	50		09/14/15 13:38	108-67-8	M5
Surrogates								
Toluene-d8 (S)	127	%	73-124	1		09/11/15 19:06	2037-26-5	M5,S2
4-Bromofluorobenzene (S)	101	%	71-124	1		09/11/15 19:06	460-00-4	M5
1,2-Dichloroethane-d4 (S)	126	%	83-138	1		09/11/15 19:06	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**15.0**	%	0.10	1		09/15/15 15:05		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-2 (10-11)" **Lab ID: 30158556012** Collected: 09/03/15 12:15 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**20.7**	ug/kg	5.1	1		09/11/15 19:32	71-43-2	M5
Ethylbenzene	**7.2**	ug/kg	5.1	1		09/11/15 19:32	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	5.1	1		09/11/15 19:32	98-82-8	M5
Methyl-tert-butyl ether	**5.3**	ug/kg	5.1	1		09/11/15 19:32	1634-04-4	M5
Naphthalene	**14.6**	ug/kg	5.1	1		09/11/15 19:32	91-20-3	M5
Toluene	**10.9**	ug/kg	5.1	1		09/11/15 19:32	108-88-3	M5
1,2,4-Trimethylbenzene	**15.0**	ug/kg	5.1	1		09/11/15 19:32	95-63-6	M5
1,3,5-Trimethylbenzene	**5.9**	ug/kg	5.1	1		09/11/15 19:32	108-67-8	M5
Surrogates								
Toluene-d8 (S)	94	%	73-124	1		09/11/15 19:32	2037-26-5	M5
4-Bromofluorobenzene (S)	98	%	71-124	1		09/11/15 19:32	460-00-4	M5
1,2-Dichloroethane-d4 (S)	108	%	83-138	1		09/11/15 19:32	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**12.3**	%	0.10	1		09/15/15 15:06		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-2 **Lab ID: 30158556013** Collected: 09/03/15 13:50 Received: 09/04/15 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**7.5**	ug/L	5.0	1		09/11/15 21:38	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		09/11/15 21:38	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/11/15 21:38	98-82-8	
Methyl-tert-butyl ether	**17.7**	ug/L	5.0	1		09/11/15 21:38	1634-04-4	
Naphthalene	**20.1**	ug/L	5.0	1		09/11/15 21:38	91-20-3	
Toluene	ND	ug/L	5.0	1		09/11/15 21:38	108-88-3	
1,2,4-Trimethylbenzene	**41.6**	ug/L	5.0	1		09/11/15 21:38	95-63-6	
1,3,5-Trimethylbenzene	**7.7**	ug/L	5.0	1		09/11/15 21:38	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	79-118	1		09/11/15 21:38	2037-26-5	
4-Bromofluorobenzene (S)	99	%	84-113	1		09/11/15 21:38	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	84-124	1		09/11/15 21:38	17060-07-0	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-1 (10-11') **Lab ID: 30158556014** Collected: 09/03/15 15:00 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**32.9**	ug/kg	3.9	1		09/11/15 19:59	71-43-2	M5
Ethylbenzene	ND	ug/kg	3.9	1		09/11/15 19:59	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	3.9	1		09/11/15 19:59	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	3.9	1		09/11/15 19:59	1634-04-4	M5
Naphthalene	ND	ug/kg	3.9	1		09/11/15 19:59	91-20-3	M5
Toluene	ND	ug/kg	3.9	1		09/11/15 19:59	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/kg	3.9	1		09/11/15 19:59	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/kg	3.9	1		09/11/15 19:59	108-67-8	M5
Surrogates								
Toluene-d8 (S)	95	%	73-124	1		09/11/15 19:59	2037-26-5	M5
4-Bromofluorobenzene (S)	97	%	71-124	1		09/11/15 19:59	460-00-4	M5
1,2-Dichloroethane-d4 (S)	108	%	83-138	1		09/11/15 19:59	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**12.0**	%	0.10	1		09/15/15 15:07		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: MW-2 (18-19') **Lab ID: 30158556015** Collected: 09/03/15 16:00 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/kg	4.8	1		09/11/15 20:25	71-43-2	M5
Ethylbenzene	ND	ug/kg	4.8	1		09/11/15 20:25	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	4.8	1		09/11/15 20:25	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	4.8	1		09/11/15 20:25	1634-04-4	M5
Naphthalene	ND	ug/kg	4.8	1		09/11/15 20:25	91-20-3	M5
Toluene	ND	ug/kg	4.8	1		09/11/15 20:25	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/kg	4.8	1		09/11/15 20:25	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/kg	4.8	1		09/11/15 20:25	108-67-8	M5
Surrogates								
Toluene-d8 (S)	93	%	73-124	1		09/11/15 20:25	2037-26-5	M5
4-Bromofluorobenzene (S)	100	%	71-124	1		09/11/15 20:25	460-00-4	M5
1,2-Dichloroethane-d4 (S)	105	%	83-138	1		09/11/15 20:25	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**16.3**	%	0.10	1		09/15/15 15:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Sample: SB-1 (16-17) **Lab ID: 30158556016** Collected: 09/03/15 17:40 Received: 09/04/15 17:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.
Comments: • This sample was not listed on the chain of custody but was received by the laboratory; client was notified.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**21.5**	ug/kg	6.9	1		09/11/15 20:52	71-43-2	M5
Ethylbenzene	ND	ug/kg	6.9	1		09/11/15 20:52	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/kg	6.9	1		09/11/15 20:52	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/kg	6.9	1		09/11/15 20:52	1634-04-4	M5
Naphthalene	ND	ug/kg	6.9	1		09/11/15 20:52	91-20-3	M5
Toluene	**13.4**	ug/kg	6.9	1		09/11/15 20:52	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/kg	6.9	1		09/11/15 20:52	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/kg	6.9	1		09/11/15 20:52	108-67-8	M5
Surrogates								
Toluene-d8 (S)	104	%	73-124	1		09/11/15 20:52	2037-26-5	M5
4-Bromofluorobenzene (S)	130	%	71-124	1		09/11/15 20:52	460-00-4	M5,S2
1,2-Dichloroethane-d4 (S)	107	%	83-138	1		09/11/15 20:52	17060-07-0	M5
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**21.5**	%	0.10	1		09/15/15 15:12		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

QC Batch: MSV/24852 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-SOIL
Associated Lab Samples: 30158556001, 30158556004, 30158556005, 30158556006, 30158556007, 30158556008, 30158556009, 30158556010, 30158556011, 30158556012, 30158556014, 30158556015, 30158556016

METHOD BLANK: 950391 Matrix: Solid
Associated Lab Samples: 30158556001, 30158556004, 30158556005, 30158556006, 30158556007, 30158556008, 30158556009, 30158556010, 30158556011, 30158556012, 30158556014, 30158556015, 30158556016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	09/11/15 11:55	M5
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	09/11/15 11:55	M5
Benzene	ug/kg	ND	5.0	09/11/15 11:55	M5
Ethylbenzene	ug/kg	ND	5.0	09/11/15 11:55	M5
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	09/11/15 11:55	M5
Methyl-tert-butyl ether	ug/kg	ND	5.0	09/11/15 11:55	M5
Naphthalene	ug/kg	ND	5.0	09/11/15 11:55	M5
Toluene	ug/kg	ND	5.0	09/11/15 11:55	M5
1,2-Dichloroethane-d4 (S)	%	94	83-138	09/11/15 11:55	M5
4-Bromofluorobenzene (S)	%	107	71-124	09/11/15 11:55	M5
Toluene-d8 (S)	%	96	73-124	09/11/15 11:55	M5

LABORATORY CONTROL SAMPLE: 950392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	21.7	108	54-131	M5
1,3,5-Trimethylbenzene	ug/kg	20	21.1	106	54-131	M5
Benzene	ug/kg	20	24.7	124	52-126	M5
Ethylbenzene	ug/kg	20	22.7	114	54-128	M5
Isopropylbenzene (Cumene)	ug/kg	20	23.0	115	58-144	M5
Methyl-tert-butyl ether	ug/kg	20	20.6	103	57-129	M5
Naphthalene	ug/kg	20	20.7	103	36-152	M5
Toluene	ug/kg	20	23.5	118	53-127	M5
1,2-Dichloroethane-d4 (S)	%			86	83-138	M5
4-Bromofluorobenzene (S)	%			102	71-124	M5
Toluene-d8 (S)	%			95	73-124	M5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

QC Batch: MSV/24868
QC Batch Method: EPA 8260B
Analysis Method: EPA 8260B
Analysis Description: 8260 MSV UST-SOIL
Associated Lab Samples: 30158556002, 30158556003

METHOD BLANK: 951395
Matrix: Solid
Associated Lab Samples: 30158556002, 30158556003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	09/14/15 11:25	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	09/14/15 11:25	
Benzene	ug/kg	ND	5.0	09/14/15 11:25	
Ethylbenzene	ug/kg	ND	5.0	09/14/15 11:25	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	09/14/15 11:25	
Methyl-tert-butyl ether	ug/kg	ND	5.0	09/14/15 11:25	
Naphthalene	ug/kg	ND	5.0	09/14/15 11:25	
Toluene	ug/kg	ND	5.0	09/14/15 11:25	
1,2-Dichloroethane-d4 (S)	%	98	83-138	09/14/15 11:25	
4-Bromofluorobenzene (S)	%	103	71-124	09/14/15 11:25	
Toluene-d8 (S)	%	96	73-124	09/14/15 11:25	

LABORATORY CONTROL SAMPLE: 951396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	22.9	115	54-131	
1,3,5-Trimethylbenzene	ug/kg	20	21.2	106	54-131	
Benzene	ug/kg	20	26.4	132	52-126	L0
Ethylbenzene	ug/kg	20	22.6	113	54-128	
Isopropylbenzene (Cumene)	ug/kg	20	23.9	120	58-144	
Methyl-tert-butyl ether	ug/kg	20	24.5	123	57-129	
Naphthalene	ug/kg	20	19.8	99	36-152	
Toluene	ug/kg	20	23.5	117	53-127	
1,2-Dichloroethane-d4 (S)	%			103	83-138	
4-Bromofluorobenzene (S)	%			98	71-124	
Toluene-d8 (S)	%			96	73-124	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

QC Batch: MSV/24844
QC Batch Method: EPA 8260B
Analysis Method: EPA 8260B
Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 30158556013

METHOD BLANK: 950188 Matrix: Water
Associated Lab Samples: 30158556013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	09/11/15 12:16	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	09/11/15 12:16	
Benzene	ug/L	ND	1.0	09/11/15 12:16	
Ethylbenzene	ug/L	ND	1.0	09/11/15 12:16	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	09/11/15 12:16	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/11/15 12:16	
Naphthalene	ug/L	ND	2.0	09/11/15 12:16	
Toluene	ug/L	ND	1.0	09/11/15 12:16	
1,2-Dichloroethane-d4 (S)	%	121	84-124	09/11/15 12:16	
4-Bromofluorobenzene (S)	%	125	84-113	09/11/15 12:16	S3
Toluene-d8 (S)	%	101	79-118	09/11/15 12:16	

LABORATORY CONTROL SAMPLE: 950189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.2	106	70-123	
1,3,5-Trimethylbenzene	ug/L	20	22.0	110	67-123	
Benzene	ug/L	20	20.4	102	69-123	
Ethylbenzene	ug/L	20	19.2	96	70-123	
Isopropylbenzene (Cumene)	ug/L	20	23.9	119	66-136	
Methyl-tert-butyl ether	ug/L	20	24.1	120	69-133	
Naphthalene	ug/L	20	20.7	103	65-134	
Toluene	ug/L	20	19.8	99	73-123	
1,2-Dichloroethane-d4 (S)	%			108	84-124	
4-Bromofluorobenzene (S)	%			108	84-113	
Toluene-d8 (S)	%			102	79-118	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 950455 950456

Parameter	Units	30158528003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	23.1	21.0	115	105	70-123	9	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	21.7	19.5	109	97	67-123	11	
Benzene	ug/L	ND	20	20	23.9	21.1	120	105	69-123	13	
Ethylbenzene	ug/L	ND	20	20	22.7	19.7	113	98	70-123	14	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	24.6	23.3	123	116	66-136	6	
Methyl-tert-butyl ether	ug/L	ND	20	20	26.2	22.6	131	113	69-133	15	
Naphthalene	ug/L	ND	20	20	21.8	18.9	109	94	65-134	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 950455 950456

Parameter	Units	30158528003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Toluene	ug/L	ND	20	20	23.0	19.1	115	95	73-123	19	
1,2-Dichloroethane-d4 (S)	%						112	114	84-124		
4-Bromofluorobenzene (S)	%						98	103	84-113		
Toluene-d8 (S)	%						96	94	79-118		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

QC Batch: PMST/5613 Analysis Method: Dry Weight
QC Batch Method: Dry Weight Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30158556001, 30158556002, 30158556003, 30158556004, 30158556005, 30158556006, 30158556007, 30158556008, 30158556009, 30158556010, 30158556011, 30158556012, 30158556014, 30158556015, 30158556016

SAMPLE DUPLICATE: 951848

Parameter	Units	30158556001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	11.5	11.9	4	

SAMPLE DUPLICATE: 951849

Parameter	Units	30158556002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	21.5	24.2	12	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/24852

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
M5	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
S2	Surrogate recovery outside laboratory control limits due to matrix interferences (confirmed by similar results from sample re-analysis).
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-M-209 Barkeyville
Pace Project No.: 30158556

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30158556001	MW-4 (7-8')	EPA 8260B	MSV/24852		
30158556002	MW-3 (6-7')	EPA 8260B	MSV/24868		
30158556003	SB-2 (5-6')	EPA 8260B	MSV/24868		
30158556004	MW-1 (3-4')	EPA 8260B	MSV/24852		
30158556005	MW-1 (6-7')	EPA 8260B	MSV/24852		
30158556006	MW-2 (1-2)	EPA 8260B	MSV/24852		
30158556007	SB-1 (2-3')	EPA 8260B	MSV/24852		
30158556008	SB-1 (5-6')	EPA 8260B	MSV/24852		
30158556009	MW-4 (10-11')	EPA 8260B	MSV/24852		
30158556010	MW-3 (10-11')	EPA 8260B	MSV/24852		
30158556011	MW-3 (8-9)	EPA 8260B	MSV/24852		
30158556012	SB-2 (10-11)"	EPA 8260B	MSV/24852		
30158556014	MW-1 (10-11')	EPA 8260B	MSV/24852		
30158556015	MW-2 (18-19')	EPA 8260B	MSV/24852		
30158556016	SB-1 (16-17)	EPA 8260B	MSV/24852		
30158556013	SB-2	EPA 8260B	MSV/24844		
30158556001	MW-4 (7-8')	Dry Weight	PMST/5613		
30158556002	MW-3 (6-7')	Dry Weight	PMST/5613		
30158556003	SB-2 (5-6')	Dry Weight	PMST/5613		
30158556004	MW-1 (3-4')	Dry Weight	PMST/5613		
30158556005	MW-1 (6-7')	Dry Weight	PMST/5613		
30158556006	MW-2 (1-2)	Dry Weight	PMST/5613		
30158556007	SB-1 (2-3')	Dry Weight	PMST/5613		
30158556008	SB-1 (5-6')	Dry Weight	PMST/5613		
30158556009	MW-4 (10-11')	Dry Weight	PMST/5613		
30158556010	MW-3 (10-11')	Dry Weight	PMST/5613		
30158556011	MW-3 (8-9)	Dry Weight	PMST/5613		
30158556012	SB-2 (10-11)"	Dry Weight	PMST/5613		
30158556014	MW-1 (10-11')	Dry Weight	PMST/5613		
30158556015	MW-2 (18-19')	Dry Weight	PMST/5613		
30158556016	SB-1 (16-17)	Dry Weight	PMST/5613		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1942946

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention:
Address: 301 Commerce Park Dr. Cranberry TWP. 16066	Copy To: Jean Amodeo	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: 800-267-2549 Fax:	Project Name: UPA - M-209	Pace Project Manager:
Requested Due Date/TAT: Standard	Project Number: 0704730 Barkeyville	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE (TW 8-31-15)	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	PA Short List	New Diesel	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-4 (7-8')	SL	G	~~8-31-15~~	~~1330~~	8-31-15	1330		4	X						X			X			001
2	MW-3 (6-7')					8-31-15	1645															002
3	SB-2 (5-6')					9-1-15	1120															003
4	MW-1 (3-4')					9-1-15	1520															004
5	MW-1 (6-7')					9-1-15	1530															005
6	MW-2 (1-2')					9-2-15	1130															006
7	SB-1 (2-3')					9-2-15	1520															007
8	SB-1 (5-6')					9-2-15	1530															008
9	MW-4 (10-11')					9-3-15	1020															009
10	MW-3 (10-11')					9-3-15	1100															010
11	MW-3 (8-9')					9-3-15	1100															011
12	SB-2 (10-11')					9-3-15	1215															012

30158556

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature]	9-3-15	1830	Lauren Bidwell	9-3-15	1830				
	Lauren Bidwell	9-4-15	0845	Sample Receiving	9-4-15					
				[signature]	9-4-15	3.05				
	[signature]	9-4-15	5.55	[signature]	9/4/15	1755	1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE: Pace

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1942944

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention:
Address: 301 Commerce Park Dr. Cranberry TWP 16066	Copy To: Jean Amodeo	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: 800-267-2549 Fax:	Project Name: UPA - M-209 / 229 J Barkyville	Pace Project Manager:
Requested Due Date/TAT: Standard	Project Number: 0704730	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	New PA	Diesel Short List	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-2	WT	G			9-3-15	1350		3				X						X			013
2	MW-1 (10-11')	SL	G			9-3-15	1500		4	X						X			X			014
3	MW-2 (18-19)	SL	G			9-3-15	1600		4	X						X			X			015
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

30158556

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] GES	9-3-15	1830	Lauren Bidwell	09-03-15	1830				
	Lauren Bidwell	9-4-15	0845	Sample Receiving	9-4-15					
				[signature] Pace	9-4-15	3:05				
	[signature] Pace	9-4-15	5:55	Alupra R Mudmney Pace	9/4/15	1755	1.5	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project # 30158556

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ✓ Bubble Bags ___ None ___ Other foam

Thermometer Used 7 Type of Ice: Wet Blue None ☑ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 1.7 °C Correction Factor: -0.2 °C Final Temp: 1.5 °C

Date and Initials of person examining contents: ARM 9/4/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☐Yes ☑No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☑No ☐N/A	12. Sample 011 I.D. is MW-3 (8-10) at 1110.
-Includes date/time/ID/Analysis Matrix: SL, WT		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☑Yes ☐No	Initial when completed ARM / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☐Yes ☑No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Joe Hinkle Date/Time: 9/8/15 1530

Comments/ Resolution: Received extra sample (a SL): I.D. is SB-1 (16-17) 1740, 9/3/15.

Notified client of extra sample received and ID discrepancy.

Project Manager Review: Rachel D Crutcher **Date:** 9/8/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number: 30158556

Client Name: CB

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other	Other
001	SL		4																						
002	SL		4																						
003	WT													3											
004	SL		4																						
005	SL		4																						

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 08, 2015

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on November 25, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: SB-3 (3-4) **Lab ID: 30166375001** Collected: 11/23/15 15:20 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B		Preparation Method: EPA 5035A					
Benzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	1634-04-4	1c
Naphthalene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	91-20-3	1c
Toluene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 15:33	108-67-8	1c
Surrogates								
Toluene-d8 (S)	98	%	68-135	1	12/03/15 08:23	12/02/15 15:33	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	1	12/03/15 08:23	12/02/15 15:33	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	1	12/03/15 08:23	12/02/15 15:33	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**9.0**	%	0.10	1		11/30/15 15:18		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: SB-4 (3-4) **Lab ID: 30166375002** Collected: 11/23/15 10:30 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	1634-04-4	1c
Naphthalene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	91-20-3	1c
Toluene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.2	1	12/03/15 08:23	12/02/15 15:59	108-67-8	1c
Surrogates								
Toluene-d8 (S)	99	%	68-135	1	12/03/15 08:23	12/02/15 15:59	2037-26-5	
4-Bromofluorobenzene (S)	103	%	65-146	1	12/03/15 08:23	12/02/15 15:59	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	69-137	1	12/03/15 08:23	12/02/15 15:59	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**14.6**	%	0.10	1		11/30/15 15:19		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: SB-5 (3-4) **Lab ID: 30166375003** Collected: 11/24/15 08:10 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	71-43-2	1c
Ethylbenzene	**38700**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	100-41-4	1c
Isopropylbenzene (Cumene)	**5350**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	1634-04-4	1c
Naphthalene	**10400**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	91-20-3	1c
Toluene	**76000**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	108-88-3	1c
1,2,4-Trimethylbenzene	**130000**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	95-63-6	1c
1,3,5-Trimethylbenzene	**46900**	ug/kg	2420	500	12/03/15 08:19	12/02/15 17:16	108-67-8	1c
Surrogates								
Toluene-d8 (S)	101	%	68-135	500	12/03/15 08:19	12/02/15 17:16	2037-26-5	
4-Bromofluorobenzene (S)	93	%	65-146	500	12/03/15 08:19	12/02/15 17:16	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	69-137	500	12/03/15 08:19	12/02/15 17:16	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.9**	%	0.10	1		11/30/15 15:19		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: SB-6 (4-5) **Lab ID: 30166375004** Collected: 11/24/15 09:45 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B		Preparation Method: EPA 5035A					
Benzene	**7.0**	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	1634-04-4	1c
Naphthalene	**4.7**	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	91-20-3	1c
Toluene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.5	1	12/03/15 08:23	12/02/15 16:25	108-67-8	1c
Surrogates								
Toluene-d8 (S)	100	%	68-135	1	12/03/15 08:23	12/02/15 16:25	2037-26-5	
4-Bromofluorobenzene (S)	99	%	65-146	1	12/03/15 08:23	12/02/15 16:25	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	69-137	1	12/03/15 08:23	12/02/15 16:25	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.6**	%	0.10	1		11/30/15 15:20		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: MW-5 (3-4) **Lab ID: 30166375005** Collected: 11/24/15 11:10 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	71-43-2	1c
Ethylbenzene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	1634-04-4	1c
Naphthalene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	91-20-3	1c
Toluene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	230	50	12/03/15 08:19	12/03/15 16:04	108-67-8	1c
Surrogates								
Toluene-d8 (S)	101	%	68-135	50	12/03/15 08:19	12/03/15 16:04	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	50	12/03/15 08:19	12/03/15 16:04	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	69-137	50	12/03/15 08:19	12/03/15 16:04	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.0**	%	0.10	1		11/30/15 15:21		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: MW-6 (3-4) **Lab ID: 30166375006** Collected: 11/24/15 14:10 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B		Preparation Method: EPA 5035A					
Benzene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	1634-04-4	1c
Naphthalene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	91-20-3	1c
Toluene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.8	1	12/03/15 08:23	12/02/15 16:50	108-67-8	1c
Surrogates								
Toluene-d8 (S)	98	%	68-135	1	12/03/15 08:23	12/02/15 16:50	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	12/03/15 08:23	12/02/15 16:50	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	69-137	1	12/03/15 08:23	12/02/15 16:50	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**12.5**	%	0.10	1		11/30/15 15:21		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: MW-7 (4-5) **Lab ID: 30166375007** Collected: 11/24/15 15:20 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B		Preparation Method: EPA 5035A					
Benzene	ND	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	71-43-2	1c
Ethylbenzene	ND	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	1634-04-4	1c
Naphthalene	**2630**	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	91-20-3	1c
Toluene	ND	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	108-88-3	1c
1,2,4-Trimethylbenzene	**1860**	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	95-63-6	1c
1,3,5-Trimethylbenzene	**682**	ug/kg	233	50	12/03/15 08:19	12/03/15 16:31	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	50	12/03/15 08:19	12/03/15 16:31	2037-26-5	
4-Bromofluorobenzene (S)	106	%	65-146	50	12/03/15 08:19	12/03/15 16:31	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	69-137	50	12/03/15 08:19	12/03/15 16:31	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**7.5**	%	0.10	1		11/30/15 15:22		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Sample: MW-8 (4-5) **Lab ID: 30166375008** Collected: 11/25/15 08:50 Received: 11/25/15 14:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	71-43-2	1c
Ethylbenzene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	1634-04-4	1c
Naphthalene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	91-20-3	1c
Toluene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	211	50	12/03/15 08:19	12/03/15 17:24	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	50	12/03/15 08:19	12/03/15 17:24	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	12/03/15 08:19	12/03/15 17:24	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	69-137	50	12/03/15 08:19	12/03/15 17:24	17060-07-0	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.4**	%	0.10	1		11/30/15 15:22		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

QC Batch: MSV/25945 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30166375001, 30166375002, 30166375004, 30166375006

METHOD BLANK: 991106 Matrix: Solid
Associated Lab Samples: 30166375001, 30166375002, 30166375004, 30166375006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	12/02/15 12:25	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	12/02/15 12:25	
Benzene	ug/kg	ND	5.0	12/02/15 12:25	
Ethylbenzene	ug/kg	ND	5.0	12/02/15 12:25	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	12/02/15 12:25	
Methyl-tert-butyl ether	ug/kg	ND	5.0	12/02/15 12:25	
Naphthalene	ug/kg	ND	5.0	12/02/15 12:25	
Toluene	ug/kg	ND	5.0	12/02/15 12:25	
1,2-Dichloroethane-d4 (S)	%	109	69-137	12/02/15 12:25	
4-Bromofluorobenzene (S)	%	98	65-146	12/02/15 12:25	
Dibromofluoromethane (S)	%	104	70-130	12/02/15 12:25	
Toluene-d8 (S)	%	95	68-135	12/02/15 12:25	

LABORATORY CONTROL SAMPLE: 991107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	19.6	98	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	19.7	98	74-129	
Benzene	ug/kg	20	22.8	114	71-137	
Ethylbenzene	ug/kg	20	20.4	102	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	19.4	97	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.0	85	77-141	
Naphthalene	ug/kg	20	17.3	87	81-126	
Toluene	ug/kg	20	21.4	107	72-127	
1,2-Dichloroethane-d4 (S)	%			98	69-137	
4-Bromofluorobenzene (S)	%			97	65-146	
Dibromofluoromethane (S)	%			100	70-130	
Toluene-d8 (S)	%			100	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

QC Batch: MSV/25946 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30166375003, 30166375005, 30166375007, 30166375008

METHOD BLANK: 991108 Matrix: Solid
Associated Lab Samples: 30166375003, 30166375005, 30166375007, 30166375008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	12/02/15 11:59	
1,3,5-Trimethylbenzene	ug/kg	ND	250	12/02/15 11:59	
Benzene	ug/kg	ND	250	12/02/15 11:59	
Ethylbenzene	ug/kg	ND	250	12/02/15 11:59	
Isopropylbenzene (Cumene)	ug/kg	ND	250	12/02/15 11:59	
Methyl-tert-butyl ether	ug/kg	ND	250	12/02/15 11:59	
Naphthalene	ug/kg	ND	250	12/02/15 11:59	
Toluene	ug/kg	ND	250	12/02/15 11:59	
1,2-Dichloroethane-d4 (S)	%	98	69-137	12/02/15 11:59	
4-Bromofluorobenzene (S)	%	96	65-146	12/02/15 11:59	
Dibromofluoromethane (S)	%	93	70-130	12/02/15 11:59	
Toluene-d8 (S)	%	99	68-135	12/02/15 11:59	

LABORATORY CONTROL SAMPLE: 991109

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	19.6	98	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	19.7	98	74-129	
Benzene	ug/kg	20	22.8	114	71-137	
Ethylbenzene	ug/kg	20	20.4	102	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	19.4	97	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.0	85	77-141	
Naphthalene	ug/kg	20	17.3	87	81-126	
Toluene	ug/kg	20	21.4	107	72-127	
1,2-Dichloroethane-d4 (S)	%			98	69-137	
4-Bromofluorobenzene (S)	%			97	65-146	
Dibromofluoromethane (S)	%			100	70-130	
Toluene-d8 (S)	%			100	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

QC Batch: PMST/5800 Analysis Method: Dry Weight
QC Batch Method: Dry Weight Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30166375001, 30166375002, 30166375003, 30166375004, 30166375005, 30166375006, 30166375007, 30166375008

SAMPLE DUPLICATE: 990265

Parameter	Units	30166178025 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	14.0	14.4	3	

SAMPLE DUPLICATE: 990266

Parameter	Units	30166178026 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	13.4	16.1	18	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/25945

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/25946

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-Barkeyville (#M-209)
Pace Project No.: 30166375

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30166375001	**SB-3 (3-4)**	EPA 5035A	MSV/25945	EPA 8260B	MSV/25963
30166375002	**SB-4 (3-4)**	EPA 5035A	MSV/25945	EPA 8260B	MSV/25963
30166375003	**SB-5 (3-4)**	EPA 5035A	MSV/25946	EPA 8260B	MSV/25962
30166375004	**SB-6 (4-5)**	EPA 5035A	MSV/25945	EPA 8260B	MSV/25963
30166375005	**MW-5 (3-4)**	EPA 5035A	MSV/25946	EPA 8260B	MSV/25962
30166375006	**MW-6 (3-4)**	EPA 5035A	MSV/25945	EPA 8260B	MSV/25963
30166375007	**MW-7 (4-5)**	EPA 5035A	MSV/25946	EPA 8260B	MSV/25962
30166375008	**MW-8 (4-5)**	EPA 5035A	MSV/25946	EPA 8260B	MSV/25962
30166375001	**SB-3 (3-4)**	Dry Weight	PMST/5800		
30166375002	**SB-4 (3-4)**	Dry Weight	PMST/5800		
30166375003	**SB-5 (3-4)**	Dry Weight	PMST/5800		
30166375004	**SB-6 (4-5)**	Dry Weight	PMST/5800		
30166375005	**MW-5 (3-4)**	Dry Weight	PMST/5800		
30166375006	**MW-6 (3-4)**	Dry Weight	PMST/5800		
30166375007	**MW-7 (4-5)**	Dry Weight	PMST/5800		
30166375008	**MW-8 (4-5)**	Dry Weight	PMST/5800		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1915396

Section A Required Client Information:

Company: GES
Address: 301 Commerce Park Drive
Conberry Twp, PA 16066
Email To: jhinkle@gesonline.com
Phone: 1-800-267-2549 Fax: 866-907-2178
Requested Due Date/TAT: Standard

Section B Required Project Information:

Report To: Joseph Hinkle
Copy To:
Purchase Order No.:
Project Name: UPA - Berkeyville (#M-209)
Project Number: 0704730

Section C Invoice Information:

Attention: Joseph Hinkle
Company Name: GES
Address: 301 Commerce Park Dr, Cranberry Twp, PA
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: PA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	PA Diesel New Short List	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-3 (3-4)	SL	G			11/23/15	1520		4	1					2	1			X		30166375001
2	SB-4 (3-4)					11/23/15	1030														002
3	SB-5 (3-4)					11/24/15	0810														003
4	SB-6 (4-5)						0945														004
5	MW-5 (3-4)						1110														005
6	MW-6 (3-4)						1410														006
7	MW-7 (4-5)						1520														007
8	MW-8 (4-5)					11/25/15	0830														008
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Equis EDD Required	Jesse Wood	11/25/15	1200	GES Warehouse	11/25/15	1200				
	Jesse Wood	11/25/15	1200	PACE	11/25/15	2.1°				
	PACE	11/25/15	1530		11-25-15	1530	2.1	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Wood

SIGNATURE of SAMPLER: Jesse Wood DATE Signed (MM/DD/YY): 11/25/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

RTB

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project # 30166375

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no **Biological Tissue is Frozen:** Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ___ Other Foam

Thermometer Used 8 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 1.9 °C **Correction Factor:** +0.2 °C **Final Temp:** 2.1 °C

Date and Initials of person examining contents: 11-25-15 NJV

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☒No	Initial when completed NJV / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Rachel Christmas **Date:** 11/25/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number: 30166375

Client Name:

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other	Other
601	SL		1																						
602	SL		1																						

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 17, 2015

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on December 03, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-8 10-11' **Lab ID: 30166781001** Collected: 11/30/15 10:58 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	71-43-2	1c
Ethylbenzene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	1634-04-4	1c
Naphthalene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	91-20-3	1c
Toluene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	284	50	12/04/15 13:26	12/04/15 14:27	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 14:27	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	50	12/04/15 13:26	12/04/15 14:27	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 14:27	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 14:27	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.1**	%	0.10	1		12/07/15 14:36		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-8 18-19' **Lab ID: 30166781002** Collected: 11/30/15 11:20 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	71-43-2	1c
Ethylbenzene	**820**	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	100-41-4	1c
Isopropylbenzene (Cumene)	**353**	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	1634-04-4	1c
Naphthalene	**999**	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	91-20-3	1c
Toluene	ND	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	108-88-3	1c
1,2,4-Trimethylbenzene	**5980**	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	95-63-6	1c
1,3,5-Trimethylbenzene	**2150**	ug/kg	248	50	12/04/15 13:26	12/04/15 14:53	108-67-8	1c
Surrogates								
Toluene-d8 (S)	106	%	68-135	50	12/04/15 13:26	12/04/15 14:53	2037-26-5	
4-Bromofluorobenzene (S)	102	%	65-146	50	12/04/15 13:26	12/04/15 14:53	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 14:53	17060-07-0	
Dibromofluoromethane (S)	90	%	70-130	50	12/04/15 13:26	12/04/15 14:53	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.6**	%	0.10	1		12/07/15 14:39		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-7 14-15' **Lab ID: 30166781003** Collected: 11/30/15 14:47 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	71-43-2	1c
Ethylbenzene	**490**	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	100-41-4	1c
Isopropylbenzene (Cumene)	**881**	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	1634-04-4	1c
Naphthalene	**1230**	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	91-20-3	1c
Toluene	ND	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	108-88-3	1c
1,2,4-Trimethylbenzene	**24100**	ug/kg	2550	500	12/04/15 13:26	12/07/15 17:29	95-63-6	
1,3,5-Trimethylbenzene	**8990**	ug/kg	255	50	12/04/15 13:26	12/04/15 15:20	108-67-8	1c
Surrogates								
Toluene-d8 (S)	106	%	68-135	50	12/04/15 13:26	12/04/15 15:20	2037-26-5	
4-Bromofluorobenzene (S)	108	%	65-146	50	12/04/15 13:26	12/04/15 15:20	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 15:20	17060-07-0	
Dibromofluoromethane (S)	90	%	70-130	50	12/04/15 13:26	12/04/15 15:20	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**9.4**	%	0.10	1		12/07/15 14:39		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-7 19-20' **Lab ID: 30166781004** Collected: 11/30/15 15:10 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	71-43-2	1c
Ethylbenzene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	98-82-8	1c
Methyl-tert-butyl ether	**356**	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	1634-04-4	1c
Naphthalene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	91-20-3	1c
Toluene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	256	50	12/04/15 13:26	12/04/15 15:47	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 15:47	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	50	12/04/15 13:26	12/04/15 15:47	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 15:47	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 15:47	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**17.2**	%	0.10	1		12/07/15 14:40		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-6 9-10' **Lab ID: 30166781005** Collected: 12/01/15 07:58 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	71-43-2	1c
Ethylbenzene	**702**	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	1634-04-4	1c
Naphthalene	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	91-20-3	1c
Toluene	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	315	50	12/04/15 13:26	12/04/15 16:13	108-67-8	1c
Surrogates								
Toluene-d8 (S)	103	%	68-135	50	12/04/15 13:26	12/04/15 16:13	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	50	12/04/15 13:26	12/04/15 16:13	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 16:13	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 16:13	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.8**	%	0.10	1		12/07/15 14:40		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-6 14-15' **Lab ID: 30166781006** Collected: 12/01/15 08:18 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	71-43-2	1c
Ethylbenzene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	1634-04-4	1c
Naphthalene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	91-20-3	1c
Toluene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	214	50	12/04/15 13:26	12/04/15 16:40	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 16:40	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	12/04/15 13:26	12/04/15 16:40	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 16:40	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 16:40	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.2**	%	0.10	1		12/07/15 14:44		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-5 10-11' **Lab ID: 30166781007** Collected: 12/01/15 10:35 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	71-43-2	1c
Ethylbenzene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	1634-04-4	1c
Naphthalene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	91-20-3	1c
Toluene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	203	50	12/04/15 13:26	12/04/15 17:06	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 17:06	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	50	12/04/15 13:26	12/04/15 17:06	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	69-137	50	12/04/15 13:26	12/04/15 17:06	17060-07-0	
Dibromofluoromethane (S)	91	%	70-130	50	12/04/15 13:26	12/04/15 17:06	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.6**	%	0.10	1		12/07/15 14:44		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: MW-5 12-13' **Lab ID: 30166781008** Collected: 12/01/15 10:40 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	71-43-2	1c
Ethylbenzene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	98-82-8	1c
Methyl-tert-butyl ether	**366**	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	1634-04-4	1c
Naphthalene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	91-20-3	1c
Toluene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	236	50	12/04/15 13:26	12/04/15 17:33	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 17:33	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	12/04/15 13:26	12/04/15 17:33	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 17:33	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 17:33	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**13.3**	%	0.10	1		12/07/15 14:43		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: Duplicate **Lab ID: 30166781009** Collected: 12/01/15 10:35 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	71-43-2	1c
Ethylbenzene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	1634-04-4	1c
Naphthalene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	91-20-3	1c
Toluene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	288	50	12/04/15 13:26	12/04/15 17:59	108-67-8	1c
Surrogates								
Toluene-d8 (S)	104	%	68-135	50	12/04/15 13:26	12/04/15 17:59	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	12/04/15 13:26	12/04/15 17:59	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 17:59	17060-07-0	
Dibromofluoromethane (S)	88	%	70-130	50	12/04/15 13:26	12/04/15 17:59	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.4**	%	0.10	1		12/07/15 14:44		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: SB-5 6-7' **Lab ID: 30166781010** Collected: 12/01/15 13:49 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**2880**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	71-43-2	1c
Ethylbenzene	**14700**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	100-41-4	1c
Isopropylbenzene (Cumene)	**1360**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	98-82-8	1c
Methyl-tert-butyl ether	**323**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	1634-04-4	1c
Naphthalene	**4710**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	91-20-3	1c
Toluene	**9160**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	108-88-3	1c
1,2,4-Trimethylbenzene	**27500**	ug/kg	2410	500	12/04/15 13:26	12/07/15 17:56	95-63-6	
1,3,5-Trimethylbenzene	**8000**	ug/kg	241	50	12/04/15 13:26	12/04/15 18:26	108-67-8	1c
Surrogates								
Toluene-d8 (S)	106	%	68-135	50	12/04/15 13:26	12/04/15 18:26	2037-26-5	
4-Bromofluorobenzene (S)	105	%	65-146	50	12/04/15 13:26	12/04/15 18:26	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 18:26	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 18:26	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**9.0**	%	0.10	1		12/07/15 14:45		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: SB-5 12-13' **Lab ID: 30166781011** Collected: 12/01/15 14:03 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	71-43-2	1c
Ethylbenzene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	98-82-8	1c
Methyl-tert-butyl ether	**287**	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	1634-04-4	1c
Naphthalene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	91-20-3	1c
Toluene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	227	50	12/04/15 13:26	12/04/15 18:52	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 18:52	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	50	12/04/15 13:26	12/04/15 18:52	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	69-137	50	12/04/15 13:26	12/04/15 18:52	17060-07-0	
Dibromofluoromethane (S)	88	%	70-130	50	12/04/15 13:26	12/04/15 18:52	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**12.7**	%	0.10	1		12/07/15 14:45		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: SB-6 9-10' **Lab ID: 30166781012** Collected: 12/01/15 15:45 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	71-43-2	1c
Ethylbenzene	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	1634-04-4	1c
Naphthalene	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	91-20-3	1c
Toluene	ND	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	108-88-3	1c
1,2,4-Trimethylbenzene	**492**	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	95-63-6	1c
1,3,5-Trimethylbenzene	**227**	ug/kg	213	50	12/04/15 13:26	12/04/15 19:19	108-67-8	1c
Surrogates								
Toluene-d8 (S)	106	%	68-135	50	12/04/15 13:26	12/04/15 19:19	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	50	12/04/15 13:26	12/04/15 19:19	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 19:19	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	12/04/15 13:26	12/04/15 19:19	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**16.0**	%	0.10	1		12/07/15 14:46		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: SB-6 20-21' **Lab ID: 30166781013** Collected: 12/01/15 16:06 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	71-43-2	1c
Ethylbenzene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	1634-04-4	1c
Naphthalene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	91-20-3	1c
Toluene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	295	50	12/04/15 13:26	12/04/15 19:45	108-67-8	1c
Surrogates								
Toluene-d8 (S)	104	%	68-135	50	12/04/15 13:26	12/04/15 19:45	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	50	12/04/15 13:26	12/04/15 19:45	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	50	12/04/15 13:26	12/04/15 19:45	17060-07-0	
Dibromofluoromethane (S)	88	%	70-130	50	12/04/15 13:26	12/04/15 19:45	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**16.9**	%	0.10	1		12/07/15 14:47		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Sample: SB-4 19-20' **Lab ID: 30166781014** Collected: 12/02/15 08:42 Received: 12/03/15 12:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	71-43-2	1c
Ethylbenzene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	1634-04-4	1c
Naphthalene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	91-20-3	1c
Toluene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	222	50	12/04/15 13:26	12/04/15 20:12	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	12/04/15 13:26	12/04/15 20:12	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	12/04/15 13:26	12/04/15 20:12	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	50	12/04/15 13:26	12/04/15 20:12	17060-07-0	
Dibromofluoromethane (S)	90	%	70-130	50	12/04/15 13:26	12/04/15 20:12	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**9.3**	%	0.10	1		12/07/15 15:13		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

QC Batch: MSV/26010 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30166781001, 30166781002, 30166781003, 30166781004, 30166781005, 30166781006, 30166781007, 30166781008, 30166781009, 30166781010, 30166781011, 30166781012, 30166781013, 30166781014

METHOD BLANK: 992489 Matrix: Solid
Associated Lab Samples: 30166781001, 30166781002, 30166781003, 30166781004, 30166781005, 30166781006, 30166781007, 30166781008, 30166781009, 30166781010, 30166781011, 30166781012, 30166781013, 30166781014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	12/04/15 12:58	
1,3,5-Trimethylbenzene	ug/kg	ND	250	12/04/15 12:58	
Benzene	ug/kg	ND	250	12/04/15 12:58	
Ethylbenzene	ug/kg	ND	250	12/04/15 12:58	
Isopropylbenzene (Cumene)	ug/kg	ND	250	12/04/15 12:58	
Methyl-tert-butyl ether	ug/kg	ND	250	12/04/15 12:58	
Naphthalene	ug/kg	ND	250	12/04/15 12:58	
Toluene	ug/kg	ND	250	12/04/15 12:58	
1,2-Dichloroethane-d4 (S)	%	104	69-137	12/04/15 12:58	
4-Bromofluorobenzene (S)	%	97	65-146	12/04/15 12:58	
Dibromofluoromethane (S)	%	91	70-130	12/04/15 12:58	
Toluene-d8 (S)	%	105	68-135	12/04/15 12:58	

LABORATORY CONTROL SAMPLE: 992490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	20.2	101	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	19.5	97	74-129	
Benzene	ug/kg	20	19.3	97	71-137	
Ethylbenzene	ug/kg	20	19.9	100	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	19.8	99	78-133	
Methyl-tert-butyl ether	ug/kg	20	16.5	83	77-141	
Naphthalene	ug/kg	20	19.3	96	81-126	
Toluene	ug/kg	20	19.7	98	72-127	
1,2-Dichloroethane-d4 (S)	%			103	69-137	
4-Bromofluorobenzene (S)	%			99	65-146	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			105	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

QC Batch: PMST/5813 Analysis Method: Dry Weight
QC Batch Method: Dry Weight Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30166781001, 30166781002, 30166781003, 30166781004, 30166781005, 30166781006, 30166781007, 30166781008, 30166781009, 30166781010, 30166781011, 30166781012, 30166781013

SAMPLE DUPLICATE: 993359

Parameter	Units	30167046004 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	12.1	12.7	5	

SAMPLE DUPLICATE: 993360

Parameter	Units	30167046005 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	7.5	9.9	28	D6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

QC Batch: PMST/5814
QC Batch Method: Dry Weight
Analysis Method: Dry Weight
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30166781014

SAMPLE DUPLICATE: 993361

Parameter	Units	30166781014 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	9.3	9.2	1	

SAMPLE DUPLICATE: 993362

Parameter	Units	30166898003 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	ND	ND		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/26010

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30166781

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30166781001	MW-8 10-11'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781002	MW-8 18-19'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781003	MW-7 14-15'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781004	MW-7 19-20'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781005	MW-6 9-10'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781006	MW-6 14-15'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781007	MW-5 10-11'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781008	MW-5 12-13'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781009	Duplicate	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781010	SB-5 6-7'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781011	SB-5 12-13'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781012	SB-6 9-10'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781013	SB-6 20-21'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781014	SB-4 19-20'	EPA 5035A	MSV/26010	EPA 8260B	MSV/26020
30166781001	MW-8 10-11'	Dry Weight	PMST/5813		
30166781002	MW-8 18-19'	Dry Weight	PMST/5813		
30166781003	MW-7 14-15'	Dry Weight	PMST/5813		
30166781004	MW-7 19-20'	Dry Weight	PMST/5813		
30166781005	MW-6 9-10'	Dry Weight	PMST/5813		
30166781006	MW-6 14-15'	Dry Weight	PMST/5813		
30166781007	MW-5 10-11'	Dry Weight	PMST/5813		
30166781008	MW-5 12-13'	Dry Weight	PMST/5813		
30166781009	Duplicate	Dry Weight	PMST/5813		
30166781010	SB-5 6-7'	Dry Weight	PMST/5813		
30166781011	SB-5 12-13'	Dry Weight	PMST/5813		
30166781012	SB-6 9-10'	Dry Weight	PMST/5813		
30166781013	SB-6 20-21'	Dry Weight	PMST/5813		
30166781014	SB-4 19-20'	Dry Weight	PMST/5814		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30166781

Section A — Required Client Information:

Company:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive
	Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com
Phone:	800-267-2549 Fax 724-779-4617
Requested Due Date/TAT:	10 Day (Default)

Section B — Required Project Information:

Report To:	Joe Hinkle
Copy To:	Joan Amodeo
	301 Commerce Park Drive, Cranberry Twp, PA 16066
Purchase Order No	UPA Barkeyville M-209
Client Project ID:	UPA Barkeyville M-209
Container Order Number:	

Section C — Invoice Information:

Attention:	Joe Hinkle
Company Name:	Groundwater & Environmental Services
Address	301 Commerce Park Drive, Cranberry Twp, PA 16066
Pace Quote Reference:	
Pace Project Manager:	Christner, Rachel
Pace Profile #:	

Regulatory Agency: UST - Underground Storage Tank

State / Location: Pennsylvania

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)
1	MW-8 10-11'	SL	G	11-30-15	1058				4	x					x	x			X	001
2	MW-8 18-19'	SL	G	11-30-15	1120				4	x					x	x			X	002
3	MW-7 14-15'	SL	G	11-30-15	1447				4	x					x	x			X	003
4	MW-7 19-20'	SL	G	11-30-15	1510				4	x					x	x			X	004
5	MW-6 9-10'	SL	G	12-1-15	0758				4	x					x	x			X	005
6	MW-6 14-15'	SL	G	12-1-15	0818				4	x					x	x			X	006
7	MW-5 10-11'	SL	G	12-1-15	1035				4	x					x	x			X	007
8	MW-5 12-13'	SL	G	12-1-15	1040				4	x					x	x			X	008
9	Duplicate	SL	G	12-1-15	1035				4	x					x	x			X	009
10	SB-5 6-7'	SL	G	12-1-15	1349				4	x					x	x			X	010
11	SB-5 12-13'	SL	G	12-1-15	1403				4	x					x	x			X	011
12	SB-6 9-10'	SL	G	12-1-15	1545				4	x					x	x			X	ON

Requested Analysis Filtered (Y/N): Y

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Lauren Bidwell/GES	12-2-15	1200	GES Receiving	12-2-15	1200
	GES Receiving	12-2-15	1200	[illegible]	12/3/15	11:25
	[illegible] 12-3-15	12:35	[illegible]		12/3/15	1235

SAMPLE CONDITIONS

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
3.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell

SIGNATURE of SAMPLER: Lauren Bidwell DATE Signed: 12-2-2015

EQUIS EDD Required

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

30166781

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 2 Of 2

Section A
Required Client Information:

Company:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive
	Cranberry Twp. PA 16066
Email To:	jhinkle@gesonline.com
Phone:	800-267-2549 Fax 724-779-4617
Requested Due Date/TAT:	10 Day (Default)

Section B
Required Project Information:

Report To:	Joe Hinkle
Copy To:	Joan Amodeo
	301 Commerce Park Drive, Cranberry Twp, PA 16066
Purchase Order No	UPA Barkeyville M-209
Client Project ID	UPA Barkeyville M-209
Container Order Number:	

Section C
Invoice Information:

Attention:	Joe Hinkle
Company Name:	Groundwater & Environmental Services
Address	301 Commerce Park Drive, Cranberry Twp, PA 16066
Pace Quote Reference:	
Pace Project Manager:	Christner, Rachel
Pace Profile #:	

Regulatory Agency	
UST - Underground Storage Tank	
State / Location	
Pennsylvania	

MATRIX CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

Requested Analysis Filtered (Y/N)

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	SB-6 20-21'	SL	G	12-1-15	1606				4	x					x	x			X		a3
2	SB-4 19-20'	SL	G	12-2-15	0842				4	X					X	X			X		a4
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Lauren Bidwell / GES	12-2-15	1200	GES Receiving	12-2-15	1200				
	GES Receiving	12-2-15	1200	[illegible]	12-3-15	1125				
	[illegible] Pace	12-3-15	1235	[illegible] Pace	12/3/15	1235	3.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell

SIGNATURE of SAMPLER: Lauren Bidwell DATE Signed: 12-2-2015

EQUIS EDD Required

BLM

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project # 30166781

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no **Biological Tissue is Frozen:** Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ___ Other foam, ziplocs

Thermometer Used 10 **Type of Ice:** Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 3.3 °C **Correction Factor:** -0.2 °C **Final Temp:** 3.1 °C

Date and Initials of person examining contents: [initials] 12/3/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☑No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☑N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☐N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☑No	Initial when completed [initials] Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: [signature] **Date:** 12/3/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Face Analytical

page 2

Project Number: 30166781

Client Name:

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001 SL	SL		X																					
014 SL	SL		X																					

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 21, 2015

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on December 05, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

Sample: SB-3 (7-8) **Lab ID: 30167043001** Collected: 12/02/15 10:30 Received: 12/05/15 11:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	71-43-2	1c
Ethylbenzene	**458**	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	1634-04-4	1c
Naphthalene	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	91-20-3	1c
Toluene	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	294	50	12/07/15 07:01	12/07/15 15:56	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	50	12/07/15 07:01	12/07/15 15:56	2037-26-5	
4-Bromofluorobenzene (S)	103	%	65-146	50	12/07/15 07:01	12/07/15 15:56	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	69-137	50	12/07/15 07:01	12/07/15 15:56	17060-07-0	
Dibromofluoromethane (S)	93	%	70-130	50	12/07/15 07:01	12/07/15 15:56	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**11.6**	%	0.10	1		12/10/15 14:26		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

Sample: SB-3 (13-14) **Lab ID: 30167043002** Collected: 12/02/15 10:50 Received: 12/05/15 11:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	1634-04-4	1c
Naphthalene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	91-20-3	1c
Toluene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.2	1	12/07/15 07:01	12/07/15 15:30	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	1	12/07/15 07:01	12/07/15 15:30	2037-26-5	
4-Bromofluorobenzene (S)	102	%	65-146	1	12/07/15 07:01	12/07/15 15:30	460-00-4	
1,2-Dichloroethane-d4 (S)	114	%	69-137	1	12/07/15 07:01	12/07/15 15:30	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	12/07/15 07:01	12/07/15 15:30	1868-53-7	
Percent Moisture	Analytical Method: Dry Weight							
Percent Moisture	**10.4**	%	0.10	1		12/10/15 14:27		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

QC Batch: MSV/26037
QC Batch Method: EPA 5035A
Associated Lab Samples: 30167043001

Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL

METHOD BLANK: 993512 Matrix: Solid
Associated Lab Samples: 30167043001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	12/07/15 12:20	
1,3,5-Trimethylbenzene	ug/kg	ND	250	12/07/15 12:20	
Benzene	ug/kg	ND	250	12/07/15 12:20	
Ethylbenzene	ug/kg	ND	250	12/07/15 12:20	
Isopropylbenzene (Cumene)	ug/kg	ND	250	12/07/15 12:20	
Methyl-tert-butyl ether	ug/kg	ND	250	12/07/15 12:20	
Naphthalene	ug/kg	ND	250	12/07/15 12:20	
Toluene	ug/kg	ND	250	12/07/15 12:20	
1,2-Dichloroethane-d4 (S)	%	106	69-137	12/07/15 12:20	
4-Bromofluorobenzene (S)	%	98	65-146	12/07/15 12:20	
Dibromofluoromethane (S)	%	93	70-130	12/07/15 12:20	
Toluene-d8 (S)	%	103	68-135	12/07/15 12:20	

LABORATORY CONTROL SAMPLE: 993513

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	17.7	89	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	16.9	85	74-129	
Benzene	ug/kg	20	16.6	83	71-137	
Ethylbenzene	ug/kg	20	16.3	82	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	16.9	84	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.5	88	77-141	
Naphthalene	ug/kg	20	16.8	84	81-126	
Toluene	ug/kg	20	16.5	82	72-127	
1,2-Dichloroethane-d4 (S)	%			108	69-137	
4-Bromofluorobenzene (S)	%			99	65-146	
Dibromofluoromethane (S)	%			102	70-130	
Toluene-d8 (S)	%			101	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

QC Batch: MSV/26038
QC Batch Method: EPA 5035A
Associated Lab Samples: 30167043002

Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL

METHOD BLANK: 993518 Matrix: Solid
Associated Lab Samples: 30167043002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	12/07/15 12:46	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	12/07/15 12:46	
Benzene	ug/kg	ND	5.0	12/07/15 12:46	
Ethylbenzene	ug/kg	ND	5.0	12/07/15 12:46	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	12/07/15 12:46	
Methyl-tert-butyl ether	ug/kg	ND	5.0	12/07/15 12:46	
Naphthalene	ug/kg	ND	5.0	12/07/15 12:46	
Toluene	ug/kg	ND	5.0	12/07/15 12:46	
1,2-Dichloroethane-d4 (S)	%	106	69-137	12/07/15 12:46	
4-Bromofluorobenzene (S)	%	97	65-146	12/07/15 12:46	
Dibromofluoromethane (S)	%	95	70-130	12/07/15 12:46	
Toluene-d8 (S)	%	104	68-135	12/07/15 12:46	

LABORATORY CONTROL SAMPLE: 993519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	17.7	89	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	16.9	85	74-129	
Benzene	ug/kg	20	16.6	83	71-137	
Ethylbenzene	ug/kg	20	16.3	82	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	16.9	84	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.5	88	77-141	
Naphthalene	ug/kg	20	16.8	84	81-126	
Toluene	ug/kg	20	16.5	82	72-127	
1,2-Dichloroethane-d4 (S)	%			108	69-137	
4-Bromofluorobenzene (S)	%			99	65-146	
Dibromofluoromethane (S)	%			102	70-130	
Toluene-d8 (S)	%			101	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

QC Batch: PMST/5817
QC Batch Method: Dry Weight
Analysis Method: Dry Weight
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30167043001, 30167043002

SAMPLE DUPLICATE: 995483

Parameter	Units	30167304001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	10.7	10.6	2	

SAMPLE DUPLICATE: 995486

Parameter	Units	30167304002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	15.8	18.0	13	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/26037

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/26038

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-M209-Barkeyville
Pace Project No.: 30167043

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30167043001	**SB-3 (7-8)**	EPA 5035A	MSV/26037	EPA 8260B	MSV/26045
30167043002	**SB-3 (13-14)**	EPA 5035A	MSV/26038	EPA 8260B	MSV/26046
30167043001	**SB-3 (7-8)**	Dry Weight	PMST/5817		
30167043002	**SB-3 (13-14)**	Dry Weight	PMST/5817		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GES	Report To:	Joe Hinkle	Attention:	
Address:	301 Commerce Park DR.	Copy To:	Joe Hinkle	Company Name:	
	Cranberry TWP,Pa, 16066			Address:	
Email To:	hjhinkle@gesonline.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	1800-267-2549 Fax:	Project Name:	UPA -M209- Barkeyville	Pace Project Manager:	
Requested Due Date/TAT:	STND	Project Number:	704730	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	New Pa Diesel Short List	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-3 (7-8)		SL	G			12.2.15	10:30		4	x					x	x			x			30167043 001
2	SB-3 (13-14)		SL	G			12.2.15	10:50		4	x					x	x			x			002
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Tom Nieman / GES	12.4.15	1545	[signature]	12/5/15	1120	2.3	Y	N	Y

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER:	Tom Nieman	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY): 12.04.15				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

30167043

Sample Condition Upon Receipt

Pace Analytical

Client Name: CES

Project #

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: 775292721370

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ___ (Other) foam

Thermometer Used 7 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 2.1 °C Correction Factor: +0.4 °C Final Temp: 2.5 °C

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: AMC 12/5/15

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☒No	Initial when completed AMC / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel O'Connor Date: 12/7/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

page 2

Project Number:

Client Name: CES

30167043

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001	SL		4																					
002	SL		4																					

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

March 06, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on February 19, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: SB-7 (3-4) **Lab ID: 30173899001** Collected: 02/15/16 13:45 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	71-43-2	1c
Ethylbenzene	**440**	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	1634-04-4	1c
Naphthalene	**319**	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	91-20-3	1c
Toluene	**674**	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	108-88-3	1c
1,2,4-Trimethylbenzene	**1290**	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	95-63-6	1c
1,3,5-Trimethylbenzene	**401**	ug/kg	189	50	02/23/16 12:00	02/23/16 16:58	108-67-8	1c
Surrogates								
Toluene-d8 (S)	97	%	68-135	50	02/23/16 12:00	02/23/16 16:58	2037-26-5	
4-Bromofluorobenzene (S)	95	%	65-146	50	02/23/16 12:00	02/23/16 16:58	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	69-137	50	02/23/16 12:00	02/23/16 16:58	17060-07-0	
Dibromofluoromethane (S)	91	%	70-130	50	02/23/16 12:00	02/23/16 16:58	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.2**	%	0.10	1		03/05/16 15:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-9 (4-5) **Lab ID: 30173899002** Collected: 02/15/16 16:45 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	1634-04-4	1c
Naphthalene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	91-20-3	1c
Toluene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.5	1	02/23/16 12:00	02/23/16 13:25	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/23/16 12:00	02/23/16 13:25	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	1	02/23/16 12:00	02/23/16 13:25	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	69-137	1	02/23/16 12:00	02/23/16 13:25	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/23/16 12:00	02/23/16 13:25	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**9.9**	%	0.10	1		03/05/16 15:09		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: SB-8 (5-6) **Lab ID: 30173899003** Collected: 02/17/16 09:10 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	71-43-2	1c
Ethylbenzene	ND	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	1634-04-4	1c
Naphthalene	**9250**	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	91-20-3	1c
Toluene	ND	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	108-88-3	1c
1,2,4-Trimethylbenzene	**13500**	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	95-63-6	1c
1,3,5-Trimethylbenzene	**3690**	ug/kg	1770	500	02/23/16 12:00	02/23/16 17:24	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	500	02/23/16 12:00	02/23/16 17:24	2037-26-5	
4-Bromofluorobenzene (S)	101	%	65-146	500	02/23/16 12:00	02/23/16 17:24	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	69-137	500	02/23/16 12:00	02/23/16 17:24	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	500	02/23/16 12:00	02/23/16 17:24	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.8**	%	0.10	1		03/05/16 15:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: SB-9 (4-5) **Lab ID: 30173899004** Collected: 02/17/16 10:55 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	71-43-2	1c
Ethylbenzene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	1634-04-4	1c
Naphthalene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	91-20-3	1c
Toluene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	170	50	02/23/16 12:00	02/23/16 17:51	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	50	02/23/16 12:00	02/23/16 17:51	2037-26-5	
4-Bromofluorobenzene (S)	92	%	65-146	50	02/23/16 12:00	02/23/16 17:51	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	69-137	50	02/23/16 12:00	02/23/16 17:51	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	02/23/16 12:00	02/23/16 17:51	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.6**	%	0.10	1		03/05/16 15:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-10D (4-5) **Lab ID: 30173899005** Collected: 02/17/16 12:05 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	71-43-2	1c
Ethylbenzene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	1634-04-4	1c
Naphthalene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	91-20-3	1c
Toluene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	158	50	02/23/16 12:00	02/23/16 18:17	108-67-8	1c
Surrogates								
Toluene-d8 (S)	97	%	68-135	50	02/23/16 12:00	02/23/16 18:17	2037-26-5	
4-Bromofluorobenzene (S)	92	%	65-146	50	02/23/16 12:00	02/23/16 18:17	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	69-137	50	02/23/16 12:00	02/23/16 18:17	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	02/23/16 12:00	02/23/16 18:17	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**8.8**	%	0.10	1		03/05/16 15:11		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-10S (4-5) **Lab ID: 30173899006** Collected: 02/17/16 14:15 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 13:51	108-67-8	1c
Surrogates								
Toluene-d8 (S)	93	%	68-135	1	02/23/16 12:00	02/23/16 13:51	2037-26-5	
4-Bromofluorobenzene (S)	95	%	65-146	1	02/23/16 12:00	02/23/16 13:51	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	69-137	1	02/23/16 12:00	02/23/16 13:51	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	02/23/16 12:00	02/23/16 13:51	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**10.9**	%	0.10	1		03/05/16 15:11		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-11 (4-5) **Lab ID: 30173899007** Collected: 02/17/16 15:55 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	1634-04-4	1c
Naphthalene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	91-20-3	1c
Toluene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.6	1	02/23/16 12:00	02/23/16 14:18	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/23/16 12:00	02/23/16 14:18	2037-26-5	
4-Bromofluorobenzene (S)	94	%	65-146	1	02/23/16 12:00	02/23/16 14:18	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	1	02/23/16 12:00	02/23/16 14:18	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/23/16 12:00	02/23/16 14:18	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**9.4**	%	0.10	1		03/05/16 15:12		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-12 (4-5) **Lab ID: 30173899008** Collected: 02/17/16 15:15 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	1634-04-4	1c
Naphthalene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	91-20-3	1c
Toluene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.8	1	02/23/16 12:00	02/23/16 14:45	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/23/16 12:00	02/23/16 14:45	2037-26-5	
4-Bromofluorobenzene (S)	94	%	65-146	1	02/23/16 12:00	02/23/16 14:45	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	69-137	1	02/23/16 12:00	02/23/16 14:45	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/23/16 12:00	02/23/16 14:45	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.6**	%	0.10	1		03/05/16 15:13		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-13 (3-4) **Lab ID: 30173899009** Collected: 02/17/16 14:45 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	1634-04-4	1c
Naphthalene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	91-20-3	1c
Toluene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.4	1	02/23/16 12:00	02/23/16 15:11	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/23/16 12:00	02/23/16 15:11	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	02/23/16 12:00	02/23/16 15:11	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	69-137	1	02/23/16 12:00	02/23/16 15:11	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/23/16 12:00	02/23/16 15:11	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.1**	%	0.10	1		03/05/16 15:13		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-13 (9-11) **Lab ID: 30173899010** Collected: 02/17/16 16:45 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	1634-04-4	1c
Naphthalene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	91-20-3	1c
Toluene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.1	1	02/23/16 12:00	02/23/16 15:38	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/23/16 12:00	02/23/16 15:38	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	1	02/23/16 12:00	02/23/16 15:38	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	1	02/23/16 12:00	02/23/16 15:38	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/23/16 12:00	02/23/16 15:38	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.8**	%	0.10	1		03/05/16 15:13		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Sample: MW-13 (11-13) **Lab ID: 30173899011** Collected: 02/17/16 16:50 Received: 02/19/16 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**20.6**	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/23/16 12:00	02/23/16 16:04	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/23/16 12:00	02/23/16 16:04	2037-26-5	
4-Bromofluorobenzene (S)	94	%	65-146	1	02/23/16 12:00	02/23/16 16:04	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	69-137	1	02/23/16 12:00	02/23/16 16:04	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/23/16 12:00	02/23/16 16:04	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**14.3**	%	0.10	1		03/05/16 15:14		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

QC Batch: MSV/27171 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30173899002, 30173899006, 30173899007, 30173899008, 30173899009, 30173899010, 30173899011

METHOD BLANK: 1029223 Matrix: Solid
Associated Lab Samples: 30173899002, 30173899006, 30173899007, 30173899008, 30173899009, 30173899010, 30173899011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	02/23/16 11:12	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	02/23/16 11:12	
Benzene	ug/kg	ND	5.0	02/23/16 11:12	
Ethylbenzene	ug/kg	ND	5.0	02/23/16 11:12	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	02/23/16 11:12	
Methyl-tert-butyl ether	ug/kg	ND	5.0	02/23/16 11:12	
Naphthalene	ug/kg	ND	5.0	02/23/16 11:12	
Toluene	ug/kg	ND	5.0	02/23/16 11:12	
1,2-Dichloroethane-d4 (S)	%	95	69-137	02/23/16 11:12	
4-Bromofluorobenzene (S)	%	93	65-146	02/23/16 11:12	
Dibromofluoromethane (S)	%	96	70-130	02/23/16 11:12	
Toluene-d8 (S)	%	96	68-135	02/23/16 11:12	

LABORATORY CONTROL SAMPLE: 1029224

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	17.4	87	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	17.3	86	74-129	
Benzene	ug/kg	20	16.8	84	71-137	
Ethylbenzene	ug/kg	20	17.6	88	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	16.6	83	78-133	
Methyl-tert-butyl ether	ug/kg	20	15.7	78	77-141	
Naphthalene	ug/kg	20	17.8	89	81-126	
Toluene	ug/kg	20	16.5	83	72-127	
1,2-Dichloroethane-d4 (S)	%			93	69-137	
4-Bromofluorobenzene (S)	%			96	65-146	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			96	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

QC Batch: MSV/27172 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30173899001, 30173899003, 30173899004, 30173899005

METHOD BLANK: 1029225 Matrix: Solid
Associated Lab Samples: 30173899001, 30173899003, 30173899004, 30173899005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	02/23/16 10:45	
1,3,5-Trimethylbenzene	ug/kg	ND	250	02/23/16 10:45	
Benzene	ug/kg	ND	250	02/23/16 10:45	
Ethylbenzene	ug/kg	ND	250	02/23/16 10:45	
Isopropylbenzene (Cumene)	ug/kg	ND	250	02/23/16 10:45	
Methyl-tert-butyl ether	ug/kg	ND	250	02/23/16 10:45	
Naphthalene	ug/kg	ND	250	02/23/16 10:45	
Toluene	ug/kg	ND	250	02/23/16 10:45	
1,2-Dichloroethane-d4 (S)	%	93	69-137	02/23/16 10:45	
4-Bromofluorobenzene (S)	%	94	65-146	02/23/16 10:45	
Dibromofluoromethane (S)	%	91	70-130	02/23/16 10:45	
Toluene-d8 (S)	%	95	68-135	02/23/16 10:45	

LABORATORY CONTROL SAMPLE: 1029226

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	17.4	87	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	17.3	86	74-129	
Benzene	ug/kg	20	16.8	84	71-137	
Ethylbenzene	ug/kg	20	17.6	88	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	16.6	83	78-133	
Methyl-tert-butyl ether	ug/kg	20	15.7	78	77-141	
Naphthalene	ug/kg	20	17.8	89	81-126	
Toluene	ug/kg	20	16.5	83	72-127	
1,2-Dichloroethane-d4 (S)	%			93	69-137	
4-Bromofluorobenzene (S)	%			96	65-146	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			96	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

QC Batch: PMST/5968 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30173899001, 30173899002, 30173899003, 30173899004, 30173899005, 30173899006, 30173899007, 30173899008, 30173899009, 30173899010, 30173899011

SAMPLE DUPLICATE: 1035967

Parameter	Units	30173899001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	13.2	12.8	3	

SAMPLE DUPLICATE: 1035968

Parameter	Units	30173899002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	9.9	9.8	2	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/27171

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27172

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30173899

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30173899001	SB-7 (3-4)	EPA 5035A	MSV/27172	EPA 8260B	MSV/27181
30173899002	MW-9 (4-5)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899003	SB-8 (5-6)	EPA 5035A	MSV/27172	EPA 8260B	MSV/27181
30173899004	SB-9 (4-5)	EPA 5035A	MSV/27172	EPA 8260B	MSV/27181
30173899005	MW-10D (4-5)	EPA 5035A	MSV/27172	EPA 8260B	MSV/27181
30173899006	MW-10S (4-5)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899007	MW-11 (4-5)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899008	MW-12 (4-5)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899009	MW-13 (3-4)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899010	MW-13 (9-11)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899011	MW-13 (11-13)	EPA 5035A	MSV/27171	EPA 8260B	MSV/27184
30173899001	SB-7 (3-4)	ASTM D2974-87	PMST/5968		
30173899002	MW-9 (4-5)	ASTM D2974-87	PMST/5968		
30173899003	SB-8 (5-6)	ASTM D2974-87	PMST/5968		
30173899004	SB-9 (4-5)	ASTM D2974-87	PMST/5968		
30173899005	MW-10D (4-5)	ASTM D2974-87	PMST/5968		
30173899006	MW-10S (4-5)	ASTM D2974-87	PMST/5968		
30173899007	MW-11 (4-5)	ASTM D2974-87	PMST/5968		
30173899008	MW-12 (4-5)	ASTM D2974-87	PMST/5968		
30173899009	MW-13 (3-4)	ASTM D2974-87	PMST/5968		
30173899010	MW-13 (9-11)	ASTM D2974-87	PMST/5968		
30173899011	MW-13 (11-13)	ASTM D2974-87	PMST/5968		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1953192

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention: Joan Amodeo
Address: 301 Commerce Park Dr.	Copy To: Joan Amodeo	Company Name: GES
Cranberry Twp, PA 16066		Address: SAME
Email To: jhinkle@gesonline.com	Purchase Order No.:	Pace Quote Reference:
Phone: 800-267-2549 Fax:	Project Name: UPA - Barkeyville (M-209)	Pace Project Manager: Rachel Christner
Requested Due Date/TAT: STANDARD	Project Number: 0704730	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☑ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	PA Diesel	"new" shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-7 (3-4)	SL	G			2/15/16	1345		4	1					2	1			X			001
2	MW-9 (4-5)	SL	G			2/15/16	1645		4	1					2	1			X			002
3	SB-8 (5-6)	SL	G			2/17/16	0910		4	1					2	1			X			003
4	SB-9 (4-5)	SL	G			2/17/16	1055		4	1					2	1			X			004
5	MW-10D (4-5)	SL	G			2/17/16	1205		4	1					2	1			X			005
6	MW-10S (4-5)	SL	G			2/17/16	1415		4	1					2	1			X			006
7	MW-11 (4-5)	SL	G			2/17/16	1555		4	1					2	1			X			007
8	MW-12 (4-5)	SL	G			2/17/16	1515		4	1					2	1			X			008
9	MW-13 (3-4)	SL	G			2/17/16	1445		4	1					2	1			X			009
10	MW-13 (9-11)	SL	G			2/17/16	1645		4	1					2	1			X			010
11	MW-13 (11-13)	SL	G			2/17/16	1650		4	1					2	1			X			011
12	Trip Blank					2/18/16	0000		2				2									012

30173899

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Temp Blank Included	Justin Paul / GES	2/18/16	1845	GES Warehouse	2/18/16	1845				
EDD required	GES Warehouse			T Martin PACE	2/19/16	3:10				
	T Martin PACE	2/19/16	5:30	Alyna R Muchaney Pace	2/19/16	1730	3.8	Y	Y	Y
Hold trip blank pending analysis										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Justin Paul

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 02/18/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

30173899

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project #: _____

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no **Biological Tissue is Frozen:** Yes No

Packing Material: Bubble Wrap ✓ Bubble Bags ___ None ___ Other (2) foam

Thermometer Used 7 Type of Ice: (Wet) Blue None ☑ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 3.7 °C Correction Factor: +0.1 °C Final Temp: 3.8 °C

Date and Initials of person examining contents: JRM 2/19/16

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☑No ☐N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☐No	Initial when completed: JRM Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Rachel B Chambers Date: 2/22/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

30173899

Pace Analytical

Project Number: _____

Client Name: GES

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001	SL		4																					
011	SL		4																					
012	WT													2										

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

March 07, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on February 22, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: MW-12 (11-13) **Lab ID: 30174103001** Collected: 02/18/16 10:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	71-43-2	1c
Ethylbenzene	**584**	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	100-41-4	1c
Isopropylbenzene (Cumene)	**670**	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	1634-04-4	1c
Naphthalene	**754**	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	91-20-3	1c
Toluene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	108-88-3	1c
1,2,4-Trimethylbenzene	**13300**	ug/kg	1490	500	02/24/16 12:00	02/25/16 11:07	95-63-6	1c
1,3,5-Trimethylbenzene	**4410**	ug/kg	149	50	02/24/16 12:00	02/24/16 16:45	108-67-8	1c
Surrogates								
Toluene-d8 (S)	98	%	68-135	50	02/24/16 12:00	02/24/16 16:45	2037-26-5	
4-Bromofluorobenzene (S)	103	%	65-146	50	02/24/16 12:00	02/24/16 16:45	460-00-4	
1,2-Dichloroethane-d4 (S)	84	%	69-137	50	02/24/16 12:00	02/24/16 16:45	17060-07-0	
Dibromofluoromethane (S)	88	%	70-130	50	02/24/16 12:00	02/24/16 16:45	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**14.6**	%	0.10	1		03/05/16 15:29		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: MW-12 (9-11) **Lab ID: 30174103002** Collected: 02/18/16 09:50 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	71-43-2	1c
Ethylbenzene	**7.6**	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	100-41-4	1c
Isopropylbenzene (Cumene)	**6.0**	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	1634-04-4	1c
Naphthalene	**4.9**	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	108-88-3	1c
1,2,4-Trimethylbenzene	**49.0**	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	95-63-6	1c
1,3,5-Trimethylbenzene	**9.2**	ug/kg	3.3	1	02/24/16 12:00	02/24/16 13:46	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/24/16 12:00	02/24/16 13:46	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	1	02/24/16 12:00	02/24/16 13:46	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	69-137	1	02/24/16 12:00	02/24/16 13:46	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/24/16 12:00	02/24/16 13:46	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**8.3**	%	0.10	1		03/05/16 15:30		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: MW-9 (15-17) **Lab ID: 30174103003** Collected: 02/18/16 14:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	71-43-2	1c
Ethylbenzene	**3.6**	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	1634-04-4	1c
Naphthalene	**4.6**	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	91-20-3	1c
Toluene	ND	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	108-88-3	1c
1,2,4-Trimethylbenzene	**69.9**	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	95-63-6	1c
1,3,5-Trimethylbenzene	**20.3**	ug/kg	3.2	1	02/24/16 12:00	02/24/16 14:08	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	1	02/24/16 12:00	02/24/16 14:08	2037-26-5	
4-Bromofluorobenzene (S)	117	%	65-146	1	02/24/16 12:00	02/24/16 14:08	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/24/16 12:00	02/24/16 14:08	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/24/16 12:00	02/24/16 14:08	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**9.4**	%	0.10	1		03/05/16 15:30		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: MW-9 (17-19) **Lab ID: 30174103004** Collected: 02/18/16 14:05 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 14:33	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/24/16 12:00	02/24/16 14:33	2037-26-5	
4-Bromofluorobenzene (S)	95	%	65-146	1	02/24/16 12:00	02/24/16 14:33	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	69-137	1	02/24/16 12:00	02/24/16 14:33	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1	02/24/16 12:00	02/24/16 14:33	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.1**	%	0.10	1		03/05/16 15:30		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-7 (5-7) **Lab ID: 30174103005** Collected: 02/19/16 07:50 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	71-43-2	1c
Ethylbenzene	**58.4**	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	100-41-4	1c
Isopropylbenzene (Cumene)	**14.7**	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	1634-04-4	1c
Naphthalene	**12.6**	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	91-20-3	1c
Toluene	ND	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	108-88-3	1c
1,2,4-Trimethylbenzene	**62.1**	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	95-63-6	1c
1,3,5-Trimethylbenzene	**5.9**	ug/kg	3.6	1	02/24/16 12:00	02/24/16 14:55	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/24/16 12:00	02/24/16 14:55	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	1	02/24/16 12:00	02/24/16 14:55	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/24/16 12:00	02/24/16 14:55	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	02/24/16 12:00	02/24/16 14:55	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**9.9**	%	0.10	1		03/05/16 15:31		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-7 (9-11) **Lab ID: 30174103006** Collected: 02/19/16 08:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	98-82-8	1c
Methyl-tert-butyl ether	**193**	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	1634-04-4	1c
Naphthalene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	91-20-3	1c
Toluene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.5	1	02/24/16 12:00	02/24/16 15:17	108-67-8	1c
Surrogates								
Toluene-d8 (S)	93	%	68-135	1	02/24/16 12:00	02/24/16 15:17	2037-26-5	
4-Bromofluorobenzene (S)	95	%	65-146	1	02/24/16 12:00	02/24/16 15:17	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/24/16 12:00	02/24/16 15:17	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	02/24/16 12:00	02/24/16 15:17	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.6**	%	0.10	1		03/05/16 15:32		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-9 (5-7) **Lab ID: 30174103007** Collected: 02/19/16 08:55 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 15:39	108-67-8	1c
Surrogates								
Toluene-d8 (S)	93	%	68-135	1	02/24/16 12:00	02/24/16 15:39	2037-26-5	
4-Bromofluorobenzene (S)	93	%	65-146	1	02/24/16 12:00	02/24/16 15:39	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/24/16 12:00	02/24/16 15:39	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	02/24/16 12:00	02/24/16 15:39	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.3**	%	0.10	1		03/05/16 15:32		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-9 (7-9) **Lab ID: 30174103008** Collected: 02/19/16 09:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/24/16 12:00	02/24/16 16:01	108-67-8	1c
Surrogates								
Toluene-d8 (S)	92	%	68-135	1	02/24/16 12:00	02/24/16 16:01	2037-26-5	
4-Bromofluorobenzene (S)	96	%	65-146	1	02/24/16 12:00	02/24/16 16:01	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	69-137	1	02/24/16 12:00	02/24/16 16:01	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	02/24/16 12:00	02/24/16 16:01	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**14.8**	%	0.10	1		03/05/16 15:33		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-8 (11-13) **Lab ID: 30174103009** Collected: 02/19/16 10:55 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	71-43-2	1c
Ethylbenzene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	1634-04-4	1c
Naphthalene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	91-20-3	1c
Toluene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	108-88-3	1c
1,2,4-Trimethylbenzene	**985**	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	149	50	02/24/16 12:00	02/24/16 17:07	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	50	02/24/16 12:00	02/24/16 17:07	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	50	02/24/16 12:00	02/24/16 17:07	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	69-137	50	02/24/16 12:00	02/24/16 17:07	17060-07-0	
Dibromofluoromethane (S)	89	%	70-130	50	02/24/16 12:00	02/24/16 17:07	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.4**	%	0.10	1		03/05/16 15:33		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: SB-8 (13-14) **Lab ID: 30174103010** Collected: 02/19/16 11:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**39.0**	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	98-82-8	1c
Methyl-tert-butyl ether	**52.4**	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	1634-04-4	1c
Naphthalene	**6.5**	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	91-20-3	1c
Toluene	ND	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	108-88-3	1c
1,2,4-Trimethylbenzene	**36.1**	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	95-63-6	1c
1,3,5-Trimethylbenzene	**4.6**	ug/kg	3.1	1	02/24/16 12:00	02/24/16 16:23	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	1	02/24/16 12:00	02/24/16 16:23	2037-26-5	
4-Bromofluorobenzene (S)	111	%	65-146	1	02/24/16 12:00	02/24/16 16:23	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	69-137	1	02/24/16 12:00	02/24/16 16:23	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/24/16 12:00	02/24/16 16:23	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.9**	%	0.10	1		03/05/16 15:34		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Sample: Trip Blank **Lab ID: 30174103011** Collected: 02/19/16 00:00 Received: 02/22/16 15:35 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	71-43-2	1c
Ethylbenzene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	1634-04-4	1c
Naphthalene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	91-20-3	1c
Toluene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	5.0	1	02/24/16 12:00	02/24/16 13:02	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	1	02/24/16 12:00	02/24/16 13:02	2037-26-5	
4-Bromofluorobenzene (S)	94	%	65-146	1	02/24/16 12:00	02/24/16 13:02	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	69-137	1	02/24/16 12:00	02/24/16 13:02	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	02/24/16 12:00	02/24/16 13:02	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

QC Batch: MSV/27186
QC Batch Method: EPA 5035A
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174103001, 30174103009

METHOD BLANK: 1029954
Matrix: Solid
Associated Lab Samples: 30174103001, 30174103009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	02/24/16 11:24	
1,3,5-Trimethylbenzene	ug/kg	ND	250	02/24/16 11:24	
Benzene	ug/kg	ND	250	02/24/16 11:24	
Ethylbenzene	ug/kg	ND	250	02/24/16 11:24	
Isopropylbenzene (Cumene)	ug/kg	ND	250	02/24/16 11:24	
Methyl-tert-butyl ether	ug/kg	ND	250	02/24/16 11:24	
Naphthalene	ug/kg	ND	250	02/24/16 11:24	
Toluene	ug/kg	ND	250	02/24/16 11:24	
1,2-Dichloroethane-d4 (S)	%	90	69-137	02/24/16 11:24	
4-Bromofluorobenzene (S)	%	92	65-146	02/24/16 11:24	
Dibromofluoromethane (S)	%	92	70-130	02/24/16 11:24	
Toluene-d8 (S)	%	96	68-135	02/24/16 11:24	

LABORATORY CONTROL SAMPLE: 1029955

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	18.5	92	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	18.3	91	74-129	
Benzene	ug/kg	20	18.3	91	71-137	
Ethylbenzene	ug/kg	20	19.0	95	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	17.5	87	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.0	85	77-141	
Naphthalene	ug/kg	20	18.9	94	81-126	
Toluene	ug/kg	20	17.6	88	72-127	
1,2-Dichloroethane-d4 (S)	%			91	69-137	
4-Bromofluorobenzene (S)	%			95	65-146	
Dibromofluoromethane (S)	%			98	70-130	
Toluene-d8 (S)	%			95	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

QC Batch: MSV/27187 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174103002, 30174103003, 30174103004, 30174103005, 30174103006, 30174103007, 30174103008, 30174103010, 30174103011

METHOD BLANK: 1029956 Matrix: Solid
Associated Lab Samples: 30174103002, 30174103003, 30174103004, 30174103005, 30174103006, 30174103007, 30174103008, 30174103010, 30174103011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	02/24/16 11:51	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	02/24/16 11:51	
Benzene	ug/kg	ND	5.0	02/24/16 11:51	
Ethylbenzene	ug/kg	ND	5.0	02/24/16 11:51	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	02/24/16 11:51	
Methyl-tert-butyl ether	ug/kg	ND	5.0	02/24/16 11:51	
Naphthalene	ug/kg	ND	5.0	02/24/16 11:51	
Toluene	ug/kg	ND	5.0	02/24/16 11:51	
1,2-Dichloroethane-d4 (S)	%	90	69-137	02/24/16 11:51	
4-Bromofluorobenzene (S)	%	93	65-146	02/24/16 11:51	
Dibromofluoromethane (S)	%	94	70-130	02/24/16 11:51	
Toluene-d8 (S)	%	95	68-135	02/24/16 11:51	

LABORATORY CONTROL SAMPLE: 1029957

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	18.5	92	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	18.3	91	74-129	
Benzene	ug/kg	20	18.3	91	71-137	
Ethylbenzene	ug/kg	20	19.0	95	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	17.5	87	78-133	
Methyl-tert-butyl ether	ug/kg	20	17.0	85	77-141	
Naphthalene	ug/kg	20	18.9	94	81-126	
Toluene	ug/kg	20	17.6	88	72-127	
1,2-Dichloroethane-d4 (S)	%			91	69-137	
4-Bromofluorobenzene (S)	%			95	65-146	
Dibromofluoromethane (S)	%			98	70-130	
Toluene-d8 (S)	%			95	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

QC Batch: PMST/5969 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30174103001, 30174103002, 30174103003, 30174103004, 30174103005, 30174103006, 30174103007, 30174103008, 30174103009, 30174103010

SAMPLE DUPLICATE: 1035969

Parameter	Units	30173978001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	15.5	15.4	1	

SAMPLE DUPLICATE: 1035970

Parameter	Units	30173978002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	14.0	13.6	3	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/27186

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27187

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkleyville (M-209)
Pace Project No.: 30174103

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30174103001	**MW-12 (11-13)**	EPA 5035A	MSV/27186	EPA 8260B	MSV/27190
30174103002	**MW-12 (9-11)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103003	**MW-9 (15-17)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103004	**MW-9 (17-19)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103005	**SB-7 (5-7)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103006	**SB-7 (9-11)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103007	**SB-9 (5-7)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103008	**SB-9 (7-9)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103009	**SB-8 (11-13)**	EPA 5035A	MSV/27186	EPA 8260B	MSV/27190
30174103010	**SB-8 (13-14)**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103011	**Trip Blank**	EPA 5035A	MSV/27187	EPA 8260B	MSV/27191
30174103001	**MW-12 (11-13)**	ASTM D2974-87	PMST/5969		
30174103002	**MW-12 (9-11)**	ASTM D2974-87	PMST/5969		
30174103003	**MW-9 (15-17)**	ASTM D2974-87	PMST/5969		
30174103004	**MW-9 (17-19)**	ASTM D2974-87	PMST/5969		
30174103005	**SB-7 (5-7)**	ASTM D2974-87	PMST/5969		
30174103006	**SB-7 (9-11)**	ASTM D2974-87	PMST/5969		
30174103007	**SB-9 (5-7)**	ASTM D2974-87	PMST/5969		
30174103008	**SB-9 (7-9)**	ASTM D2974-87	PMST/5969		
30174103009	**SB-8 (11-13)**	ASTM D2974-87	PMST/5969		
30174103010	**SB-8 (13-14)**	ASTM D2974-87	PMST/5969		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30174103

Page: 1 of 1

1915048

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention: Joan Amadeo
Address: 301 Commerce Park Dr. Cranberry Twp, PA 16066	Copy To: Joan Amadeo	Company Name: GES
		Address: SAME
Email To: jhinkle@gesonline.com	Purchase Order No.:	Pace Quote Reference:
Phone: 800-267-2549 Fax:	Project Name: UPA - Barkeyville (M-209)	Pace Project Manager: Rachel Christner
Requested Due Date/TAT: STANDARD	Project Number: 0704730	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
- ☑ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	PA Diesel	"new" shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-12 (11-13)	SL	G			2/18/16	1000		4	1					2	1			X			001
2	MW-12 (9-11)	↓	↓			2/18/16	0950		4	1					2	1			X			002
3	MW-9 (15-17)	↓	↓			2/18/16	1400		4	1					2	1			X			003
4	MW-9 (17-19)	↓	↓			2/18/16	1405		4	1					2	1			X			004
5	SB-7 (5-7)	↓	↓			2/19/16	0750		4	1					2	1			X			005
6	SB-7 (9-11)	↓	↓			2/19/16	0800		4	1					2	1			X			006
7	SB-9 (5-7)	↓	↓			2/19/16	0855		4	1					2	1			X			007
8	SB-9 (7-9)	↓	↓			2/19/16	0900		4	1					2	1			X			008
9	SB-8 (11-13)	↓	↓			2/19/16	1055		4	1					2	1			X			009
10	SB-8 (13-14)	↓	↓			2/19/16	1100		4	1					2	1			X			010
11	Trip Blank	WT				2/19/16	0000		2				2									011
12	Temp Blank																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
-Hold trip blank pending analysis	Justin Paul / GES	2/19/16	1700	GES Warehouse	2/19/16	1700				
	GES Warehouse			[signature]	2-22-16	12:05				ARM 2/22/16
-EDD required	[signature]	2-22-16	3:35	Alyna R Muchoney Pace	2/22/16	1535	1.7	Y	N Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Justin Paul

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 02/19/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

BLM

30174103

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ✓ Bubble Bags ___ None ___ Other foam

Thermometer Used 7 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 1.0 °C Correction Factor: +0.1 °C Final Temp: 1.7 °C

Date and initials of person examining contents: 2/22/16

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL, WT		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed: ARM Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☐Yes ☑No ☐N/A	16.
Trip Blank Custody Seals Present	☑Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel K. Mitchell **Date:** 2/23/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, cut of temp, incorrect containers)

page 2

Project Number:

Client Name: GES

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml / 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other	Other
009	SL		4																						
010	SL		4																						
011	WT													2											

Page Analytical

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

March 08, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on February 24, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-11 (17-19) **Lab ID: 30174353001** Collected: 02/22/16 11:35 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**12.5**	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	98-82-8	1c
Methyl-tert-butyl ether	**3.0**	ug/kg	2.9	1	02/29/16 12:00	02/29/16 12:47	1634-04-4	1c
Naphthalene	**4.5**	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	91-20-3	1c
Toluene	ND	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	108-88-3	1c
1,2,4-Trimethylbenzene	**29.3**	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	95-63-6	1c
1,3,5-Trimethylbenzene	**3.3**	ug/kg	3.1	1	02/26/16 12:00	02/26/16 13:17	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/29/16 12:00	02/29/16 12:47	2037-26-5	
4-Bromofluorobenzene (S)	97	%	65-146	1	02/29/16 12:00	02/29/16 12:47	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	69-137	1	02/29/16 12:00	02/29/16 12:47	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1	02/29/16 12:00	02/29/16 12:47	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.7**	%	0.10	1		03/07/16 16:24		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-11 (23-25) **Lab ID: 30174353002** Collected: 02/22/16 11:50 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**6.0**	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	98-82-8	1c
Methyl-tert-butyl ether	**31.6**	ug/kg	3.5	1	02/29/16 12:00	02/29/16 13:09	1634-04-4	1c
Naphthalene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	91-20-3	1c
Toluene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 13:43	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	1	02/29/16 12:00	02/29/16 13:09	2037-26-5	
4-Bromofluorobenzene (S)	95	%	65-146	1	02/29/16 12:00	02/29/16 13:09	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/29/16 12:00	02/29/16 13:09	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/29/16 12:00	02/29/16 13:09	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.1**	%	0.10	1		03/07/16 16:25		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: DUP-1 **Lab ID: 30174353003** Collected: 02/22/16 00:00 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**6.3**	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	98-82-8	1c
Methyl-tert-butyl ether	**31.4**	ug/kg	3.6	1	02/29/16 12:00	02/29/16 13:32	1634-04-4	1c
Naphthalene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	91-20-3	1c
Toluene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 14:10	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/29/16 12:00	02/29/16 13:32	2037-26-5	
4-Bromofluorobenzene (S)	99	%	65-146	1	02/29/16 12:00	02/29/16 13:32	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	69-137	1	02/29/16 12:00	02/29/16 13:32	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	02/29/16 12:00	02/29/16 13:32	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.3**	%	0.10	1		03/07/16 16:25		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-10S (23-25) **Lab ID: 30174353004** Collected: 02/22/16 16:00 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**23.6**	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	98-82-8	1c
Methyl-tert-butyl ether	**928**	ug/kg	175	50	02/29/16 12:00	02/29/16 17:36	1634-04-4	1c
Naphthalene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	91-20-3	1c
Toluene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.6	1	02/26/16 12:00	02/26/16 14:36	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/26/16 12:00	02/26/16 14:36	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	02/26/16 12:00	02/26/16 14:36	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/26/16 12:00	02/26/16 14:36	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	1	02/26/16 12:00	02/26/16 14:36	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.9**	%	0.10	1		03/07/16 16:25		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-10S (25-27) **Lab ID: 30174353005** Collected: 02/22/16 16:05 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**36.4**	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	98-82-8	1c
Methyl-tert-butyl ether	**828**	ug/kg	166	50	02/29/16 12:00	02/29/16 17:58	1634-04-4	1c
Naphthalene	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	91-20-3	1c
Toluene	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.4	1	02/26/16 12:00	02/26/16 15:03	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/26/16 12:00	02/26/16 15:03	2037-26-5	
4-Bromofluorobenzene (S)	99	%	65-146	1	02/26/16 12:00	02/26/16 15:03	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/26/16 12:00	02/26/16 15:03	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1	02/26/16 12:00	02/26/16 15:03	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.5**	%	0.10	1		03/07/16 16:26		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-10D (17-19) **Lab ID: 30174353006** Collected: 02/23/16 08:15 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**189**	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	71-43-2	1c
Ethylbenzene	ND	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	173	50	02/26/16 12:00	02/29/16 18:20	1634-04-4	1c,L2
Naphthalene	ND	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	91-20-3	1c
Toluene	**262**	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	108-88-3	1c
1,2,4-Trimethylbenzene	**475**	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	173	50	02/26/16 12:00	02/26/16 19:29	108-67-8	1c
Surrogates								
Toluene-d8 (S)	96	%	68-135	50	02/26/16 12:00	02/29/16 18:20	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	50	02/26/16 12:00	02/29/16 18:20	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	69-137	50	02/26/16 12:00	02/29/16 18:20	17060-07-0	
Dibromofluoromethane (S)	87	%	70-130	50	02/26/16 12:00	02/29/16 18:20	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.9**	%	0.10	1		03/07/16 16:27		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-10D (27-29) **Lab ID: 30174353007** Collected: 02/23/16 08:40 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	98-82-8	1c
Methyl-tert-butyl ether	**581**	ug/kg	174	50	03/01/16 12:00	03/02/16 16:49	1634-04-4	
Naphthalene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	91-20-3	1c
Toluene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.7	1	02/26/16 12:00	02/26/16 15:30	108-67-8	1c
Surrogates								
Toluene-d8 (S)	95	%	68-135	1	02/29/16 12:00	02/29/16 13:54	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	1	02/29/16 12:00	02/29/16 13:54	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	69-137	1	02/29/16 12:00	02/29/16 13:54	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1	02/29/16 12:00	02/29/16 13:54	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.3**	%	0.10	1		03/07/16 16:27		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Sample: MW-10D (29-31) **Lab ID: 30174353008** Collected: 02/23/16 08:45 Received: 02/24/16 15:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	98-82-8	1c
Methyl-tert-butyl ether	**219**	ug/kg	3.6	1	02/29/16 12:00	02/29/16 14:16	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	02/26/16 12:00	02/26/16 15:56	108-67-8	1c
Surrogates								
Toluene-d8 (S)	94	%	68-135	1	02/29/16 12:00	02/29/16 14:16	2037-26-5	
4-Bromofluorobenzene (S)	105	%	65-146	1	02/29/16 12:00	02/29/16 14:16	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	69-137	1	02/29/16 12:00	02/29/16 14:16	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1	02/29/16 12:00	02/29/16 14:16	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**19.6**	%	0.10	1		03/07/16 16:28		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: MSV/27223 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174353001, 30174353002, 30174353003, 30174353004, 30174353005, 30174353007, 30174353008

METHOD BLANK: 1031384 Matrix: Solid
Associated Lab Samples: 30174353001, 30174353002, 30174353003, 30174353004, 30174353005, 30174353007, 30174353008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	02/26/16 12:46	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	02/26/16 12:46	
Benzene	ug/kg	ND	5.0	02/26/16 12:46	
Ethylbenzene	ug/kg	ND	5.0	02/26/16 12:46	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	02/26/16 12:46	
Naphthalene	ug/kg	ND	5.0	02/26/16 12:46	
Toluene	ug/kg	ND	5.0	02/26/16 12:46	
1,2-Dichloroethane-d4 (S)	%	89	69-137	02/26/16 12:46	
4-Bromofluorobenzene (S)	%	100	65-146	02/26/16 12:46	
Dibromofluoromethane (S)	%	90	70-130	02/26/16 12:46	
Toluene-d8 (S)	%	99	68-135	02/26/16 12:46	

LABORATORY CONTROL SAMPLE: 1031385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	20.5	103	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	19.8	99	74-129	
Benzene	ug/kg	20	19.3	97	71-137	
Ethylbenzene	ug/kg	20	19.3	97	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	20.0	100	78-133	
Naphthalene	ug/kg	20	21.0	105	81-126	
Toluene	ug/kg	20	20.0	100	72-127	
1,2-Dichloroethane-d4 (S)	%			89	69-137	
4-Bromofluorobenzene (S)	%			98	65-146	
Dibromofluoromethane (S)	%			97	70-130	
Toluene-d8 (S)	%			102	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: MSV/27224
QC Batch Method: EPA 5035A
Associated Lab Samples: 30174353006

Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL

METHOD BLANK: 1031387
Associated Lab Samples: 30174353006

Matrix: Solid

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	02/26/16 12:19	
1,3,5-Trimethylbenzene	ug/kg	ND	250	02/26/16 12:19	
Benzene	ug/kg	ND	250	02/26/16 12:19	
Ethylbenzene	ug/kg	ND	250	02/26/16 12:19	
Isopropylbenzene (Cumene)	ug/kg	ND	250	02/26/16 12:19	
Methyl-tert-butyl ether	ug/kg	ND	250	02/26/16 12:19	
Naphthalene	ug/kg	ND	250	02/26/16 12:19	
Toluene	ug/kg	ND	250	02/26/16 12:19	
1,2-Dichloroethane-d4 (S)	%	86	69-137	02/26/16 12:19	
4-Bromofluorobenzene (S)	%	97	65-146	02/26/16 12:19	
Dibromofluoromethane (S)	%	86	70-130	02/26/16 12:19	
Toluene-d8 (S)	%	99	68-135	02/26/16 12:19	

LABORATORY CONTROL SAMPLE: 1031388

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	20.5	103	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	19.8	99	74-129	
Benzene	ug/kg	20	19.3	97	71-137	
Ethylbenzene	ug/kg	20	19.3	97	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	20.0	100	78-133	
Methyl-tert-butyl ether	ug/kg	20	14.5	73	77-141	L0
Naphthalene	ug/kg	20	21.0	105	81-126	
Toluene	ug/kg	20	20.0	100	72-127	
1,2-Dichloroethane-d4 (S)	%			89	69-137	
4-Bromofluorobenzene (S)	%			98	65-146	
Dibromofluoromethane (S)	%			97	70-130	
Toluene-d8 (S)	%			102	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: MSV/27243 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174353001, 30174353002, 30174353003, 30174353007, 30174353008

METHOD BLANK: 1032257 Matrix: Solid
Associated Lab Samples: 30174353001, 30174353002, 30174353003, 30174353007, 30174353008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	5.0	02/29/16 11:50	
1,2-Dichloroethane-d4 (S)	%	88	69-137	02/29/16 11:50	
4-Bromofluorobenzene (S)	%	99	65-146	02/29/16 11:50	
Dibromofluoromethane (S)	%	92	70-130	02/29/16 11:50	
Toluene-d8 (S)	%	97	68-135	02/29/16 11:50	

LABORATORY CONTROL SAMPLE: 1032258

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl-tert-butyl ether	ug/kg	20	17.1	85	77-141	
1,2-Dichloroethane-d4 (S)	%			86	69-137	
4-Bromofluorobenzene (S)	%			99	65-146	
Dibromofluoromethane (S)	%			96	70-130	
Toluene-d8 (S)	%			98	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: MSV/27244
QC Batch Method: EPA 5035A
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174353004, 30174353005

METHOD BLANK: 1032259
Matrix: Solid
Associated Lab Samples: 30174353004, 30174353005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	250	02/29/16 11:24	
1,2-Dichloroethane-d4 (S)	%	85	69-137	02/29/16 11:24	
4-Bromofluorobenzene (S)	%	98	65-146	02/29/16 11:24	
Dibromofluoromethane (S)	%	88	70-130	02/29/16 11:24	
Toluene-d8 (S)	%	96	68-135	02/29/16 11:24	

LABORATORY CONTROL SAMPLE: 1032260

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl-tert-butyl ether	ug/kg	20	17.1	85	77-141	
1,2-Dichloroethane-d4 (S)	%			86	69-137	
4-Bromofluorobenzene (S)	%			99	65-146	
Dibromofluoromethane (S)	%			96	70-130	
Toluene-d8 (S)	%			98	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: MSV/27259
QC Batch Method: EPA 5035A
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30174353007

METHOD BLANK: 1032730 Matrix: Solid
Associated Lab Samples: 30174353007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	250	03/01/16 12:48	
1,2-Dichloroethane-d4 (S)	%	85	69-137	03/01/16 12:48	
4-Bromofluorobenzene (S)	%	100	65-146	03/01/16 12:48	
Dibromofluoromethane (S)	%	86	70-130	03/01/16 12:48	
Toluene-d8 (S)	%	96	68-135	03/01/16 12:48	

LABORATORY CONTROL SAMPLE: 1032731

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl-tert-butyl ether	ug/kg	20	14.5	73	77-141	L0
1,2-Dichloroethane-d4 (S)	%			85	69-137	
4-Bromofluorobenzene (S)	%			97	65-146	
Dibromofluoromethane (S)	%			95	70-130	
Toluene-d8 (S)	%			95	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

QC Batch: PMST/5973 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30174353001, 30174353002, 30174353003, 30174353004, 30174353005, 30174353006, 30174353007, 30174353008

SAMPLE DUPLICATE: 1036391

Parameter	Units	30174211013 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	20.1	24.7	20	

SAMPLE DUPLICATE: 1036392

Parameter	Units	30174211014 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	20.1	13.9	37	D6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/27223
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27224
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27243
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27244
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/27259
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-Barkeyville (M-209)
Pace Project No.: 30174353

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30174353001	**MW-11 (17-19)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353001	**MW-11 (17-19)**	EPA 5035A	MSV/27243	EPA 8260B	MSV/27249
30174353002	**MW-11 (23-25)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353002	**MW-11 (23-25)**	EPA 5035A	MSV/27243	EPA 8260B	MSV/27249
30174353003	**DUP-1**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353003	**DUP-1**	EPA 5035A	MSV/27243	EPA 8260B	MSV/27249
30174353004	**MW-10S (23-25)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353004	**MW-10S (23-25)**	EPA 5035A	MSV/27244	EPA 8260B	MSV/27250
30174353005	**MW-10S (25-27)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353005	**MW-10S (25-27)**	EPA 5035A	MSV/27244	EPA 8260B	MSV/27250
30174353006	**MW-10D (17-19)**	EPA 5035A	MSV/27224	EPA 8260B	MSV/27235
30174353007	**MW-10D (27-29)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353007	**MW-10D (27-29)**	EPA 5035A	MSV/27243	EPA 8260B	MSV/27249
30174353007	**MW-10D (27-29)**	EPA 5035A	MSV/27259	EPA 8260B	MSV/27275
30174353008	**MW-10D (29-31)**	EPA 5035A	MSV/27223	EPA 8260B	MSV/27236
30174353008	**MW-10D (29-31)**	EPA 5035A	MSV/27243	EPA 8260B	MSV/27249
30174353001	**MW-11 (17-19)**	ASTM D2974-87	PMST/5973		
30174353002	**MW-11 (23-25)**	ASTM D2974-87	PMST/5973		
30174353003	**DUP-1**	ASTM D2974-87	PMST/5973		
30174353004	**MW-10S (23-25)**	ASTM D2974-87	PMST/5973		
30174353005	**MW-10S (25-27)**	ASTM D2974-87	PMST/5973		
30174353006	**MW-10D (17-19)**	ASTM D2974-87	PMST/5973		
30174353007	**MW-10D (27-29)**	ASTM D2974-87	PMST/5973		
30174353008	**MW-10D (29-31)**	ASTM D2974-87	PMST/5973		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30174353

Page: of

2007037

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention: Joan Amadeo
Address: 301 Commerce Park Dr.	Copy To: Joan Amadeo	Company Name: GES
Cranberry Twp, PA 16066		Address: SAME
Email To: jhinkle@gesonline.com	Purchase Order No.:	Pace Quote Reference:
Phone: 800-267-2549 Fax:	Project Name: WPA Barkeyville (M-209)	Pace Project Manager: Rachel Christner
Requested Due Date/TAT: STANDARD	Project Number: 0704730	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☑ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	PA Diesel	"new" shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-11 (17-19)	SL	G			2/22/16	1135		4	1					2	1			X			001
2	MW-11 (23-25)	SL	G			2/22/16	1150		4	1					2	1			X			002
3	Dup. 1	SL	G			2/22/16	0000		4	1					2	1			X			003
4	MW-10S (23-25)	SL	G			2/22/16	1600		4	1					2	1			X			004
5	MW-10S (25-27)	SL	G			2/22/16	1605		4	1					2	1			X			005
6	MW-10D (17-19)	SL	G			2/23/16	0815		4	1					2	1			X			006
7	MW-10D (27-29)	SL	G			2/23/16	0840		4	1					2	1			X			007
8	MW-10D (29-31)	SL	G			2/23/16	0845		4	1					2	1			X			008
9	Trip blank	WT				2/23/16	0000		2				2						X			009
10	Temp blank																					
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
-Hold trip blank pending	Justin Paul / GES	2/23/16	1700	GES Warehouse	2/23/16	1701				
analysis	GES Warehouse			[signature]	2-24-16	11:20				
-GDD required	[signature]	2-24-16	2:50	Alyna R Muchoney Pace	2/24/16	1550	1.6	Y	N	Y
-Temp blank included										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Justin Paul

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 02/23/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Sample Condition Upon Receipt

30174353

Pace Analytical

Client Name: GES

Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ___ Other Foam

Thermometer Used 7 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 1.5 °C Correction Factor: +0.1 °C Final Temp: 1.6 °C

Date and initials of person examining contents: 2/24/14 ARM

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☐Yes ☐No	Initial when completed: ARM / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel B Christian **Date:** 2/25/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Project Number: 301743

Client Name: GES

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml) 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other	Other
001	SL		4											2											
008	SL		4																						
009	WT																								

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 30, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on June 23, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-15 (4-5) **Lab ID: 30187560001** Collected: 06/20/16 11:40 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	1634-04-4	1c
Naphthalene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	91-20-3	1c
Toluene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:02	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	1	06/27/16 12:16	06/27/16 15:02	2037-26-5	
4-Bromofluorobenzene (S)	98	%	65-146	1	06/27/16 12:16	06/27/16 15:02	460-00-4	
1,2-Dichloroethane-d4 (S)	121	%	69-137	1	06/27/16 12:16	06/27/16 15:02	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1	06/27/16 12:16	06/27/16 15:02	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.9**	%	0.10	1		06/29/16 14:00		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-10 (7-8) **Lab ID: 30187560002** Collected: 06/20/16 16:20 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**627**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	71-43-2	1c
Ethylbenzene	**969**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	100-41-4	1c
Isopropylbenzene (Cumene)	**866**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	1634-04-4	1c
Naphthalene	**5170**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	91-20-3	1c
Toluene	ND	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	108-88-3	1c
1,2,4-Trimethylbenzene	**10800**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	95-63-6	1c
1,3,5-Trimethylbenzene	**4570**	ug/kg	243	50	06/27/16 12:19	06/27/16 21:41	108-67-8	1c
Surrogates								
Toluene-d8 (S)	106	%	68-135	50	06/27/16 12:19	06/27/16 21:41	2037-26-5	
4-Bromofluorobenzene (S)	113	%	65-146	50	06/27/16 12:19	06/27/16 21:41	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	69-137	50	06/27/16 12:19	06/27/16 21:41	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	50	06/27/16 12:19	06/27/16 21:41	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**12.9**	%	0.10	1		06/29/16 14:00		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-11 (3-4) **Lab ID: 30187560003** Collected: 06/21/16 08:15 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	1634-04-4	1c
Naphthalene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	91-20-3	1c
Toluene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 15:29	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	1	06/27/16 12:16	06/27/16 15:29	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	06/27/16 12:16	06/27/16 15:29	460-00-4	
1,2-Dichloroethane-d4 (S)	121	%	69-137	1	06/27/16 12:16	06/27/16 15:29	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	06/27/16 12:16	06/27/16 15:29	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**10.6**	%	0.10	1		06/29/16 13:59		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-14 (4-5) **Lab ID: 30187560004** Collected: 06/21/16 12:42 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	1634-04-4	1c
Naphthalene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	91-20-3	1c
Toluene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.2	1	06/27/16 12:16	06/27/16 15:56	108-67-8	1c
Surrogates								
Toluene-d8 (S)	99	%	68-135	1	06/27/16 12:16	06/27/16 15:56	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	06/27/16 12:16	06/27/16 15:56	460-00-4	
1,2-Dichloroethane-d4 (S)	123	%	69-137	1	06/27/16 12:16	06/27/16 15:56	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	06/27/16 12:16	06/27/16 15:56	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.4**	%	0.10	1		06/29/16 13:59		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-16 (4-5) **Lab ID: 30187560005** Collected: 06/21/16 14:28 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**56.0**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	71-43-2	1c
Ethylbenzene	**71.6**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	100-41-4	1c
Isopropylbenzene (Cumene)	**31.0**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	1634-04-4	1c
Naphthalene	ND	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	91-20-3	1c
Toluene	**9.4**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	108-88-3	1c
1,2,4-Trimethylbenzene	**36.4**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	95-63-6	1c
1,3,5-Trimethylbenzene	**134**	ug/kg	5.9	1	06/27/16 12:16	06/27/16 16:22	108-67-8	1c
Surrogates								
Toluene-d8 (S)	102	%	68-135	1	06/27/16 12:16	06/27/16 16:22	2037-26-5	
4-Bromofluorobenzene (S)	99	%	65-146	1	06/27/16 12:16	06/27/16 16:22	460-00-4	
1,2-Dichloroethane-d4 (S)	128	%	69-137	1	06/27/16 12:16	06/27/16 16:22	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1	06/27/16 12:16	06/27/16 16:22	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**24.3**	%	0.10	1		06/29/16 13:59		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-16 (13-14) **Lab ID: 30187560006** Collected: 06/21/16 15:00 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**511**	ug/kg	217	50	06/27/16 12:19	06/27/16 20:48	71-43-2	1c
Ethylbenzene	**21300**	ug/kg	2170	500	06/27/16 12:19	06/29/16 15:11	100-41-4	1c
Isopropylbenzene (Cumene)	**4750**	ug/kg	217	50	06/27/16 12:19	06/27/16 20:48	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	217	50	06/27/16 12:19	06/27/16 20:48	1634-04-4	1c
Naphthalene	**9170**	ug/kg	217	50	06/27/16 12:19	06/27/16 20:48	91-20-3	1c
Toluene	**4070**	ug/kg	217	50	06/27/16 12:19	06/27/16 20:48	108-88-3	1c
1,2,4-Trimethylbenzene	**113000**	ug/kg	2170	500	06/27/16 12:19	06/29/16 15:11	95-63-6	1c
1,3,5-Trimethylbenzene	**39600**	ug/kg	2170	500	06/27/16 12:19	06/29/16 15:11	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	50	06/27/16 12:19	06/27/16 20:48	2037-26-5	
4-Bromofluorobenzene (S)	110	%	65-146	50	06/27/16 12:19	06/27/16 20:48	460-00-4	
1,2-Dichloroethane-d4 (S)	136	%	69-137	50	06/27/16 12:19	06/27/16 20:48	17060-07-0	
Dibromofluoromethane (S)	80	%	70-130	50	06/27/16 12:19	06/27/16 20:48	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.1**	%	0.10	1		06/29/16 13:58		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-16 (17-18) **Lab ID: 30187560007** Collected: 06/21/16 15:08 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**33.9**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	71-43-2	1c
Ethylbenzene	**59.6**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	100-41-4	1c
Isopropylbenzene (Cumene)	**5.5**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	1634-04-4	1c
Naphthalene	**9.7**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	91-20-3	1c
Toluene	**68.3**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	108-88-3	1c
1,2,4-Trimethylbenzene	**98.7**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	95-63-6	1c
1,3,5-Trimethylbenzene	**26.6**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 16:49	108-67-8	1c
Surrogates								
Toluene-d8 (S)	103	%	68-135	1	06/27/16 12:16	06/27/16 16:49	2037-26-5	
4-Bromofluorobenzene (S)	109	%	65-146	1	06/27/16 12:16	06/27/16 16:49	460-00-4	
1,2-Dichloroethane-d4 (S)	117	%	69-137	1	06/27/16 12:16	06/27/16 16:49	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	06/27/16 12:16	06/27/16 16:49	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.2**	%	0.10	1		06/29/16 13:58		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-15 (15-16) **Lab ID: 30187560008** Collected: 06/22/16 08:20 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	71-43-2	1c
Ethylbenzene	**28.8**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	100-41-4	1c
Isopropylbenzene (Cumene)	**9.7**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	1634-04-4	1c
Naphthalene	**12.5**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	91-20-3	1c
Toluene	**11.9**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	108-88-3	1c
1,2,4-Trimethylbenzene	**157**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	95-63-6	1c
1,3,5-Trimethylbenzene	**44.5**	ug/kg	4.5	1	06/27/16 12:16	06/27/16 17:15	108-67-8	1c
Surrogates								
Toluene-d8 (S)	105	%	68-135	1	06/27/16 12:16	06/27/16 17:15	2037-26-5	
4-Bromofluorobenzene (S)	118	%	65-146	1	06/27/16 12:16	06/27/16 17:15	460-00-4	
1,2-Dichloroethane-d4 (S)	123	%	69-137	1	06/27/16 12:16	06/27/16 17:15	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1	06/27/16 12:16	06/27/16 17:15	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.4**	%	0.10	1		06/29/16 13:57		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-15 (26-27) **Lab ID: 30187560009** Collected: 06/22/16 08:56 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**8.1**	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	71-43-2	1c
Ethylbenzene	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	98-82-8	1c
Methyl-tert-butyl ether	**113**	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	1634-04-4	1c
Naphthalene	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	91-20-3	1c
Toluene	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	3.3	1	06/27/16 12:16	06/27/16 17:42	108-67-8	1c
Surrogates								
Toluene-d8 (S)	101	%	68-135	1	06/27/16 12:16	06/27/16 17:42	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	06/27/16 12:16	06/27/16 17:42	460-00-4	
1,2-Dichloroethane-d4 (S)	120	%	69-137	1	06/27/16 12:16	06/27/16 17:42	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1	06/27/16 12:16	06/27/16 17:42	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.8**	%	0.10	1		06/29/16 13:57		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-14 (14-15) **Lab ID: 30187560010** Collected: 06/22/16 12:35 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**18.3**	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	1634-04-4	1c
Naphthalene	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	91-20-3	1c
Toluene	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.4	1	06/27/16 12:16	06/27/16 18:08	108-67-8	1c
Surrogates								
Toluene-d8 (S)	101	%	68-135	1	06/27/16 12:16	06/27/16 18:08	2037-26-5	
4-Bromofluorobenzene (S)	101	%	65-146	1	06/27/16 12:16	06/27/16 18:08	460-00-4	
1,2-Dichloroethane-d4 (S)	123	%	69-137	1	06/27/16 12:16	06/27/16 18:08	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	06/27/16 12:16	06/27/16 18:08	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.6**	%	0.10	1		06/29/16 13:56		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: MW-14 (19-20) **Lab ID: 30187560011** Collected: 06/22/16 12:50 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	1634-04-4	1c
Naphthalene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	91-20-3	1c
Toluene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 18:35	108-67-8	1c
Surrogates								
Toluene-d8 (S)	100	%	68-135	1	06/27/16 12:16	06/27/16 18:35	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	06/27/16 12:16	06/27/16 18:35	460-00-4	
1,2-Dichloroethane-d4 (S)	114	%	69-137	1	06/27/16 12:16	06/27/16 18:35	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1	06/27/16 12:16	06/27/16 18:35	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.6**	%	0.10	1		06/29/16 13:56		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-11 (5-7) **Lab ID: 30187560012** Collected: 06/22/16 15:50 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	1634-04-4	1c
Naphthalene	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	91-20-3	1c
Toluene	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	108-88-3	1c
1,2,4-Trimethylbenzene	**4.6**	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.1	1	06/27/16 12:16	06/27/16 19:01	108-67-8	1c
Surrogates								
Toluene-d8 (S)	100	%	68-135	1	06/27/16 12:16	06/27/16 19:01	2037-26-5	
4-Bromofluorobenzene (S)	101	%	65-146	1	06/27/16 12:16	06/27/16 19:01	460-00-4	
1,2-Dichloroethane-d4 (S)	119	%	69-137	1	06/27/16 12:16	06/27/16 19:01	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1	06/27/16 12:16	06/27/16 19:01	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.3**	%	0.10	1		06/29/16 13:56		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-11 (11-13) **Lab ID: 30187560013** Collected: 06/22/16 16:05 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**98.9**	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	98-82-8	1c
Methyl-tert-butyl ether	**78.0**	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	1634-04-4	1c
Naphthalene	ND	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	91-20-3	1c
Toluene	ND	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	108-88-3	1c
1,2,4-Trimethylbenzene	**15.7**	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.9	1	06/27/16 12:16	06/27/16 19:28	108-67-8	1c
Surrogates								
Toluene-d8 (S)	101	%	68-135	1	06/27/16 12:16	06/27/16 19:28	2037-26-5	
4-Bromofluorobenzene (S)	99	%	65-146	1	06/27/16 12:16	06/27/16 19:28	460-00-4	
1,2-Dichloroethane-d4 (S)	120	%	69-137	1	06/27/16 12:16	06/27/16 19:28	17060-07-0	
Dibromofluoromethane (S)	100	%	70-130	1	06/27/16 12:16	06/27/16 19:28	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**18.5**	%	0.10	1		06/29/16 13:55		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-10 (11-12) **Lab ID: 30187560014** Collected: 06/22/16 17:13 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	**7820**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	71-43-2	1c
Ethylbenzene	**14700**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	100-41-4	1c
Isopropylbenzene (Cumene)	**3000**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	98-82-8	1c
Methyl-tert-butyl ether	ND	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	1634-04-4	1c
Naphthalene	**7270**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	91-20-3	1c
Toluene	**1460**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	108-88-3	1c
1,2,4-Trimethylbenzene	**44100**	ug/kg	2250	500	06/27/16 12:19	06/29/16 15:37	95-63-6	1c
1,3,5-Trimethylbenzene	**6280**	ug/kg	225	50	06/27/16 12:19	06/27/16 21:14	108-67-8	1c
Surrogates								
Toluene-d8 (S)	104	%	68-135	50	06/27/16 12:19	06/27/16 21:14	2037-26-5	
4-Bromofluorobenzene (S)	112	%	65-146	50	06/27/16 12:19	06/27/16 21:14	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	69-137	50	06/27/16 12:19	06/27/16 21:14	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	50	06/27/16 12:19	06/27/16 21:14	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**11.7**	%	0.10	1		06/29/16 13:55		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: SB-10 (15-16) **Lab ID: 30187560015** Collected: 06/22/16 17:22 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	71-43-2	1c
Ethylbenzene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	98-82-8	1c
Methyl-tert-butyl ether	**1250**	ug/kg	275	50	06/28/16 11:17	06/28/16 18:08	1634-04-4	1c
Naphthalene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	91-20-3	1c
Toluene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	5.2	1	06/27/16 12:16	06/27/16 19:55	108-67-8	1c
Surrogates								
Toluene-d8 (S)	98	%	68-135	1	06/27/16 12:16	06/27/16 19:55	2037-26-5	
4-Bromofluorobenzene (S)	100	%	65-146	1	06/27/16 12:16	06/27/16 19:55	460-00-4	
1,2-Dichloroethane-d4 (S)	123	%	69-137	1	06/27/16 12:16	06/27/16 19:55	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1	06/27/16 12:16	06/27/16 19:55	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.1**	%	0.10	1		06/29/16 13:54		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Sample: Dup-01 **Lab ID: 30187560016** Collected: 06/22/16 00:01 Received: 06/23/16 15:35 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B Preparation Method: EPA 5035A							
Benzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	71-43-2	1c
Ethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	100-41-4	1c
Isopropylbenzene (Cumene)	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	98-82-8	1c
Methyl-tert-butyl ether	**604**	ug/kg	210	50	06/28/16 11:17	06/29/16 16:03	1634-04-4	1c
Naphthalene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	91-20-3	1c
Toluene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	108-88-3	1c
1,2,4-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	95-63-6	1c
1,3,5-Trimethylbenzene	ND	ug/kg	4.6	1	06/27/16 12:16	06/27/16 20:21	108-67-8	1c
Surrogates								
Toluene-d8 (S)	99	%	68-135	1	06/27/16 12:16	06/27/16 20:21	2037-26-5	
4-Bromofluorobenzene (S)	101	%	65-146	1	06/27/16 12:16	06/27/16 20:21	460-00-4	
1,2-Dichloroethane-d4 (S)	114	%	69-137	1	06/27/16 12:16	06/27/16 20:21	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1	06/27/16 12:16	06/27/16 20:21	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**15.0**	%	0.10	1		06/29/16 13:54		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

QC Batch: MSV/29132 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30187560001, 30187560003, 30187560004, 30187560005, 30187560007, 30187560008, 30187560009, 30187560010, 30187560011, 30187560012, 30187560013, 30187560015, 30187560016

METHOD BLANK: 1098920 Matrix: Solid
Associated Lab Samples: 30187560001, 30187560003, 30187560004, 30187560005, 30187560007, 30187560008, 30187560009, 30187560010, 30187560011, 30187560012, 30187560013, 30187560015, 30187560016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	06/27/16 12:24	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	06/27/16 12:24	
Benzene	ug/kg	ND	5.0	06/27/16 12:24	
Ethylbenzene	ug/kg	ND	5.0	06/27/16 12:24	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	06/27/16 12:24	
Methyl-tert-butyl ether	ug/kg	ND	5.0	06/27/16 12:24	
Naphthalene	ug/kg	ND	5.0	06/27/16 12:24	
Toluene	ug/kg	ND	5.0	06/27/16 12:24	
1,2-Dichloroethane-d4 (S)	%	111	69-137	06/27/16 12:24	
4-Bromofluorobenzene (S)	%	100	65-146	06/27/16 12:24	
Dibromofluoromethane (S)	%	99	70-130	06/27/16 12:24	
Toluene-d8 (S)	%	101	68-135	06/27/16 12:24	

LABORATORY CONTROL SAMPLE: 1098921

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	18.4	92	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	18.6	93	74-129	
Benzene	ug/kg	20	18.9	94	71-137	
Ethylbenzene	ug/kg	20	18.6	93	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	18.2	91	78-133	
Methyl-tert-butyl ether	ug/kg	20	20.2	101	77-141	
Naphthalene	ug/kg	20	18.3	91	81-126	
Toluene	ug/kg	20	18.8	94	72-127	
1,2-Dichloroethane-d4 (S)	%			116	69-137	
4-Bromofluorobenzene (S)	%			100	65-146	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			103	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

QC Batch: MSV/29133 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035A Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30187560002, 30187560006, 30187560014

METHOD BLANK: 1098929 Matrix: Solid
Associated Lab Samples: 30187560002, 30187560006, 30187560014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	ND	250	06/27/16 11:57	
1,3,5-Trimethylbenzene	ug/kg	ND	250	06/27/16 11:57	
Benzene	ug/kg	ND	250	06/27/16 11:57	
Ethylbenzene	ug/kg	ND	250	06/27/16 11:57	
Isopropylbenzene (Cumene)	ug/kg	ND	250	06/27/16 11:57	
Methyl-tert-butyl ether	ug/kg	ND	250	06/27/16 11:57	
Naphthalene	ug/kg	ND	250	06/27/16 11:57	
Toluene	ug/kg	ND	250	06/27/16 11:57	
1,2-Dichloroethane-d4 (S)	%	114	69-137	06/27/16 11:57	
4-Bromofluorobenzene (S)	%	101	65-146	06/27/16 11:57	
Dibromofluoromethane (S)	%	96	70-130	06/27/16 11:57	
Toluene-d8 (S)	%	104	68-135	06/27/16 11:57	

LABORATORY CONTROL SAMPLE: 1098930

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	20	18.4	92	79-125	
1,3,5-Trimethylbenzene	ug/kg	20	18.6	93	74-129	
Benzene	ug/kg	20	18.9	94	71-137	
Ethylbenzene	ug/kg	20	18.6	93	78-126	
Isopropylbenzene (Cumene)	ug/kg	20	18.2	91	78-133	
Methyl-tert-butyl ether	ug/kg	20	20.2	101	77-141	
Naphthalene	ug/kg	20	18.3	91	81-126	
Toluene	ug/kg	20	18.8	94	72-127	
1,2-Dichloroethane-d4 (S)	%			116	69-137	
4-Bromofluorobenzene (S)	%			100	65-146	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			103	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

QC Batch: MSV/29162
QC Batch Method: EPA 5035A
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-SOIL
Associated Lab Samples: 30187560015, 30187560016

METHOD BLANK: 1099633
Matrix: Solid
Associated Lab Samples: 30187560015, 30187560016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	250	06/28/16 10:43	
1,2-Dichloroethane-d4 (S)	%	111	69-137	06/28/16 10:43	
4-Bromofluorobenzene (S)	%	101	65-146	06/28/16 10:43	
Dibromofluoromethane (S)	%	98	70-130	06/28/16 10:43	
Toluene-d8 (S)	%	99	68-135	06/28/16 10:43	

LABORATORY CONTROL SAMPLE: 1099634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl-tert-butyl ether	ug/kg	20	20.2	101	77-141	
1,2-Dichloroethane-d4 (S)	%			114	69-137	
4-Bromofluorobenzene (S)	%			104	65-146	
Dibromofluoromethane (S)	%			100	70-130	
Toluene-d8 (S)	%			99	68-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

QC Batch: PMST/6247 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 30187560001, 30187560002, 30187560003, 30187560004, 30187560005, 30187560006, 30187560007, 30187560008, 30187560009, 30187560010, 30187560011, 30187560012, 30187560013, 30187560014, 30187560015, 30187560016

SAMPLE DUPLICATE: 1100697

Parameter	Units	30186774001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	0.61	0.55	11	

SAMPLE DUPLICATE: 1100698

Parameter	Units	30186777001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	2.5	3.4	31	D6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/29132

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/29133

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/29162

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA-Barkeyville M-209
Pace Project No.: 30187560

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30187560001	MW-15 (4-5)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560002	SB-10 (7-8)	EPA 5035A	MSV/29133	EPA 8260B	MSV/29143
30187560003	SB-11 (3-4)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560004	MW-14 (4-5)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560005	MW-16 (4-5)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560006	MW-16 (13-14)	EPA 5035A	MSV/29133	EPA 8260B	MSV/29143
30187560007	MW-16 (17-18)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560008	MW-15 (15-16)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560009	MW-15 (26-27)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560010	MW-14 (14-15)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560011	MW-14 (19-20)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560012	SB-11 (5-7)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560013	SB-11 (11-13)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560014	SB-10 (11-12)	EPA 5035A	MSV/29133	EPA 8260B	MSV/29143
30187560015	SB-10 (15-16)	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560015	SB-10 (15-16)	EPA 5035A	MSV/29162	EPA 8260B	MSV/29178
30187560016	Dup-01	EPA 5035A	MSV/29132	EPA 8260B	MSV/29142
30187560016	Dup-01	EPA 5035A	MSV/29162	EPA 8260B	MSV/29178
30187560001	MW-15 (4-5)	ASTM D2974-87	PMST/6247		
30187560002	SB-10 (7-8)	ASTM D2974-87	PMST/6247		
30187560003	SB-11 (3-4)	ASTM D2974-87	PMST/6247		
30187560004	MW-14 (4-5)	ASTM D2974-87	PMST/6247		
30187560005	MW-16 (4-5)	ASTM D2974-87	PMST/6247		
30187560006	MW-16 (13-14)	ASTM D2974-87	PMST/6247		
30187560007	MW-16 (17-18)	ASTM D2974-87	PMST/6247		
30187560008	MW-15 (15-16)	ASTM D2974-87	PMST/6247		
30187560009	MW-15 (26-27)	ASTM D2974-87	PMST/6247		
30187560010	MW-14 (14-15)	ASTM D2974-87	PMST/6247		
30187560011	MW-14 (19-20)	ASTM D2974-87	PMST/6247		
30187560012	SB-11 (5-7)	ASTM D2974-87	PMST/6247		
30187560013	SB-11 (11-13)	ASTM D2974-87	PMST/6247		
30187560014	SB-10 (11-12)	ASTM D2974-87	PMST/6247		
30187560015	SB-10 (15-16)	ASTM D2974-87	PMST/6247		
30187560016	Dup-01	ASTM D2974-87	PMST/6247		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2039915

Section A Required Client Information:

Company: GES
Address: 301 Commerce Park Drive
Cranberry Twp, PA 16066
Email To: jhinkle@gesonline.com
Phone: 800-267-2549 Fax:
Requested Due Date/TAT: 5-day

Section B Required Project Information:

Report To: Joe Hinkle
Copy To: Joan Amadeo
Purchase Order No.:
Project Name: UPA- Barkeyville M-209
Project Number:

Section C Invoice Information:

Attention: Joan Amadeo
Company Name: GES
Address: 301 Commerce Park Dr. Cranberry Twp, PA 16066
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: PA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

WO#: 30187560

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Residual	Pace Project No./ Lab I.D.
1	MW-15 (4-5)	SL	G			6/20/16	1140		4						2			X		001
2	SB-10 (7-8)	SL	G			6/20/16	1620													002
3	SB-9 (3-4)	SL	G			6/21/16	0815													003
4	MW-14 (4-5)	SL	G			6/21/16	1242													004
5	MW-16 (4-5)	SL	G			6/21/16	1428													005
6	MW-16 (13-14)	SL	G			6/21/16	1500													006
7	MW-16 (17-18)	SL	G			6/21/16	1508													007
8	MW-15 (15-16)	SL	G			6/22/16	0820													008
9	MW-15 (26-27)	SL	G			6/22/16	0856													009
10	MW-14 (14-15)	SL	G			6/22/16	1235													010
11	MW-14 (19-20)	SL	G			6/22/16	1250													011
12	SB-9 (5-7)	SL	G			6/22/16	1550													012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Lauren Bidwell / GES	6/23/16	0900	GES-Warehouse	6/23/16	0900				
				[signature]	6-22-16	10:55				
	[signature] 6-23-16	2:35		Lauren F. Hill Pace	6/23/16	15:35	5.7	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell
SIGNATURE of SAMPLER: Lauren Bidwell
DATE Signed (MM/DD/YY): 06/22/2016

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of 2

2039916

Section A Required Client Information:

Company:	GES
Address:	301 Commerce Park Dr. Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com
Phone:	Fax:
Requested Due Date/TAT:	5-day

Section B Required Project Information:

Report To:	Joe Hinkle
Copy To:	Joan Amodeo
Purchase Order No.:	
Project Name:	UPA-Barkeyville M-209
Project Number:	

Section C Invoice Information:

Attention:	Joan Amodeo
Company Name:	GES
Address:	301 Commerce Park Dr. Cranberry Twp, PA 16066
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	#A new diesel short list	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-9 (11-13)	SL	G			6/22/16	1605		4	1			1		2				X		013
2	SB-10 (11-12)	SL	G			6/22/16	1713		↓	↓			↓		↓				↓		014
3	SB-10 (15-16)	SL	G			6/22/16	1722		↓	↓			↓		↓				↓		015
4	Dup-01	SL	G			6/22/16			↓	↓			↓		↓				↓		016
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

30 87560

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Lauren Bidwell / GES	6/23/16	0900	GES Warehouse	6/23/16	0900				
				[signature]	6-23-16	10:55				
	[signature]	6-23-16	3:35	Karen E. Hill / Pace	6/23/16	15:35	5.7	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell

SIGNATURE of SAMPLER: Lauren Bidwell

DATE Signed (MM/DD/YY): 06/22/2016

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical®
www.pacelabs.com

RECEIVED
By Rachel Christner at 11:13 am, 6/29/16

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

2039915

Section A Required Client Information:

Company: GES
Address: 301 Commerce Park Drive Cranberry Twp, PA 16066
Email To: jhinkle@gesonline.com
Phone: 800-267-2549 Fax:
Requested Due Date/TAT: 5-day

Section B Required Project Information:

Report To: Joe Hinkle
Copy To: Joan Amodeo
Purchase Order No.:
Project Name: UPA- Barkeyville M-209
Project Number:

Section C Invoice Information:

Attention: Joan Amodeo
Company Name: GES
Address: 301 Commerce Park Dr. Cranberry Twp, PA 16066
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	PA new diesel shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-15 (4-5)	SL	G			6/20/16	1140		4	1			1		2				X		
2	SB-10 (7-8)	SL	G			6/20/16	1620														
3	~~SB-9~~ (3-4) SB-11	SL	G			6/21/16	0815														
4	MW-14 (4-5) LB 6/29/16	SL	G			6/21/16	1242														
5	MW-16 (4-5)	SL	G			6/21/16	1428														
6	MW-16 (13-14)	SL	G			6/21/16	1500														
7	MW-16 (17-18)	SL	G			6/21/16	1508														
8	MW-15 (15-16)	SL	G			6/22/16	0820														
9	MW-15 (26-27)	SL	G			6/22/16	0856														
10	MW-14 (14-15)	SL	G			6/22/16	1235														
11	MW-14 (19-20)	SL	G			6/22/16	1250														
12	SB-11 ~~SB-9~~ (5-7)	SL	G			6/22/16	1550														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Lauren Bidwell / GES	6/23/16	0900	GES Warehouse	6/23/16	0900	

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell
SIGNATURE of SAMPLER: Lauren Bidwell
DATE Signed (MM/DD/YY): 06/22/2016

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical
www.pacelabs.com

RECEIVED
by Rachel Christner at 11:13 am, 6/28/16

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of 2

2039916

Section A Required Client Information:

Company: GES
Address: 301 commerce Park Dr.
Cranberry Twp, PA 16066
Email To: jhinkle@gesonline.com
Phone: Fax:
Requested Due Date/TAT: 5-day

Section B Required Project Information:

Report To: Joe Hinkle
Copy To: Joan Amodeo
Purchase Order No.:
Project Name: UPA-Barkeyville M-209
Project Number:

Section C Invoice Information:

Attention: Joan Amodeo
Company Name: GES
Address: 301 Commerce Park Dr. Cranberry Twp, PA 16066
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: PA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

LB 6/29/16

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	#A new diesel shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-11 ~~SB-9~~ (11-13)	SL	G			6/22/16	1605		4	1			1		2				X		
2	SB-10 (11-12)	SL	G			6/22/16	1713														
3	SB-10 (15-16)	SL	G			6/22/16	1722														
4	DUP-01	SL	G			6/22/16			↓	↓			↓		↓				↓		
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Lauren Bidwell / GES	6/23/16	0900	GES Warehouse	6/23/16	0900	

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lauren Bidwell

SIGNATURE of SAMPLER: Lauren Bidwell DATE Signed (MM/DD/YY): 06/22/2016

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Sample Condition Upon Receipt Pittsburgh

Pace Analytical

Client Name: GES Project # 30187560

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 8 **Type of Ice:** (Wet) Blue None

Cooler Temperature **Observed Temp** 5.6 °C Correction Factor: +0.1 °C Final Temp: 5.7 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KH 6/23/16

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:	✓			8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Filtered volume received for Dissolved tests			✓	12.
All containers needing preservation have been checked.			✓	13.
All containers needing preservation are found to be in compliance with EPA recommendation.			✓	
exceptions: (VOA) coliform, TOC, O&G, Phenolics				Initial when completed KH / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	14.
Trip Blank Present:			✓	15.
Trip Blank Custody Seals Present			✓	

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APPENDIX G

Geotechnical Laboratory Report, 2016

March 14, 2016

Project No. 2016-097-001

Joseph Hinkle
Groundwater & Environmental Services, Inc.
301 Commerce Park Drive
Cranberry Township, PA 16066

Transmittal
Laboratory Test Results
UPA Barkeyville (M-209) 0704730

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens that were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,
Geotechnics, Inc.

David R. Backstrom
Laboratory Director

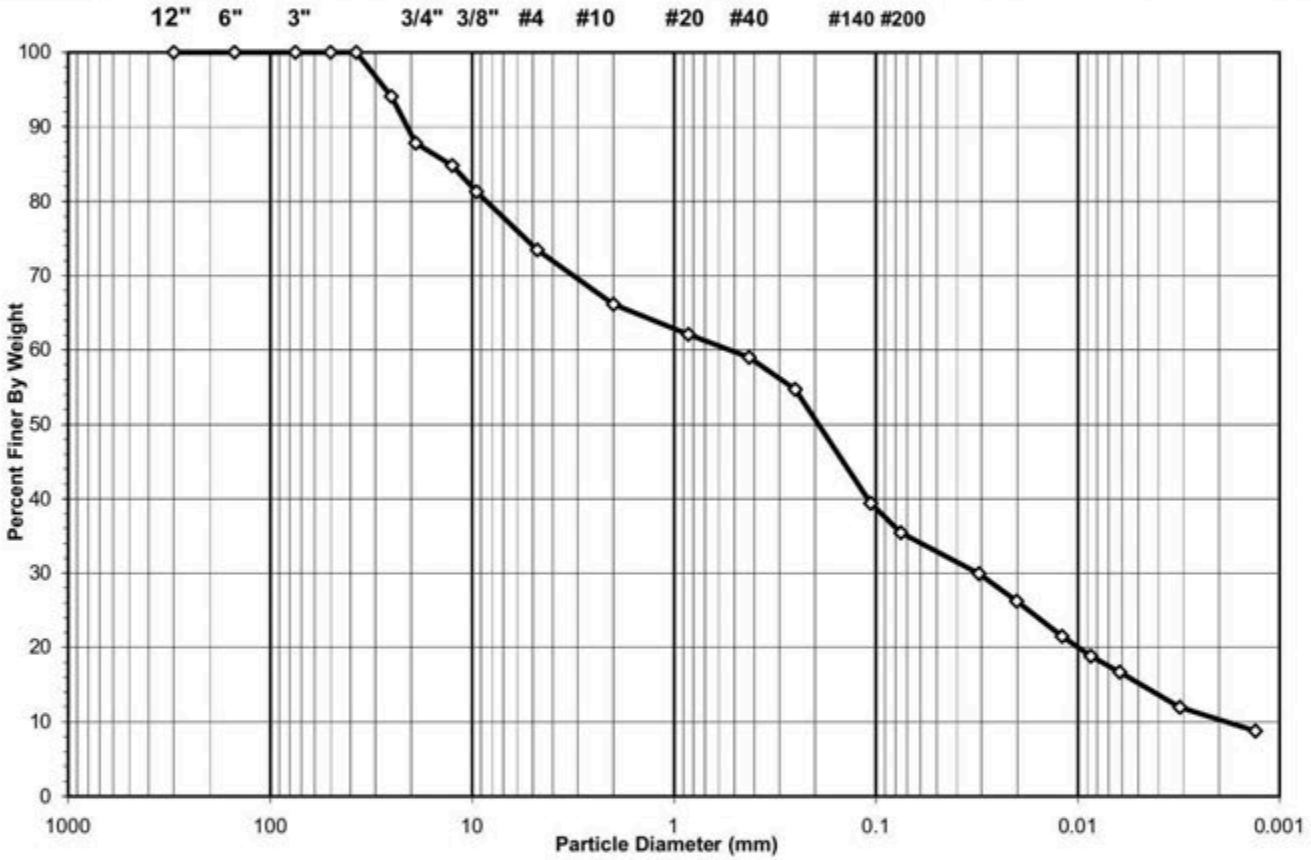
We understand that you have a choice in your laboratory services and we thank you for choosing Geotechnics.

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.4-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Soil Color:	Brown

	SIEVE ANALYSIS				HYDROMETER	
USCS	cobbles	gravel		sand	silt and clay fraction	
USDA	cobbles	gravel		sand	silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	26.54
#4 To #200	*Sand*	38.05
Finer Than #200	*Silt & Clay*	35.40

USCS Symbol:

SC-SM, TESTED

USCS Classification:

SILTY, CLAYEY SAND WITH GRAVEL

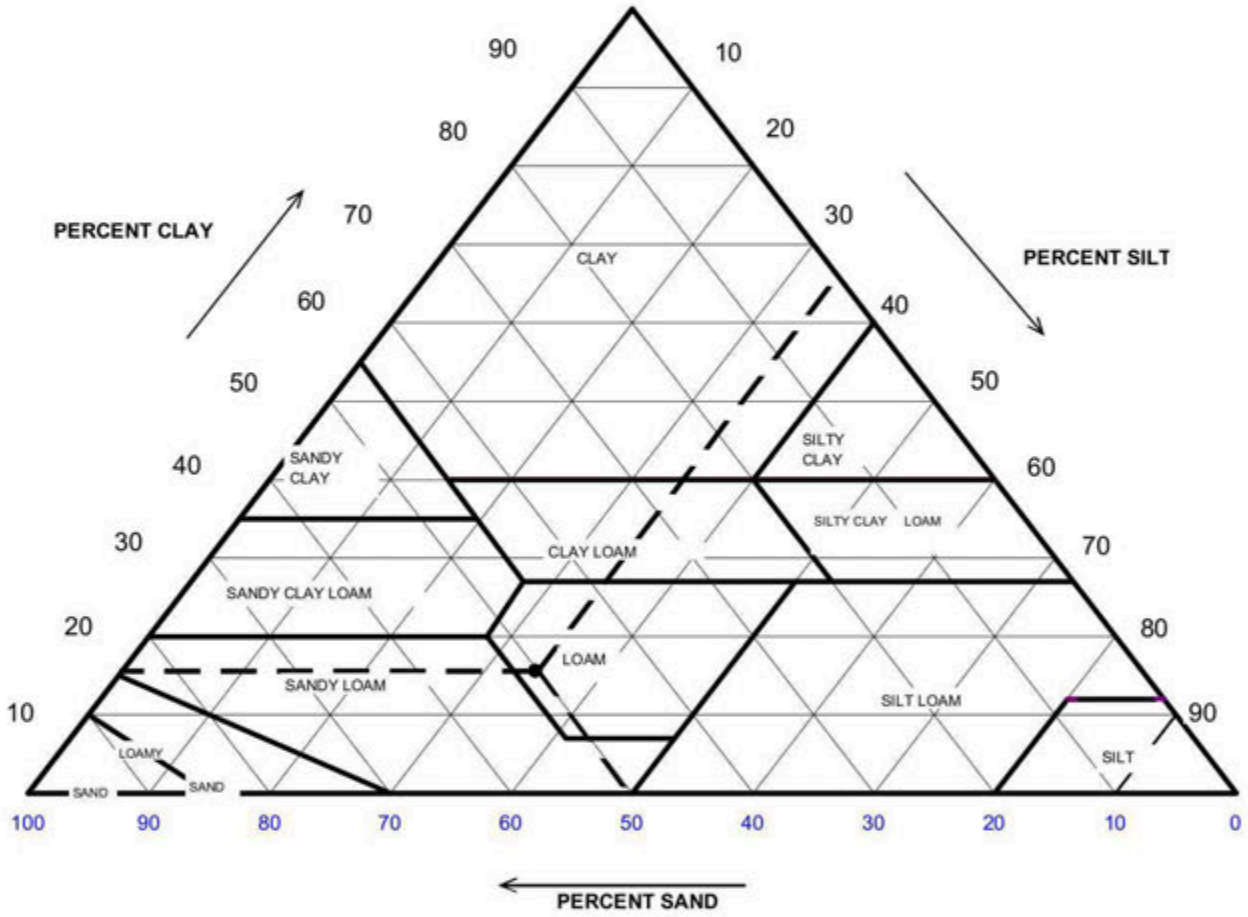
DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

geotechnics
geotechnical & geosynthetic testing

USDA CLASSIFICATION CHART

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.4-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Soil Color:	Brown



Particle Size	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
(mm)	(%)		(%)	(%)
		Gravel	33.90	**0.00**
2	66.10	*Sand*	33.21	**50.24**
0.05	32.90	*Silt*	22.61	**34.20**
0.002	10.29	*Clay*	10.29	**15.57**

USDA Classification: ***LOAM***

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.4-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Materia		Water Content of Retained 3/4" Material	
Tare No.	22	Tare No.	NA
Weight of Tare & Wet Sample (g)	1067.46	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	972.20	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	202.98	Weight of Tare (g)	NA
Weight of Water (g)	95.26	Weight of Water (g)	NA
Weight of Dry Sample (g)	769.22	Weight of Dry Sample (g)	NA
Moisture Content (%)	**12.4**	**Moisture Content (%)**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	769.22
Dry Weight of -3/4" Sample (g)	402.79	Weight of - #200 Material (g)	272.34
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	496.88
Dry Weight of +3/4" Sample (g)	94.09		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	45.38	5.90	5.90		94.10	**94.10**
3/4"	19.0	48.71	6.33	12.23		87.77	**87.77**
1/2"	12.5	22.79	2.96	15.19		84.81	**84.81**
3/8"	9.50	27.10	3.52	18.72		81.28	**81.28**
#4	4.75	60.18	7.82	26.54		73.46	**73.46**
#10	2.00	56.58	7.36	33.90		66.10	**66.10**
#20	0.85	31.16	4.05	37.95		62.05	**62.05**
#40	0.425	23.88	3.10	41.05		58.95	**58.95**
#60	0.250	32.97	4.29	45.34		54.66	**54.66**
#140	0.106	117.28	15.25	60.58		39.42	**39.42**
#200	0.075	30.85	4.01	64.60		35.40	**35.40**
Pan	-	272.34	35.40	100.00		-	-

Tested By HL Date 3/4/16 Checked By KC Date 3/6/16

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

geotechnics
geotechnical & geosynthetic testing

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.4-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Soil Color:	Brown

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		34.5	22.6	6.15	28.4	84.6	0.01343	0.0310	**29.9**
5		31.0	22.6	6.15	24.9	74.1	0.01343	0.0201	**26.2**
15		26.5	22.6	6.15	20.4	60.7	0.01343	0.0120	**21.5**
30		24.0	22.6	6.15	17.9	53.2	0.01343	0.0086	**18.9**
60		22.0	22.4	6.22	15.8	47.1	0.01347	0.0062	**16.7**
250		17.5	22.4	6.22	11.3	33.6	0.01347	0.0031	**11.9**
1440		14.5	22.5	6.18	8.3	24.8	0.01345	0.0013	**8.8**

Soil Specimen Data		Other Corrections		
Tare No.	697			
Weight of Tare & Dry Material (g)	136.22	a - Factor	1.01	
Weight of Tare (g)	97.35			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	35.40	
Weight of Dry Material (g)	33.9			
		Specific Gravity	2.6	Measured

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By NJM Date 3/4/16 Checked By KC Date 3/6/16

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

S:\Excel\Excel QA\Spreadsheets\SieveHyd.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.2-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Soil Description:	BROWN SILTY CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description .

(Minus No. 40 sieve material, Airdried)

Liquid Limit Test	**1**	**2**	**3**
Tare Number:	241	165	244
Wt. of Tare & Wet Sample (g):	39.21	38.55	39.14
Wt. of Tare & Dry Sample (g):	34.87	34.49	35.31
Weight of Tare (g):	18.53	18.05	18.80
Weight of Water (g):	4.3	4.1	3.8
Weight of Dry Sample (g):	16.3	16.4	16.5
Moisture Content (%):	**26.6**	**24.7**	**23.2**
Number of Blows:	**16**	**22**	**30**

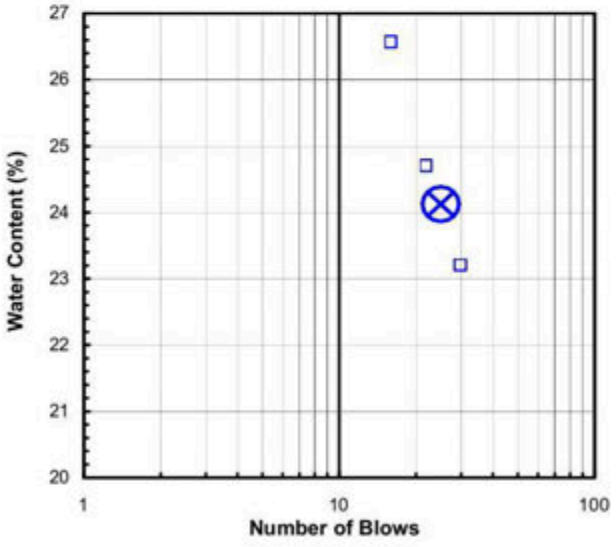
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	231	226	
Wt. of Tare & Wet Sample (g):	25.92	25.67	
Wt. of Tare & Dry Sample (g):	25.01	24.76	
Weight of Tare (g):	19.67	19.34	
Weight of Water (g):	0.9	0.9	
Weight of Dry Sample (g):	5.3	5.4	
Moisture Content (%):	**17.0**	**16.8**	**0.3**

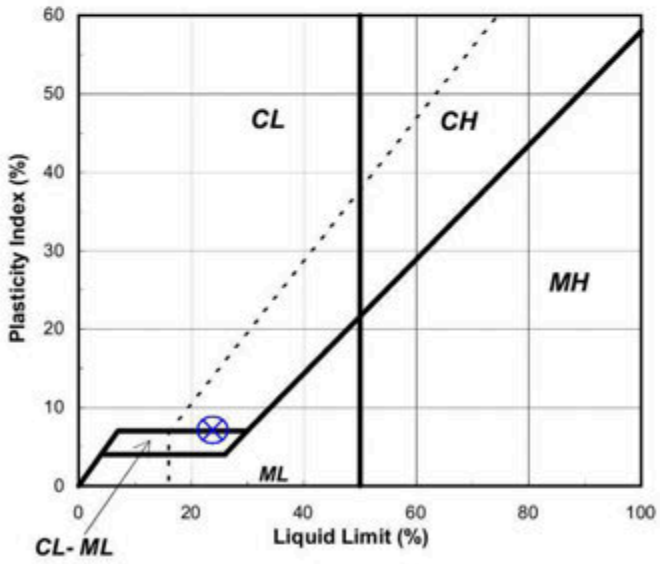
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**24**
Plastic Limit (%):	**17**
Plasticity Index (%):	**7**
USCS Symbol:	**CL-ML**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 3/5/16 *Checked By* KC *Date* 3/6/16

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

Moisture, Ash, and Organic Matter (Loss on Ignition)

ASTM D 2974-14, AASHTO T 267-86

Client:	Groundwater & Environmental Services, Inc.
Client Reference:	UPA Barkeyville (M-209) 0704730
Project No.:	2016-097-001

Moisture Content (Oven Dried, minus #10 Sieve Material)

Lab ID:	001
Boring No.:	SB-8
Depth (ft):	10.2-10.8
Sample No.:	ST-1
Tare Number	T+C
Weight of Tare & Wet Sample (g)	81.35
Weight of Tare & Dry Sample (g)	81.19
Weight of Tare (g)	38.06
Weight of Water (g)	0.16
Weight of Dry Sample (g)	43.13
Moisture Content	**0.4%**

Ash Content, Organic Matter

Furnace Temperature (°C)	440
Weight of Tare & Ash (g)	79.27
Weight of Volatiles (g)	1.92
Weight of Ash (g)	41.21
Ash Content (%)	**95.5%**
Organic Matter (%)	**4.5%**

Tested By RAL *Date* 3/5/16 *Checked By* KC *Date* 3/5/16

DCN: CT-S8 DATE: 11/15/10 REVISION:4

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

geotechnics
geotechnical & geosynthetic testing

SPECIFIC GRAVITY

ASTM D 854-14

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Reference:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.2-10.8
Project No.:	2016-097-001	Sample No.:	ST-1
Lab ID:	2016-097-001-001	Visual Description:	Brown Sandy Clay

(MInus No.4 sieve material,oven dried)

Replicate Number	**1**	**2**
Pycnometer ID:	G 1255	G 1504
Weight of Pycnometer & Soil & Water (g):	729.21	712.31
Temperature (°C):	24.0	24.2
Weight of Pycnometer & Water (g):	685.21	672.35
Tare Number:	644	961
Weight of Tare & Dry Soil (g):	170.76	165.87
Weight of Tare (g):	99.38	100.89
Weight of Dry Soil (g):	71.38	64.98
Specific Gravity of Soil @ Measured Temperature:	2.607	2.597
Specific Gravity of Water @ Measured Temperature:	0.99730	0.99725
Conversion Factor for Measured Temperature:	0.99909	0.99905
Specific Gravity @ 20° Celsius:	2.609	2.600

Average Specific Gravity @ 20° Celsius	2.60

Tested By TO *Date* 3/11/16 *Checked By* CLK *Date* 3/12/16

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNIT WEIGHT WITH POROSITY

ASTM D7263-09

geotechnics
geotechnical & geosynthetic testing

Client:	Groundwater & Environmental Services, Inc.	Boring No.:	SB-8
Client Project:	UPA Barkeyville (M-209) 0704730	Depth (ft):	10.4-10.8
Project No. :	2016-097-001	Sample No.:	ST-1
Lab ID No.:	2016-097-001-001		

Specific Gravity: 2.60 Measured

Visual Description: Brown Sandy Clay with Rock Fragments

MOISTURE CONTENT:

Tare Number	22
Wt. of Tare & WS (gm)	1067.46
Wt. of Tare & DS (gm)	972.20
Wt. of Tare (gm)	202.92
Wt. of Water (gm)	95.26
Wt. of DS (gm)	769.28
Moisture Content (%)	**12.4**

SPECIMEN: Undisturbed

Wt. of Mold/Tube & WS (gm)	1197.69
Wt. of Mold/Tube (gm)	300.56
Wt. of WS (gm)	897.13
Length 1 (in)	4.235
Length 2 (in)	4.232
Length 3 (in)	4.248
Top Diameter (in)	2.891
Middle Diameter (in)	2.869
Bottom Diameter (in)	2.852
Average Length (in)	4.24
Average Area (in^2)	6.47
Sample Volume (cm^3)	449.52
Unit Wet Wt. (gm/cm^3)	2.00
Unit Wet Wt. (pcf)	124.6
Unit Dry Wt. (pcf)	110.9
Unit Dry Wt. (gm/cm^3)	1.78
Void Ratio (e)	0.46
Porosity (n)	0.32
Pore Volume (cm^3)	142.5

Tested By: TRE Date: 3/2/16 Checked By: CLK Date: 3/12/16

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

APPENDIX H

Groundwater Laboratory Analytical Reports, 2015 and 2016

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

November 13, 2015

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on November 02, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Sample: MW-1 **Lab ID: 30163876001** Collected: 10/30/15 08:30 Received: 11/02/15 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		11/11/15 18:24	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		11/11/15 18:24	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/11/15 18:24	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		11/11/15 18:24	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		11/11/15 18:24	91-20-3	M5
Toluene	ND	ug/L	5.0	1		11/11/15 18:24	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 18:24	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 18:24	108-67-8	M5
Surrogates								
Toluene-d8 (S)	95	%	84-115	1		11/11/15 18:24	2037-26-5	M5
4-Bromofluorobenzene (S)	96	%	81-119	1		11/11/15 18:24	460-00-4	M5
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		11/11/15 18:24	17060-07-0	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Sample: MW-2 **Lab ID: 30163876002** Collected: 10/30/15 08:50 Received: 11/02/15 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		11/11/15 18:50	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		11/11/15 18:50	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/11/15 18:50	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		11/11/15 18:50	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		11/11/15 18:50	91-20-3	M5
Toluene	ND	ug/L	5.0	1		11/11/15 18:50	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 18:50	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 18:50	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		11/11/15 18:50	2037-26-5	M5
4-Bromofluorobenzene (S)	97	%	81-119	1		11/11/15 18:50	460-00-4	M5
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		11/11/15 18:50	17060-07-0	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Sample: MW-3 **Lab ID: 30163876003** Collected: 10/30/15 09:30 Received: 11/02/15 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**17.2**	ug/L	5.0	1		11/11/15 19:16	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		11/11/15 19:16	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/11/15 19:16	98-82-8	M5
Methyl-tert-butyl ether	**113**	ug/L	5.0	1		11/11/15 19:16	1634-04-4	M5
Naphthalene	**9.0**	ug/L	5.0	1		11/11/15 19:16	91-20-3	M5
Toluene	ND	ug/L	5.0	1		11/11/15 19:16	108-88-3	M5
1,2,4-Trimethylbenzene	**24.7**	ug/L	5.0	1		11/11/15 19:16	95-63-6	M5
1,3,5-Trimethylbenzene	**9.9**	ug/L	5.0	1		11/11/15 19:16	108-67-8	M5
Surrogates								
Toluene-d8 (S)	94	%	84-115	1		11/11/15 19:16	2037-26-5	M5
4-Bromofluorobenzene (S)	96	%	81-119	1		11/11/15 19:16	460-00-4	M5
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		11/11/15 19:16	17060-07-0	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Sample: MW-4 **Lab ID: 30163876004** Collected: 10/30/15 09:10 Received: 11/02/15 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**8.3**	ug/L	5.0	1		11/11/15 19:42	71-43-2	M5
Ethylbenzene	**14.9**	ug/L	5.0	1		11/11/15 19:42	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/11/15 19:42	98-82-8	M5
Methyl-tert-butyl ether	**6.7**	ug/L	5.0	1		11/11/15 19:42	1634-04-4	M5
Naphthalene	**9.3**	ug/L	5.0	1		11/11/15 19:42	91-20-3	M5
Toluene	ND	ug/L	5.0	1		11/11/15 19:42	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 19:42	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 19:42	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		11/11/15 19:42	2037-26-5	M5
4-Bromofluorobenzene (S)	95	%	81-119	1		11/11/15 19:42	460-00-4	M5
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		11/11/15 19:42	17060-07-0	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Sample: DUPLICATE **Lab ID: 30163876005** Collected: 10/30/15 08:30 Received: 11/02/15 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		11/11/15 20:08	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		11/11/15 20:08	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/11/15 20:08	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		11/11/15 20:08	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		11/11/15 20:08	91-20-3	M5
Toluene	ND	ug/L	5.0	1		11/11/15 20:08	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 20:08	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/11/15 20:08	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		11/11/15 20:08	2037-26-5	M5
4-Bromofluorobenzene (S)	94	%	81-119	1		11/11/15 20:08	460-00-4	M5
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		11/11/15 20:08	17060-07-0	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

QC Batch: MSV/25630 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 30163876001, 30163876002, 30163876003, 30163876004, 30163876005

METHOD BLANK: 981883 Matrix: Water
Associated Lab Samples: 30163876001, 30163876002, 30163876003, 30163876004, 30163876005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	11/11/15 14:53	M5
1,3,5-Trimethylbenzene	ug/L	ND	5.0	11/11/15 14:53	M5
Benzene	ug/L	ND	1.0	11/11/15 14:53	M5
Ethylbenzene	ug/L	ND	1.0	11/11/15 14:53	M5
Isopropylbenzene (Cumene)	ug/L	ND	1.0	11/11/15 14:53	M5
Methyl-tert-butyl ether	ug/L	ND	1.0	11/11/15 14:53	M5
Naphthalene	ug/L	ND	2.0	11/11/15 14:53	M5
Toluene	ug/L	ND	1.0	11/11/15 14:53	M5
1,2-Dichloroethane-d4 (S)	%	100	77-126	11/11/15 14:53	M5
4-Bromofluorobenzene (S)	%	97	81-119	11/11/15 14:53	M5
Toluene-d8 (S)	%	96	84-115	11/11/15 14:53	M5

LABORATORY CONTROL SAMPLE: 981884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.2	101	75-128	M5
1,3,5-Trimethylbenzene	ug/L	20	20.0	100	74-125	M5
Benzene	ug/L	20	20.1	100	69-115	M5
Ethylbenzene	ug/L	20	19.4	97	71-116	M5
Isopropylbenzene (Cumene)	ug/L	20	19.5	97	79-121	M5
Methyl-tert-butyl ether	ug/L	20	19.4	97	83-140	M5
Naphthalene	ug/L	20	19.4	97	64-140	M5
Toluene	ug/L	20	19.5	97	70-115	M5
1,2-Dichloroethane-d4 (S)	%			102	77-126	M5
4-Bromofluorobenzene (S)	%			97	81-119	M5
Toluene-d8 (S)	%			96	84-115	M5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/25630

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

M5 A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA BARKEYVILLE M-209
Pace Project No.: 30163876

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30163876001	**MW-1**	EPA 8260B	MSV/25630		
30163876002	**MW-2**	EPA 8260B	MSV/25630		
30163876003	**MW-3**	EPA 8260B	MSV/25630		
30163876004	**MW-4**	EPA 8260B	MSV/25630		
30163876005	**DUPLICATE**	EPA 8260B	MSV/25630		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

30163876

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp. PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager	Christner, Rachel
Requested Due Date/TAT:	~~10 Day (Default)~~ 5 Day RT	Container Order Number:		Pace Profile #:	

Regulatory Agency: UST - Underground Storage Tank

State / Location: Pennsylvania

Requested Analysis Filtered (Y/N)

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)
1	MW-1	WT	G			11-30	0930		6				X						X	
2	MW-2	WT	G				0850		3				X						X	
3	MW-3	WT	G				0930		3				X						X	
4	MW-4	WT	G				0910		3				X						X	
5	Duplicate	WT	G				0830		3				X						X	
6	Trip Blank	WT	G						2				X						X	
7																				
8																				
9																				
10																				
11																				
12																				

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Hold trip blank analysis pending results.	[illegible] / GES	11-2-15	0615	Jones Sample Area	11-2-15	0615				
EQUIS EDT	[illegible] / GES			[illegible]	11-2-15	12:40				
	[illegible]	11-2-15	3:50	[illegible]	11-2-15	1550	4.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James R Albert

SIGNATURE of SAMPLER: [signature] DATE Signed: 10-30-15

EQUIS EDD Required

RTB

30163876

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES

Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap X Bubble Bags ___ None ___ Other

Thermometer Used 8 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 4.0 °C Correction Factor: +0.2 °C Final Temp: 4.2 °C

Date and initials of person examining contents: 11-2-15 MJV

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☒Yes ☐No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☐Yes ☒No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☒No ☐N/A	Initial when completed MJV / Lot # of added preservative
exceptions: (VOA) coliform, TOC, O&G, Phenols	☒Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☒No ☐N/A	15.
Trip Blank Present:	☒Yes ☐No ☐N/A	16.
Trip Blank Custody Seals Present	☒Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel B Craft **Date:** 11/3/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

30163876

Face Analytical

Project Number: _____

Client Name: ESS

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml / 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001	WT													2										
002	WT													3										
005	WT													3										
006	WT													2										

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

January 13, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on December 29, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Pennsylvania Certification IDs
Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-1 **Lab ID: 30169213001** Collected: 12/28/15 11:50 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 17:14	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 17:14	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 17:14	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		01/06/16 17:14	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 17:14	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 17:14	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 17:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 17:14	108-67-8	
Surrogates								
Toluene-d8 (S)	95	%	84-115	1		01/06/16 17:14	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		01/06/16 17:14	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	77-126	1		01/06/16 17:14	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		01/06/16 17:14	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-2 **Lab ID: 30169213002** Collected: 12/28/15 12:10 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 17:39	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 17:39	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 17:39	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		01/06/16 17:39	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 17:39	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 17:39	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 17:39	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 17:39	108-67-8	
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		01/06/16 17:39	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		01/06/16 17:39	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	77-126	1		01/06/16 17:39	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		01/06/16 17:39	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-3 **Lab ID: 30169213003** Collected: 12/28/15 12:30 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 18:05	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 18:05	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 18:05	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		01/06/16 18:05	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 18:05	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 18:05	108-88-3	
1,2,4-Trimethylbenzene	**6.1**	ug/L	5.0	1		01/06/16 18:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 18:05	108-67-8	
Surrogates								
Toluene-d8 (S)	93	%	84-115	1		01/06/16 18:05	2037-26-5	
4-Bromofluorobenzene (S)	100	%	81-119	1		01/06/16 18:05	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	77-126	1		01/06/16 18:05	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1		01/06/16 18:05	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-4 **Lab ID: 30169213004** Collected: 12/28/15 12:55 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 18:30	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 18:30	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 18:30	98-82-8	
Methyl-tert-butyl ether	**7.0**	ug/L	5.0	1		01/06/16 18:30	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 18:30	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 18:30	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 18:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 18:30	108-67-8	
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		01/06/16 18:30	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		01/06/16 18:30	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	77-126	1		01/06/16 18:30	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		01/06/16 18:30	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-5 **Lab ID: 30169213005** Collected: 12/28/15 12:40 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 18:56	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 18:56	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 18:56	98-82-8	
Methyl-tert-butyl ether	**22.6**	ug/L	5.0	1		01/06/16 18:56	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 18:56	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 18:56	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 18:56	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 18:56	108-67-8	
Surrogates								
Toluene-d8 (S)	94	%	84-115	1		01/06/16 18:56	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		01/06/16 18:56	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	77-126	1		01/06/16 18:56	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		01/06/16 18:56	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-6 **Lab ID: 30169213006** Collected: 12/28/15 13:15 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 19:22	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 19:22	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 19:22	98-82-8	
Methyl-tert-butyl ether	**1850**	ug/L	50.0	10		01/07/16 20:50	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 19:22	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 19:22	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 19:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 19:22	108-67-8	
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		01/06/16 19:22	2037-26-5	
4-Bromofluorobenzene (S)	100	%	81-119	1		01/06/16 19:22	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		01/06/16 19:22	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1		01/06/16 19:22	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: MW-7 **Lab ID: 30169213007** Collected: 12/28/15 13:35 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**5.2**	ug/L	5.0	1		01/06/16 19:47	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 19:47	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 19:47	98-82-8	
Methyl-tert-butyl ether	**262**	ug/L	5.0	1		01/06/16 19:47	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 19:47	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 19:47	108-88-3	
1,2,4-Trimethylbenzene	**5.1**	ug/L	5.0	1		01/06/16 19:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 19:47	108-67-8	
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		01/06/16 19:47	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		01/06/16 19:47	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	77-126	1		01/06/16 19:47	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1		01/06/16 19:47	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: DUPLICATE **Lab ID: 30169213008** Collected: 12/28/15 00:01 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 20:12	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 20:12	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 20:12	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		01/06/16 20:12	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 20:12	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 20:12	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 20:12	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 20:12	108-67-8	
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		01/06/16 20:12	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		01/06/16 20:12	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		01/06/16 20:12	17060-07-0	
Dibromofluoromethane (S)	100	%	70-130	1		01/06/16 20:12	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Sample: TRIP BLANK **Lab ID: 30169213009** Collected: 12/28/15 13:35 Received: 12/29/15 13:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		01/06/16 20:38	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		01/06/16 20:38	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		01/06/16 20:38	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		01/06/16 20:38	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		01/06/16 20:38	91-20-3	
Toluene	ND	ug/L	5.0	1		01/06/16 20:38	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 20:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		01/06/16 20:38	108-67-8	
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		01/06/16 20:38	2037-26-5	
4-Bromofluorobenzene (S)	95	%	81-119	1		01/06/16 20:38	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		01/06/16 20:38	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		01/06/16 20:38	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

QC Batch: MSV/26495 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30169213001, 30169213002, 30169213003, 30169213004, 30169213005, 30169213006, 30169213007, 30169213008, 30169213009

METHOD BLANK: 1007185 Matrix: Water
Associated Lab Samples: 30169213001, 30169213002, 30169213003, 30169213004, 30169213005, 30169213006, 30169213007, 30169213008, 30169213009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	01/06/16 16:23	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	01/06/16 16:23	
Benzene	ug/L	ND	1.0	01/06/16 16:23	
Ethylbenzene	ug/L	ND	1.0	01/06/16 16:23	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	01/06/16 16:23	
Methyl-tert-butyl ether	ug/L	ND	1.0	01/06/16 16:23	
Naphthalene	ug/L	ND	2.0	01/06/16 16:23	
Toluene	ug/L	ND	1.0	01/06/16 16:23	
1,2-Dichloroethane-d4 (S)	%	104	77-126	01/06/16 16:23	
4-Bromofluorobenzene (S)	%	97	81-119	01/06/16 16:23	
Dibromofluoromethane (S)	%	100	70-130	01/06/16 16:23	
Toluene-d8 (S)	%	98	84-115	01/06/16 16:23	

LABORATORY CONTROL SAMPLE: 1007186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.4	107	75-128	
1,3,5-Trimethylbenzene	ug/L	20	21.5	107	74-125	
Benzene	ug/L	20	21.4	107	69-115	
Ethylbenzene	ug/L	20	19.9	99	71-116	
Isopropylbenzene (Cumene)	ug/L	20	21.4	107	79-121	
Methyl-tert-butyl ether	ug/L	20	20.2	101	83-140	
Naphthalene	ug/L	20	20.5	102	64-140	
Toluene	ug/L	20	19.8	99	70-115	
1,2-Dichloroethane-d4 (S)	%			101	77-126	
4-Bromofluorobenzene (S)	%			99	81-119	
Dibromofluoromethane (S)	%			104	70-130	
Toluene-d8 (S)	%			93	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1007904 1007905

Parameter	Units	30169213001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	19.9	19.4	100	97	69-121	3	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.0	19.7	100	99	68-118	1	
Benzene	ug/L	ND	20	20	21.2	20.5	102	98	63-123	3	
Ethylbenzene	ug/L	ND	20	20	19.7	18.3	99	91	70-120	8	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1007904 1007905

Parameter	Units	30169213001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Isopropylbenzene (Cumene)	ug/L	ND	20	20	20.0	19.7	100	98	71-129	2	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.9	18.8	89	88	63-143	1	
Naphthalene	ug/L	ND	20	20	19.2	18.8	96	94	55-122	2	
Toluene	ug/L	ND	20	20	19.1	18.1	94	89	66-124	6	
1,2-Dichloroethane-d4 (S)	%						102	114	77-126		
4-Bromofluorobenzene (S)	%						95	98	81-119		
Dibromofluoromethane (S)	%						103	105	70-130		
Toluene-d8 (S)	%						92	92	84-115		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA BARKEYVILLE
Pace Project No.: 30169213

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30169213001	**MW-1**	EPA 8260B	MSV/26495		
30169213002	**MW-2**	EPA 8260B	MSV/26495		
30169213003	**MW-3**	EPA 8260B	MSV/26495		
30169213004	**MW-4**	EPA 8260B	MSV/26495		
30169213005	**MW-5**	EPA 8260B	MSV/26495		
30169213006	**MW-6**	EPA 8260B	MSV/26495		
30169213007	**MW-7**	EPA 8260B	MSV/26495		
30169213008	**DUPLICATE**	EPA 8260B	MSV/26495		
30169213009	**TRIP BLANK**	EPA 8260B	MSV/26495		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

30169213

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1973893

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: GES	Report To: Joe Hinkle	Attention:
Address: 301 Commerce Park DR. Cranberry TWP PA 16066	Copy To:	Company Name:
		Address:
Email To: JHinkle@GESonline.Com	Purchase Order No.:	Pace Quote Reference:
Phone: 1-800-267-2549 Fax:	Project Name: UPA Barkeyville	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: PA

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	5260B New Diesel Shortlist	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-1	WT	G			12-28-15	1150		3				3						X		001
2	MW-2						1210												X		002
3	MW-3						1230												X		003
4	MW-4						1255												X		004
5	MW-5						1240												X		005
6	MW-6						1315												X		006
7	MW-7						1335												X		007
8	Duplicate						—												X		008
9	TRIP Blank						—		2				2						X		009
10																					~~01~~ RSB 12/29/15
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
USE 5 PPB Reporting Limit	[signature] / GES	12-29-15	0700	To GES Sample Area	12-29-15	0700				
Hold Trip Blank For Analysis	[signature] / GES			Cliff Mt Joy Pace	12/29/15	10:10				
	Cliff Mt Joy Pace	12/29/15	1:00P	[signature]	12/29/15	1300	3.2	Y	N	Y

EQUIS EDD Required ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Aylesworth

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 12-28-15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

30169213 WW

Sample Condition Upon Receipt

Pace Analytical

Client Name: CES Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap ___ Bubble Bags ___ None ___ Other

Thermometer Used 8 Type of Ice: Wet Blue None ☑ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 3.2 °C Correction Factor: 0.0 °C Final Temp: 3.2 °C

Date and initials of person examining contents: AM

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☑Yes ☐No	Initial when completed AM / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☑Yes ☐No ☐N/A	16. not Pace Prepared TB
Trip Blank Custody Seals Present	☐Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel K. Christian **Date:** 12/30/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

page 2

Project Number: 3016921 3

Client Name: GES

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other	Other
001	W													5+3											
008	W																								
009	W													2											

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

February 10, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on February 01, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-1 **Lab ID: 30172070001** Collected: 01/28/16 11:30 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**40.0**	ug/L	5.0	1		02/06/16 14:35	71-43-2	M1
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 14:35	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 14:35	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		02/06/16 14:35	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 14:35	91-20-3	
Toluene	**25.0**	ug/L	5.0	1		02/06/16 14:35	108-88-3	M1
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 14:35	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 14:35	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		02/06/16 14:35	2037-26-5	
4-Bromofluorobenzene (S)	103	%	81-119	1		02/06/16 14:35	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		02/06/16 14:35	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1		02/06/16 14:35	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-2 **Lab ID: 30172070002** Collected: 01/28/16 11:50 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 15:00	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 15:00	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 15:00	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		02/06/16 15:00	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 15:00	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 15:00	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 15:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 15:00	108-67-8	
Surrogates								
Toluene-d8 (S)	101	%	84-115	1		02/06/16 15:00	2037-26-5	
4-Bromofluorobenzene (S)	104	%	81-119	1		02/06/16 15:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		02/06/16 15:00	17060-07-0	
Dibromofluoromethane (S)	93	%	70-130	1		02/06/16 15:00	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-3 **Lab ID: 30172070003** Collected: 01/28/16 12:10 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**58.5**	ug/L	5.0	1		02/06/16 15:26	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 15:26	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 15:26	98-82-8	
Methyl-tert-butyl ether	**18.2**	ug/L	5.0	1		02/06/16 15:26	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 15:26	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 15:26	108-88-3	
1,2,4-Trimethylbenzene	**6.2**	ug/L	5.0	1		02/06/16 15:26	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 15:26	108-67-8	
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		02/06/16 15:26	2037-26-5	
4-Bromofluorobenzene (S)	102	%	81-119	1		02/06/16 15:26	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	77-126	1		02/06/16 15:26	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		02/06/16 15:26	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-4 **Lab ID: 30172070004** Collected: 01/28/16 12:30 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 15:51	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 15:51	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 15:51	98-82-8	
Methyl-tert-butyl ether	**8.8**	ug/L	5.0	1		02/06/16 15:51	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 15:51	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 15:51	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 15:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 15:51	108-67-8	
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		02/06/16 15:51	2037-26-5	
4-Bromofluorobenzene (S)	103	%	81-119	1		02/06/16 15:51	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		02/06/16 15:51	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		02/06/16 15:51	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-5 **Lab ID: 30172070005** Collected: 01/28/16 12:50 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 16:17	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 16:17	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 16:17	98-82-8	
Methyl-tert-butyl ether	**55.8**	ug/L	5.0	1		02/06/16 16:17	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 16:17	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 16:17	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 16:17	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 16:17	108-67-8	
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		02/06/16 16:17	2037-26-5	
4-Bromofluorobenzene (S)	102	%	81-119	1		02/06/16 16:17	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	77-126	1		02/06/16 16:17	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		02/06/16 16:17	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-6 **Lab ID: 30172070006** Collected: 01/28/16 13:10 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 16:42	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 16:42	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 16:42	98-82-8	
Methyl-tert-butyl ether	**827**	ug/L	50.0	10		02/10/16 13:42	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 16:42	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 16:42	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 16:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 16:42	108-67-8	
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		02/06/16 16:42	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		02/06/16 16:42	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	77-126	1		02/06/16 16:42	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		02/06/16 16:42	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: MW-7 **Lab ID: 30172070007** Collected: 01/28/16 13:30 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 17:07	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 17:07	100-41-4	
Isopropylbenzene (Cumene)	**5.4**	ug/L	5.0	1		02/06/16 17:07	98-82-8	
Methyl-tert-butyl ether	**70.7**	ug/L	5.0	1		02/06/16 17:07	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 17:07	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 17:07	108-88-3	
1,2,4-Trimethylbenzene	**15.0**	ug/L	5.0	1		02/06/16 17:07	95-63-6	
1,3,5-Trimethylbenzene	**7.3**	ug/L	5.0	1		02/06/16 17:07	108-67-8	
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		02/06/16 17:07	2037-26-5	
4-Bromofluorobenzene (S)	100	%	81-119	1		02/06/16 17:07	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	77-126	1		02/06/16 17:07	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		02/06/16 17:07	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: Duplicate **Lab ID: 30172070009** Collected: 01/28/16 00:00 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/06/16 17:33	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/06/16 17:33	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/06/16 17:33	98-82-8	
Methyl-tert-butyl ether	**55.4**	ug/L	5.0	1		02/06/16 17:33	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/06/16 17:33	91-20-3	
Toluene	ND	ug/L	5.0	1		02/06/16 17:33	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 17:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/06/16 17:33	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		02/06/16 17:33	2037-26-5	
4-Bromofluorobenzene (S)	103	%	81-119	1		02/06/16 17:33	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	77-126	1		02/06/16 17:33	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		02/06/16 17:33	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Sample: Trip Blank **Lab ID: 30172070010** Collected: 01/28/16 00:00 Received: 02/01/16 14:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		02/07/16 10:02	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		02/07/16 10:02	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		02/07/16 10:02	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		02/07/16 10:02	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		02/07/16 10:02	91-20-3	
Toluene	ND	ug/L	5.0	1		02/07/16 10:02	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		02/07/16 10:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		02/07/16 10:02	108-67-8	
Surrogates								
Toluene-d8 (S)	92	%	84-115	1		02/07/16 10:02	2037-26-5	
4-Bromofluorobenzene (S)	103	%	81-119	1		02/07/16 10:02	460-00-4	
1,2-Dichloroethane-d4 (S)	125	%	77-126	1		02/07/16 10:02	17060-07-0	
Dibromofluoromethane (S)	117	%	70-130	1		02/07/16 10:02	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

QC Batch: MSV/26954 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30172070001, 30172070002, 30172070003, 30172070004, 30172070005, 30172070006, 30172070007, 30172070009

METHOD BLANK: 1022541 Matrix: Water
Associated Lab Samples: 30172070001, 30172070002, 30172070003, 30172070004, 30172070005, 30172070006, 30172070007, 30172070009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	02/06/16 14:10	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	02/06/16 14:10	
Benzene	ug/L	ND	1.0	02/06/16 14:10	
Ethylbenzene	ug/L	ND	1.0	02/06/16 14:10	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	02/06/16 14:10	
Methyl-tert-butyl ether	ug/L	ND	1.0	02/06/16 14:10	
Naphthalene	ug/L	ND	2.0	02/06/16 14:10	
Toluene	ug/L	ND	1.0	02/06/16 14:10	
1,2-Dichloroethane-d4 (S)	%	92	77-126	02/06/16 14:10	
4-Bromofluorobenzene (S)	%	102	81-119	02/06/16 14:10	
Dibromofluoromethane (S)	%	96	70-130	02/06/16 14:10	
Toluene-d8 (S)	%	102	84-115	02/06/16 14:10	

LABORATORY CONTROL SAMPLE: 1022542

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.6	103	75-128	
1,3,5-Trimethylbenzene	ug/L	20	20.3	101	74-125	
Benzene	ug/L	20	20.0	100	69-115	
Ethylbenzene	ug/L	20	20.0	100	71-116	
Isopropylbenzene (Cumene)	ug/L	20	20.5	103	79-121	
Methyl-tert-butyl ether	ug/L	20	18.8	94	83-140	
Naphthalene	ug/L	20	21.3	107	64-140	
Toluene	ug/L	20	20.2	101	70-115	
1,2-Dichloroethane-d4 (S)	%			91	77-126	
4-Bromofluorobenzene (S)	%			104	81-119	
Dibromofluoromethane (S)	%			99	70-130	
Toluene-d8 (S)	%			101	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1022543 1022544

Parameter	Units	30172070001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	18.1	15.7	91	79	69-121	14	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	18.1	15.3	91	77	68-118	17	
Benzene	ug/L	40.0	20	20	48.5	52.7	43	63	63-123	8	M1
Ethylbenzene	ug/L	ND	20	20	18.2	16.7	81	74	70-120	9	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1022543 1022544

Parameter	Units	30172070001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Isopropylbenzene (Cumene)	ug/L	ND	20	20	18.4	15.8	92	79	71-129	16	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.3	20.3	87	97	63-143	10	
Naphthalene	ug/L	ND	20	20	17.8	15.9	89	79	55-122	12	
Toluene	ug/L	25.0	20	20	34.9	36.2	50	56	66-124	4	M1
1,2-Dichloroethane-d4 (S)	%						103	104	77-126		
4-Bromofluorobenzene (S)	%						104	103	81-119		
Dibromofluoromethane (S)	%						103	100	70-130		
Toluene-d8 (S)	%						99	98	84-115		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

QC Batch: MSV/26955
QC Batch Method: EPA 8260B
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30172070010

METHOD BLANK: 1022557
Matrix: Water
Associated Lab Samples: 30172070010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	02/07/16 01:22	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	02/07/16 01:22	
Benzene	ug/L	ND	1.0	02/07/16 01:22	
Ethylbenzene	ug/L	ND	1.0	02/07/16 01:22	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	02/07/16 01:22	
Methyl-tert-butyl ether	ug/L	ND	1.0	02/07/16 01:22	
Naphthalene	ug/L	ND	2.0	02/07/16 01:22	
Toluene	ug/L	ND	1.0	02/07/16 01:22	
1,2-Dichloroethane-d4 (S)	%	114	77-126	02/07/16 01:22	
4-Bromofluorobenzene (S)	%	104	81-119	02/07/16 01:22	
Dibromofluoromethane (S)	%	106	70-130	02/07/16 01:22	
Toluene-d8 (S)	%	98	84-115	02/07/16 01:22	

LABORATORY CONTROL SAMPLE: 1022558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.2	106	75-128	
1,3,5-Trimethylbenzene	ug/L	20	20.9	104	74-125	
Benzene	ug/L	20	20.0	100	69-115	
Ethylbenzene	ug/L	20	19.6	98	71-116	
Isopropylbenzene (Cumene)	ug/L	20	21.3	106	79-121	
Methyl-tert-butyl ether	ug/L	20	20.1	100	83-140	
Naphthalene	ug/L	20	20.9	105	64-140	
Toluene	ug/L	20	18.9	95	70-115	
1,2-Dichloroethane-d4 (S)	%			118	77-126	
4-Bromofluorobenzene (S)	%			106	81-119	
Dibromofluoromethane (S)	%			102	70-130	
Toluene-d8 (S)	%			95	84-115	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30172070

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30172070001	MW-1	EPA 8260B	MSV/26954		
30172070002	MW-2	EPA 8260B	MSV/26954		
30172070003	MW-3	EPA 8260B	MSV/26954		
30172070004	MW-4	EPA 8260B	MSV/26954		
30172070005	MW-5	EPA 8260B	MSV/26954		
30172070006	MW-6	EPA 8260B	MSV/26954		
30172070007	MW-7	EPA 8260B	MSV/26954		
30172070009	Duplicate	EPA 8260B	MSV/26954		
30172070010	Trip Blank	EPA 8260B	MSV/26955		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

30172070

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No:	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	10 Day (Default)	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Analyses Test: 8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-1	WT	G			12816	1130		3				X						X		001
2	MW-2	WT	G				1150		3				X						X		002
3	MW-3	WT	G				210		3				X						X		003
4	MW-4	WT	G				1230		3				X						X		004
5	MW-5	WT	G				1250		3				X						X		005
6	MW-6	WT	G				1310		3				X						X		006
7	MW-7	WT	G			↓	1330		3				X						X		007
8	MW-8	WT	G						3				X						X		~~008~~ 2/1/16
9	Duplicate	WT	G						3				X						X		008 ~~009~~ 2/1/16
10	Trip Blank	WT	G						2				X						X		009 ~~010~~ 2/1/16
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Hold trip blank analysis pending results.	[illegible] TGES	2-1-16	0600	[illegible]	2-1-16	0600				
Please use 5 ppb detection limit.	[illegible]			[illegible]	2-1-16	1041				
	[illegible]	2-1-16	2:36	[illegible] Pace	2/1/16	1430	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James R. Ellsworth

SIGNATURE of SAMPLER: [signature] DATE Signed: 1-28-16

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

EQUIS EDD Required

RTB

30172070

Sample Condition Upon Receipt

Pace Analytical

Client Name: GES Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☒ yes ☒ no RTB 2/1/16 Seals intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap X Bubble Bags ___ None ___ Other

Thermometer Used 8 Type of Ice: (Wet) Blue None ☒ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 1.0 °C Correction Factor: 40.0 °C Final Temp: 1.0 °C

Date and initials of person examining contents: 2/1/16 RTB

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: (VOA) coliform, TOC, O&G, Phenols	☑Yes ☐No	Initial when completed 2/1/16 RTB / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☒No ☐N/A	15.
Trip Blank Present:	☒Yes ☐No ☐N/A	16.
Trip Blank Custody Seals Present	☒Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rachel B Craddock Date: 2/2/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

30172070

page 2

Project Number: _____

Client Name: GES

Item No	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil Kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml) 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Subtainer (500 ml / 4L)	Ziploc	Other	Other
001 → 008	MT → SW													3 → 3										
009	SW													2										

SCURF Back (C016-4 15May2012).xls

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

April 28, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Pennsylvania Certification IDs
Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-1 **Lab ID: 30180059001** Collected: 04/14/16 14:15 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**96.4**	ug/L	5.0	1		04/21/16 13:23	71-43-2	
Ethylbenzene	**7.9**	ug/L	5.0	1		04/21/16 13:23	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 13:23	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 13:23	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 13:23	91-20-3	
Toluene	**53.5**	ug/L	5.0	1		04/21/16 13:23	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 13:23	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 13:23	108-67-8	
Surrogates								
Toluene-d8 (S)	113	%	84-115	1		04/21/16 13:23	2037-26-5	
4-Bromofluorobenzene (S)	101	%	81-119	1		04/21/16 13:23	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	77-126	1		04/21/16 13:23	17060-07-0	
Dibromofluoromethane (S)	106	%	70-130	1		04/21/16 13:23	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-2 **Lab ID: 30180059002** Collected: 04/14/16 14:00 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 12:57	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 12:57	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 12:57	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 12:57	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 12:57	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 12:57	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 12:57	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 12:57	108-67-8	
Surrogates								
Toluene-d8 (S)	108	%	84-115	1		04/21/16 12:57	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		04/21/16 12:57	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	77-126	1		04/21/16 12:57	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		04/21/16 12:57	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-3 **Lab ID: 30180059003** Collected: 04/14/16 13:10 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**227**	ug/L	5.0	1		04/21/16 13:49	71-43-2	
Ethylbenzene	**36.6**	ug/L	5.0	1		04/21/16 13:49	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 13:49	98-82-8	
Methyl-tert-butyl ether	**17.0**	ug/L	5.0	1		04/21/16 13:49	1634-04-4	
Naphthalene	**25.5**	ug/L	5.0	1		04/21/16 13:49	91-20-3	
Toluene	**48.3**	ug/L	5.0	1		04/21/16 13:49	108-88-3	
1,2,4-Trimethylbenzene	**80.0**	ug/L	5.0	1		04/21/16 13:49	95-63-6	
1,3,5-Trimethylbenzene	**28.8**	ug/L	5.0	1		04/21/16 13:49	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		04/21/16 13:49	2037-26-5	
4-Bromofluorobenzene (S)	99	%	81-119	1		04/21/16 13:49	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	77-126	1		04/21/16 13:49	17060-07-0	
Dibromofluoromethane (S)	106	%	70-130	1		04/21/16 13:49	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-4 **Lab ID: 30180059004** Collected: 04/14/16 11:10 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**10.3**	ug/L	5.0	1		04/21/16 14:15	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 14:15	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 14:15	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 14:15	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 14:15	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 14:15	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 14:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 14:15	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		04/21/16 14:15	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		04/21/16 14:15	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	77-126	1		04/21/16 14:15	17060-07-0	
Dibromofluoromethane (S)	108	%	70-130	1		04/21/16 14:15	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-5 **Lab ID: 30180059005** Collected: 04/14/16 11:30 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 14:41	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 14:41	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 14:41	98-82-8	
Methyl-tert-butyl ether	**50.4**	ug/L	5.0	1		04/21/16 14:41	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 14:41	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 14:41	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 14:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 14:41	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		04/21/16 14:41	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		04/21/16 14:41	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	77-126	1		04/21/16 14:41	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1		04/21/16 14:41	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-6 **Lab ID: 30180059006** Collected: 04/14/16 11:40 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 20:16	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 20:16	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 20:16	98-82-8	
Methyl-tert-butyl ether	**598**	ug/L	50.0	10		04/21/16 20:42	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 20:16	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 20:16	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 20:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 20:16	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		04/21/16 20:16	2037-26-5	
4-Bromofluorobenzene (S)	91	%	81-119	1		04/21/16 20:16	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		04/21/16 20:16	17060-07-0	
Dibromofluoromethane (S)	100	%	70-130	1		04/21/16 20:16	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-7 **Lab ID: 30180059007** Collected: 04/14/16 12:40 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 15:06	71-43-2	
Ethylbenzene	**8.0**	ug/L	5.0	1		04/21/16 15:06	100-41-4	
Isopropylbenzene (Cumene)	**13.6**	ug/L	5.0	1		04/21/16 15:06	98-82-8	
Methyl-tert-butyl ether	**9.6**	ug/L	5.0	1		04/21/16 15:06	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 15:06	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 15:06	108-88-3	
1,2,4-Trimethylbenzene	**81.4**	ug/L	5.0	1		04/21/16 15:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 15:06	108-67-8	
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		04/21/16 15:06	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		04/21/16 15:06	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		04/21/16 15:06	17060-07-0	
Dibromofluoromethane (S)	97	%	70-130	1		04/21/16 15:06	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-9 **Lab ID: 30180059008** Collected: 04/14/16 10:40 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 15:32	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 15:32	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 15:32	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 15:32	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 15:32	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 15:32	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 15:32	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 15:32	108-67-8	
Surrogates								
Toluene-d8 (S)	93	%	84-115	1		04/21/16 15:32	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		04/21/16 15:32	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		04/21/16 15:32	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1		04/21/16 15:32	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-10D **Lab ID: 30180059009** Collected: 04/14/16 12:20 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 15:58	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 15:58	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 15:58	98-82-8	
Methyl-tert-butyl ether	**23.4**	ug/L	5.0	1		04/21/16 15:58	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 15:58	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 15:58	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 15:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 15:58	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		04/21/16 15:58	2037-26-5	
4-Bromofluorobenzene (S)	93	%	81-119	1		04/21/16 15:58	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		04/21/16 15:58	17060-07-0	
Dibromofluoromethane (S)	91	%	70-130	1		04/21/16 15:58	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-10S **Lab ID: 30180059010** Collected: 04/14/16 12:05 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 16:24	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 16:24	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 16:24	98-82-8	
Methyl-tert-butyl ether	**146**	ug/L	5.0	1		04/21/16 16:24	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 16:24	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 16:24	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 16:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 16:24	108-67-8	
Surrogates								
Toluene-d8 (S)	91	%	84-115	1		04/21/16 16:24	2037-26-5	
4-Bromofluorobenzene (S)	87	%	81-119	1		04/21/16 16:24	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	77-126	1		04/21/16 16:24	17060-07-0	
Dibromofluoromethane (S)	117	%	70-130	1		04/21/16 16:24	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-11 **Lab ID: 30180059011** Collected: 04/14/16 13:35 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/22/16 20:27	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/22/16 20:27	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/22/16 20:27	98-82-8	
Methyl-tert-butyl ether	**641**	ug/L	50.0	10		04/22/16 20:50	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/22/16 20:27	91-20-3	
Toluene	ND	ug/L	5.0	1		04/22/16 20:27	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/22/16 20:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/22/16 20:27	108-67-8	
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		04/22/16 20:27	2037-26-5	
4-Bromofluorobenzene (S)	107	%	81-119	1		04/22/16 20:27	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	77-126	1		04/22/16 20:27	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1		04/22/16 20:27	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-12 **Lab ID: 30180059012** Collected: 04/14/16 15:00 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/22/16 20:03	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/22/16 20:03	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/22/16 20:03	98-82-8	
Methyl-tert-butyl ether	**9.8**	ug/L	5.0	1		04/22/16 20:03	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/22/16 20:03	91-20-3	
Toluene	ND	ug/L	5.0	1		04/22/16 20:03	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/22/16 20:03	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/22/16 20:03	108-67-8	
Surrogates								
Toluene-d8 (S)	94	%	84-115	1		04/22/16 20:03	2037-26-5	
4-Bromofluorobenzene (S)	110	%	81-119	1		04/22/16 20:03	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		04/22/16 20:03	17060-07-0	
Dibromofluoromethane (S)	104	%	70-130	1		04/22/16 20:03	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: MW-13 **Lab ID: 30180059013** Collected: 04/14/16 14:35 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 17:41	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 17:41	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 17:41	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 17:41	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 17:41	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 17:41	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 17:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 17:41	108-67-8	
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		04/21/16 17:41	2037-26-5	
4-Bromofluorobenzene (S)	125	%	81-119	1		04/21/16 17:41	460-00-4	S3
1,2-Dichloroethane-d4 (S)	100	%	77-126	1		04/21/16 17:41	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		04/21/16 17:41	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Sample: Duplicate **Lab ID: 30180059014** Collected: 04/14/16 00:00 Received: 04/15/16 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		04/21/16 18:07	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		04/21/16 18:07	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		04/21/16 18:07	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		04/21/16 18:07	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		04/21/16 18:07	91-20-3	
Toluene	ND	ug/L	5.0	1		04/21/16 18:07	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 18:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		04/21/16 18:07	108-67-8	
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		04/21/16 18:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		04/21/16 18:07	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		04/21/16 18:07	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1		04/21/16 18:07	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

QC Batch: MSV/28156 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30180059001, 30180059002, 30180059003, 30180059004, 30180059005, 30180059006, 30180059007, 30180059008, 30180059009, 30180059010, 30180059013, 30180059014

METHOD BLANK: 1062324 Matrix: Water
Associated Lab Samples: 30180059001, 30180059002, 30180059003, 30180059004, 30180059005, 30180059006, 30180059007, 30180059008, 30180059009, 30180059010, 30180059013, 30180059014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	04/21/16 12:31	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	04/21/16 12:31	
Benzene	ug/L	ND	1.0	04/21/16 12:31	
Ethylbenzene	ug/L	ND	1.0	04/21/16 12:31	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	04/21/16 12:31	
Methyl-tert-butyl ether	ug/L	ND	1.0	04/21/16 12:31	
Naphthalene	ug/L	ND	2.0	04/21/16 12:31	
Toluene	ug/L	ND	1.0	04/21/16 12:31	
1,2-Dichloroethane-d4 (S)	%	102	77-126	04/21/16 12:31	
4-Bromofluorobenzene (S)	%	103	81-119	04/21/16 12:31	
Dibromofluoromethane (S)	%	97	70-130	04/21/16 12:31	
Toluene-d8 (S)	%	90	84-115	04/21/16 12:31	

LABORATORY CONTROL SAMPLE: 1062325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-128	
1,3,5-Trimethylbenzene	ug/L	20	19.2	96	74-125	
Benzene	ug/L	20	23.4	117	69-115	L5
Ethylbenzene	ug/L	20	18.8	94	71-116	
Isopropylbenzene (Cumene)	ug/L	20	18.8	94	79-121	
Methyl-tert-butyl ether	ug/L	20	22.6	113	83-140	
Naphthalene	ug/L	20	20.5	103	64-140	
Toluene	ug/L	20	18.8	94	70-115	
1,2-Dichloroethane-d4 (S)	%			116	77-126	
4-Bromofluorobenzene (S)	%			103	81-119	
Dibromofluoromethane (S)	%			122	70-130	
Toluene-d8 (S)	%			100	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1062326 1062327

Parameter	Units	30180059002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	15.4	15.9	77	79	69-121	3	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	15.7	16.8	78	84	68-118	7	
Benzene	ug/L	ND	20	20	16.5	15.2	83	76	63-123	8	
Ethylbenzene	ug/L	ND	20	20	16.7	16.3	84	82	70-120	3	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1062326 1062327

Parameter	Units	30180059002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Isopropylbenzene (Cumene)	ug/L	ND	20	20	16.2	15.8	81	79	71-129	2	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.5	17.2	79	72	63-143	7	
Naphthalene	ug/L	ND	20	20	14.0	15.1	70	76	55-122	8	
Toluene	ug/L	ND	20	20	15.9	17.2	80	86	66-124	8	
1,2-Dichloroethane-d4 (S)	%						102	92	77-126		
4-Bromofluorobenzene (S)	%						99	105	81-119		
Dibromofluoromethane (S)	%						101	96	70-130		
Toluene-d8 (S)	%						104	104	84-115		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

QC Batch: MSV/28169 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30180059011, 30180059012

METHOD BLANK: 1063199 Matrix: Water
Associated Lab Samples: 30180059011, 30180059012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	04/22/16 13:15	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	04/22/16 13:15	
Benzene	ug/L	ND	1.0	04/22/16 13:15	
Ethylbenzene	ug/L	ND	1.0	04/22/16 13:15	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	04/22/16 13:15	
Methyl-tert-butyl ether	ug/L	ND	1.0	04/22/16 13:15	
Naphthalene	ug/L	ND	2.0	04/22/16 13:15	
Toluene	ug/L	ND	1.0	04/22/16 13:15	
1,2-Dichloroethane-d4 (S)	%	93	77-126	04/22/16 13:15	
4-Bromofluorobenzene (S)	%	106	81-119	04/22/16 13:15	
Dibromofluoromethane (S)	%	100	70-130	04/22/16 13:15	
Toluene-d8 (S)	%	98	84-115	04/22/16 13:15	

LABORATORY CONTROL SAMPLE: 1063200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.6	98	75-128	
1,3,5-Trimethylbenzene	ug/L	20	19.2	96	74-125	
Benzene	ug/L	20	17.9	89	69-115	
Ethylbenzene	ug/L	20	19.6	98	71-116	
Isopropylbenzene (Cumene)	ug/L	20	19.2	96	79-121	
Methyl-tert-butyl ether	ug/L	20	17.3	87	83-140	
Naphthalene	ug/L	20	22.0	110	64-140	
Toluene	ug/L	20	17.5	87	70-115	
1,2-Dichloroethane-d4 (S)	%			96	77-126	
4-Bromofluorobenzene (S)	%			100	81-119	
Dibromofluoromethane (S)	%			98	70-130	
Toluene-d8 (S)	%			95	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1063201 1063202

Parameter	Units	30180414001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	15.9	17.5	79	88	69-121	10	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	16.3	17.4	81	87	68-118	7	
Benzene	ug/L	ND	20	20	16.1	19.8	80	99	63-123	20	
Ethylbenzene	ug/L	ND	20	20	16.9	19.6	84	98	70-120	15	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	16.4	18.4	82	92	71-129	11	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1063201 1063202

Parameter	Units	30180414001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Methyl-tert-butyl ether	ug/L	ND	20	20	15.5	15.6	78	78	63-143	0	
Naphthalene	ug/L	ND	20	20	15.3	18.4	76	92	55-122	18	
Toluene	ug/L	ND	20	20	16.2	18.5	81	93	66-124	13	
1,2-Dichloroethane-d4 (S)	%						90	97	77-126		
4-Bromofluorobenzene (S)	%						106	103	81-119		
Dibromofluoromethane (S)	%						100	100	70-130		
Toluene-d8 (S)	%						100	98	84-115		

SAMPLE DUPLICATE: 1063203

Parameter	Units	30180414002 Result	Dup Result	RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/L	15.5	14.8	5	
1,3,5-Trimethylbenzene	ug/L	ND	ND		
Benzene	ug/L	2.0	1.8J	6	
Ethylbenzene	ug/L	152	151	1	
Isopropylbenzene (Cumene)	ug/L	32.1	29.8	7	
Methyl-tert-butyl ether	ug/L	5.3	5.2	2	
Naphthalene	ug/L	4.0	3.9J	1	
Toluene	ug/L	ND	.21J		
1,2-Dichloroethane-d4 (S)	%	98	95	3	
4-Bromofluorobenzene (S)	%	101	97	4	
Dibromofluoromethane (S)	%	100	97	3	
Toluene-d8 (S)	%	91	97	6	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

L5	LCS recovery exceeded QC limits. Batch accepted based on matrix spike recovery within LCS limits.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30180059

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30180059001	MW-1	EPA 8260B	MSV/28156		
30180059002	MW-2	EPA 8260B	MSV/28156		
30180059003	MW-3	EPA 8260B	MSV/28156		
30180059004	MW-4	EPA 8260B	MSV/28156		
30180059005	MW-5	EPA 8260B	MSV/28156		
30180059006	MW-6	EPA 8260B	MSV/28156		
30180059007	MW-7	EPA 8260B	MSV/28156		
30180059008	MW-9	EPA 8260B	MSV/28156		
30180059009	MW-10D	EPA 8260B	MSV/28156		
30180059010	MW-10S	EPA 8260B	MSV/28156		
30180059011	MW-11	EPA 8260B	MSV/28169		
30180059012	MW-12	EPA 8260B	MSV/28169		
30180059013	MW-13	EPA 8260B	MSV/28156		
30180059014	Duplicate	EPA 8260B	MSV/28156		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30180059

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	3-DAY TAT	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

WO#:30180059

ITEM#	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)		
1	MW-1	WT	G			4-14-16	14:15		3				X						X		001
2	MW-2	WT	G				14:00		3				X						X		002
3	MW-3	WT	G				13:10		3				X						X		003
4	MW-4	WT	G				11:10		3				X						X		004
5	MW-5	WT	G				11:30		3				X						X		005
6	MW-6	WT	G				11:40		3				X						X		006
7	MW-7	WT	G				12:40		3				X						X		007
8	MW-8 N/A	WT	G				N/A		3				X						X		
9	MW-9	WT	G				10:40		3				X						X		008
10	MW-10D	WT	G				12:20		3				X						X		009
11	MW-10S	WT	G				12:05		3				X						X		010
12	MW-11	WT	G				13:30		3				X						X		011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Hold trip blank analysis pending results.	GES	4-14-16	16:30	Receiving / GES	4-14-16	16:30				
Please use 5 ppb detection limit.	GES	4-15-16		Pace	4/15/16	3:00				
	Pace	4/15/16	5:15	Ashley Rowe / Pace	4/15/16	1515	0.3	Y	Y	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Smith

SIGNATURE of SAMPLER: [signature] DATE Signed: 4-14-16

EQUIS EDD Required

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30160059

Page : 2 Of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	3-DAY TAT	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-12	WT	G			4/14/16	15:00		3				X						X		012
2	MW-13	WT	G				14:30		3				X						X		013
3	Duplicate	WT	G				—		3				X						X		014
4	Trip Blank	WT	G				—		2				X						X		015
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Hold trip blank analysis pending results.	James Smith / GES	4-14-16	16:30	Receiving / GES	4-14-16	16:30				
Please use 5 ppb detection limit.	James Smith / GES	4-15-16		Tim Monte / Pace	4/15/16	3:00				
	Tim Monte / Pace	4/15/16	5:15	Chris Race / Pace	4/15/16	1515	0.3	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Smith

SIGNATURE of SAMPLER: James Smith DATE Signed: 4-14-16

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

EQUIS EDD Required

30180059

Sample Condition Upon Receipt

Pace Analytical

Client Name: Groundwater & Enviro Ser. Project #: _____

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals Intact: ☐ yes ☐ no Biological Tissue is Frozen: Yes No

Packing Material: Bubble Wrap 1 Bubble Bags 1 None ___ Other 0 gore 2 ziploc

Thermometer Used 7 Type of Ice: (Wet) Blue None ☑ Samples on ice, cooling process has begun

Cooler Temp.: Observed Temp.: 0.1 °C Correction Factor: +0.2 °C Final Temp: 0.3 °C

Date and Initials of person examining contents: 0908 4/15/16

Temp should be above freezing to 6°C		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: W		
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	
exceptions: VOA, coliform, TOC, O&G, Phenols	☑Yes ☐No	Initial when completed 0908 Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☑No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] Date: 4/18/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 02, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on May 24, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was reissued on June 2, 2016 to remove Xylenes which were not requested on the chain of custody.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-1 **Lab ID: 30184293001** Collected: 05/23/16 16:05 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**333**	ug/L	50.0	10		05/31/16 13:42	71-43-2	M5
Ethylbenzene	**36.5**	ug/L	5.0	1		05/28/16 10:32	100-41-4	M5
Isopropylbenzene (Cumene)	**5.3**	ug/L	5.0	1		05/28/16 10:32	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 10:32	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 10:32	91-20-3	M5
Toluene	**21.1**	ug/L	5.0	1		05/28/16 10:32	108-88-3	M5
1,2,4-Trimethylbenzene	**14.7**	ug/L	5.0	1		05/28/16 10:32	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 10:32	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		05/28/16 10:32	2037-26-5	M5
4-Bromofluorobenzene (S)	94	%	81-119	1		05/28/16 10:32	460-00-4	M5
1,2-Dichloroethane-d4 (S)	85	%	77-126	1		05/28/16 10:32	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 10:32	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-2 **Lab ID: 30184293002** Collected: 05/23/16 14:05 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 03:38	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 03:38	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 03:38	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 03:38	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 03:38	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 03:38	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 03:38	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 03:38	108-67-8	M5
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		05/28/16 03:38	2037-26-5	M5
4-Bromofluorobenzene (S)	94	%	81-119	1		05/28/16 03:38	460-00-4	M5
1,2-Dichloroethane-d4 (S)	78	%	77-126	1		05/28/16 03:38	17060-07-0	M5
Dibromofluoromethane (S)	93	%	70-130	1		05/28/16 03:38	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-3 **Lab ID: 30184293003** Collected: 05/23/16 12:55 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**260**	ug/L	5.0	1		05/28/16 10:57	71-43-2	M5
Ethylbenzene	**50.6**	ug/L	5.0	1		05/28/16 10:57	100-41-4	M5
Isopropylbenzene (Cumene)	**9.2**	ug/L	5.0	1		05/28/16 10:57	98-82-8	M5
Methyl-tert-butyl ether	**8.5**	ug/L	5.0	1		05/28/16 10:57	1634-04-4	M5
Naphthalene	**33.7**	ug/L	5.0	1		05/28/16 10:57	91-20-3	M5
Toluene	**23.7**	ug/L	5.0	1		05/28/16 10:57	108-88-3	M5
1,2,4-Trimethylbenzene	**140**	ug/L	5.0	1		05/28/16 10:57	95-63-6	M5
1,3,5-Trimethylbenzene	**45.0**	ug/L	5.0	1		05/28/16 10:57	108-67-8	M5
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		05/28/16 10:57	2037-26-5	M5
4-Bromofluorobenzene (S)	96	%	81-119	1		05/28/16 10:57	460-00-4	M5
1,2-Dichloroethane-d4 (S)	85	%	77-126	1		05/28/16 10:57	17060-07-0	M5
Dibromofluoromethane (S)	98	%	70-130	1		05/28/16 10:57	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-4 **Lab ID: 30184293004** Collected: 05/23/16 12:35 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 06:09	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 06:09	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 06:09	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 06:09	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 06:09	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 06:09	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 06:09	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 06:09	108-67-8	M5
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		05/28/16 06:09	2037-26-5	M5
4-Bromofluorobenzene (S)	91	%	81-119	1		05/28/16 06:09	460-00-4	M5
1,2-Dichloroethane-d4 (S)	82	%	77-126	1		05/28/16 06:09	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 06:09	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-5 **Lab ID: 30184293005** Collected: 05/23/16 13:20 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 06:34	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 06:34	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 06:34	98-82-8	M5
Methyl-tert-butyl ether	**18.3**	ug/L	5.0	1		05/28/16 06:34	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 06:34	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 06:34	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 06:34	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 06:34	108-67-8	M5
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		05/28/16 06:34	2037-26-5	M5
4-Bromofluorobenzene (S)	96	%	81-119	1		05/28/16 06:34	460-00-4	M5
1,2-Dichloroethane-d4 (S)	84	%	77-126	1		05/28/16 06:34	17060-07-0	M5
Dibromofluoromethane (S)	96	%	70-130	1		05/28/16 06:34	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-6 **Lab ID: 30184293006** Collected: 05/23/16 14:20 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 12:37	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 12:37	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 12:37	98-82-8	M5
Methyl-tert-butyl ether	**484**	ug/L	50.0	10		05/28/16 13:03	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 12:37	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 12:37	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 12:37	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 12:37	108-67-8	M5
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		05/28/16 12:37	2037-26-5	M5
4-Bromofluorobenzene (S)	93	%	81-119	1		05/28/16 12:37	460-00-4	M5
1,2-Dichloroethane-d4 (S)	84	%	77-126	1		05/28/16 12:37	17060-07-0	M5
Dibromofluoromethane (S)	93	%	70-130	1		05/28/16 12:37	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-7 **Lab ID: 30184293007** Collected: 05/23/16 14:45 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 06:59	71-43-2	M5
Ethylbenzene	**12.3**	ug/L	5.0	1		05/28/16 06:59	100-41-4	M5
Isopropylbenzene (Cumene)	**12.5**	ug/L	5.0	1		05/28/16 06:59	98-82-8	M5
Methyl-tert-butyl ether	**8.3**	ug/L	5.0	1		05/28/16 06:59	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 06:59	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 06:59	108-88-3	M5
1,2,4-Trimethylbenzene	**74.1**	ug/L	5.0	1		05/28/16 06:59	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 06:59	108-67-8	M5
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		05/28/16 06:59	2037-26-5	M5
4-Bromofluorobenzene (S)	95	%	81-119	1		05/28/16 06:59	460-00-4	M5
1,2-Dichloroethane-d4 (S)	83	%	77-126	1		05/28/16 06:59	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 06:59	1868-53-7	M5

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-9 **Lab ID: 30184293009** Collected: 05/23/16 13:40 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 07:24	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 07:24	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 07:24	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 07:24	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 07:24	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 07:24	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 07:24	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 07:24	108-67-8	M5
Surrogates								
Toluene-d8 (S)	95	%	84-115	1		05/28/16 07:24	2037-26-5	M5
4-Bromofluorobenzene (S)	97	%	81-119	1		05/28/16 07:24	460-00-4	M5
1,2-Dichloroethane-d4 (S)	82	%	77-126	1		05/28/16 07:24	17060-07-0	M5
Dibromofluoromethane (S)	93	%	70-130	1		05/28/16 07:24	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-10D **Lab ID: 30184293010** Collected: 05/23/16 15:20 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 07:49	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 07:49	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 07:49	98-82-8	M5
Methyl-tert-butyl ether	**15.6**	ug/L	5.0	1		05/28/16 07:49	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 07:49	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 07:49	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 07:49	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 07:49	108-67-8	M5
Surrogates								
Toluene-d8 (S)	97	%	84-115	1		05/28/16 07:49	2037-26-5	M5
4-Bromofluorobenzene (S)	95	%	81-119	1		05/28/16 07:49	460-00-4	M5
1,2-Dichloroethane-d4 (S)	82	%	77-126	1		05/28/16 07:49	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 07:49	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-10S **Lab ID: 30184293011** Collected: 05/23/16 15:05 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 08:14	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 08:14	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 08:14	98-82-8	M5
Methyl-tert-butyl ether	**78.7**	ug/L	5.0	1		05/28/16 08:14	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 08:14	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 08:14	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 08:14	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 08:14	108-67-8	M5
Surrogates								
Toluene-d8 (S)	96	%	84-115	1		05/28/16 08:14	2037-26-5	M5
4-Bromofluorobenzene (S)	95	%	81-119	1		05/28/16 08:14	460-00-4	M5
1,2-Dichloroethane-d4 (S)	85	%	77-126	1		05/28/16 08:14	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 08:14	1868-53-7	M5

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-11 **Lab ID: 30184293012** Collected: 05/23/16 15:45 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 11:47	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 11:47	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 11:47	98-82-8	M5
Methyl-tert-butyl ether	**390**	ug/L	5.0	1		05/28/16 11:47	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 11:47	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 11:47	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 11:47	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 11:47	108-67-8	M5
Surrogates								
Toluene-d8 (S)	98	%	84-115	1		05/28/16 11:47	2037-26-5	M5
4-Bromofluorobenzene (S)	89	%	81-119	1		05/28/16 11:47	460-00-4	M5
1,2-Dichloroethane-d4 (S)	83	%	77-126	1		05/28/16 11:47	17060-07-0	M5
Dibromofluoromethane (S)	96	%	70-130	1		05/28/16 11:47	1868-53-7	M5

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-12 **Lab ID: 30184293013** Collected: 05/23/16 16:45 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**6.1**	ug/L	5.0	1		05/28/16 08:40	71-43-2	M5
Ethylbenzene	**6.5**	ug/L	5.0	1		05/28/16 08:40	100-41-4	M5
Isopropylbenzene (Cumene)	**13.9**	ug/L	5.0	1		05/28/16 08:40	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 08:40	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 08:40	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 08:40	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 08:40	95-63-6	M5
1,3,5-Trimethylbenzene	**5.3**	ug/L	5.0	1		05/28/16 08:40	108-67-8	M5
Surrogates								
Toluene-d8 (S)	99	%	84-115	1		05/28/16 08:40	2037-26-5	M5
4-Bromofluorobenzene (S)	92	%	81-119	1		05/28/16 08:40	460-00-4	M5
1,2-Dichloroethane-d4 (S)	83	%	77-126	1		05/28/16 08:40	17060-07-0	M5
Dibromofluoromethane (S)	95	%	70-130	1		05/28/16 08:40	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: MW-13 **Lab ID: 30184293014** Collected: 05/23/16 16:25 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 09:05	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 09:05	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 09:05	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 09:05	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 09:05	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 09:05	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 09:05	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 09:05	108-67-8	M5
Surrogates								
Toluene-d8 (S)	101	%	84-115	1		05/28/16 09:05	2037-26-5	M5
4-Bromofluorobenzene (S)	92	%	81-119	1		05/28/16 09:05	460-00-4	M5
1,2-Dichloroethane-d4 (S)	82	%	77-126	1		05/28/16 09:05	17060-07-0	M5
Dibromofluoromethane (S)	93	%	70-130	1		05/28/16 09:05	1868-53-7	M5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Sample: Duplicate **Lab ID: 30184293015** Collected: 05/23/16 00:01 Received: 05/24/16 13:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		05/28/16 09:30	71-43-2	M5
Ethylbenzene	ND	ug/L	5.0	1		05/28/16 09:30	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		05/28/16 09:30	98-82-8	M5
Methyl-tert-butyl ether	ND	ug/L	5.0	1		05/28/16 09:30	1634-04-4	M5
Naphthalene	ND	ug/L	5.0	1		05/28/16 09:30	91-20-3	M5
Toluene	ND	ug/L	5.0	1		05/28/16 09:30	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 09:30	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		05/28/16 09:30	108-67-8	M5
Surrogates								
Toluene-d8 (S)	93	%	84-115	1		05/28/16 09:30	2037-26-5	M5
4-Bromofluorobenzene (S)	92	%	81-119	1		05/28/16 09:30	460-00-4	M5
1,2-Dichloroethane-d4 (S)	85	%	77-126	1		05/28/16 09:30	17060-07-0	M5
Dibromofluoromethane (S)	100	%	70-130	1		05/28/16 09:30	1868-53-7	M5

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

QC Batch: MSV/28709 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30184293001, 30184293002, 30184293003, 30184293004, 30184293005, 30184293006, 30184293007, 30184293009, 30184293010, 30184293011, 30184293012, 30184293013, 30184293014, 30184293015

METHOD BLANK: 1083095 Matrix: Water
Associated Lab Samples: 30184293001, 30184293002, 30184293003, 30184293004, 30184293005, 30184293006, 30184293007, 30184293009, 30184293010, 30184293011, 30184293012, 30184293013, 30184293014, 30184293015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	05/28/16 03:13	M5
1,3,5-Trimethylbenzene	ug/L	ND	1.0	05/28/16 03:13	M5
Benzene	ug/L	ND	1.0	05/28/16 03:13	M5
Ethylbenzene	ug/L	ND	1.0	05/28/16 03:13	M5
Isopropylbenzene (Cumene)	ug/L	ND	1.0	05/28/16 03:13	M5
Methyl-tert-butyl ether	ug/L	ND	1.0	05/28/16 03:13	M5
Naphthalene	ug/L	ND	2.0	05/28/16 03:13	M5
Toluene	ug/L	ND	1.0	05/28/16 03:13	M5
1,2-Dichloroethane-d4 (S)	%	79	77-126	05/28/16 03:13	M5
4-Bromofluorobenzene (S)	%	98	81-119	05/28/16 03:13	M5
Dibromofluoromethane (S)	%	94	70-130	05/28/16 03:13	M5
Toluene-d8 (S)	%	101	84-115	05/28/16 03:13	M5

LABORATORY CONTROL SAMPLE: 1083096

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	16.6	83	75-128	M5
1,3,5-Trimethylbenzene	ug/L	20	16.3	81	74-125	M5
Benzene	ug/L	20	18.0	90	69-115	M5
Ethylbenzene	ug/L	20	16.6	83	71-116	M5
Isopropylbenzene (Cumene)	ug/L	20	16.8	84	79-121	M5
Methyl-tert-butyl ether	ug/L	20	18.2	91	83-140	M5
Naphthalene	ug/L	20	20.1	100	64-140	M5
Toluene	ug/L	20	17.6	88	70-115	M5
1,2-Dichloroethane-d4 (S)	%			81	77-126	M5
4-Bromofluorobenzene (S)	%			96	81-119	M5
Dibromofluoromethane (S)	%			92	70-130	M5
Toluene-d8 (S)	%			102	84-115	M5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: MSV/28709

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

M5 A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30184293

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30184293001	MW-1	EPA 8260B	MSV/28709		
30184293002	MW-2	EPA 8260B	MSV/28709		
30184293003	MW-3	EPA 8260B	MSV/28709		
30184293004	MW-4	EPA 8260B	MSV/28709		
30184293005	MW-5	EPA 8260B	MSV/28709		
30184293006	MW-6	EPA 8260B	MSV/28709		
30184293007	MW-7	EPA 8260B	MSV/28709		
30184293009	MW-9	EPA 8260B	MSV/28709		
30184293010	MW-10D	EPA 8260B	MSV/28709		
30184293011	MW-10S	EPA 8260B	MSV/28709		
30184293012	MW-11	EPA 8260B	MSV/28709		
30184293013	MW-12	EPA 8260B	MSV/28709		
30184293014	MW-13	EPA 8260B	MSV/28709		
30184293015	Duplicate	EPA 8260B	MSV/28709		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

WO#:30184293

30184293

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Doc

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be c

Page : 1 Of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	5-DAY TAT	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-1	WT	G			5/23/16	16:05		3				X						X		001
2	MW-2	WT	G				14:05		3				X						X		002
3	MW-3	WT	G				12:55		3				X						X		003
4	MW-4	WT	G				12:35		3				X						X		004
5	MW-5	WT	G				13:20		3				X						X		005
6	MW-6	WT	G				14:20		3				X						X		006
7	MW-7	WT	G				14:45		3				X						X		007
8	MW-8	WT	G			N/A	N/A		3				X						X		008
9	MW-9	WT	G			5/23/16	13:40		3				X						X		009
10	MW-10D	WT	G				15:20		3				X						X		010
11	MW-10S	WT	G				15:05		3				X						X		011
12	MW-11	WT	G				15:45		3				X						X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Hold trip blank analysis pending results.	[signature] / GES	5-23-16	18:00	Receiving / GES	5-23-16	18:00	
Please use 5 ppb detection limit.	[signature] / GES	5-24-16		[signature]	5-24-16	12:10	
	[signature]	5-24-16	1:15	Karen Hill	5/24/16	13:15	

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	James Smith
SIGNATURE of SAMPLER: [signature]	DATE Signed: 5-23-16

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

EQUIS EDD Required

30184293

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:

Company:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive
	Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com
Phone:	800-267-2549 Fax: 724-779-4617
Requested Due Date/TAT:	5-DAY TAT

Section B — Required Project Information:

Report To:	Joe Hinkle
Copy To:	Joan Amodeo
	301 Commerce Park Drive, Cranberry Twp, PA 16066
Purchase Order No.	UPA Barkeyville M-209
Client Project ID:	UPA Barkeyville M-209
Container Order Number:	

Section C — Invoice Information:

Attention:	Joe Hinkle
Company Name:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Pace Quote Reference:	
Pace Project Manager:	Christner, Rachel
Pace Profile #:	

Regulatory Agency: UST - Underground Storage Tank

State / Location: Pennsylvania

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-12	WT	G			5-23-16	16:45		3				X						X		013
2	MW-13	WT	G				16:21		3				X						X		014
3	Duplicate	WT	G				—		3				X						X		015
4	Trip Blank	WT	G				—		2				X						X		016
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Hold trip blank analysis pending results.	GES	5-23-16	18:00	Receiving / GES	5-23-16	18:00				
Please use 5 ppb detection limit.	GES	5-24-16			5-24-16	12:10				
	5-24-16	1145		Zurich Hill / Pace	5/24/16	13:15	5.4	Y	Y	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Smith

SIGNATURE of SAMPLER: [signature] DATE Signed: 5-23-16

EQUIS EDD Required

Sample Condition Upon Receipt Pittsburgh

30184293

Pace Analytical

Client Name: GES Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☐ yes ☐ no

Thermometer Used 7 **Type of Ice:** (Wet) Blue None

Cooler Temperature **Observed Temp** 5.2 °C Correction Factor: +0.2 °C Final Temp: 5.4 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KA 5/24/16

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC:	✓			5.
-Includes date/time/ID/Analysis Matrix: WT				
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:	✓			8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:	✓			
Containers Intact:	✓			11.
Filtered volume received for Dissolved tests			✓	12.
All containers needing preservation have been checked.			✓	13.
All containers needing preservation are found to be in compliance with EPA recommendation.			✓	
exceptions: (VOA), coliform, TOC, O&G, Phenolics				Initial when completed KA / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):		✓		14.
Trip Blank Present:	✓			15.
Trip Blank Custody Seals Present	✓			

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

July 27, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-1 **Lab ID: 30189983001** Collected: 07/14/16 14:05 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**59.7**	ug/L	5.0	1		07/21/16 18:01	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 18:01	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 18:01	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		07/21/16 18:01	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 18:01	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 18:01	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 18:01	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 18:01	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		07/21/16 18:01	2037-26-5	
4-Bromofluorobenzene (S)	95	%	81-119	1		07/21/16 18:01	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	77-126	1		07/21/16 18:01	17060-07-0	
Dibromofluoromethane (S)	92	%	70-130	1		07/21/16 18:01	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-2 **Lab ID: 30189983002** Collected: 07/14/16 10:30 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 11:44	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 11:44	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 11:44	98-82-8	
Methyl-tert-butyl ether	**6.0**	ug/L	5.0	1		07/21/16 11:44	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 11:44	91-20-3	M1
Toluene	ND	ug/L	5.0	1		07/21/16 11:44	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 11:44	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 11:44	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 11:44	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		07/21/16 11:44	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	77-126	1		07/21/16 11:44	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1		07/21/16 11:44	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-3 **Lab ID: 30189983003** Collected: 07/14/16 13:20 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**164**	ug/L	5.0	1		07/21/16 17:36	71-43-2	
Ethylbenzene	**48.9**	ug/L	5.0	1		07/21/16 17:36	100-41-4	
Isopropylbenzene (Cumene)	**6.4**	ug/L	5.0	1		07/21/16 17:36	98-82-8	
Methyl-tert-butyl ether	**6.3**	ug/L	5.0	1		07/21/16 17:36	1634-04-4	
Naphthalene	**61.8**	ug/L	5.0	1		07/21/16 17:36	91-20-3	
Toluene	**9.0**	ug/L	5.0	1		07/21/16 17:36	108-88-3	
1,2,4-Trimethylbenzene	**129**	ug/L	5.0	1		07/21/16 17:36	95-63-6	
1,3,5-Trimethylbenzene	**43.5**	ug/L	5.0	1		07/21/16 17:36	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		07/21/16 17:36	2037-26-5	
4-Bromofluorobenzene (S)	93	%	81-119	1		07/21/16 17:36	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	77-126	1		07/21/16 17:36	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	1		07/21/16 17:36	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-4 **Lab ID: 30189983004** Collected: 07/14/16 09:45 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 12:09	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 12:09	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 12:09	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		07/21/16 12:09	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 12:09	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 12:09	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:09	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:09	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 12:09	2037-26-5	
4-Bromofluorobenzene (S)	100	%	81-119	1		07/21/16 12:09	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	77-126	1		07/21/16 12:09	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	1		07/21/16 12:09	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-5 **Lab ID: 30189983005** Collected: 07/14/16 09:15 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 14:15	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 14:15	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 14:15	98-82-8	
Methyl-tert-butyl ether	**7.3**	ug/L	5.0	1		07/21/16 14:15	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 14:15	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 14:15	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 14:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 14:15	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 14:15	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		07/21/16 14:15	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		07/21/16 14:15	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1		07/21/16 14:15	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-6 **Lab ID: 30189983006** Collected: 07/14/16 10:50 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 18:52	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 18:52	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 18:52	98-82-8	
Methyl-tert-butyl ether	**550**	ug/L	50.0	10		07/21/16 19:17	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 18:52	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 18:52	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 18:52	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 18:52	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		07/21/16 18:52	2037-26-5	
4-Bromofluorobenzene (S)	99	%	81-119	1		07/21/16 18:52	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	77-126	1		07/21/16 18:52	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		07/21/16 18:52	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-7 **Lab ID: 30189983007** Collected: 07/14/16 11:10 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 14:40	71-43-2	
Ethylbenzene	**6.3**	ug/L	5.0	1		07/21/16 14:40	100-41-4	
Isopropylbenzene (Cumene)	**27.5**	ug/L	5.0	1		07/21/16 14:40	98-82-8	
Methyl-tert-butyl ether	**7.5**	ug/L	5.0	1		07/21/16 14:40	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 14:40	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 14:40	108-88-3	
1,2,4-Trimethylbenzene	**212**	ug/L	5.0	1		07/21/16 14:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 14:40	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		07/21/16 14:40	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		07/21/16 14:40	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		07/21/16 14:40	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1		07/21/16 14:40	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-8 **Lab ID: 30189983008** Collected: 07/14/16 13:00 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 13:49	71-43-2	
Ethylbenzene	**16.1**	ug/L	5.0	1		07/21/16 13:49	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 13:49	98-82-8	
Methyl-tert-butyl ether	**633**	ug/L	50.0	10		07/23/16 08:18	1634-04-4	
Naphthalene	**8.9**	ug/L	5.0	1		07/21/16 13:49	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 13:49	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 13:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 13:49	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		07/21/16 13:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%	81-119	1		07/21/16 13:49	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	77-126	1		07/21/16 13:49	17060-07-0	
Dibromofluoromethane (S)	93	%	70-130	1		07/21/16 13:49	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-9 **Lab ID: 30189983009** Collected: 07/14/16 10:05 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 12:34	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 12:34	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 12:34	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		07/21/16 12:34	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 12:34	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 12:34	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:34	108-67-8	
Surrogates								
Toluene-d8 (S)	101	%	84-115	1		07/21/16 12:34	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		07/21/16 12:34	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	77-126	1		07/21/16 12:34	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		07/21/16 12:34	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-10D **Lab ID: 30189983010** Collected: 07/14/16 11:50 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 15:05	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 15:05	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 15:05	98-82-8	
Methyl-tert-butyl ether	**9.1**	ug/L	5.0	1		07/21/16 15:05	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 15:05	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 15:05	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:05	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		07/21/16 15:05	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		07/21/16 15:05	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	77-126	1		07/21/16 15:05	17060-07-0	
Dibromofluoromethane (S)	93	%	70-130	1		07/21/16 15:05	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-10S **Lab ID: 30189983011** Collected: 07/14/16 11:30 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 15:30	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 15:30	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 15:30	98-82-8	
Methyl-tert-butyl ether	**281**	ug/L	5.0	1		07/21/16 15:30	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 15:30	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 15:30	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:30	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		07/21/16 15:30	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		07/21/16 15:30	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	77-126	1		07/21/16 15:30	17060-07-0	
Dibromofluoromethane (S)	100	%	70-130	1		07/21/16 15:30	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-11 **Lab ID: 30189983012** Collected: 07/14/16 12:10 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 17:11	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 17:11	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 17:11	98-82-8	
Methyl-tert-butyl ether	**37.7**	ug/L	5.0	1		07/21/16 17:11	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 17:11	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 17:11	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 17:11	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 17:11	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 17:11	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		07/21/16 17:11	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	77-126	1		07/21/16 17:11	17060-07-0	
Dibromofluoromethane (S)	96	%	70-130	1		07/21/16 17:11	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-12 **Lab ID: 30189983013** Collected: 07/14/16 15:10 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**5.6**	ug/L	5.0	1		07/21/16 15:55	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 15:55	100-41-4	
Isopropylbenzene (Cumene)	**25.2**	ug/L	5.0	1		07/21/16 15:55	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		07/21/16 15:55	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 15:55	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 15:55	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:55	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 15:55	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		07/21/16 15:55	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		07/21/16 15:55	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		07/21/16 15:55	17060-07-0	
Dibromofluoromethane (S)	92	%	70-130	1		07/21/16 15:55	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-13 **Lab ID: 30189983014** Collected: 07/14/16 14:50 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**15.6**	ug/L	5.0	1		07/21/16 12:59	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 12:59	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 12:59	98-82-8	
Methyl-tert-butyl ether	**6.4**	ug/L	5.0	1		07/21/16 12:59	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 12:59	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 12:59	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 12:59	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 12:59	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		07/21/16 12:59	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	77-126	1		07/21/16 12:59	17060-07-0	
Dibromofluoromethane (S)	98	%	70-130	1		07/21/16 12:59	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-14 **Lab ID: 30189983015** Collected: 07/14/16 13:45 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 16:21	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 16:21	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 16:21	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		07/21/16 16:21	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 16:21	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 16:21	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 16:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 16:21	108-67-8	
Surrogates								
Toluene-d8 (S)	101	%	84-115	1		07/21/16 16:21	2037-26-5	
4-Bromofluorobenzene (S)	97	%	81-119	1		07/21/16 16:21	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		07/21/16 16:21	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1		07/21/16 16:21	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-15 **Lab ID: 30189983016** Collected: 07/14/16 12:40 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 16:46	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 16:46	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 16:46	98-82-8	
Methyl-tert-butyl ether	**8.4**	ug/L	5.0	1		07/21/16 16:46	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 16:46	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 16:46	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 16:46	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 16:46	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 16:46	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		07/21/16 16:46	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		07/21/16 16:46	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	1		07/21/16 16:46	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: MW-16 **Lab ID: 30189983017** Collected: 07/14/16 14:30 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**226**	ug/L	5.0	1		07/21/16 19:42	71-43-2	
Ethylbenzene	**456**	ug/L	50.0	10		07/21/16 20:07	100-41-4	
Isopropylbenzene (Cumene)	**51.8**	ug/L	5.0	1		07/21/16 19:42	98-82-8	
Methyl-tert-butyl ether	**5.6**	ug/L	5.0	1		07/21/16 19:42	1634-04-4	
Naphthalene	**165**	ug/L	5.0	1		07/21/16 19:42	91-20-3	
Toluene	**176**	ug/L	5.0	1		07/21/16 19:42	108-88-3	
1,2,4-Trimethylbenzene	**1740**	ug/L	50.0	10		07/21/16 20:07	95-63-6	
1,3,5-Trimethylbenzene	**646**	ug/L	50.0	10		07/21/16 20:07	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		07/21/16 19:42	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		07/21/16 19:42	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	77-126	1		07/21/16 19:42	17060-07-0	
Dibromofluoromethane (S)	85	%	70-130	1		07/21/16 19:42	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Sample: Duplicate **Lab ID: 30189983018** Collected: 07/14/16 00:01 Received: 07/15/16 17:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		07/21/16 13:24	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		07/21/16 13:24	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		07/21/16 13:24	98-82-8	
Methyl-tert-butyl ether	**6.9**	ug/L	5.0	1		07/21/16 13:24	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		07/21/16 13:24	91-20-3	
Toluene	ND	ug/L	5.0	1		07/21/16 13:24	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 13:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		07/21/16 13:24	108-67-8	
Surrogates								
Toluene-d8 (S)	100	%	84-115	1		07/21/16 13:24	2037-26-5	
4-Bromofluorobenzene (S)	101	%	81-119	1		07/21/16 13:24	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		07/21/16 13:24	17060-07-0	
Dibromofluoromethane (S)	94	%	70-130	1		07/21/16 13:24	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

QC Batch: 227095 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30189983001, 30189983002, 30189983003, 30189983004, 30189983005, 30189983006, 30189983007, 30189983008, 30189983009, 30189983010, 30189983011, 30189983012, 30189983013, 30189983014, 30189983015, 30189983016, 30189983017, 30189983018

METHOD BLANK: 1112540 Matrix: Water
Associated Lab Samples: 30189983001, 30189983002, 30189983003, 30189983004, 30189983005, 30189983006, 30189983007, 30189983008, 30189983009, 30189983010, 30189983011, 30189983012, 30189983013, 30189983014, 30189983015, 30189983016, 30189983017, 30189983018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	07/21/16 11:18	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	07/21/16 11:18	
Benzene	ug/L	ND	1.0	07/21/16 11:18	
Ethylbenzene	ug/L	ND	1.0	07/21/16 11:18	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	07/21/16 11:18	
Methyl-tert-butyl ether	ug/L	ND	1.0	07/21/16 11:18	
Naphthalene	ug/L	ND	2.0	07/21/16 11:18	
Toluene	ug/L	ND	1.0	07/21/16 11:18	
1,2-Dichloroethane-d4 (S)	%	92	77-126	07/21/16 11:18	
4-Bromofluorobenzene (S)	%	94	81-119	07/21/16 11:18	
Dibromofluoromethane (S)	%	97	70-130	07/21/16 11:18	
Toluene-d8 (S)	%	104	84-115	07/21/16 11:18	

LABORATORY CONTROL SAMPLE: 1112541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.7	103	75-128	
1,3,5-Trimethylbenzene	ug/L	20	20.6	103	74-125	
Benzene	ug/L	20	19.3	97	69-115	
Ethylbenzene	ug/L	20	19.5	98	71-116	
Isopropylbenzene (Cumene)	ug/L	20	20.6	103	79-121	
Methyl-tert-butyl ether	ug/L	20	17.0	85	83-140	
Naphthalene	ug/L	20	25.5	127	64-140	
Toluene	ug/L	20	19.4	97	70-115	
1,2-Dichloroethane-d4 (S)	%			91	77-126	
4-Bromofluorobenzene (S)	%			96	81-119	
Dibromofluoromethane (S)	%			91	70-130	
Toluene-d8 (S)	%			101	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1112542 1112543

Parameter	Units	30189983002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	22.0	20.1	110	101	69-121	9	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	21.2	20.3	106	102	68-118	4	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1112542 1112543

Parameter	Units	30189983002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Benzene	ug/L	ND	20	20	22.0	21.2	110	106	63-123	3	
Ethylbenzene	ug/L	ND	20	20	20.7	19.3	103	97	70-120	7	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	22.0	20.6	110	103	71-129	7	
Methyl-tert-butyl ether	ug/L	6.0	20	20	22.1	21.0	81	75	63-143	5	
Naphthalene	ug/L	ND	20	20	25.4	23.2	127	116	55-122	9	M1
Toluene	ug/L	ND	20	20	21.2	20.1	105	100	66-124	5	
1,2-Dichloroethane-d4 (S)	%						91	92	77-126		
4-Bromofluorobenzene (S)	%						96	95	81-119		
Dibromofluoromethane (S)	%						99	95	70-130		
Toluene-d8 (S)	%						101	98	84-115		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30189983

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30189983001	MW-1	EPA 8260B	227095		
30189983002	MW-2	EPA 8260B	227095		
30189983003	MW-3	EPA 8260B	227095		
30189983004	MW-4	EPA 8260B	227095		
30189983005	MW-5	EPA 8260B	227095		
30189983006	MW-6	EPA 8260B	227095		
30189983007	MW-7	EPA 8260B	227095		
30189983008	MW-8	EPA 8260B	227095		
30189983009	MW-9	EPA 8260B	227095		
30189983010	MW-10D	EPA 8260B	227095		
30189983011	MW-10S	EPA 8260B	227095		
30189983012	MW-11	EPA 8260B	227095		
30189983013	MW-12	EPA 8260B	227095		
30189983014	MW-13	EPA 8260B	227095		
30189983015	MW-14	EPA 8260B	227095		
30189983016	MW-15	EPA 8260B	227095		
30189983017	MW-16	EPA 8260B	227095		
30189983018	Duplicate	EPA 8260B	227095		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	Standard	Container Order Number:		Pace Profile #:	

Regulatory Agency: UST - Underground Storage Tank

State / Location: Pennsylvania

WO#: 30189983

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): 8260B (NEW Diesel Shortlist)	Re	
1	MW-1	WT	G			7-14-16	14:05		3				X						X		001
2	MW-2	WT	G				10:30		3				X						X		002
3	MW-3	WT	G				13:20		3				X						X		003
4	MW-4	WT	G				09:45		3				X						X		004
5	MW-5	WT	G				09:15		3				X						X		005
6	MW-6	WT	G				10:50		3				X						X		006
7	MW-7	WT	G				11:10		3				X						X		007
8	MW-8	WT	G				13:00		3				X						X		008
9	MW-9	WT	G				10:05		3				X						X		009
10	MW-10D	WT	G				11:50		3				X						X		010
11	MW-10S	WT	G				11:30		3				X						X		011
12	MW-11	WT	G				12:10		3				X						X		012

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Hold trip blank analysis pending results.	GES	7-14-16	17:00	Receiving / GES	7-14-16	17:00				
Please use 5 ppb detection limit.	GES	7-15-16		PACE	7/15/16	3:00				
	PACE	7/15/16	4:50		7-15-16	1650	2.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Smith

SIGNATURE of SAMPLER: [signature] DATE Signed: 7-14-16

EQUIS EDD Required

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:

Company:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive
	Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com
Phone:	800-267-2549 Fax: 724-779-4617
Requested Due Date/TAT:	Standard

Section B — Required Project Information:

Report To:	Joe Hinkle
Copy To:	Joan Amodeo
	301 Commerce Park Drive, Cranberry Twp, PA 16066
Purchase Order No.	UPA Barkeyville M-209
Client Project ID:	UPA Barkeyville M-209
Container Order Number:	

Section C — Invoice Information:

Attention:	Joe Hinkle
Company Name:	Groundwater & Environmental Services
Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Pace Quote Reference:	
Pace Project Manager:	Christner, Rachel
Pace Profile #:	

Regulatory Agency: UST - Underground Storage Tank

State / Location: Pennsylvania

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM#	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): 8260B (NEW Diesel Shortlist)	30	Residual Chlorine (Y/N)	89983
1	MW-12	WT	G			7-14-16	15:10		3				X						X			013
2	MW-13	WT	G				14:50		3				X						X			014
3	MW-14	WT	G				13:45		3				X						X			015
4	MW-15	WT	G				12:40		3				X						X			016
5	MW-16	WT	G				14:30		3				X						X			017
6	Duplicate	WT	G				—		3				X						X			018
7	Trip Blank	WT	G				—		2				X						X			019
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Hold trip blank analysis pending results.	[illegible] / GES	7-14-16	17:00	Receiving / GES	7-14-16	17:00				
Please use 5 ppb detection limit.	[illegible] / GES			[illegible] / PACE	7/15/16	3:00				
	[illegible] PACE	7/15/16	4:50	[illegible]	7-15-16	1650	2.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James Smith

SIGNATURE of SAMPLER: [signature] DATE Signed: 7-14-16

EQUIS EDD Required

Sample Condition Upon Receipt Pittsburgh

Pace Analytical

Client Name: GES Project # 30189983

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 6 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 2.9 °C Correction Factor: -0.1 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: MV 7-15-16

Comments:	Yes	No	N/A	
Chain of Custody Present:	X			1.
Chain of Custody Filled Out:	X			2.
Chain of Custody Relinquished:	X			3.
Sampler Name & Signature on COC:	X			4.
Sample Labels match COC:	X			5.
-Includes date/time/ID/Analysis Matrix: WT				
Samples Arrived within Hold Time:	X			6.
Short Hold Time Analysis (<72hr remaining):		X		7.
Rush Turn Around Time Requested:		X		8.
Sufficient Volume:	X			9.
Correct Containers Used:	X			10.
-Pace Containers Used:	X			
Containers Intact:	X			11.
Filtered volume received for Dissolved tests			X	12.
All containers needing preservation have been checked.			X	13.
All containers needing preservation are found to be in compliance with EPA recommendation.			X	
exceptions: (VOA), coliform, TOC, O&G, Phenolics				Initial when completed MV Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):		X		14.
Trip Blank Present:	X			15.
Trip Blank Custody Seals Present	X			

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

August 19, 2016

Mr. Joe Hinkle
Groundwater & Environmental Services
301 Commerce Park Drive
Cranberry Twp, PA 16066

RE: Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Dear Mr. Hinkle:
Enclosed are the analytical results for sample(s) received by the laboratory on August 16, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
Project Manager

Enclosures

cc: Ms. Joan Amodeo, Groundwater and Environmental Services, Inc.
Lauren Bidwell, Groundwater & Environmental Services, Inc.
Ms. Debbie Burgan, Groundwater & Environmental Services, Inc.
Mr. Justin Paul, Groundwater & Environmental Sesrvices, Inc.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-1 **Lab ID: 30193232001** Collected: 08/15/16 09:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**371**	ug/L	5.0	1		08/17/16 18:51	71-43-2	
Ethylbenzene	**26.8**	ug/L	5.0	1		08/17/16 18:51	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 18:51	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 18:51	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 18:51	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 18:51	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 18:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 18:51	108-67-8	
Surrogates								
Toluene-d8 (S)	105	%	84-115	1		08/17/16 18:51	2037-26-5	
4-Bromofluorobenzene (S)	95	%	81-119	1		08/17/16 18:51	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		08/17/16 18:51	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 18:51	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-2 **Lab ID: 30193232002** Collected: 08/15/16 09:40 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 19:16	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 19:16	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 19:16	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 19:16	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 19:16	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 19:16	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 19:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 19:16	108-67-8	
Surrogates								
Toluene-d8 (S)	105	%	84-115	1		08/17/16 19:16	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		08/17/16 19:16	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		08/17/16 19:16	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 19:16	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-3 **Lab ID: 30193232003** Collected: 08/15/16 10:40 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**84.1**	ug/L	5.0	1		08/17/16 19:42	71-43-2	
Ethylbenzene	**68.7**	ug/L	5.0	1		08/17/16 19:42	100-41-4	
Isopropylbenzene (Cumene)	**8.4**	ug/L	5.0	1		08/17/16 19:42	98-82-8	
Methyl-tert-butyl ether	**6.4**	ug/L	5.0	1		08/17/16 19:42	1634-04-4	
Naphthalene	**82.1**	ug/L	5.0	1		08/17/16 19:42	91-20-3	
Toluene	**10.4**	ug/L	5.0	1		08/17/16 19:42	108-88-3	
1,2,4-Trimethylbenzene	**190**	ug/L	5.0	1		08/17/16 19:42	95-63-6	
1,3,5-Trimethylbenzene	**59.7**	ug/L	5.0	1		08/17/16 19:42	108-67-8	
Surrogates								
Toluene-d8 (S)	102	%	84-115	1		08/17/16 19:42	2037-26-5	
4-Bromofluorobenzene (S)	95	%	81-119	1		08/17/16 19:42	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		08/17/16 19:42	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1		08/17/16 19:42	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-4 **Lab ID: 30193232004** Collected: 08/15/16 10:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 20:07	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 20:07	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 20:07	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 20:07	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 20:07	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 20:07	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 20:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 20:07	108-67-8	
Surrogates								
Toluene-d8 (S)	109	%	84-115	1		08/17/16 20:07	2037-26-5	
4-Bromofluorobenzene (S)	91	%	81-119	1		08/17/16 20:07	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		08/17/16 20:07	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 20:07	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-5 **Lab ID: 30193232005** Collected: 08/15/16 10:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 20:33	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 20:33	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 20:33	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 20:33	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 20:33	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 20:33	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 20:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 20:33	108-67-8	
Surrogates								
Toluene-d8 (S)	108	%	84-115	1		08/17/16 20:33	2037-26-5	
4-Bromofluorobenzene (S)	93	%	81-119	1		08/17/16 20:33	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	77-126	1		08/17/16 20:33	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1		08/17/16 20:33	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-6 **Lab ID: 30193232006** Collected: 08/15/16 11:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/18/16 01:38	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/18/16 01:38	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/18/16 01:38	98-82-8	
Methyl-tert-butyl ether	**613**	ug/L	50.0	10		08/18/16 03:45	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/18/16 01:38	91-20-3	
Toluene	ND	ug/L	5.0	1		08/18/16 01:38	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 01:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 01:38	108-67-8	
Surrogates								
Toluene-d8 (S)	105	%	84-115	1		08/18/16 01:38	2037-26-5	
4-Bromofluorobenzene (S)	96	%	81-119	1		08/18/16 01:38	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		08/18/16 01:38	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/18/16 01:38	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-7 **Lab ID: 30193232007** Collected: 08/15/16 12:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 20:58	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 20:58	100-41-4	
Isopropylbenzene (Cumene)	**8.1**	ug/L	5.0	1		08/17/16 20:58	98-82-8	
Methyl-tert-butyl ether	**9.6**	ug/L	5.0	1		08/17/16 20:58	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 20:58	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 20:58	108-88-3	
1,2,4-Trimethylbenzene	**34.3**	ug/L	5.0	1		08/17/16 20:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 20:58	108-67-8	
Surrogates								
Toluene-d8 (S)	108	%	84-115	1		08/17/16 20:58	2037-26-5	
4-Bromofluorobenzene (S)	91	%	81-119	1		08/17/16 20:58	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		08/17/16 20:58	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 20:58	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-8 **Lab ID: 30193232008** Collected: 08/15/16 11:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 21:24	71-43-2	
Ethylbenzene	**5.2**	ug/L	5.0	1		08/17/16 21:24	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 21:24	98-82-8	
Methyl-tert-butyl ether	**830**	ug/L	50.0	10		08/18/16 12:09	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 21:24	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 21:24	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 21:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 21:24	108-67-8	
Surrogates								
Toluene-d8 (S)	107	%	84-115	1		08/17/16 21:24	2037-26-5	
4-Bromofluorobenzene (S)	92	%	81-119	1		08/17/16 21:24	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	77-126	1		08/17/16 21:24	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 21:24	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-9 **Lab ID: 30193232009** Collected: 08/15/16 11:40 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 21:49	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 21:49	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 21:49	98-82-8	
Methyl-tert-butyl ether	**9.7**	ug/L	5.0	1		08/17/16 21:49	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 21:49	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 21:49	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 21:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 21:49	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		08/17/16 21:49	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		08/17/16 21:49	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	77-126	1		08/17/16 21:49	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 21:49	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-10D **Lab ID: 30193232010** Collected: 08/15/16 12:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 22:15	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 22:15	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 22:15	98-82-8	
Methyl-tert-butyl ether	**25.6**	ug/L	5.0	1		08/17/16 22:15	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 22:15	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 22:15	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 22:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 22:15	108-67-8	
Surrogates								
Toluene-d8 (S)	103	%	84-115	1		08/17/16 22:15	2037-26-5	
4-Bromofluorobenzene (S)	92	%	81-119	1		08/17/16 22:15	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		08/17/16 22:15	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/17/16 22:15	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-10S **Lab ID: 30193232011** Collected: 08/15/16 12:40 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 22:40	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 22:40	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 22:40	98-82-8	
Methyl-tert-butyl ether	**33.4**	ug/L	5.0	1		08/17/16 22:40	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 22:40	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 22:40	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 22:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 22:40	108-67-8	
Surrogates								
Toluene-d8 (S)	107	%	84-115	1		08/17/16 22:40	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		08/17/16 22:40	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	77-126	1		08/17/16 22:40	17060-07-0	
Dibromofluoromethane (S)	104	%	70-130	1		08/17/16 22:40	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-11 **Lab ID: 30193232012** Collected: 08/15/16 13:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 23:06	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 23:06	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 23:06	98-82-8	
Methyl-tert-butyl ether	**189**	ug/L	5.0	1		08/17/16 23:06	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 23:06	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 23:06	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:06	108-67-8	
Surrogates								
Toluene-d8 (S)	107	%	84-115	1		08/17/16 23:06	2037-26-5	
4-Bromofluorobenzene (S)	93	%	81-119	1		08/17/16 23:06	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		08/17/16 23:06	17060-07-0	
Dibromofluoromethane (S)	101	%	70-130	1		08/17/16 23:06	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-12 **Lab ID: 30193232013** Collected: 08/15/16 14:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 23:31	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 23:31	100-41-4	
Isopropylbenzene (Cumene)	**26.7**	ug/L	5.0	1		08/17/16 23:31	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 23:31	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 23:31	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 23:31	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:31	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		08/17/16 23:31	2037-26-5	
4-Bromofluorobenzene (S)	92	%	81-119	1		08/17/16 23:31	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		08/17/16 23:31	17060-07-0	
Dibromofluoromethane (S)	99	%	70-130	1		08/17/16 23:31	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-13 **Lab ID: 30193232014** Collected: 08/15/16 14:00 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**27.1**	ug/L	5.0	1		08/17/16 23:57	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 23:57	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 23:57	98-82-8	
Methyl-tert-butyl ether	**6.3**	ug/L	5.0	1		08/17/16 23:57	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 23:57	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 23:57	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:57	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 23:57	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		08/17/16 23:57	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		08/17/16 23:57	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		08/17/16 23:57	17060-07-0	
Dibromofluoromethane (S)	102	%	70-130	1		08/17/16 23:57	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-14 **Lab ID: 30193232015** Collected: 08/15/16 09:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/18/16 00:22	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/18/16 00:22	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/18/16 00:22	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/18/16 00:22	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/18/16 00:22	91-20-3	
Toluene	ND	ug/L	5.0	1		08/18/16 00:22	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 00:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 00:22	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		08/18/16 00:22	2037-26-5	
4-Bromofluorobenzene (S)	93	%	81-119	1		08/18/16 00:22	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		08/18/16 00:22	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/18/16 00:22	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-15 **Lab ID: 30193232016** Collected: 08/15/16 13:20 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/18/16 00:47	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/18/16 00:47	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/18/16 00:47	98-82-8	
Methyl-tert-butyl ether	**10.8**	ug/L	5.0	1		08/18/16 00:47	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/18/16 00:47	91-20-3	
Toluene	ND	ug/L	5.0	1		08/18/16 00:47	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 00:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 00:47	108-67-8	
Surrogates								
Toluene-d8 (S)	107	%	84-115	1		08/18/16 00:47	2037-26-5	
4-Bromofluorobenzene (S)	92	%	81-119	1		08/18/16 00:47	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		08/18/16 00:47	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/18/16 00:47	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: MW-16 **Lab ID: 30193232017** Collected: 08/15/16 13:40 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	**168**	ug/L	5.0	1		08/18/16 02:04	71-43-2	
Ethylbenzene	**423**	ug/L	50.0	10		08/18/16 02:29	100-41-4	
Isopropylbenzene (Cumene)	**46.5**	ug/L	5.0	1		08/18/16 02:04	98-82-8	
Methyl-tert-butyl ether	**5.4**	ug/L	5.0	1		08/18/16 02:04	1634-04-4	
Naphthalene	**136**	ug/L	5.0	1		08/18/16 02:04	91-20-3	
Toluene	**218**	ug/L	5.0	1		08/18/16 02:04	108-88-3	
1,2,4-Trimethylbenzene	**1100**	ug/L	50.0	10		08/18/16 02:29	95-63-6	
1,3,5-Trimethylbenzene	**329**	ug/L	50.0	10		08/18/16 02:29	108-67-8	
Surrogates								
Toluene-d8 (S)	105	%	84-115	1		08/18/16 02:04	2037-26-5	
4-Bromofluorobenzene (S)	95	%	81-119	1		08/18/16 02:04	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	77-126	1		08/18/16 02:04	17060-07-0	
Dibromofluoromethane (S)	95	%	70-130	1		08/18/16 02:04	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: Duplicate **Lab ID: 30193232018** Collected: 08/15/16 00:01 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/18/16 01:13	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/18/16 01:13	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/18/16 01:13	98-82-8	
Methyl-tert-butyl ether	**5.0**	ug/L	5.0	1		08/18/16 01:13	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/18/16 01:13	91-20-3	
Toluene	ND	ug/L	5.0	1		08/18/16 01:13	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 01:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/18/16 01:13	108-67-8	
Surrogates								
Toluene-d8 (S)	106	%	84-115	1		08/18/16 01:13	2037-26-5	
4-Bromofluorobenzene (S)	94	%	81-119	1		08/18/16 01:13	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	77-126	1		08/18/16 01:13	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/18/16 01:13	1868-53-7	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Sample: Trip Blank **Lab ID: 30193232019** Collected: 08/15/16 00:01 Received: 08/16/16 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	5.0	1		08/17/16 18:00	71-43-2	
Ethylbenzene	ND	ug/L	5.0	1		08/17/16 18:00	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/17/16 18:00	98-82-8	
Methyl-tert-butyl ether	ND	ug/L	5.0	1		08/17/16 18:00	1634-04-4	
Naphthalene	ND	ug/L	5.0	1		08/17/16 18:00	91-20-3	
Toluene	ND	ug/L	5.0	1		08/17/16 18:00	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 18:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/17/16 18:00	108-67-8	
Surrogates								
Toluene-d8 (S)	105	%	84-115	1		08/17/16 18:00	2037-26-5	
4-Bromofluorobenzene (S)	99	%	81-119	1		08/17/16 18:00	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	77-126	1		08/17/16 18:00	17060-07-0	
Dibromofluoromethane (S)	103	%	70-130	1		08/17/16 18:00	1868-53-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

QC Batch: 230111 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 30193232001, 30193232002, 30193232003, 30193232004, 30193232005, 30193232006, 30193232007, 30193232008, 30193232009, 30193232010, 30193232011, 30193232012, 30193232013, 30193232014, 30193232015, 30193232016, 30193232017, 30193232018, 30193232019

METHOD BLANK: 1127800 Matrix: Water
Associated Lab Samples: 30193232001, 30193232002, 30193232003, 30193232004, 30193232005, 30193232006, 30193232007, 30193232008, 30193232009, 30193232010, 30193232011, 30193232012, 30193232013, 30193232014, 30193232015, 30193232016, 30193232017, 30193232018, 30193232019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	5.0	08/17/16 17:34	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	08/17/16 17:34	
Benzene	ug/L	ND	1.0	08/17/16 17:34	
Ethylbenzene	ug/L	ND	1.0	08/17/16 17:34	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	08/17/16 17:34	
Methyl-tert-butyl ether	ug/L	ND	1.0	08/17/16 17:34	
Naphthalene	ug/L	ND	2.0	08/17/16 17:34	
Toluene	ug/L	ND	1.0	08/17/16 17:34	
1,2-Dichloroethane-d4 (S)	%	92	77-126	08/17/16 17:34	
4-Bromofluorobenzene (S)	%	96	81-119	08/17/16 17:34	
Dibromofluoromethane (S)	%	101	70-130	08/17/16 17:34	
Toluene-d8 (S)	%	104	84-115	08/17/16 17:34	

LABORATORY CONTROL SAMPLE: 1127801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	18.6	93	75-128	
1,3,5-Trimethylbenzene	ug/L	20	18.9	94	74-125	
Benzene	ug/L	20	19.5	98	69-115	
Ethylbenzene	ug/L	20	21.0	105	71-116	
Isopropylbenzene (Cumene)	ug/L	20	19.0	95	79-121	
Methyl-tert-butyl ether	ug/L	20	21.4	107	83-140	
Naphthalene	ug/L	20	19.7	98	64-140	
Toluene	ug/L	20	21.3	106	70-115	
1,2-Dichloroethane-d4 (S)	%			92	77-126	
4-Bromofluorobenzene (S)	%			92	81-119	
Dibromofluoromethane (S)	%			101	70-130	
Toluene-d8 (S)	%			106	84-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1127802 1127803

Parameter	Units	30193165001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	17.6	17.6	88	88	69-121	0	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	17.3	17.5	87	88	68-118	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1127802 1127803

Parameter	Units	30193165001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Benzene	ug/L	ND	20	20	19.1	19.4	95	97	63-123	2	
Ethylbenzene	ug/L	ND	20	20	19.9	19.7	99	98	70-120	1	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	18.0	18.5	90	93	71-129	3	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.6	20.0	93	100	63-143	7	
Naphthalene	ug/L	ND	20	20	15.7	16.0	78	80	55-122	2	
Toluene	ug/L	ND	20	20	20.4	20.4	102	102	66-124	0	
1,2-Dichloroethane-d4 (S)	%						91	95	77-126		
4-Bromofluorobenzene (S)	%						96	96	81-119		
Dibromofluoromethane (S)	%						99	102	70-130		
Toluene-d8 (S)	%						107	105	84-115		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPA Barkeyville M-209
Pace Project No.: 30193232

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30193232001	MW-1	EPA 8260B	230111		
30193232002	MW-2	EPA 8260B	230111		
30193232003	MW-3	EPA 8260B	230111		
30193232004	MW-4	EPA 8260B	230111		
30193232005	MW-5	EPA 8260B	230111		
30193232006	MW-6	EPA 8260B	230111		
30193232007	MW-7	EPA 8260B	230111		
30193232008	MW-8	EPA 8260B	230111		
30193232009	MW-9	EPA 8260B	230111		
30193232010	MW-10D	EPA 8260B	230111		
30193232011	MW-10S	EPA 8260B	230111		
30193232012	MW-11	EPA 8260B	230111		
30193232013	MW-12	EPA 8260B	230111		
30193232014	MW-13	EPA 8260B	230111		
30193232015	MW-14	EPA 8260B	230111		
30193232016	MW-15	EPA 8260B	230111		
30193232017	MW-16	EPA 8260B	230111		
30193232018	Duplicate	EPA 8260B	230111		
30193232019	Trip Blank	EPA 8260B	230111		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

WO#:30193232

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Dc

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must b

30193232

Page : 1 Of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	3-Day TAT	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): 8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-1	WT	G			8-15-16	0900		3				X						X		001
2	MW-2	WT	G				0940		3				X						X		002
3	MW-3	WT	G				1040		3				X						X		003
4	MW-4	WT	G				1020		3				X						X		004
5	MW-5	WT	G				1000		3				X						X		005
6	MW-6	WT	G				1120		3				X						X		006
7	MW-7	WT	G				1200		3				X						X		007
8	MW-8	WT	G				1100		3				X						X		008
9	MW-9	WT	G				1140		3				X						X		009
10	MW-10D	WT	G				1220		3				X						X		010
11	MW-10S	WT	G				1240		3				X						X		011
12	MW-11	WT	G				1300		3				X						X		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Hold trip blank analysis pending results.	[signature] / GES	8-16-16	0600	To GES Sample Area	8-16-16	0600				
Please use 5 ppb detection limit.	[signature] / GES			[signature]	8-16-16	12.00				
	[signature]	8-16-16	1-05	[signature] / Pace	8-16-16	1305	2.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James R Lesworth

SIGNATURE of SAMPLER: [signature] DATE Signed: 8-15-16

EQUIS EDD Required

30193232

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 2 Of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Groundwater & Environmental Services	Report To:	Joe Hinkle	Attention:	Joe Hinkle
Address:	301 Commerce Park Drive	Copy To:	Joan Amodeo	Company Name:	Groundwater & Environmental Services
Cranberry Twp, PA 16066		301 Commerce Park Drive, Cranberry Twp, PA 16066		Address:	301 Commerce Park Drive, Cranberry Twp, PA 16066
Email To:	jhinkle@gesonline.com	Purchase Order No.	UPA Barkeyville M-209	Pace Quote Reference:	
Phone:	800-267-2549 Fax: 724-779-4617	Client Project ID:	UPA Barkeyville M-209	Pace Project Manager:	Christner, Rachel
Requested Due Date/TAT:	3-day TAT	Container Order Number:		Pace Profile #:	

Regulatory Agency
UST - Underground Storage Tank
State / Location
Pennsylvania

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260B (NEW Diesel Shortlist)	Residual Chlorine (Y/N)	
1	MW-12	WT	G			8-15-16	1420		3				X						X		013
2	MW-13	WT	G				1400		3				X						X		014
3	MW-14	WT	G				0920		3				X						X		015
4	MW-15	WT	G				1320		3				X						X		016
5	MW-16	WT	G				1340		3				X						X		017
6	Duplicate	WT	G				—		3				X						X		018
7	Trip Blank	WT	G				—		2				X						X		019
8																					
9																					
10																					
11																					
12																					

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Hold trip blank analysis pending results.	[signature] / GES	8-16-16	0600	To GES Sample Area	8-16-16	0600				
Please use 5 ppb detection limit.	[signature] / GES			[signature]	8-16-16	12:00				
	[signature]	8-16	1105	[signature] Pace / Pace	8-16-16	1305	2.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: James R Alesauer TH

SIGNATURE of SAMPLER: [signature] DATE Signed: 8-15-16

EQUIS EDD Required

Sample Condition Upon Receipt Pittsburgh

30193232

Pace Analytical

Client Name: GES Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 6 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 2.1 °C Correction Factor: 0.1 °C Final Temp: 2.0 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: dnA 8-16-16

Comments:	Yes	No	N/A	
Chain of Custody Present:	X			1.
Chain of Custody Filled Out:	X			2.
Chain of Custody Relinquished:	X			3.
Sampler Name & Signature on COC:	X			4.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: WT	X			5.
Samples Arrived within Hold Time:	X			6.
Short Hold Time Analysis (<72hr remaining):		X		7.
Rush Turn Around Time Requested:	X			8.
Sufficient Volume:	X			9.
Correct Containers Used: -Pace Containers Used:	X X			10.
Containers Intact:	X			11.
Filtered volume received for Dissolved tests			X	12.
All containers needing preservation have been checked.			X	13.
All containers needing preservation are found to be in compliance with EPA recommendation.			X	
exceptions: (VOA), coliform, TOC, O&G, Phenolics				Initial when completed dnA Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):		X		14.
Trip Blank Present:	X			15.
Trip Blank Custody Seals Present	X			
Rad Aqueous Samples Screened > 0.5 mrem/hr			X	Initial when completed: Date:

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

APPENDIX I

Investigation Derived Waste Documentation

McCutcheon Enterprises, Inc.
Complete Waste Management

McCutcheon Enterprises, Inc.
250 Park Road
Apollo, PA 15613
(724)568-3623 Fax (724)568-2571
www.completewastemgmt.com

00139688

Non Hazardous Waste Manifest	1. Generator's US EPA ID No.	Manifest Document No. 061219	2. Page 1 of 1 JWO0194554

3. Generator's Name and Mailing Address
United Refining Company
814 Lexington Avenue, P. O. Box 688
Warren, PA 16365

MC061219

4. Generator's Phone ( )

B. State Generator's ID

5. Transporter 1 Company Name: McCutcheon Enterprises Inc
6. US EPA ID Number: PAD013826847

C. State Trans. ID

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone ( ) 724-568-3623

E. State Trans. ID

9. Designated Facility Name and Site Address
McCutcheon Ent. Biosolids Treatment Facility
250 Park Road, .
Apollo, PA 15613

10. US EPA ID Number: PAD013826847

F. Transporter's Phone ( )

G. State Facility's ID

H. Facility's Phone (724 568-3623

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a. Waste petroleum material contaminated soil/debris	16	DM	est 9	T	507
b. Oil/water emulsions, oily wastewaters	6	DM TT	est 250	G	422
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. 061108-00002291
b. 061308-00002229
c.
d.

K. Handling Codes for Wastes Listed Above
a.
b.
c.
d.

15. Special Handling Instructions and Additional Information

UPA Barkelyville M-209
5574 State Route 8
Harrisville, PA
Butler County

Drilling waste, Decon water & Sampling water 16 drums - 4.40 to
6 drums - 1.62 ton

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

Printed/Typed Name	Signature	Month Day Year
X James R Ainsworth on B	X [signature] on Behalf of United Refining Co.	12 29 15

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Shawn Johnston	[signature]	12 29 15

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
Aleesha Bertino	[signature]	12 29 15

GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

Bill To: **United Ref** Ticket#: 80909

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-668-3623

MANUAL ORIGINAL

IN: 12/29/2015 3:11:51PM
OUT: 12/29/2015 3:11:51PM
Operater: Owenb71108

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BVG
Truck: N
Container:
JWO#: 0194554
Manifest#: 61219

GROSS lbs:	29,700.00
TARE lbs:	20,900.00
NET lbs:	8,800.00
ADJUSTED lbs:	8,800.00
Tons:	4.40

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
507 - Waste petroleum material con	4.40	ton	$0.00	$0.00

16 DRUMS

Alaska Bento

White Copy - Customer
All Others Void-Customer Do Not Accept

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

Bill To: **United Ref** Ticket#: 80910

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-668-3623

MANUAL ORIGINAL

IN: 12/29/2015 3:13:07PM
OUT: 12/29/2015 3:13:07PM
Operater: Owenb71108

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BVG
Truck: N
Container:
JWO#: 0194554
Manifest#: 61219

GROSS lbs:	20,900.00
TARE lbs:	17,660.00
NET lbs:	3,240.00
ADJUSTED lbs:	3,240.00
Tons:	1.62

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
422 - oil/water emulsions, oily wa	1.62	ton	$0.00	$0.00

5 DRUMS

Alaska Bento

White Copy - Customer
All Others Void-Customer Do Not Accept

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

McCutcheon Enterprises, Inc.
Complete Waste Management

McCutcheon Enterprises, Inc.
250 Park Road
Apollo, PA 15613
(724)568-3623 Fax (724)568-2571
www.completewastemgmt.com

00139687

Non Hazardous Waste Manifest	1. Generator's US EPA ID No.	Manifest Document No. 081218	2. Page 1 of 1	IWO0194555

3. Generator's Name and Mailing Address
United Refining Company
814 Lexington Avenue, P. O. Box 688
Warren, PA 16365

4. Generator's Phone ( )

MC061218

B. State Generator's ID

5. Transporter 1 Company Name: McCutcheon Enterprises Inc
6. US EPA ID Number: PAD013826847

C. State Trans. ID: 724 568-3623

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone ( )

E. State Trans. ID

9. Designated Facility Name and Site Address
McCutcheon Ent. Biosolids Treatment Facility
250 Park Road,
Apollo, PA 15613

10. US EPA ID Number: PAD013826847

F. Transporter's Phone ( )

G. State Facility's ID

H. Facility's Phone (724 568-3623

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L. Waste No.
a.	Waste petroleum material contaminated soil/debris	24	DM	913	T	507
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. 081106-00002281
b.
c.
d.

K. Handling Codes for Wastes Listed Above
a.
b.
c.
d.

15. Special Handling Instructions and Additional Information
UPA Barkelyville M-209
5574 State Route 8
Harrisville, PA
Butler County

Drilling waste

24 drums = 6.45 [illegible]

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

Printed/Typed Name	Signature	Month Day Year
[illegible]	[illegible] on behalf of [illegible]	[illegible]

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Larry Stewart	[illegible] 723	12 29 15

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
[illegible]	[illegible]	[illegible]

GENERATOR

TRANSPORTER

FACILITY

TRANSPORTER COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

Bill To: **United Ref**

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-568-3822

Ticket#: 80911
MANUAL ORIGINAL

IN: 12/29/2015 3:15:13PM
OUT: 12/29/2015 3:15:13PM
Operator: [redacted]
FC73795

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: EV2
Truck: N
Container:
JWO#: 0194555
Manifest#: 01218

GROSS lbs:	40,800.00
TARE lbs:	27,900.00
NET lbs:	12,900.00
ADJUSTED lbs:	12,900.00
Tons:	6.45

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
607 - Waste petroleum material con	6.45	Ton	$0.00	$0.00

24 DRUMS

Frank Colwell

White Copy - Customer
All Others Void Customer Do Not Accept

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

McCutcheon Enterprises, Inc.
Complete Waste Management

McCutcheon Enterprises, Inc.
250 Park Road
Apollo, PA 15613
(724)568-3623 Fax (724)568-2571
www.completewastemgmt.com

0014464

Non Hazardous Waste Manifest

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of 1 | JW0019693

3. Generator's Name and Mailing Address: United Refining Company
814 Lexington Avenue, P. O. Box 688
Warren, PA 16365

MC062115

4. Generator's Phone ( )

B. State Generator's ID

5. Transporter 1 Company Name: McCutcheon Enterprises Inc | 6. US EPA ID Number: PAD013826847 | C. State Trans. ID 724-568-3623

7. Transporter 2 Company Name | 8. US EPA ID Number | D. Transporter's Phone ( ) | E. State Trans. ID

9. Designated Facility Name and Site Address: McCutcheon Ent. Biosolids Treatment Facility
250 Park Road.
Apollo, PA 15613 | 10. US EPA ID Number: PAD013826847 | F. Transporter's Phone ( ) | G. State Facility's ID 724 568-3623 | H. Facility's Phone ( )

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a.	Waste petroleum material contaminated soil/debris	027	DM	19000	P	507
b.	Oil/water emulsions, oily wastewaters		TT		G	4222 MLP
c.						
d.						

J. Additional Descriptions for Materials Listed Above

a. 081106-00002291 | c.

b. ~~081506-00002229~~ OWS | d.

K. Handling Codes for Wastes Listed Above

a. | c.

b. | d.

15. Special Handling Instructions and Additional Information

~~UPA Barkeyville M-209~~
~~5574 State Route 8~~
~~Harrisville, PA~~
~~Butler County~~

27 Drums
14,740P
7.37 TON
All weights are estimated

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

GENERATOR

Printed/Typed Name: X James R Foswerth | Signature: X on Behalf of United Refining | Month 03 Day 07 Year 16

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Michael w Pearson | Signature: Michael w Pearson | Month 03 Day 07 Year 16

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Owen Britz | Signature | Month 03 Day 07 Year 16

GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

McCutcheon Enterprises, Inc.
Complete Waste Management

McCutcheon Enterprises, Inc.
250 Park Road
Apollo, PA 15613
(724)568-3623 Fax (724)568-2571
www.completewastemgmt.com

00141539

Non Hazardous Waste Manifest	1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	JWQ0197020

3. Generator's Name and Mailing Address
United Refining Company
814 Lexington Avenue, P. O. Box 688
Warren, PA 16365

MC062157

4. Generator's Phone ( )

B. State Generator's ID

5. Transporter 1 Company Name: McCutcheon Enterprises Inc
6. US EPA ID Number: PAD013826847

C. State Trans. ID: 724 568-3623

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone ( )

E. State Trans. ID

9. Designated Facility Name and Site Address
McCutcheon Ent. Biosolids Treatment Facility
250 Park Road,
Apollo, PA 15613

10. US EPA ID Number: PAD013826847

F. Transporter's Phone ( )

G. State Facility's ID: 724 568-3623

H. Facility's Phone ( )

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a.	Waste petroleum material contaminated soil/debris	-09	DM	0000	T	507
b.	Oil/water emulsions, oily wastewaters	-04	DM	EST 1210	P	422
c.						
d.						

J. Additional Descriptions for Materials Listed Above

a. ~~061108-00002291~~ owb
b. 061308-00002229
c.
d.

K. Handling Codes for Wastes Listed Above

a.
b.
c.
d.

15. Special Handling Instructions and Additional Information

UPA Barkelyville M-209
5574 State Route 8
Harrisville, PA
Butler County

Br-8

4 DRUMS
1620P owb
0.81 TON

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

Printed/Typed Name: James Rayleswerth
Signature: [signature] on behalf of United Refining
Month Day Year: 03 07 16

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRAD BROMAN
Signature: Brad Broman
Month Day Year: 03 07 16

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name
Signature
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: OWEN BIGGS
Signature: [signature]
Month Day Year: 03 07 16

GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

Bill To: **United Ref**

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Ticket#: 82359

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-568-3623

MANUAL ORIGINAL

IN: 3/7/2016 4:00:04PM
OUT: 3/7/2016 4:00:04PM
Operater: Owenb71108

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BV5
Truck: N
Container:
JWO#: 196934
Manifest#: 62115

GROSS lbs:	42,680.00
TARE lbs:	27,940.00
NET lbs:	14,740.00
ADJUSTED lbs:	14,740.00
Tons:	7.37

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
507 - Waste petroleum material con	7.37	ton	$0.00	$0.00

5574 State Route 8, Harrisville, PA

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

White Copy - Customer
All Others Void-Customer Do Not Accept

Bill To: **United Ref**

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Ticket#: 82355

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-568-3623

MANUAL ORIGINAL

IN: 3/7/2016 3:45:10PM
OUT: 3/7/2016 3:45:10PM
Operater: Owenb71108

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BV8
Truck: N
Container:
JWO#: 197020
Manifest#: 62157

GROSS lbs:	13,460.00
TARE lbs:	11,840.00
NET lbs:	1,620.00
ADJUSTED lbs:	1,620.00
Tons:	0.81

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
522 - oil/water emulsions, oily wa	0.81	ton	$0.00	$0.00

5574 State Route 8, Harrisville, PA

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

White Copy - Customer
All Others Void-Customer Do Not Accept

BV5

McCUTCHEON Enterprises, Inc.
Complete Waste Management
McCutcheon Enterprises, Inc.
250 Park Road
Apollo, PA 15613
(724)568-3623 Fax (724)568-2571
www.completewastemgmt.com

(0)144883

Non Hazardous Waste Manifest

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of 1 | JWC0201875

3. Generator's Name and Mailing Address: United Refining Company
814 Lexington Avenue, P. O. Box 688
Warren, PA 16365

MC063760

4. Generator's Phone ( )

B. State Generator's ID

5. Transporter 1 Company Name: McCutcheon Enterprises Inc

6. US EPA ID Number: PAD013826847

C. State Trans. ID

7. Transporter 2 Company Name

8. US EPA ID Number

D. Transporter's Phone ( )

E. State Trans. ID

9. Designated Facility Name and Site Address: McCutcheon Ent. Biosolids Treatment Facility
250 Park Road. .
Apollo, PA 15613

10. US EPA ID Number: PAD013826647

F. Transporter's Phone ( )

G. State Facility's ID 724-568-3623

H. Facility's Phone ( )

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a.	Waste petroleum material contaminated soil/debris	018	DM	Est 9000	P	507
b.	Oil/water emulsions, oily wastewaters	006	DM	Est 300	G	422
c.						
d.						

J. Additional Descriptions for Materials Listed Above

a. 081108-00002291

b. 061308-00002229

K. Handling Codes for Wastes Listed Above

a. | b. | c. | d.

15. Special Handling Instructions and Additional Information

UPA Berkeyville M-209
5574 State Route 8
Harrisville, PA
Butler County

a.) 18 Drums 4.14 TON

b.) 6 Drums 1.38 TON

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

Printed/Typed Name: (X) James Smith/GES on behalf of UPA | Signature: (X) | Month Day Year: 07 14 16

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Nick Myers | Signature: Nick Myers | Month Day Year: 07 14 16

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Frank Colwell | Signature: Frank Colwell | Month Day Year: 07 14 16

GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

Bill To: **United Ref**

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Ticket#: 86762

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-568-3623

MANUAL ORIGINAL

IN: 7/14/2016 3:43:48PM
OUT: 7/14/2016 3:43:48PM
Operater: ~~Gwenb7110~~ GM7228

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BV5
Truck: N
Container:
JWO#: 201875
Manifest#: 63760

GROSS lbs:	30,320.00
TARE lbs:	27,560.00
NET lbs:	2,760.00
ADJUSTED lbs:	2,760.00
Tons:	1.38

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
422 - oil/water emulsions, oily wa	1.38	ton	$0.00	$0.00
BARKLEYVILLE (6 DRUMS)				

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

White Copy - Customer
All Others Void-Customer Do Not Accept

Bill To: **United Ref**

United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Ticket#: 86761

McCutcheon Ent., Inc.
250 Park Road, Apollo, PA 1561
724-568-3623

MANUAL ORIGINAL

IN: 7/14/2016 3:41:12PM
OUT: 7/14/2016 3:41:12PM
Operater: ~~Gwenb7110~~ GM7228

Bio Facility

Customer: United Ref
United Refinning
Kwik Fill Stations
PO Box 780
Warren PA, 16365

Hauler: BV5
Truck: N
Container:
JWO#: 201875
Manifest#: 63760

GROSS lbs:	38,600.00
TARE lbs:	30,320.00
NET lbs:	8,280.00
ADJUSTED lbs:	8,280.00
Tons:	4.14

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
307 - Waste petroleum material con	4.14	ton	$0.00	$0.00
BARKLEYVILLE (18 DRUMS)				

Product Total:	$0.00
Total Fees:	$0.00
Total Taxes:	$0.00
Ticket Total:	$0.00

White Copy - Customer
All Others Void-Customer Do Not Accept

ICF-USTIF

From: files@sendthisfile.com
Sent: Monday, October 03, 2016 8:22 AM
To: ICF-USTIF
Subject: Incoming File from SendThisFile(sm)

Follow Up Flag: Follow up
Flag Status: Completed

Sender: jamodeo@gesonline.com
Upload Date: 2016-10-03 07:21:36.0
Message:

Click the following link to download your file(s).

Click to Retrieve File(s)

USTIF Claim #2015-0054(F)_Site Characterization Report September 2016.pdf

If the above link is not clickable, copy and paste the following URL into your browser.

https://www.sendthisfile.com/lzM3HnlAjWCFZwhugTFpEOr7

Note: These files will expire in 14 days from the time this email was generated.

Powered by www.SendThisFile.com

Facility Name:	UPA Kwik Fill Station #M-209, Barkeyville
Facility Address:	5574 Route 8, Barkeyville, PA
Responsible Party :	United Refining Company of PA
RP Mailing Address:	814 Lexington Avenue
	Warren, PA 16365

Storage Tank Facility ID#: 61-23779

Corrective Action Process Report /Plan Cover Sheet

CHAPTER 245
STORAGE TANK ACT

- ❑ **Site Characterization Report – Section 245.310(b)**
- ❑ **Site Characterization Report – Site-Specific Standard**
- ✓ **Site Characterization Report – Statewide Health or Background Standard**
- ❑ **Site Characterization Report PLUS – Statewide Health Standard**
- ❑ **Remedial Action Plan – Statewide Health or Background Standard**
- ❑ **Remedial Action Plan – Site Specific Standard**
- ❑ **Remedial Action Progress Report**
- ❑ **Remedial Action Completion Report – Statewide Health or Background Standard**
- ❑ **Remedial Action Completion Report – Site-Specific Standard**
- ❑ **Post Remediation Care Plan Report**
- ❑ **Environmental Covenant**

(check all that apply to the enclosed submission)

SITE CHARACTERIZATION REPORT

(Pennsylvania Code, Title 25, Chapter 245)

Kwik Fill Station #M-209
Facility ID #61-23779
USTIF Claim #2015-0054(F)
5574 State Route 8
Barkeyville, Pennsylvania
Venango County

Prepared for:

United Refining Company of Pennsylvania
814 Lexington Ave, P.O. Box 688
Warren, Pennsylvania, 16365

Prepared by:

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
301 Commerce Park Drive
Cranberry Township, Pennsylvania 16066

September 2016

SITE CHARACTERIZATION REPORT

Kwik Fill Station #M-209
Facility ID #61-23779
USTIF Claim #2015-0054(F)
5574 State Route 8
Barkeyville, Pennsylvania
Venango County

Prepared for:

United Refining Company of Pennsylvania
814 Lexington Ave, P.O. Box 688
Warren, Pennsylvania, 16365

Prepared by:

Groundwater & Environmental Services, Inc.
301 Commerce Park Drive
Cranberry Township, Pennsylvania 16066

Prepared by:

Justin M. Paul
Associate Scientist

Lauren A. Bidwell
Staff Scientist

Reviewed by:

Erin Letrick, P.G.
Project Geologist

Joseph Skurka
Senior Project Manager

Joseph E. Hinkle
Project Manager

By affixing my seal to this document, I am certifying that to the best of my knowledge the information is true and correct. I further certify that I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information.

September 2016

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS vi
EXECUTIVE SUMMARY viii
1.0 INTRODUCTION 1-1
2.0 FACILITY LOCATION AND DESCRIPTION 2-1
2.1 Location 2-1
2.2 Description 2-1
2.3 Sensitive Receptor Evaluation 2-2
2.3.1 Well Search 2-2
2.3.2 Potential Sensitive Receptors 2-3
2.3.3 Potential Ecological Receptors 2-4
2.3.4 Potential Migration Pathways 2-4
2.3.5 Current and Future Land Use 2-5
2.4 Physical Setting 2-5
2.4.1 Topography and Drainage 2-5
2.4.2 Stratigraphy 2-5
2.4.3 Hydrology 2-7
3.0 REGIONAL HISTORY 3-1
3.1 Local Tank Search 3-1
3.2 Local Mining Activities 3-2
4.0 FACILITY HISTORY 4-1
4.1 1996 Reportable Release - Unleaded Gasoline 4-1
4.2 1997 Reportable Release - Unleaded Gasoline 4-1
4.3 UST Closure Activities - April 1998 4-1
4.4 2015 Reportable Release - Diesel 4-2
5.0 SITE CHARACTERIZATION ACTIVITIES 5-1
5.1 Investigation Methods 5-1
5.2 Soil Investigation 5-2
5.2.1 Number and Location of Soil Borings 5-2
5.2.2 Sample Collection 5-3
5.2.3 Soil Analytical Results 5-3
5.2.4 Geotechnical Analytical Results 5-3
5.3 Groundwater Investigation 5-4
5.3.1 Well Installation and Construction 5-4
5.3.2 Well Development/Survey 5-4
5.3.3 Groundwater Sampling – Monitoring Wells 5-4
5.4 Vapor Intrusion Investigation 5-5
5.5 Investigation-Derived Waste 5-5
6.0 CONCEPTUAL SITE MODEL 6-1
6.1 Nature and Extent of Release 6-1
6.2 Soil 6-1
6.3 Groundwater 6-3

TABLE OF CONTENTS (continued)

6.3.1 Benzene and 1,2,4-trimethylbenzene 6-4
6.3.2 MTBE and Naphthalene 6-5
6.4 Soil Gas 6-5
6.5 Fate and Transport Assessment 6-5
6.5.1 Shallow Overburden Aquifer 6-5
6.5.2 Deep Overburden Aquifer 6-6

7.0 POTENTIAL EXPOSURE PATHWAYS AND SENSITIVE RECEPTORS 7-1

7.1 Soil Exposure Pathways 7-1
7.2 Groundwater Exposure Pathways 7-1
7.3 Surface Water Exposure Pathways 7-2
7.4 Vapor Exposure Pathways 7-3
7.4.1 Soil Vapor Inhalation 7-3
7.4.2 Groundwater Vapor Inhalation 7-3

8.0 SELECTION OF CLEANUP STANDARDS AND RATIONALE 8-1

8.1 Statewide Health Standard 8-1
8.1.1 Soil MSCs 8-1
8.1.2 Groundwater MSCs 8-3
8.2 Site-Specific Standard 8-3
8.3 Standard Selection 8-3

9.0 REMEDIAL OPTIONS EVALUATION 9-1

9.1 Soil 9-1
9.2 Groundwater 9-2

10.0 PLANNED ACTIVITIES 10-1

10.1 Schedule 10-1

11.0 SUMMARY 11-1

12.0 REFERENCES 12-1

TABLE OF CONTENTS (continued)

LIST OF FIGURES

1 Site Location Map
2 Local Area Map
3 Site Map
4 Soil Survey Map
5 Bedrock Geologic Map
6A Cross-Section Location Map
6B Cross-Section A-A', B-B' and C-C'
7 Groundwater Contour Map (Shallow Overburden Aquifer) July 14, 2016
8 Groundwater Contour Map (Deep Overburden Aquifer) July 14, 2016
9 Groundwater Contour Map (Shallow Overburden Aquifer) August15, 2016
10 Groundwater Contour Map (Deep Overburden Aquifer) August 15, 2016
11 Soil Boring Location Map
12 Area of Concern Location Map
13 Benzene Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
14 MTBE Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
15 1,2,4-TMB Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs)
16 Benzene Groundwater Isoconcentration Map, August 15, 2016
17 MTBE Groundwater Isoconcentration Map, August 15, 2016
18 Naphthalene Groundwater Isoconcentration Map, August 15, 2016
19 1,2,4-TMB Groundwater Isoconcentration Map, August 15, 2016
20 Proposed Monitoring Location Map

LIST OF TABLES

1 Groundwater Data Summary
2 Well Construction Summary
3 Soil Data Summary

LIST OF APPENDICES

A Facility Photographs
B Water Well Inventory Report, Local Water Supply Well Documentation & Ordinance Correspondence
C Soil Boring Logs and Well Construction Diagrams
D PADEP eMap PA Documentation
E Sampling and Analysis and Quality Assurance Project Plan
F Soil Laboratory Analytical Reports, 2015 and 2016
G Geotechnical Laboratory Report, 2016
H Groundwater Laboratory Analytical Reports, 2015 and 2016
I Investigation Derived Waste Documentation

ABBREVIATIONS AND ACRONYMS

Act 2	Pennsylvania Land Recycling Act, Title 25, 25 PA Code Chapter 250
APH	adsorbed phase hydrocarbons
AOC 1	Area of Concern 1
AOC 2	Area of Concern 2
AS	air sparge
ASTM	American Standard Test Method
bgs	below ground surface
CWF	cold water fishery
COC	constituents of concern
COPIAC	chemical of potential indoor air concern
CSM	conceptual site model
DC	direct contact
DOT	Department of Transportation
DPH	dissolved phase hydrocarbons
EPA	Environmental Protection Agency
facility	Kwik Fill Station #M-209, 5574 State Route 8, Barkeyville, Pennsylvania
FeB	Frenchtown Silt Loam
f_{oc}	fraction of organic carbon
GES	Groundwater & Environmental Services, Inc.
gpm	gallons per minute
GPR	ground penetrating radar
HASP	health and safety plan
In. Hg	inches of mercury
in w.c.	inches of water column
LNAPL	light non-aqueous phase liquid
LRP	liquid ring pump
MEI	McCutcheon Enterprises, Inc.
mg/kg	milligrams per kilogram
mm Hg	millimeters of mercury
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
MNA	monitored natural attenuation
MSC	medium-specific concentration
MSC_{SG}	medium-specific concentration - soil gas
MSL	mean sea level
MTBE	methyl tert-butyl ether
MW	monitoring well
NOCR	Notification of Confirmed Release
NORR	Notification of Reportable Release
NR	non-residential
NU	non-use aquifer
NWI	National Wetland Inventory
NWRO	Northwest Regional Office
OSM	Office of Surface Mining
PA	Pennsylvania
PADCNR	Pennsylvania Department of Conservation and Natural Resources

ABBREVIATIONS AND ACRONYMS (continued)

PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PD	positive displacement
PID	photoionization detector
POC	point of compliance
PRCP	Post Remedial Care Plan
PVC	poly-vinyl chloride
QD	Quick Domenico
R	residential
RACR	Remedial Action Completion Report
RAP	Remedial Action Plan
S/GW	soil-to-groundwater
SAP/QAPP	Sampling and Analysis and Quality Assurance Project Plan
SB	soil boring
scfm	standard cubic feet per minute
SCR	Site Characterization Report
SCRA	Site Characterization Report Addendum
SHS	statewide health standard
SPLP	synthetic precipitation leaching procedure
SSS	site-specific standard
SVE	soil vapor extraction
TDS	total dissolved solids
TMB	trimethylbenzene
TOC	top of casing
TPE	total phase extraction
U	used aquifer
U/NR	used aquifer, non-residential
U/R	used aquifer, residential
UPA	United Refining Company of Pennsylvania
USGS	United States Geologic Survey
UST	underground storage tank
VEGE	vacuum enhanced groundwater extraction
VOC	volatile organic compound

EXECUTIVE SUMMARY

Groundwater & Environmental Services, Inc. (GES) was contracted by United Refining Company of Pennsylvania (UPA) to complete site characterization for an active Kwik Fill retail petroleum facility located at 5574 State Route 8 in Barkeyville, Venango County, Pennsylvania (Kwik Fill Station #M-209, PADEP ID #61-23779) (facility). The results of these activities were to be utilized to complete a *Site Characterization Report* (SCR).

During a third party inspection on April 14, 2015, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined. A verbal *Notification of Reportable Release* (NORR) was made to the Northwest Regional Office (NWRO) of the Pennsylvania Department of Environmental Protection (PADEP) by UPA on April 15, 2015, and a written NORR was submitted to PADEP by UPA on April 15, 2015, describing the reportable release (UPA, 2015). Corrective action activities were initiated consistent with the requirements of 25 PA Code § 245 (Administration of the Storage Tank and Spill Prevention Program, Subchapter D) (PADEP, 2001) and Act 2 (Pennsylvania Land Recycling Act, 25 PA Code § 250).

Site characterization activities were initiated in August 2015, and assessment/delineation of site soil and groundwater continued through August 2016. Two water-bearing zones were observed during site characterization activities, a shallow overburden aquifer and a deep overburden aquifer. A total of thirteen shallow (MW-1 through MW-9, MW-10S, MW-11, MW-14, and MW-15) and four deep (MW-10D, MW-12, MW-13, and MW-16) overburden groundwater monitoring wells were installed. Soil screening and sampling was performed during monitoring well installation and at 11 soil boring locations (SB-1 through SB-11).

Site topography slopes sharply to the west separating the upper paved portion of the site where the 2015 diesel release occurred from the lower area of the site near the on-site stormwater retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond at a maximum depth of 27.35 feet below ground surface (bgs). The deep overburden aquifer was observed at a minimum depth of approximately 39.38 feet bgs below the upper paved portion of the site and at a minimum depth of approximately 8.79 feet bgs downgradient of the paved portion of the facility near the retention pond. Site characterization activities indicate the subsurface of the upper portion of the site, to a maximum depth of approximately 45 feet bgs, consists of unconsolidated fill material overlying layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel. Bedrock was encountered in monitoring well MW-10D at approximately 41 feet bgs and consisted of weathered sandstone. Downgradient facility lithology near the retention pond is similar with the exception of the unconsolidated fill. Facility lithology in the lower portion of the site was observed to a maximum depth of 20 feet bgs. Bedrock (weathered sandstone) was observed at approximately 19 feet bgs in monitoring well MW-12 and at approximately 15 feet bgs in groundwater monitoring well MW-13.

Adsorbed phase hydrocarbon (APH) impacts were observed in site subsurface (>2 feet bgs) soil in the vicinity of diesel dispensers #1/2 and 7/8 (release areas) and near the retention pond (downgradient). Diesel constituents were detected in soil between 2 and 14 feet bgs at concentrations above current Act 2 Statewide Health Standard (SHS) used aquifer, non-residential (U/NR), medium-specific concentrations (MSCs).

Groundwater monitoring wells have been gauged and/or sampled at the facility since October 2015. Dissolved phase hydrocarbon (DPH) impacts were observed in the shallow overburden aquifer near the release areas (diesel dispensers #1/2 and 7/8) and to the west (downgradient) at concentrations above current U/NR MSCs. DPH impacts were detected in groundwater in the deep overburden aquifer west (downgradient) of the release areas (diesel dispensers #1/2 and 7/8) at concentrations above current U/NR MSCs. Light non-aqueous phase liquid (LNAPL) has not been detected at the site since groundwater gauging was initiated in October 2015. The most recent site groundwater gauging and sampling event was conducted in August 2016. Based on current and future land use of the site and the distance to off-site residential receptors, the data were compared only to current applicable U/NR MSCs. Dissolved phase benzene, methyl tert-butyl ether (MTBE), naphthalene, and 1,2,4-trimethylbenzene were detected at concentrations above current U/NR MSCs.

Soil gas sampling activities have not been performed at the facility to date. However, APH and DPH impacts observed during site characterization activities were evaluated by comparing the analytical data from soil and groundwater samples collected to the PA Default Residential (R) and Non-Residential (NR) Screening Values for volatilization to indoor air. Based on the assessment, migration of soil gas from APH impacts to potential receptors is a concern and will be further evaluated during future site activities (i.e., active remediation). Migration of soil gas generated from existing DPH impacts is not a concern based on the assessment; however, DPH impacts were identified in facility groundwater, so further vapor intrusion assessment will be completed to confirm potential groundwater vapor inhalation pathways are not a concern. Mitigation of APH and DPH impacts will be required, and will be addressed in a *Site Characterization Report Addendum/Remedial Action Plan* (SCRA/RAP).

Historical documented unleaded gasoline releases occurred at the facility in 1996 and 1997, and according to the *Remedial Action Completion Report* (RACR) submitted by GSC/Kleinfelder in June 2006, residual DPH and APH impacts remained in facility soil and groundwater at concentrations above current U/NR MSCs (GSC/Kleinfelder, 2006). Based on remaining historical impacts, two areas of concern have been identified for APH and DPH impacts observed during current site characterization activities. APH and DPH impacts related to historical releases are referred to as Area of Concern 1 (AOC 1). APH and DPH impacts related to the 2015 diesel release are referred to as Area of Concern 2 (AOC 2). A conceptual site model (CSM) was developed based on evaluation of site characterization observations and data related to the 2015 diesel release. The CSM was used to evaluate potential remedial options to remediate identified APH and DPH impacts in AOC 2 (i.e., the subject 2015 release). The following report summarizes site characterization activities and findings, describes the CSM, evaluates potential exposure pathways and receptors, discusses the Act 2 standard selection rationale, presents planned supplemental site characterization activities and evaluates potential remedial options. The Act 2 attainment goal for site soil and groundwater are SHS, U/NR MSCs. Vapor intrusion for the facility will be addressed consistent with SHS requirements. Planned activity findings and the selected approach for remediation of identified diesel fuel impacts related to the 2015 diesel release will be presented in a SCRA/RAP.

1.0 INTRODUCTION

Ponded product and stained backfill was observed in diesel dispensers #1/2 and 7/8 during a third party inspection in April 2015. In response, corrective action activities were initiated consistent with the requirements of 25 PA Code § 245 and Act 2 (25 PA Code § 250). The following report provides facility background, a summary of site characterization activities, and proposed strategies planned to demonstrate attainment of the Act 2 Statewide Health Standard for diesel fuel constituents in site soil and groundwater and assessing vapor intrusion.

2.0 FACILITY LOCATION AND DESCRIPTION

2.1 Location

The facility is located at 5574 State Route 8, Barkeyville, Venango County, Pennsylvania. **Figure 1** (Site Location Map) illustrates the location of the facility on a U.S. Geological Survey (USGS) 7.5-Minute Topographic Quadrangle, Barkeyville, Pennsylvania (1980).

The facility is located in a mixed commercial and residential area. The facility is bordered to the north, beyond Stevenson Road, by a commercial property (Barkeyville Travel Center), to the east, beyond State Route 8, by commercial properties (Gahr's Truck and Tire Service and Heath Oil, Inc.) and residential properties, to the south by residential properties and undeveloped land, and to the west by undeveloped land. **Figure 2** (Local Area Map) illustrates the facility and adjacent properties. Photographs are provided in **Appendix A** (Facility Photographs).

2.2 Description

According to the Venango County Recorder of Deeds, the property is owned by UPA and has operated as a retail petroleum facility since at least 1980. The facility occupies an irregular-shaped parcel (Parcel ID #31,001.-026..-000) that measures approximately 2,300 feet along the northern property boundary, approximately 2,200 feet along the western property boundary, approximately 1,200 feet along the southern property boundary and approximately 2,500 feet along the eastern property boundary (**Figure 2**). The subject parcel encompasses approximately 93.4 acres.

Facility features include a single-story, slab-on-grade convenience store (Kwik Fill station #M-209), a two-story, slab-on-grade motel/restaurant, four 10,000-gallon steel underground storage tanks (USTs), and six associated product dispensers located on six concrete islands. According to the Regulated Storage Tank List for the PADEP-NWRO, the four steel USTs (#001, #002, #003 and #004) were installed at the facility in December 1972. All four USTs have steel piping and impressed current cathodic protection. Each UST contains and dispenses diesel fuel. Facility features are illustrated on **Figure 3** (Site Map). Photographs are provided in **Appendix A.**

An additional single-story, slab-on-grade unleaded gasoline/diesel fuel retail convenience store (Kwik Fill station #M-229), three USTs (two 10,000-gallon USTs containing unleaded gasoline and one 10,000-gallon UST containing diesel fuel) and three associated bi-product dispensers located on three concrete islands are also located beyond the motel/restaurant on the property to the east (upgradient) of the truck stop operations (station #M-209).

A sewage treatment plant operates in the northwestern portion of the parcel beyond the parking lot. The plant is located approximately 0.16 miles west (downgradient) of the facility along Stevenson Road.

The facility lot is comprised of asphalt and concrete with grassy areas along the northern, eastern, southern, and western property boundaries. Based on current grading at the facility, surface water runoff in the asphalt-paved and concrete areas is directed towards multiple stormwater catch basins located in the northern and central portions of the facility which all direct surface water runoff to the west. Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, site topography decreases sharply by approximately 35 feet in elevation. Subsurface stormwater lines connecting the stormwater catch basins run beyond the western parking lot boundary downgradient to the west to a stormwater retention pond.

Overhead electric lines run along the northern property boundary parallel with Stevenson Road. Electric service enters the facility from a utility pole near the intersection of State Route 8 and Stevenson Road where a series of utility poles and overhead lines connect the main service lines to the motel/restaurant, station and light poles surrounding the lot. An overhead telephone line runs from the motel/restaurant to light poles surrounding the motel/restaurant and connects to the main service line along State Route 8.

Seventeen groundwater monitoring wells (MW-1 through MW-9, MW-10D, MW-10S and MW-11 through MW-16) are located on-site. Observations during site characterization activities identified an overburden aquifer with two water-bearing zones (shallow and deep). Monitoring wells MW-1 through MW-9, MW-10S, MW-11, MW-14 and MW-15 monitor the shallow overburden aquifer. Monitoring wells MW-10D, MW-12, MW-13 and MW-16 monitor the deep overburden aquifer. **Figure 3** illustrates the location of relevant facility features and a portion of the approximate property boundary. The entire, approximate property boundary is illustrated on **Figure 2**.

2.3 Sensitive Receptor Evaluation

2.3.1 Well Search

The Pennsylvania Department of Conservation and Natural Resources (PADCNR) Groundwater Information System (PaGWIS) and PADEP eMap databases were used to identify potable or withdrawal wells within a ½-mile radius of the facility.

The PaGWIS database identified one domestic well (Record #1 [PA Well ID #145517]) and four industrial withdrawal wells (Record #2 [PA Well ID #145537], Record #3 [PA Well ID #145516], Record #4 [PA Well ID #145510] and Record #5 [PA Well ID #145509]) within ½-mile of the facility. The PaGWIS database also identified an abandoned well north of Interstate 80 (Record #6 [PA Well ID #515425]), four monitoring wells on the Heath Oil property (Record #7 [PA Well ID #642144], Record #8 [PA Well ID #642203], Record #9 [PA Well ID #642204), Record #10 [PA Well ID #642205] and four on-site monitoring wells (Record #11 [PA Well ID #626601], Record #12 [PA Well ID #626602], Record #13 [PA Well ID #626769), Record #14 [PA Well ID #626770], associated with this SCR investigation. A copy of the PaGWIS report is contained in **Appendix B** (Water Well Inventory Report, Local Water Supply Well Documentation & Ordinance Correspondence) which includes a map (**Figure B-1** [PaGWIS Well Search Location Map]) illustrating approximate well locations. The table below summarizes details for the one domestic well and four industrial withdrawal wells identified within a ½-mile radius of the facility (details for the referenced monitoring wells are not included in the below table).

Well ID	Name	Distance (miles)	Direction	Depth (feet)	Notes
145517	Beaver Oil	0.15	Northeast (upgradient)	88	Domestic
145509	Humble Oil	0.27	Northeast (upgradient)	68	Industrial
145537	Elliot Oil Co.	0.41	North (upgradient)	159	Industrial
145510	Texaco Inc.	0.44	North/Northeast (upgradient)	55	Industrial
145516	Texaco Inc.	0.44	North/Northeast (upgradient)	85	Industrial

The PADEP eMap database identified eight additional withdrawal wells (one domestic [PA Well ID #141385], two public supply [PA Well ID #141389 and #141440] and five industrial [PA Well ID #141413, #141414, #141421, #141433 and #141441]) within a ½-mile radius of the facility. However, the locations of these withdrawal wells could not be verified through PaGWIS. The table below

summarizes details for the additional withdrawal wells identified. A map (**Figure B-2** [eMap Well Search Location Map]) illustrating the approximate well locations is included in **Appendix B**.

Well ID	Name	Distance (miles)	Direction	Depth (feet)	Notes
141385	J. Borger	0.36	Northeast (upgradient)	60	Domestic
141440	Barkeyville Bor.	0.18	East/Southeast (upgradient)	357	Public Supply
141389	Elliot Oil Co.	0.27	North/Northwest (sidegradient)	135	Public Supply
141421	Beaver Oil Co.	0.11	East (upgradient)	88	Industrial
141413	Humble Oil Co.	0.16	Northeast (upgradient)	68	Industrial
141414	Texaco Inc.	0.27	North (upgradient)	55	Industrial
141441	Elliot Oil Co.	0.32	North (upgradient)	159	Industrial
141433	R. Weibel	0.50	North/Northeast (upgradient)	407	Industrial

Mr. Jeremy Holtz of Barkeyville Borough was contacted in September 2016 in regards to the public water supply near the facility. Mr. Holtz indicated that potable water is supplied to the facility and surrounding area by the Barkeyville Borough. The PADEP eMap database confirmed the facility and surrounding areas are within public water supply service area. Mr. Holtz also indicated the facility is within Zone 3 of the Wellhead Protection Plan which limits land use, facilities and their activities. Furthermore, Mr. William Coursen of the Barkeyville Borough Council confirmed an ordinance is in effect requiring the connection of all occupied buildings within the Barkeyville Municipal Authority service area to the public water supply and prohibiting all private drinking water sources. Correspondence relating to local water supply distribution and ordinances is provided in **Appendix B**.

The Barkeyville Borough obtains its raw water from withdrawal wells located at the Barkeyville Borough Municipal office approximately 0.63 miles south/southwest (sidegradient) of the facility. The water is transferred to a water treatment plant and then pumped to the residential and commercial customers.

2.3.2 Potential Sensitive Receptors

A sensitive receptor survey was conducted for the facility and adjacent properties within a one-mile radius of the facility. Petroleum hydrocarbon impacts are currently present in facility soil and groundwater at concentrations above current U/NR MSCs. Potential on- and off-site sensitive receptors include the following relative to groundwater flow direction at the facility:

- the subject property including station buildings M #209 and M #229 and the motel/restaurant building;
- residential properties located to the south (sidegradient) beyond the southern parking lot boundary between 100 feet and one mile from the facility;
- commercial and residential properties located to the east (upgradient) beyond State Route 8 between 200 feet and one mile from the facility;
- commercial and residential properties located to the north (sidegradient) beyond Stevenson Road between 150 feet and one mile from the facility;
- commercial and residential properties located to the west (downgradient) beyond the western parking lot boundary at a minimum of 0.30 miles from the facility;
- retention pond located to the west (downgradient) approximately 150 feet beyond the western parking lot boundary;
- unnamed pond located to the northwest (downgradient) beyond Stevenson Road approximately 400 feet from the facility;

- unnamed tributary of the North Branch of Slippery Rock Creek located to the west (downgradient) approximately 0.20 miles from the facility;
- sewage treatment plant located to the west (downgradient) approximately 700 feet beyond the western parking lot boundary;
- North Branch of Slippery Rock Creek located to the west (downgradient) approximately 0.25 miles from the facility; and
- unnamed pond located to the west (downgradient) approximately 0.25 miles from the facility near North Branch of Slippery Rock Creek.

The nearest downgradient surface body of water is an unnamed pond located approximately 400 feet northwest of the facility beyond Stevenson Road. The pond is listed on the National Wetland Inventory (NWI) (US EPA - My Waters Mapper). The unnamed pond may be a stormwater retention pond for the adjacent Barkeyville Travel Center truck stop. A stormwater retention pond for the Kwik Fill facility is located approximately 200 feet west of the dispenser islands.

The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility. The US EPA My Waters Mapper identified another unnamed pond on the NWI directly west (downgradient) of the facility near the North Branch of Slippery Rock Creek. The waters of the North Branch of Slippery Rock Creek (Ohio River Basin) are designated as a cold water fishery (CWF) by PADEP (25 PA Code § 93) (PADEP, 2016). The CWF designation is defined as surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying 25 PA Code § 93.4b(a). The CWF designation relates to the maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to cold water.

2.3.3 Potential Ecological Receptors

Title 25 PA Code § 250.311 requires that potential ecological receptors be evaluated unless one or more of the following conditions are met:

- Jet fuel, gasoline, kerosene, No. 2 fuel oil or diesel fuel are the only constituents detected on-site;
- The area of contaminated soil is less than two acres, and the area of contaminated sediment is less than 1,000 square feet;
- The facility has features such as buildings, parking lots, or gravel-paved areas that eliminate specific exposure pathways (e.g., soil exposure).

As discussed throughout this report, diesel fuel constituents are the only constituents of concern (COCs) at the facility relating to the subject release. APH impacts were identified in facility soil in the vicinity of dispenser islands #1/2 and 7/8 and downgradient near the retention pond west of the dispensers. The area of impact is less than two acres. There are no sediment impacts at the facility and no specific ecological exposure pathways related to facility groundwater as the depth to groundwater observed to date ranges from approximately 5 to 44 feet bgs. Based on the evaluation, no further ecological assessment is warranted.

2.3.4 Potential Migration Pathways

Underground utilities are typically located at depths ranging from 2 to 6 feet bgs and may serve as a potential pathway for groundwater and/or soil gas migration. Known subsurface utilities are identified in **Section 2.2** and illustrated on **Figure 3**. Depth to water observations during site gauging activities on August 15, 2016, indicate the average depth to groundwater in the shallow overburden aquifer is 14.82

feet, which is below the likely depth of underground utility trenching. Soil and groundwater vapor migration to potential receptors is discussed further in **Section 7.4**.

2.3.5 Current and Future Land Use

The facility is currently an active retail petroleum facility. There are no plans for sale or redevelopment of the property at this time.

2.4 Physical Setting

2.4.1 Topography and Drainage

The facility is located at an elevation of approximately 1,430 feet above mean sea level (MSL). Local topography slopes toward an intermittent, unnamed tributary to the North Branch of Slippery Rock Creek, at an elevation of approximately 1,360 feet above MSL. The unnamed tributary is located approximately 0.20 miles west of the facility and flows to the southwest where it meets the North Branch of Slippery Rock Creek.

The facility lot is comprised of asphalt and concrete with grassy areas along the northern, eastern, southern, and western property boundaries. Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, site topography decreases sharply by approximately 35 feet in elevation. Surface water runoff in the asphalt-paved and concrete areas is directed towards multiple storm water catch basins located in the northern and central portions of the facility, which all direct surface water runoff to the west. Underground stormwater lines connecting the stormwater catch basins run beyond the western parking lot boundary downgradient to the west to a stormwater retention pond.

2.4.2 Stratigraphy

Regional Soil Lithology

Soil type at the facility was evaluated using current U.S. Department of Agriculture Natural Resources Conservation Service Website data. Information obtained from the website indicates that facility soils belong to the Frenchtown Silt Loam (FeB) association. The FeB association consists of Frenchtown and similar soils and approximately 10% of minor components, and 3 to 8 percent slopes. Frenchtown Silt loam is poorly drained. Soil survey information in the vicinity of the facility is illustrated on **Figure 4** (Soil Survey Map).

Regional Bedrock Geology

The facility is situated within the Pittsburgh Low Plateau Section-Prototypical area of the Appalachian Plateau Physiographic Province. The Prototypical Area is characterized by broad, rolling interfluves separated by relatively narrow, steep-walled, moderately incised valleys (Shultz, 1999).

The underlying bedrock at the site belongs to the Allegheny Formation (Berg, T.M. et. al., 1980). The Formation consists of cyclic, sequences of sandstone, shale, limestone, clay and coal; includes valuable clay deposits and Vanport Limestone; commercially valuable Freeport, Kittanning, and Brookeville-Clarion coals are present in varying proportions as shown in **Figure 5** (Bedrock Geologic Map).

Facility Lithology

Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, the site topography decreases sharply separating the upper portion of the site where the 2015 diesel release occurred from the lower portion of the site near the

retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond. The deep overburden aquifer was observed below the shallow overburden aquifer in the upper paved portion of the site and continues downgradient of the paved portion of the site near the retention pond. Monitoring wells MW-1 through MW-9, MW-10S, MW-11, MW-14 and MW-15 monitor the shallow overburden aquifer. Monitoring wells MW-10D, MW-12, MW-13 and MW-16 monitor the deep overburden aquifer.

Groundwater monitoring well MW-10D is located in the upper paved portion of the site near the western asphalt-grass boundary and was constructed to monitor the deep overburden aquifer (**Figure 3**). During drilling activities, groundwater in the deep overburden aquifer was observed near the soil-bedrock interface. Monitoring well MW-10D was constructed with well screen to a maximum depth of 40 feet bgs, directly above bedrock which was observed at approximately 41 feet bgs. Since groundwater was observed near the bottom of the deep overburden aquifer, approximately 5 feet of poly-vinyl chloride (PVC) riser was installed from 45 feet bgs to 40 feet bgs to allow for additional space for groundwater from the deep overburden aquifer to collect in to achieve a sufficient amount of water for groundwater sampling collection and analysis. The well was constructed with bentonite seal from 45 feet bgs to 42 feet bgs to eliminate the potential of vertical migration of groundwater from the bedrock aquifer. Sand pack was added from 42 feet bgs to 1 foot above the screened interval. Monitoring well MW-10D is not screened in the bedrock aquifer, however, bedrock was observed at approximately 41 feet bgs and there is 1 foot of sand pack material at a maximum depth of 42 feet bgs. Although there is the potential for groundwater from the bedrock aquifer to migrate vertically through the sand pack between 42 feet bgs to the well screen at 40 feet bgs, monitoring well MW-10D is not screened in the bedrock aquifer and is likely monitoring groundwater observed in the deep overburden aquifer.

Soil boring logs and well construction diagrams are provided in **Appendix C** (Soil Boring Logs and Well Construction Diagrams). The logs were developed from site characterization activities which indicate the subsurface of the upper portion of the site, to a maximum depth of approximately 45 feet bgs, consists of unconsolidated fill material overlying layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel. Bedrock was encountered in monitoring well MW-10D at approximately 41 feet bgs and consisted of weathered sandstone. Facility lithology downgradient of the diesel station building near the retention pond is similar with the exception of the unconsolidated fill. Facility lithology in the lower portion of the site was observed to a maximum depth of 20 feet bgs. Bedrock (weathered sandstone) was observed at approximately 19 feet bgs in monitoring well MW-12 and at approximately 15 feet bgs in monitoring well MW-13. Using these data, cross sections A-A', B-B' and C-C' were constructed. **Figure 6A** (Cross-Section Location Map) shows the location and orientation of each cross-section.

Figure 6B (Cross-Section A-A', B-B' and C-C') illustrates cross section A-A' extending from monitoring well MW-13 (located downgradient, west of the grass-asphalt boundary near the retention pond) east to soil boring SB-7 (located near the motel/restaurant). The cross section illustrates a 1 to 2 feet layer of asphalt overlying unconsolidated fill material to a maximum depth of approximately 7 feet bgs, excluding the area west of parking lot which is comprised of topsoil. The fill material is underlain predominantly by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 41 feet bgs in monitoring well MW-10D. Intervals of clayey sand are present in monitoring well MW-13 from 2 to 4 feet bgs and 15 to 17 feet bgs with sandy clay in between. Weathered sandstone was encountered in monitoring well MW-10D from 41 to 45 feet bgs.

Cross section B-B' extends along the western grass-asphalt boundary from monitoring well MW-10S south to monitoring well MW-15 (located at the southern extent of site characterization activities). Similar to cross-section A-A', a 1 foot layer of asphalt overlies unconsolidated fill material to a maximum

depth of 7 feet bgs. The fill material is underlain by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 41 feet bgs in monitoring well MW-10D. A 2 foot lens of clayey gravel is present from 11 to 13 feet bgs in monitoring well MW-15 and 15 to 17 feet bgs in monitoring well MW-11, however, this gravel lens is not present north of monitoring well MW-11 in monitoring wells MW-10D and MW-10S. Weathered sandstone was encountered in MW-10D from 41 to 45 feet bgs.

Cross section C-C' extends from soil boring SB-7 south through the concrete dispenser drive pad to soil boring SB-3 (located along the southern boundary of site characterization activities). A 1 to 2 foot layer of asphalt overlies unconsolidated fill material to a maximum depth of 5 feet bgs, except for where the dispenser drive pad is present. There, a 1 foot layer of concrete overlies unconsolidated fill material to a depth of 3 feet bgs. The fill material is underlain exclusively by mixtures of clay, silty clay, sandy clay and gravelly clay down to a maximum depth of 21 feet bgs in soil boring SB-5. Bedrock was not encountered.

2.4.3 Hydrology

Surface Water

The facility is located at an elevation of approximately 1,430 feet above MSL. Local topography slopes toward an intermittent, unnamed tributary to the North Branch of Slippery Rock Creek, at an elevation of approximately 1,360 feet above MSL. The unnamed tributary is located approximately 0.20 miles west of the facility and flows to the southwest where it meets the North Branch of Slippery Rock Creek.

The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility and flows southeast then west/southwest toward Slippery Rock Creek. The North Branch of Slippery Rock Creek is located in the North Branch of Slippery Rock Creek Watershed (Watershed HUC12) and is located within the Connoquenessing Subbasin (Subbasin HUC8). The waters within the Connoquenessing Subbasin are located within the Ohio River Basin (US EPA - My Waters Mapper).

Groundwater

Site groundwater was gauged and/or sampled during seven separate events conducted between October 2015 and August 2016. Based on gauging data, the following table shows minimum, maximum and average depths to groundwater, general groundwater flow direction and average gradient of the shallow and deep overburden aquifers for the two most recent events conducted in July and August 2016.

Date	Aquifer	Minimum Depth to Groundwater (feet)	Maximum Depth to Groundwater (feet)	Average Depth to Groundwater (feet)	Groundwater Flow Direction	Average Groundwater Gradient (feet/foot)
July 14, 2016	Shallow Overburden	7.52 (MW-5)	28.44 (MW-9)	14.55	Radial-West/ Southwest and Northwest	0.20
	Deep Overburden	8.08 (MW-13)	43.69 (MW-10D)	18.64	Northwest	0.03
August 15, 2016	Shallow Overburden	7.31 (MW-5)	27.35 (MW-9)	14.82	Radial-West/ Southwest and Northwest	0.18
	Deep Overburden	8.79 (MW-13)	44.31 (MW-10D)	19.36	Northwest	0.03

Groundwater gauging information is summarized in **Table 1** (Groundwater Data Summary). Well construction details are summarized in **Table 2** (Well Construction Summary). **Figure 7** (Groundwater Contour Map [Shallow Overburden Aquifer] July 14, 2016), **Figure 8** (Groundwater Contour Map [Deep Overburden Aquifer] July 14, 2016), **Figure 9** (Groundwater Contour Map [Shallow Overburden Aquifer] August 15, 2016) and **Figure 10** (Groundwater Contour Map [Deep Overburden Aquifer] August 15, 2016) illustrate the groundwater flow patterns for the two most recent groundwater gauging and sampling events.

3.0 REGIONAL HISTORY

3.1 Local Tank Search

The PADEP Regulated Storage Tank List (PADEP, 2016) was utilized to determine potential off-site sources of contamination at the site. A search radius of one mile was utilized. Search results are summarized in the following table.

Facility Name	Distance (miles)	Direction	UST Information
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Site	(4) 10,000-gallon diesel UST
Kwik Fill # M-229 5574 State Route 8 Barkeyville, PA 16038	0.07	East	(2) 10,000-gallon gasoline UST (1) 10,000-gallon diesel UST
Barkeyville Travel Center 5644 State Route 8 Barkeyville, PA 15853	0.10	North	(2) 10,000-gallon gasoline UST (8) 10,000-gallon diesel UST (1) 520-gallon used oil UST
Rich's Fuel Stop 5609 State Route 8 Barkeyville, PA 15853	0.14	Northeast	(1) 3,000-gallon diesel UST (1) 6,000-gallon gasoline UST (1) 10,000-gallon unleaded gasoline UST (1) 10,000-gallon diesel UST (1) 1,000-gallon kerosene AST (1) 1,000-gallon heating oil (second grade) AST (1) 20,000-gallon heating oil AST (2) 20,000-gallon biodiesel AST (2) 20,000-gallon ethanol AST (1) 20,000-gallon other AST (2) 20,000-gallon kerosene AST
Speedway # 2921 5742 State Route 8 Barkeyville, PA 16038	0.40	North	(2) 20,000-gallon diesel UST (1) 12,000-gallon diesel UST (1) 20,000-gallon gasoline UST (1) 8,000-gallon gasoline UST (1) 4,000-gallon gasohol UST
Glenn O. Hawbaker Inc. 157 Hawbaker Industrial Blvd. Grove City, PA 16127	0.50	West	(1) 12,000-gallon diesel AST (1) 2,000-gallon diesel AST

AST = Above ground storage tank
UST = Underground storage tank

The PADEP Storage Tank Clean-Up Location database (PADEP, 2016) was utilized to identify sites within a one mile search radius with a confirmed release and associated site characterization and/or remedial activity. Search results are summarized in the following table.

Facility Name	Distance (miles)	Direction	Facility Information
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Property	Release Date: 08/05/1989 Current Status: Cleanup Complete as of 12/12/2006
Kwik Fill # M-209 5574 State Route 8 Barkeyville, PA 16038	0.00	Subject Property	Release Date: 04/15/2015 Current Status: Interim Remedial Actions not Initiated
Barkeyville Travel Center Truckstops of America 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 11/01/1992 Current Status: Cleanup complete as of 07/25/2005
Barkeyville Travel Center BP # 07124 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 08/05/2000 Current Status: Cleanup complete as of 02/12/2014
Barkeyville Travel Center BP # 07124 5644 State Route 8 Barkeyville, PA 15853	0.10	North	Release Date: 10/29/2014 Current Status: Cleanup complete as of 05/25/2015
Rich's Fuel Stop 5609 State Route 8 Barkeyville, PA 15853	0.14	Northeast	Release Date: 04/09/2015 Current Status: Interim Remedial Actions not Initiated
Speedway # 2921 5742 State Route 8 Barkeyville, PA 16038	0.40	North	Release Date: 10/18/2007 Current Status: Cleanup complete as of 07/10/2014

Information regarding the current environmental status of these facilities was not reviewed.

3.2 Local Mining Activities

Information obtained from the PADCNR and the Department of Interior, Office of Surface Mining (OSM), website (OSM, 2016) indicates no historical mining activities occurred in the area. Information obtained from the PADEP eMap PA website (PADEP, 2016) indicates historical underground mining activities occurred in the area of the facility. However, mining activities do not appear to have taken place directly beneath the facility and mine related problems were not identified near the facility. An active surface mining operation is located approximately 0.4 miles west of the facility. A copy of the map (**Figure D-1** – eMAP Mining Locations) obtained through the PADEP eMap PA website is provided in **Appendix D** (PADEP eMap PA Documentation).

4.0 FACILITY HISTORY

4.1 1996 Reportable Release - Unleaded Gasoline

In November 1996, a plus product line failed annual tightness testing and was subsequently removed from service. UPA initiated corrective action activities in January 1997. Initial site characterization activities included installation of eight soil borings and four groundwater monitoring wells which confirmed that unleaded gasoline constituents were present in facility soil and groundwater at concentrations above PADEP 1996 standards for UST closure site assessments north of the station building and dispenser islands east of the station building. LNAPL recovery was also initiated at the facility. A verbal *Notification of Confirmed Release* (NOCR) was called into the PADEP on January 20, 1997 followed by a written NORR submitted on February 10, 1997. In June 1997, additional site characterization activities were completed including the installation of six soil borings, three groundwater monitoring wells, and seven drive points and additional LNAPL recovery events. Additional site characterization activities identified soil and groundwater impacts above PADEP standards.

4.2 1997 Reportable Release - Unleaded Gasoline

A premium product line failed during annual line testing in October 1997. Additional site characterization activities were completed at the facility from November 1997 through January 2004. A total of thirty-eight soil borings, twenty-one groundwater monitoring wells, seven extraction wells, and seven drive points were installed at the facility as part of site characterization activities. Site characterization activities confirmed that unleaded gasoline constituents were present in facility soil and groundwater at concentrations above U/NR MSCs around the dispenser islands, north of the restaurant/motel building, and north, east, and west of the retention pond downgradient of the station building.

Pilot testing was completed in November 1997, and approximately 700 gallons of LNAPL were recovered via dual phase extraction activities. A remediation system was installed at the facility to mitigate soil and groundwater impacts identified and operated from November 1998 through January 2004. Site-specific standards were chosen as the remedial goals for the facility. A baseline risk assessment was completed which concluded that no unacceptable risk was present for identified receptors via complete and potentially complete exposure pathways. Ecological screening determined that no additional ecological evaluation is required in accordance with PA Code § 250.311(c). A *Comprehensive Site Characterization/Risk Assessment Report* was submitted to PADEP in May 2004 (GSC/Kleinfelder, 2004) and subsequently approved, with modifications, in November 2004. PADEP requested additional data related to the diesel USTs removed in April 1998.

4.3 UST Closure Activities - April 1998

During an internal inspection of the USTs in April 1998, several holes were observed in one of the steel USTs. Seven diesel USTs were removed in February 1999. It is not known if UST closure activities were performed at that time, and no record of a NORR submittal to PADEP was identified. Additional site characterization activities were performed in October 2005 with the completion of 12 soil borings in the former diesel UST area and collection of soil samples for the 1999 diesel UST closure per PADEP's request. Soil samples collected during the additional soil boring investigation indicated diesel constituent concentrations in soil were either not detected or detected at concentrations below applicable U/NR MSCs.

Following the completion of the additional soil boring investigation around the diesel UST field, four soil gas monitoring points were installed at the facility and sampled in November and December 2005. Soil gas sampling confirmed unleaded gasoline constituent concentrations were below PADEP R-NR soil gas screening criteria (MSC_{SG}). An *Additional Site Characterization/Remedial Action Completion Report* (ASC/RACR) was submitted by GSC/Kleinfelder and approved by PADEP in June 2006 (GSC/Kleinfelder, 2006). The selected remedial closure standards for the historical releases noted above were a combination of Statewide Health Standards and Site-Specific Standards (SSS). Total xylenes, MTBE, naphthalene, isopropylbenzene, benzo(a)anthracene, benzo(a)pyrene, fluorene, and phenanthrene in facility soil were demonstrated to be in attainment with the SHS. Benzene, toluene, and ethylbenzene in facility soil were demonstrated to be in attainment with the SSS. For facility groundwater, benzene, toluene, ethylbenzene, total xylenes, MTBE, naphthalene, and isopropylbenzene were demonstrated to be in attainment with the SHS. As noted in the 2006 RACR, residual concentrations of benzene, toluene, and ethylbenzene remain in facility soil, and residual concentrations of benzene and MTBE in facility groundwater (GSC/Kleinfelder, 2006). Following approval of the ASC/RACR, a *Post Remedial Care Plan* (PRCP) was initiated at the facility and consisted of annual site inspections to document that groundwater is not being utilized within areas of remaining soil and groundwater exceedances of the SHS.

4.4 2015 Reportable Release - Diesel

On April 14, 2015 during a third party inspection, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection and the source of the product was undetermined. A verbal NORR was made to the PADEP-NWRO by UPA on April 15, 2015, and a written NORR was submitted to PADEP on April 16, 2015 (UPA, 2015). Corrective action activities were initiated in August 2015 and are ongoing. The results of initial site characterization activities completed to date for the April 2015 diesel release are compared to applicable Act 2 MSCs and also in the context of known historical petroleum impacts and areas of concern.

5.0 SITE CHARACTERIZATION ACTIVITIES

Site characterization activities were completed from August 2015 through August 2016 to:

- Identify and quantify COCs in environmental media;
- Define the vertical and horizontal extent of COCs in environmental media;
- Identify appropriate interim remedial response measures; and
- Define the nature and scope of appropriate response actions.

To achieve these objectives, the following tasks were completed:

- Advanced 11 soil borings (SB-1 through SB-11);
- Collected one Shelby tube to evaluate soil properties;
- Constructed 13 shallow overburden aquifer groundwater monitoring wells (MW-1 through MW-9, MW-10S, MW-11, MW-14, and MW-15);
- Constructed 4 deep overburden aquifer groundwater monitoring wells (MW-10D, MW-12, MW-13, and MW-16);
- Collected 81 soil samples at soil boring and groundwater monitoring well locations; and
- Completed seven rounds of groundwater gauging and sampling.

All samples were submitted for laboratory analysis of the revised (March 2008) PADEP short list of diesel constituents via Environmental Protection Agency (EPA) Method 5035/8260B.

The following sections describe investigative and sample collection methodologies utilized during site characterization activities and summarize sample analytical results relative to current applicable Act 2 MSCs. Environmental media sampling was completed in accordance with a site-specific *Sampling and Analysis and Quality Assurance Project Plan* (SAP/QAPP). The SAP/QAPP is included in **Appendix E**.

5.1 Investigation Methods

The following sample collection methods were utilized during site characterization activities. Field activities were conducted in accordance with a site-specific Health and Safety Plan (HASP) (available on file).

Hand auguring and air knife methods were used to clear proposed soil boring and groundwater monitoring well locations to a minimum of five feet bgs to prevent damage to underground utilities, when possible. When within 10 feet of dispensers, product piping and/or the UST field, soil boring and monitoring well locations were pre-cleared to a minimum depth of 8 feet bgs, when possible. Groundwater monitoring wells were either installed using a Geoprobe 7822DT track rig via direct-push methods or CME LC-60 drill rig with hollow-stem augers. Soil samples were collected via two-foot split spoons or 5-foot acetate sleeves. Soil samples were screened for volatile organic compounds (VOCs) with a calibrated photoionization detector (PID).

During air knife/hand auguring activities, a soil sample was collected for laboratory analysis from the interval with the highest observed PID reading or at the base of the borehole (up to eight feet bgs) to assess potential shallow subsurface impacts. If the soil sample was collected from the base of the borehole, the sample was collected via a hand auger six inches below the contact point of the air knife (i.e., undisturbed soil). During drilling, soil samples were collected from the interval with the highest observed PID reading and one interval below for delineation purposes. If PID readings were not observed, one sample was collected from the interval directly above the apparent soil/groundwater interface. Soil samples were collected from 1 to 31 feet bgs using laboratory-supplied disposable

syringes, placed into the appropriate laboratory vials containing methanol or sodium bisulfate (EPA Method 5035), mixed and sealed. Samples were immediately placed on ice in a cooler to maintain appropriate sample temperature. Chain-of-custody forms were maintained from sample collection to laboratory receipt. Soil samples were analyzed for the revised (March 2008) PADEP short list of diesel constituents (benzene, toluene, ethylbenzene, MTBE, naphthalene, isopropylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene) via EPA Method 8260B.

Groundwater monitoring wells were constructed with varying lengths of either 2 or 4-inch diameter, 0.010 or 0.020-inch machine-slot well screen set across the saturated zone to monitor the groundwater table interface. PVC riser was added to the well screen to bring the monitoring wells to ground surface. The screen annulus was backfilled with sand from the base of the borehole to approximately 1 foot above the well screen. The remaining annulus was filled to approximately 1 to 2 feet bgs with hydrated bentonite chips. Groundwater monitoring wells MW-12, MW-13, and MW-16 were cased within 4-inch diameter steel pro-casing (with locking cap) which extends from 3 feet above ground surface to approximately 2 feet bgs and secured in a concrete pad. All other groundwater monitoring wells were finished flush with grade with an eight-inch diameter road box and locking cap secured in a concrete pad. Borings that were not converted to monitoring wells were backfilled with bentonite to two feet bgs and concrete or asphalt flush to grade to match existing site conditions.

Soil boring and groundwater monitoring well locations are illustrated on **Figure 11** (Soil Boring Location Map). Boring logs, including lithologic descriptions and PID readings, are included in **Appendix C**. Soil and decontamination water generated during drilling activities were containerized in steel 55-gallon, PA Department of Transportation (DOT) approved drums for disposal. Investigation derived waste was transported off-site for appropriate disposal (**Section 5.6**).

5.2 Soil Investigation

5.2.1 Number and Location of Soil Borings

From August 31 through September 8, 2015, two soil borings (SB-1 and SB-2) were completed and four groundwater monitoring wells (MW-1 through MW-4) were installed north, south, east, and west of the release area (diesel dispensers #1/2 and 7/8) in order to identify potential DPH impacts in groundwater, confirm localized groundwater flow direction(s), and confirm the presence or absence of APH impacts in soil. Due to the presence of historical APH and DPH impacts at the facility, soil borings and groundwater monitoring well locations were selected in as close proximity to diesel dispensers #1/2 and 7/8 as possible (i.e., in the concrete drive pad). Prior to completing intrusive work, a Limited Geophysical Survey (i.e., ground penetrating radar [GPR] and electromagnetic survey) was completed to assess the location of subsurface product lines and/or utilities in the vicinity of the dispenser islands.

From November 30 through December 2, 2015, four soil borings (SB-3 through SB-6) and four groundwater monitoring wells (MW-5 through MW-8) were installed to further delineate and assess on-site APH and DPH impacts. Further horizontal and vertical delineation of soil impacts and horizontal delineation of groundwater impacts was completed from February 15 through 23, 2016, by installing three additional soil borings (SB-7 through SB-9) and six groundwater monitoring wells (MW-9, MW-10S, MW-10D, and MW-11 through MW-13). Groundwater monitoring well MW-10D was installed downgradient of the station building to assess if identified DPH impacts were migrating vertically downgradient of the release area (i.e., dispenser islands). Groundwater monitoring wells MW-12 and MW-13 were completed downgradient of the station building near the retention pond to further assess the extent of DPH impacts observed in the vicinity of the dispenser islands at the base of the slope; however,

upon installation of monitoring wells MW-10D, MW-12 and MW-13, it was determined that an overburden aquifer with two water-bearing zones (shallow and deep) was present

Further horizontal and/or vertical delineation of APH and DPH impacts were completed from June 20 through 22, 2016 with the installation of two soil borings (SB-10 and SB-11) and three groundwater monitoring wells (MW-14 through MW-16).

5.2.2 Sample Collection

A total of 81 soil samples were collected during soil investigation activities. Soil samples were collected at depths ranging from 1 to 31 feet bgs to evaluate potential soil impacts in the shallow and deep overburden clay. Samples were collected consistent with the methods described in **Section 5.1**. Surficial soil samples were only collected where field screening and observations indicated a potential concern. Soil samples were analyzed by a PA-certified laboratory for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 5035/8260B.

5.2.3 Soil Analytical Results

Soil analytical results are summarized in **Table 3** (Soil Data Summary) relative to current U/NR MSCs. Accurate assessment of unsaturated (and periodically saturated) and saturated soil intervals is not possible at this point in time due to the limited seasonal groundwater elevation data set for the entire groundwater monitoring well network. The data were evaluated based on an assumed unsaturated soil column. The following COCs were identified at concentrations above current U/NR MSCs at the following locations:

- Benzene in MW-1, MW-3, MW-4, MW-16, SB-1, SB-5, SB-8, and SB-10;
- MTBE in SB-5 (reporting limit exceedance); and
- 1,2,4-trimethylbenzene in MW-3, MW-4, MW-16, SB-5, and SB-10.

Diesel constituents in the remaining soil borings and groundwater monitoring wells were either not detected or detected at concentrations below current U/NR MSCs. Laboratory reports and associated chain-of-custody forms are provided in **Appendix F** (Soil Laboratory Analytical Reports, 2015 and 2016).

5.2.4 Geotechnical Analytical Results

One Shelby tube sample was collected for geotechnical analysis at soil boring SB-8 from 9 to 11 feet bgs. Analyses conducted provided site-specific data to be used for fate and transport assessment and further CSM development. Samples were submitted to Geotechnics, Inc. of East Pittsburgh, Pennsylvania for analysis of the following parameters:

- Loss-on-ignition (American Standard Test Method [ASTM] D2974-14)
- Unit weight with porosity (ASTM D7263-09)
- Hydrometer analysis and wash sieve analysis (ASTM D422-63)
- Specific gravity (ASTM D854-14)

A sub-sample was collected from the Shelby tube from 10.2 to 10.8 feet bgs for analysis. Analytical results indicated the organic matter content of the sample was 4.5% from the loss-on-ignition processes. To determine the fraction of organic carbon (f_{oc}) from soil organic matter, a correction factor of 58% was utilized as recommended by the Indiana Department of Environmental Management (IDEM, 2007). Therefore, the f_{oc} for the SB-8 sample was approximately 2.61%. The average specific gravity and

porosity were 2.60 and 0.32, respectively. Sieve analysis classified the soil as silty, clayey sand with gravel (SC-SM).

The geotechnical laboratory report is included in **Appendix G** (Geotechnical Laboratory Report, 2016) and data are summarized in the following table:

Sample ID	Sample Depth (feet)	Soil Organic Matter	Fraction of Organic Carbon	Specific Gravity	Porosity	Sieve Analysis (USCS Classification)
SB-8	10.2-10.8	4.5%	2.61% (0.0261)	2.60	0.32	Silty, clayey sand with gravel

USCS = Unified Soil Classification System

5.3 Groundwater Investigation

5.3.1 Well Installation and Construction

Groundwater monitoring wells MW-1 through MW-9, MW-10D, MW-10S, and MW-11 through MW-16 were installed at the locations illustrated on **Figure 3** to identify and delineate the extent of DPH impacts in facility groundwater. Construction details are included on the well construction logs in **Appendix C** and are summarized in **Table 2**.

5.3.2 Well Development/Survey

Groundwater monitoring wells were developed and surveyed following installation. Monitoring wells were developed following installation to remove sediments and fines from around the well screens and the well bore by bailing a minimum of five well volumes from each monitoring well if sufficient recharge was available. Monitoring wells were surveyed to determine top-of-casing (TOC) elevations and horizontal positions relative to an on-site benchmark. Survey elevations are provided in **Table 1**. Monitoring well positions were measured from existing facility features.

5.3.3 Groundwater Sampling – Monitoring Wells

Prior to collecting groundwater samples from the monitoring well network, static water level elevations were recorded for each monitoring well using an electronic oil/water interface probe capable of measuring to an accuracy of 0.01 feet. The interface probe is also capable of detecting static elevations of LNAPL to an accuracy of 0.01 feet. Three well volumes were purged from each monitoring well before sampling if sufficient recharge was available.

Groundwater monitoring wells monitoring the shallow overburden aquifer were gauged and/or sampled during seven separate events conducted between October 2015 and August 2016. One groundwater sample from each monitoring well was analyzed for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 8260B during each event. Groundwater data are summarized in **Table 1** relative to current U/NR MSCs. The following COCs were identified at concentrations above current U/NR MSCs at the following shallow overburden groundwater monitoring wells:

- Benzene in MW-1, MW-3, MW-4, and MW-7;
- MTBE in MW-3, MW-5 through MW-8, MW-10S, and MW-11; and
- 1,2,4-trimethylbenzene in MW-3 and MW-7.

Diesel constituents in the remaining shallow overburden aquifer monitoring wells were either not detected or detected at concentrations below current U/NR MSCs. Laboratory analytical reports are provided in **Appendix H** (Groundwater Laboratory Analytical Reports, 2015 and 2016).

Groundwater monitoring wells monitoring the deep overburden aquifer were gauged and/or sampled during four separate events conducted between April 2016 and August 2016. One groundwater sample from each monitoring well was analyzed for the revised (March 2008) PADEP short list of diesel constituents via EPA Method 8260B during each event. Groundwater data are summarized in **Table 1** relative to current U/NR MSCs. The following COCs were identified at concentrations above current U/NR MSCs at the following deep overburden groundwater monitoring wells:

- Benzene in MW-12, MW-13, and MW-16;
- MTBE in MW-10D;
- Naphthalene in MW-16; and
- 1,2,4-trimethylbenzene in MW-16.

Laboratory analytical reports are provided in **Appendix H**.

5.4 Vapor Intrusion Investigation

A vapor intrusion assessment was not initiated as part of site characterization activities completed at the facility to date. However, potential vapor intrusion pathways were evaluated relative to the February 2015 diesel release consistent with PADEP's *Land Recycling Program Technical Guidance Manual-Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard* (January, 2004) which provides additional screening requirements to prevent the occurrence of unacceptable risks resulting from intrusion of vapors from soil and/or groundwater into indoor structures. The guidance identifies chemicals of potential indoor air concern (COPIACs) and determines if additional characterization or remedial actions are required to mitigate vapor impacts to sensitive receptors. Certain constituents typically associated with a release of diesel fuel are identified as COPIACs and may represent a concern even at concentrations below U/NR soil-to-groundwater (S/GW) pathway MSCs. The guidance provides for utilizing the Indoor Air Quality Decision Matrix for Statewide Health Standards flow charts to determine if additional evaluation is necessary. Further evaluation of the decision matrices and vapor exposure pathways is presented in **Section 7.4**.

5.5 Investigation-Derived Waste

Solid waste including soil cuttings and construction debris (i.e., asphalt and/or concrete) generated during drilling activities were containerized in steel 55-gallon, DOT-approved drums and stored in a secure on-site location. The solid waste was transported by McCutcheon Enterprises, Inc. (MEI) of Apollo, Pennsylvania, as non-hazardous waste to MEI's Biosolids Treatment Facility in Apollo, PA for disposal. A total of 26.96 tons of solid waste were transported to MEI for disposal between December 2015 and July 2016 from site characterization activities. Waste disposal manifests are provided in **Appendix I** (Investigation Derived Waste Documentation).

Approximately 750 gallons of decontamination, well development, and purge water from drilling and groundwater sampling activities were containerized in steel 55-gallon, DOT-approved drums and stored in a secure on-site location. The liquid waste was transported by MEI as non-hazardous waste to MEI's Biosolids Treatment Facility for disposal. Waste disposal documentation is provided in **Appendix I**.

Purged groundwater from groundwater monitoring events that was not containerized was treated using granular activated carbon prior to discharge on-site.

6.0 CONCEPTUAL SITE MODEL

Analytical results from soil and groundwater samples collected during site characterization activities indicate petroleum hydrocarbon constituents typically associated with a release of diesel fuel are present at the site at concentrations above current applicable PADEP Act 2 U/R-NR MSCs. The nature and extent of the diesel release and potential migration pathways were evaluated through the comparison of current soil and groundwater analytical data in relation to the geologic and hydrogeologic settings of the facility. The CSM developed from this evaluation is discussed in the following sections.

6.1 Nature and Extent of Release

During a third party inspection on April 14, 2015, ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined. A written NORR was submitted by UPA on April 15, 2015 describing the reportable release. The exact volume and timing of the 2015 diesel release is unknown, and the nature and extent of the release was further evaluated through site characterization activities.

Based on details of the release and evaluation of the existing site data, diesel constituents have migrated through unconsolidated fill material below diesel dispensers #1/2 and 7/8. Further evaluation of current site characterization data indicates diesel constituents continued to migrate vertically into the shallow overburden clay aquifer underlying dispenser islands #1/2 and 7/8. Impacts remained isolated near the dispenser islands and confined within the shallow overburden clay aquifer. A more detailed summary of areas and COCs for facility soil, groundwater, and soil gas are provided in the following sections.

As noted in the 2006 RACR (GSC/Kleinfelder, 2006), APH and DPH impacts remained in facility soil and groundwater at concentrations above current U/R-NR MSCs from historical unleaded gasoline releases in 1996 and 1997. Relief of liability was granted for COCs identified in facility soil and groundwater with approval of the 2006 RACR in June 2006. Due to the presence of these remaining historical impacts, two areas of concern have been identified. APH and DPH impacts related to historical releases are referred to as Area of Concern 1 (AOC 1). APH and DPH impacts related to the 2015 diesel release are referred to as Area of Concern 2 (AOC 2). AOC 1 and AOC 2 are illustrated on **Figure 12** (Area of Concern Location Map). This CSM summarizes the results of current site characterization activities conducted at the site in 2015 and 2016 and is intended to focus on AOC 2. APH and DPH impacts identified during current site characterization activities that are related to historical facility releases based on the location and nature of the impacts will be discussed, as applicable.

6.2 Soil

The lithology of the facility subsurface is composed of unconsolidated fill material consisting of clay with varying amounts of silt, sand, and gravel to a maximum depth of approximately 7 feet bgs. The fill material is underlain predominantly by layers of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel to a maximum observed depth of 41 feet bgs (**Section 2.4.2**). Bedrock was not encountered in the shallow overburden aquifer during drilling activities. Weathered sandstone was encountered in the deep overburden aquifer at approximately 41 feet bgs at groundwater monitoring well MW-10D and at depths ranging from 15 to 19 feet bgs in the deep overburden aquifer near the retention pond (**Figure 3**).

Benzene and 1,2,4-trimethylbenzene were detected in facility subsurface (>2 feet bgs) soil near diesel dispenser islands #1/2 and 7/8 between 2 to 12 feet bgs at concentrations above current U/NR MSCs for

unsaturated soil. Adsorbed phase MTBE was detected in soil boring SB-5 (north of dispenser island #1/2) at 3 to 4 feet bgs above current U/NR MSCs for unsaturated soil; however, the detected MTBE concentration was a reporting limit exceedance. Benzene and 1,2,4-trimethylbenzene were also detected in one soil sample collected at monitoring well MW-16 downgradient of the station building near the retention pond (AOC 1) at 13 to 14 feet bgs at concentrations above current U/NR MSCs for unsaturated soil.

Constituent concentrations observed in facility soil likely reflect both constituents absorbed to the soil particles as well as residual liquid diesel being held within the soil matrix by capillary forces. Accurate assessment of unsaturated (and periodically saturated) and saturated soil intervals is not possible at this point in time due to the limited seasonal groundwater elevation data set for the entire groundwater monitoring well network. Therefore, for the purpose of presentation throughout this report, soil impacts are collectively referred to as adsorbed phase and are compared to current U/NR MSCs for unsaturated soil. The unsaturated, periodically saturated and permanently saturated soil intervals will be further evaluated and established in more detail as additional seasonal groundwater elevation data is collected. Note that samples were only collected for surface soils (0-2 feet bgs) where field screening and observations indicated the potential presence of petroleum hydrocarbon impacts.

Adsorbed phase benzene, MTBE, and 1,2,4-trimethylbenzene were detected at concentrations above current applicable U/NR MSCs for subsurface soil as follows:

Sample ID	Sample Date	Sample Depth (feet)	Benzene (µg/kg)	MTBE (µg/kg)	1,2,4-TMB (µg/kg)
Act 2 U/NR MSC (2-15 ft bgs)(unsaturated)			***500***	***2,000***	***35,000***
MW-1	09/01/2015	3-4	886	-	-
MW-3	08/31/2015	6-7	3,770	-	55,700
MW-3	09/03/2015	8-9	2,260	-	-
MW-3	09/03/2015	10-11	3,150	-	-
MW-4	08/31/2015	7-8	1,750	-	-
MW-4	09/03/2015	10-11	8,180	-	41,600
MW-16	06/21/2016	13-14	511	-	113,000
SB-1	09/02/2015	2-3	4,370	-	-
SB-5	11/24/2015	3-4	<2,420	<2,420	130,000
SB-5	12/01/2015	6-7	2,880	-	-
SB-8	02/17/2016	5-6	<1,770	-	-
SB-10	06/20/2016	7-8	627	-	-
SB-10	06/22/2016	11-12	7,820	-	44,100

U/NR MSC = used aquifer, non-residential medium-specific concentration
µg/kg = micrograms per kilogram
TMB = Trimethylbenzene
- = concentration reported below Act 2 U/NR MSCs
<# = Less than laboratory reporting limit of #

The approximate extent of APH impacts in unsaturated soil is illustrated on the following figures:

- **Figure 13** - Benzene Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs),
- **Figure 14** - MTBE Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs); and
- **Figure 15** - 1,2,4-TMB Soil Isoconcentration Map, August 2015 - June 2016 (2-15 feet bgs).

APH impacts identified are limited to the upper shallow overburden clay layer observed below dispenser islands #1/2 and 7/8 and define the approximate extent of AOC 2 (**Figure 12**). APH impacts related to the 2015 diesel release appear to be limited to facility soil within the shallow overburden aquifer.

Based on the location and extent of the 2015 diesel release and approximate limits of identified APH impacts near dispenser islands #1/2 and 7/8, the APH impacts observed at monitoring well MW-16 are considered to be related to historical releases documented in the 2006 RACR (GSC/Kleinfelder, 2006). The depth to water for monitoring well MW-16 during the July and August 2016 groundwater gauging and sampling events were 12.84 feet bgs and 13.39 feet bgs, respectively (**Table 1**). Based on the depth to water measurements, the APH impacts in soil at monitoring well MW-16 observed at 13 to 14 feet bgs may be permanently saturated. The unsaturated, periodically saturated and permanently saturated soil intervals will be further evaluated and established in more detail as additional seasonal groundwater elevation data is collected.

Adsorbed phase soil impacts are delineated horizontally and vertically in AOC 2. A plan for remediation of soil impacts identified in AOC 2 and demonstration of attainment of a selected standard will be discussed further in a SCRA/RAP. Adsorbed phase soil impacts identified in AOC 1 appear to be isolated near monitoring well MW-16, and no further horizontal or vertical delineation is warranted.

6.3 Groundwater

Constituents of concern in groundwater are defined as regulated substances whose concentrations exceed Act 2 MSCs at and beyond the point of compliance (POC). For groundwater, Act 2 defines the POC as the property boundary that existed at the time of the release. Based on the distribution of groundwater monitoring wells currently being used to monitor the diesel release across the property, groundwater monitoring wells MW-5, MW-9, MW-12, MW-13, MW-14, MW-15, and MW-16 are currently considered POC wells. Based on the current observed groundwater flow (west/northwest/southwest), all POC wells are considered relevant to evaluate groundwater attainment for the site.

Groundwater analytical data from sampling events completed between October 2015 and August 2016 identified diesel constituents in facility groundwater at concentrations above current U/NR MSCs including benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene (**Table 1**). Groundwater isoconcentration maps were generated from data collected in August 2016 to illustrate the current horizontal extent of diesel constituents in facility groundwater. Analytical data from the August 2016 groundwater sampling event indicate that dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene are currently present within the overburden aquifer at concentrations above current U/NR MSCs. The approximate current extent of DPH impacts in facility groundwater is illustrated on the following figures:

- **Figure 16** - Benzene Groundwater Isoconcentration Map, August 15, 2016,
- **Figure 17** - MTBE Groundwater Isoconcentration Map, August 15, 2016,
- **Figure 18** - Naphthalene Groundwater Isoconcentration Map, August 15, 2016; and
- **Figure 19** - 1,2,4-TMB Groundwater Isoconcentration Map, August 15, 2016.

Refer to **Table 1** for a summary of constituents observed in site groundwater to date at concentrations above current U/NR MSCs.

6.3.1 Benzene and 1,2,4-trimethylbenzene

Since groundwater monitoring was initiated in October 2015, dissolved phase benzene and 1,2,4-trimethylbenzene have been observed in facility groundwater at concentrations above current U/NR MSCs. The DPH impacts are located near dispenser islands #1/2 and 7/8 (AOC 2) in the shallow overburden aquifer and near the retention pond (AOC 1) in the deep overburden aquifer. The current extent of dissolved phase benzene in the shallow overburden aquifer is limited to dispenser islands #1/2 and 7/8, and dissolved phase 1,2,4-trimethylbenzene in the shallow overburden aquifer is limited to dispenser island #7/8 as illustrated on **Figure 16** and **Figure 19**, respectively. Since groundwater monitoring was initiated, dissolved phase benzene and 1,2,4-trimethylbenzene have not been detected in monitoring well MW-10D, which is located in the paved portion of the site and monitors the deep overburden aquifer or in groundwater monitoring wells MW-9, MW-10S, MW-11, and MW-15 along the western boundary of the paved area on-site. This indicates dissolved phase benzene and 1,2,4-trimethylbenzene impacts near the dispenser islands in AOC 2 are related to the 2015 diesel release and have not migrated horizontally or vertically from the release area. The dissolved phase benzene and 1,2,4-trimethylbenzene impacts in the deep overburden aquifer near the retention pond in AOC 1 are residual impacts from the historical unleaded gasoline releases in 1996 and 1997. Based on the average depth to water in the deep overburden aquifer downgradient of the parking lot near the retention pond (10 feet bgs), it is not likely that groundwater impacts are migrating into the retention pond.

Relief of liability was granted for dissolved phase benzene impacts remaining in facility groundwater as described in the 2006 RACR (GSC/Kleinfelder, 2006). During site characterization activities for historical unleaded gasoline releases at the facility, groundwater samples were analyzed for the pre-March 2008 short list of unleaded gasoline constituents. Relief of liability was not granted for 1,2,4-trimethylbenzene since this constituent was not analyzed as part of the pre-March 2008 unleaded gasoline short list. However, 1,2,4-trimethylbezene was likely present along with the other unleaded gasoline constituents, and the 1,2,4-trimethylbenzene impacts identified in AOC 1 are most likely attributed to the historical releases documented in the 2006 RACR.

The shallow overburden aquifer terminates west of the paved portion of the site due to the 35 foot vertical change in topography (**Section 2.2**). The shallow overburden aquifer may appear as seeps or springs in the hillside. Seeps in the hillside were historically observed and documented in the GSC/Kleinfelder May 2004 SCR (GSC/Kleinfelder, 2004). Springs and seeps from the shallow overburden aquifer were not assessed along the hillside during site characterization activities. Dissolved phase benzene and 1,2,4-trimethylbenzene impacts related to the 2015 diesel release are fully delineated and appear to be confined horizontally to the shallow overburden aquifer near the dispenser islands; therefore, evaluation of hillside seeps is not warranted at this time.

Dissolved phase benzene and 1,2,4-trimethylbenzene in the deep overburden aquifer are not fully delineated. Although these impacts in the deep overburden aquifer are related to the documented historical releases, POC wells located in the deep overburden aquifer will continue to be monitored, and additional groundwater monitoring well installation is proposed downgradient of the current POC wells in order to further delineate potential remaining historical impacts to the west. Additional site characterization and delineation activities and a remedial action plan will be summarized in a SCRA/RAP. Upon installation of additional groundwater monitoring wells to the west of the retention pond, the current POC well network will be re-evaluated.

6.3.2 MTBE and Naphthalene

Dissolved phase MTBE was identified within AOC 1 in the shallow overburden aquifer in the western portion of the paved area of the facility parking lot, downgradient and sidegradient of the dispenser islands, at concentrations above current U/NR MSCs. In the deep overburden aquifer within AOC 1, dissolved phase MTBE was identified in monitoring well MW-10D at concentrations above current U/NR MSCs. Between October 2015 and April 2016, dissolved phase MTBE concentrations above current U/NR MSCs were also identified (**Table 1**) in the shallow overburden aquifer in groundwater monitoring wells MW-3 and MW-5 near dispenser island #7/8. MTBE was not being used as a fuel additive at the facility at the time of the 2015 release. Furthermore, based on the extent of dissolved phase MTBE as illustrated on **Figure 17** and similar concentrations and locations of residual dissolved phase MTBE observed and presented in the 2006 RACR (GSC/Kleinfelder, 2006), the MTBE impacts are related to the historical unleaded gasoline releases in 1996 and 1997.

Dissolved phase naphthalene was identified in AOC 1 in one groundwater monitoring well (MW-16) in the deep overburden aquifer, east of the retention pond, at concentrations above current U/NR MSCs in groundwater. Dissolved phase naphthalene was not detected at concentrations above current U/NR MSCs in AOC 2 since groundwater monitoring was initiated at the facility in October 2015 (**Table 1**). The dissolved phase naphthalene impacts identified are within AOC 1 and are related to the historical unleaded gasoline releases in 1996 and 1997.

Dissolved phase MTBE impacts in the shallow and deep overburden aquifer are fully delineated. Dissolved phase naphthalene impacts are not currently delineated to the west in the deep overburden aquifer. Following the approval of the 2006 RACR (GSC/Kleinfelder, 2006), relief of liability was granted for facility groundwater for dissolved phase MTBE and naphthalene. Although the dissolved phase MTBE and naphthalene impacts are within AOC 1 and related to historical releases, installation of additional groundwater monitoring wells is proposed downgradient of the current POC wells as mentioned in **Section 6.3.1**. Further details summarizing planned monitoring well installation activities will be discussed in **Section 10.0**.

6.4 Soil Gas

Currently, no soil gas monitoring points are installed at the facility. A vapor intrusion assessment is planned to be completed and is discussed further in **Section 10.0**.

6.5 Fate and Transport Assessment

6.5.1 Shallow Overburden Aquifer

As described above, DPH impacts related to the 2015 diesel release are confined to the shallow overburden aquifer in the area of the dispenser islands. Groundwater monitoring wells located downgradient to the west are not currently impacted with DPH constituents associated with the current release suggesting that the current release has not migrated from the source area. DPH constituents currently identified in AOC 1 within the shallow overburden aquifer (i.e., MTBE) remain at similar concentrations and plume extents historically observed and summarized in the 2006 RACR (GSC/Kleinfelder, 2006), indicating these impacts are stable and have not migrated since they were last evaluated.

No additional quantitative fate and transport modeling is warranted at this time for the shallow overburden aquifer. Further fate and transport evaluation for all COCs will be re-evaluated and

completed, as necessary, upon completion of additional groundwater monitoring well installation and any remedial action activities.

6.5.2 Deep Overburden Aquifer

The DPH impacts identified in the deep overburden aquifer are related to documented historical releases at the facility (**Section 6.3**). Dissolved phase benzene and MTBE were previously modeled using the PADEP-approved Quick Domenico (QD) groundwater modeling program and summarized in the 2006 RACR (GSC/Kleinfelder, 2006). According to the model outputs, dissolved phase benzene will not migrate to the POC at concentrations above U/NR MSCs, and dissolved phase MTBE will not migrate to the POC in the future (GSC/Kleinfelder, 2006). Since DPH impacts identified during site characterization activities completed in 2015 and 2016 in the deep overburden aquifer are related to documented historical facility releases and further evaluation of potential downgradient impacts is planned via additional POC well installation, no additional quantitative fate and transport analysis is warranted at this time for the deep overburden aquifer.

7.0 POTENTIAL EXPOSURE PATHWAYS AND SENSITIVE RECEPTORS

An initial qualitative analysis of potential current and future exposure pathways and sensitive receptors was completed consistent with the procedures contained in the *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM, 2002). The following potential exposure pathways were evaluated:

- ingestion of surface soils, inhalation of outdoor vapors and particulates from surface soils, and dermal absorption from surface soils in contact with skin;
- ingestion and dermal absorption in subsurface soils;
- groundwater ingestion;
- inhalation of vapors generated from existing subsurface soil impacts;
- inhalation of vapors generated from existing groundwater impacts; and
- ingestion, dermal absorption and inhalation relating to potential surface water impacts.

The following potential non-residential receptors were evaluated:

- facility employees,
- facility visitors,
- trespassers, and
- construction/utility workers.

7.1 Soil Exposure Pathways

The ingestion of surface soils, inhalation of outdoor vapors and particulates from surface soils, and dermal absorption from surface soils in contact with skin were evaluated. Field readings and soil samples collected during site characterization activities suggest no petroleum hydrocarbon impacts are present within surface soils (0 to 2 feet bgs) at the facility. Therefore, ingestion, inhalation and dermal absorption of petroleum hydrocarbon impacts from surface soils are not considered potential exposure pathways.

Ingestion of and dermal contact with petroleum hydrocarbons in subsurface soils were evaluated for potential non-residential receptors. Site characterization data identified benzene, MTBE, and 1,2,4-trimethylbenzene in subsurface soils between 2 and 14 feet bgs at concentrations above current U/NR MSCs (**Table 3**). The non-residential direct contact MSCs for benzene (330,000 µg/kg), MTBE (9,900,000 µg/kg), and 1,2,4-trimethylbenzene (640,000 µg/kg) were not exceeded for subsurface (2 to 15 feet bgs) soil; therefore, no complete direct contact pathways exist for potential non-residential receptors. Potential exposure to indoor and outdoor vapors associated with subsurface petroleum impacts in soil is discussed further in **Section 7.3**.

Although no complete direct contact exposure pathways are identified for soil impacts, further mitigation will be required for attainment of applicable SHS U/NR MSCs.

7.2 Groundwater Exposure Pathways

Dissolved phase benzene, MTBE, and 1,2,4-trimethylbenzene impacts were identified in groundwater in the shallow overburden aquifer at concentrations above current U/NR MSCs. Dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene were identified in the deep overburden aquifer at concentrations above current U/NR MSCs. Groundwater in the shallow overburden aquifer ranges in depth from 5.42 feet bgs (MW-4, December 2015) to 28.68 feet bgs (MW-9, May 2016). Groundwater in

the deep overburden aquifer ranges from 7.74 feet bgs (MW-13, April 2016) to 44.31 feet bgs (MW-10D, August 2016). Based on the minimum depth to water in the shallow and deep overburden aquifers, direct contact with groundwater during intrusive activities is a potential complete exposure pathway. Further evaluation of this potential exposure pathway will be completed following proposed additional site characterization activities.

The PaGWIS database identified one domestic well and four industrial withdrawal wells within a ½-mile radius of the facility (**Section 2.3.1**). The domestic well is located approximately 0.15 miles northeast of the facility in an upgradient direction (relative to the inferred western direction of regional groundwater flow). The PADEP eMap database identified one additional domestic, two public supply, and five industrial withdrawal wells within a ½-mile radius of the facility (**Section 2.3.1**). The domestic well is located approximately 0.36 miles northeast of the facility in an upgradient direction. The public supply withdrawal wells are located approximately 0.18 miles east/southeast and 0.27 miles north/northwest of the facility in upgradient and sidegradient directions, respectively. Potable water is supplied to the facility and surrounding area by the Barkeyville Borough which obtains its raw water from withdrawal wells located approximately 0.63 miles south/southwest of the facility. An ordinance exists requiring all property owners in the borough to connect to the public water supply (**Appendix B**). Based on this assessment, groundwater ingestion is not considered a current or future exposure pathway of concern.

7.3 Surface Water Exposure Pathways

Diesel constituents have been observed in facility groundwater near the station building and downgradient of the facility near the retention pond at concentrations above current U/NR MSCs. The nearest downgradient surface body of water is an unnamed pond located approximately 400 feet northwest of the facility, beyond Stevenson Road and north of the on-site retention pond. The approximate groundwater flow direction near the northern property boundary of the facility and on-site retention pond is to the northwest. Diesel constituents were not identified at concentrations above current U/NR MSCs at POC wells MW-9 and MW-12 during the most recent groundwater sampling event in August 2016. The North Branch of Slippery Rock Creek is located approximately 0.25 miles west of the facility, and another unnamed pond is also located near the North Branch Slippery Rock Creek. Although the North Branch Slippery Rock Creek is in the downgradient direction of groundwater flow, the current CSM and results of previous QD modeling presented in **Section 6.5.2** indicate that the migration and discharge of impacted groundwater to surface water is not likely.

Although DPH impacts were not observed at concentrations above current U/NR MSCs in POC well MW-12 located north of the retention pond, dissolved phase benzene impacts were identified in monitoring well MW-12 at concentrations above current U/NR MSCs during the May and July 2016 groundwater sampling events. Based on the presence of dissolved phase benzene in POC well MW-12 during the May and July 2016 groundwater sampling events and the approximate direction of groundwater flow to the northwest in this area of the deep overburden aquifer, there is a potential for off-site migration and discharge of impacted groundwater to the unnamed pond northwest of the facility beyond Stevenson Road. Further evaluation of this potential pathway of concern is proposed, as needed, based on continued groundwater monitoring and sampling activities. Results of additional groundwater sampling activities and continued evaluation of groundwater flow direction will be included in a SCRA/RAP submitted to PADEP.

7.4 Vapor Exposure Pathways

7.4.1 Soil Vapor Inhalation

Soil vapor samples were not collected during site characterization activities at the facility. The inhalation of soil vapors potentially generated from existing adsorbed phase soil impacts at the facility was evaluated by comparing the analytical data from soil samples collected during site characterization activities to the PA Default R-NR Screening Values for volatilization to indoor air in Table 4 and Table 5 in Section IV.A.4 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004). According to Table 10 in Section IV.A.4 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004), benzene, toluene, and ethylbenzene are considered COPIACs under a residential setting. Ethylbenzene is considered a COPIAC under a non-residential setting. The following table summarizes the comparison of the highest detected concentrations of COCs in soil to indoor air screening values.

Constituent	Maximum On-site Soil Concentration (µg/kg)	Residential J&E Default Indoor Air Screening Value (µg/kg)	Non-Residential J&E Default Indoor Air Screening Value (µg/kg)
Benzene	8,180 (MW-4)	370	630
Toluene	76,000 (SB-5)	76,000	110,000
Ethylbenzene	38,700 (SB-5)	5,700	9,500
MTBE	<2,420 (SB-5)	51,000	86,000
Isopropylbenzene	5,350 (SB-5)	360,000+	360,000+
Naphthalene	21,700 (MW-3)	64,000	Not of Concern
1,2,4-Trimethylbenzene	130,000 (SB-5)	20,000	29,000
1,3,5-Trimethylbenzene	46,900 (SB-5)	4,600	6,400

Bold constituents indicate residential COPIACs
Bold & Italicized constituents indicate residential and non-residential COPIACs
µg/kg = microgram per kilogram
<# = reporting limit exceedance

Current maximum benzene, ethylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene concentrations in soil exceed respective J&E default screening values for residential and non-residential settings. Based on the assessment above, migration of vapors from APH impacts to potential receptors is a potentially complete exposure pathway. Vapor intrusion will be further evaluated and soil gas data will be presented in a SCRA/RAP. Planned vapor intrusion assessment activities will be discussed further in **Section 9.0**.

7.4.2 Groundwater Vapor Inhalation

The inhalation of soil vapors potentially generated from existing dissolved phase groundwater impacts at the facility was evaluated. According to the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004), ethylbenzene and naphthalene are residential COPIACs in groundwater. Ethylbenzene is also a non-residential COPIAC in groundwater. Since groundwater sampling was initiated in October 2015, benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene have been identified in groundwater at concentrations exceeding U/NR MSCs. Maximum on-site groundwater concentrations observed since October 2015 are compared to the default screening values for volatilization to indoor air from Table 1 and Table 2 of the PA *Land Recycling Program Technical Guidance Manual* (PADEP, 2004) for the following constituents:

Constituent	Maximum On-site Groundwater Concentration (µg/L)	Residential J&E Default Indoor Air Screening Value (µg/L)	Non-Residential J&E Default Indoor Air Screening Value (µg/L)	U/NR MSC (µg/L)
Benzene	371 (MW-1)	3,500	5,900	5
Toluene	218 (MW-16)	490,000	Not of Concern	1,000
Ethylbenzene	456 (MW-16)	27,000	45,000	700
MTBE	1,850 (MW-6)	380,000	640,000	20
Isopropylbenzene	51.8 (MW-16)	Not of Concern	Not of Concern	3,500
Naphthalene	165 (MW-16)	25,000	Not of Concern	100
1,2,4-Trimethylbenzene	1,740 (MW-16)	8,600	12,000	62
1,3,5-Trimethylbenzene	646 (MW-16)	7,200	10,000	1,200

Bold constituents indicate residential COPIACs
Bold & Italicized constituents indicate residential and non-residential COPIACs
U/NR MSC = used aquifer, non-residential medium-specific concentration
µg/L = micrograms per Liter

No maximum dissolved phase concentrations in facility groundwater exceed respective J&E default screening values for residential and non-residential settings; therefore, ongoing migration of soil vapor generated from existing dissolved phase groundwater impacts is not a concern with respect to potential future groundwater vapor inhalation exposure pathways. However, based on DPH impacts identified within AOC 2, groundwater mitigation is required and further vapor intrusion assessment will be completed to confirm potential groundwater vapor inhalation pathways are not a concern.

8.0 SELECTION OF CLEANUP STANDARDS AND RATIONALE

Cleanup standards are established by PADEP in the Land Recycling Act (Act 2) which is codified in 25 PA Code Chapter § 250 (PADEP, 2011). The Act 2 regulations establish the following three potential standards for remediating a site from which an owner/operator can select one or a combination of standards to successfully remediate a site and obtain liability relief.

The three cleanup standards are identified as the:

- Background Standard,
- Statewide Health Standard; and
- Site-Specific Standard.

Each standard is associated with a unique set of compliance criteria that establish acceptable procedures for determining the concentrations of regulated substances allowed in various media, identify points of compliance, define attainment criteria, and specify reporting and public involvement requirements. There is no current evidence that the site is being impacted by an off-site source; therefore, the Background Standard will be eliminated from further consideration at this time. The remaining standards to be considered are the SHS and the SSS.

8.1 Statewide Health Standard

8.1.1 Soil MSCs

The SHS for soils are intended to protect: (1) direct contact with the regulated substances in soils; and, (2) groundwater in the underlying aquifer. In order to accomplish this goal, Act 2 establishes two sets of MSCs for soils. The first group of MSCs for soils is the direct contact (DC) numeric values. In this set of values, the PADEP formalized MSCs for two potential risk-based scenarios: residential and non-residential direct contact. For the residential scenario, only one direct contact MSC is specified which is applicable to the soil column from the surface to a depth of 15 feet bgs. For the non-residential scenario, two MSCs are established: a direct contact MSC for surface soils (0 to 2 feet bgs); and a direct contact MSC for subsurface soils (2 to 15 feet bgs). The site is currently non-residential and the property will remain non-residential; therefore, the NR-DC soil MSCs are applicable to the site. However, to remain conservative and protective of potential residential receptors, the R-DC soil MSCs can also be utilized.

To protect groundwater in the underlying aquifer, Act 2 specifies a S/GW pathway numeric value. This value is the concentration of a regulated substance that may remain in soil without adversely affecting groundwater quality. S/GW pathway numeric values are based upon a determination of an aquifer's current and projected use. Aquifers that are currently used (U) are further subdivided based upon the current and future land use and the concentration of total dissolved solids (TDS) in the groundwater. Non-use (NU) aquifers are also subdivided by current and future land use.

There are five options for selecting the appropriate S/GW pathway numeric value:

- one hundred times the appropriate groundwater MSC expressed as milligrams per kilogram (mg/kg) of soil (published value),
- a generic published value determined not to produce a concentration in groundwater in excess of the appropriate MSC as calculated using equilibrium partitioning methods (the generic value is replaced by $1/10^{th}$ of the published value for soils collected in the saturated zone),

- using the Synthetic Precipitation Leaching Procedure (SPLP) to calculate a concentration in soil that does not produce a concentration in groundwater at the site in excess of the MSC for groundwater,
- document the presence of a S/GW buffer zone as specified in 25 PA Code § 250.308(c); or
- meet the requirements for a S/GW equivalency demonstration as specified in 25 PA Code § 250.308(d).

The S/GW buffer option cannot be selected here since there is no buffer distances specified for several constituents including benzene. The S/GW equivalency demonstration not is applicable to this site since it requires that site groundwater be below respective MSCs or the background standard prior to remediation. Also, soil samples were not analyzed by SPLP, eliminating the third option from current consideration. The S/GW pathway numeric value, therefore, was selected as the higher of 100 times the groundwater MSC or the generic value.

In order to evaluate site soil relative to the SHS MSCs contained in Act 2, 25 PA Code § 250.305 states that the MSCs for regulated substances contained in surface or subsurface soils at a depth of 0 to 15 feet bgs is the lowest of the following:

- The direct contact MSC; or
- The S/GW pathway numeric value.

Alternatively, the direct contact MSC may be selected as the appropriate MSC provided either the S/GW buffer zone or the S/GW equivalency demonstration could be applied. Since neither of these was applicable, the appropriate unsaturated soil MSC is the lowest of the direct contact value or the S/GW pathway numeric value. In accordance with 25 PA Code § 250.308(a)(2)(ii), the applicable MSC is 1/10th the generic value for soil in the zone of periodic and/or permanent groundwater saturation.

Adsorbed phase benzene, MTBE, and 1,2,4-trimethylbenzene have been identified in facility soil at concentrations above current applicable U/NR MSCs. Therefore, soil is a medium of concern. Further evaluation of the zone of permanent and periodic saturation via collection of seasonal groundwater elevation data is required. Using the SHS, soil attainment will be pursued relative to the MSCs summarized below for site COCs.

Constituent of Concern	**Soil U/NR MSC (µg/kg) (unsaturated)**	**Soil U/NR MSC (µg/kg) (saturated)**	**Soil U/NR MSC (µg/kg) (unsaturated)**
	0-2 feet bgs	***2-15 feet bgs***	
Benzene	500	13	500
Toluene	100,000	4,400	100,000
Ethylbenzene	70,000	4,600	70,000
Methyl tert-butyl ether	2,000	28	2,000
Isopropylbenzene	2,500,000	250,000	2,500,000
Naphthalene	25,000	2,500	25,000
1,2,4-Trimethylbenzene	35,000	3,500	35,000
1,3,5-Trimethylbenzene	210,000	21,000	210,000

U/NR MSC = used aquifer, non-residential medium-specific concentrations
µg/kg = micrograms per kilogram

8.1.2 Groundwater MSCs

The SHS MSCs have been established for groundwater under Act 2 for U or NU aquifers. In this set of values, PADEP formalized MSCs for both R and NR scenarios. The U aquifer MSCs are further divided into two categories based upon TDS within the aquifer. A NU aquifer determination may be applied if NU aquifer determination requirements are met and approved by PADEP.

Dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene have been identified in facility groundwater at concentrations above U/NR MSCs. Therefore, groundwater is a medium of concern. At this time, there is an ordinance which requires property owners to connect to the municipal water supply. Based on site conditions, the U aquifer (<2,500 TDS), NR MSC was selected as the appropriate SHS criterion for the facility. Using the SHS, groundwater attainment will be pursued relative to the MSCs summarized below for site COCs.

Constituent of Concern	Groundwater U/NR MSC (µg/L)
Benzene	5
Toluene	1,000
Ethylbenzene	700
Methyl tert-butyl ether	20
Isopropylbenzene	3,500
Naphthalene	100
1,2,4-Trimethylbenzene	62
1,3,5-Trimethylbenzene	1,200

U/NR MSC = used aquifer, non-residential medium-specific concentrations
µg/L = micrograms per Liter

8.2 Site-Specific Standard

Remediating to the SSS requires a more detailed evaluation of potential receptors and exposure pathways. If complete exposure pathways exist after considering engineering and institutional controls, then a risk assessment and an ecological assessment would be needed to quantify environmental impacts to sensitive receptors and to develop site-specific cleanup levels that are protective of human health and the environment. Based on data acquired during site characterization activities collected to date, a site-specific standard does not appear appropriate at this site at this time. An evaluation of the SSS will be completed in the future, if necessary.

8.3 Standard Selection

Based on the preceding discussion and the current knowledge of the site, the following options are available in selecting appropriate cleanup standards for the site:

- *Statewide Health Standards, Used Aquifer*: Attaining SHS MSCs will require:
  - Mitigating facility soil to meet applicable saturated/unsaturated U/NR MSCs for benzene, MTBE, and1,2,4-trimethylbenzene.
  - Additional groundwater monitoring well installation for attainment of horizontal delineation of DPH impacts in facility groundwater.
  - Mitigation of groundwater impacts to meet applicable U/NR MSCs for benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene.
  - Completing a vapor intrusion assessment.

- *Site-Specific Standard*:
  - Remediating to the SSS will require evaluation of potential receptors and exposure pathways. If a complete exposure pathway exists even after engineering and institutional controls are considered, then a formal risk assessment would need to be completed and site-specific cleanup levels determined.

Due to the current and future land use of the property and the proximity of potential sensitive receptors (e.g., station building, utility trenches, surface water, etc.), the selected approach to obtaining Act 2 liability relief for facility soil and groundwater is the statewide health standard for a used aquifer, non-residential scenario. Historical impacts will be considered throughout the corrective action process for the 2015 diesel release as they relate to SHS attainment demonstrations. Therefore, historical impacts are included in the remedial options evaluation.

9.0 REMEDIAL OPTIONS EVALUATION

Remedial technologies considered as potentially viable in addressing current petroleum hydrocarbon impacts in facility soil and groundwater are discussed in the following sections:

9.1 Soil

Following removal of the ponded product observed in diesel dispensers #1/2 and 7/8, any continuing source of diesel impacts to site soil should have been removed. Based on site characterization findings, current impacts in facility soil include benzene, MTBE, and 1,2,4-trimethylbenzene in the vicinity of soil sample locations MW-1, MW-3, MW-4, SB-1, SB-5, SB-8, and SB-10 ranging in depth from 2 to 14 feet bgs. The following alternatives are considered for remediation of these soil impacts:

- *No Action:* Eighty-one soil samples were analyzed for diesel constituents during various characterization activities conducted from August 2015 to June 2016. Exceedances of potentially applicable soil MSCs were identified at locations MW-1, MW-3, MW-4, MW-16, SB-1, SB-5, SB-8, and SB-10 at depths ranging from 2 to 14 feet bgs. Based on these results, active remediation appears necessary.

- *Soil Excavation (Ex Situ Treatment)*: This option requires the excavation and removal of impacted soil for off-site treatment/disposal. Excavation can be effective to complete APH source removal in a relatively short time frame. Due to the location of the impacts related to the release (between 2 to 14 feet bgs) being mostly beneath the dispenser area, an in-situ remediation option will be considered for soil impacts.

- *Soil Vapor Extraction (SVE):* SVE is an in-situ remedial technology that is effective in removing volatile constituents from the vadose or unsaturated zone. SVE utilizes a blower (regenerative, positive displacement, or liquid ring pump) to extract soil vapors from the pore space of the soil matrix. The effectiveness of an SVE system is determined by two major factors: permeability of the soil and volatility of the constituent to be extracted. Permeability of the soil determines the rate at which soil vapors can be removed. Soils that tend to be fine-grained (i.e., clays and silts) are less likely to allow sufficient vapor flow than coarse-grained soils (i.e., sands and gravels). The composition of the impacted soil is unconsolidated fill material underlain by varying amounts of clay, silty clay, sandy clay, gravelly clay, clayey sand and sandy gravel.

The volatility of the constituent to be removed determines the rate or degree at which the constituent will vaporize from the adsorbed phase to the vapor phase. Vapor pressure is a key factor to determining the volatility of a constituent. In general, vapor pressures greater than 0.5 millimeters of mercury (mm Hg) are generally considered amenable for soil vapor extraction. The vapor pressure for diesel range organic compounds varies from 75 mm Hg for benzene to 7.1 mm Hg for ethylbenzene. Because the impacts are diesel-range organic compounds, SVE could be effective at achieving VPH and APH mass reduction in on-site unsaturated soil; however, SVE alone would not address saturated APH impacts or DPH impacts. Remedial feasibility testing is required to determine the applicability to this site.

- *Natural Attenuation:* Natural attenuation relies upon natural subsurface processes to reduce constituent concentrations to below current Act 2 MSCs. This option typically requires long-term sampling and data evaluation to establish constituent reduction and degradation by-product trends.

Natural attenuation is eliminated from current consideration due to the elevated APH impacts and potential on-/off-site and downgradient receptors.

9.2 Groundwater

DPH impacts identified to date in facility groundwater include benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene at concentrations above U/NR MSCs at groundwater monitoring wells MW-1, MW-3, MW-6, MW-7, MW-8, MW-10S, MW-10D, MW-11, MW-12, MW-13, and MW-16. The DPH plume related to the 2015 diesel release appears to be limited to the area sidegradient and downgradient of dispensers #1/2 and 7/8. The following alternatives are considered for remediation of these impacts:

- *Groundwater Extraction:* Groundwater extraction is a practical remedial technology to gain hydraulic control and to retard downgradient migration of DPH. However, groundwater pump-and-treat remediation technology may lead to many years of system operation and maintenance before MSCs are attained. In addition pump-and-treat remediation would not address the observed APH impacts. Groundwater extraction may be enhanced through the application of a vacuum to the wellheads. Remedial feasibility testing will be required to evaluate groundwater extraction rates and estimate the effective hydraulic radius of influence..

- *Dual Phase Extraction:* Dual phase extraction or vacuum enhanced groundwater extraction (VEGE) combines both SVE and pump-and-treat remedial technologies. The application of a vacuum to an extraction well creates pressure gradients that enhance total fluid flow towards the extraction well. Conventional dual-phase/VEGE extraction systems use a submersible pump to extract liquids from the well and a surface blower to extract vapors. A dual-phase/VEGE remedial system removes vapor and groundwater independently using one of several methodologies.

The first option involves the use of low vacuums (<50 inches of water column [in w.c.]) and submersible pumps (pneumatic or electric). Low vacuum dual-phase/VEGE systems are most effective in high yielding, high transmissivity formations. The second dual-phase/VEGE option involves the use of mid-range vacuums (50–100 in w.c.) and submersible pumps. Mid-range vacuum dual-phase/VEGE systems are most effective in medium yielding, medium transmissivity formations. The third type of dual-phase/VEGE system involves the use of a high vacuum (>100 in w.c.) positive displacement (PD) blower and submersible pumps. PD blowers are capable of vacuum levels approaching 18 inches of mercury (in. Hg).

Dual phase extraction may be a viable option to remediate DPH impacts in facility groundwater; however, further remedial feasibility testing will be required to determine the applicability to this site.

- *Total Phase Extraction (TPE):* TPE typically utilizes a single blower to extract groundwater and soil vapor simultaneously through the same extraction pipe. Liquid ring pumps (LRPs) and PD blowers are capable of high vacuum levels (approaching 30 in. Hg for LRPs, and 18 in. Hg for PD blowers) and are most effective in low yield (<1.0 gallon per minute [gpm]/well) formations. A TPE system utilizes a drop tube inside the well to extract total fluids. A pitless adapter attached to the extraction well connects the drop tube to a piping network. During conveyance of the extracted fluids through the piping network, turbulence causes dissolved phase VOCs to partition to the vapor-phase. The total fluids enter the equipment compound and are separated inside a vapor/liquid separator.

A typical TPE system is designed to handle groundwater recovery rates less than one gpm per extraction well and vapor flow rates less than 20 standard cubic feet per minute (scfm) per extraction well. Dual

phase/VEGE systems which utilize submersible pumps and surface blowers are more appropriately designed to handle groundwater recovery rates greater than one gpm per well.

TPE may be a viable option to remediate APH and DPH impacts in facility soil and groundwater; however, further remedial feasibility testing will be required to determine the applicability to this site.

- *Air Sparge/Soil Vapor Extraction (AS/SVE):* Air sparging involves the delivery of air into the saturated zone to volatilize DPH and APH constituents. Typically, the volatilized constituents are removed from the vadose zone by an SVE system. The effectiveness of air sparging primarily depends on two key factors, vapor/dissolved phase partitioning and permeability of the soil.

AS/SVE may be effective at remediation APH and DPH impacts at this facility; however, due to the varying clay lithology at the site, short circuiting (i.e., preferential pathway) to more permeable layers may occur. As a result, this remedial technology is not considered a viable remedial option at this time. A more passive form of remediation (low flow oxygen injection) may be considered as a polishing step following active remediation.

- *Oxidation:* Oxidants, such as ozone, peroxides and oxygen may be added to the groundwater to promote both biological activity and chemical oxidation. The oxidation process breaks the chemical bonds of organic compounds and renders innocuous by-products, depending on the strength of the oxidant. Introduction of oxidants into facility groundwater may be a viable option to remediate DPH in the overburden aquifer; however, oxidation is not selected as a remedial strategy at this time. Due to the proximity to subsurface features (i.e., UST field, product piping, etc.), oxidation is eliminated as a potential polishing technology.

- *In-Situ Bioremediation:* Bioremediation involves the introduction of nutrients, such as nitrogen and phosphorus, and oxygen to the groundwater to enhance microbial growth. Remedial feasibility testing will be required to determine if subsurface conditions are favorable for injection; however, bioremediation is not being considered at this time. Bioremediation may be re-evaluated following active remediation via the VEGE system, as a polishing technology.

- *Monitored Natural Attenuation (MNA):* Natural attenuation relies upon natural subsurface microbiological and chemical processes to reduce constituent concentrations to below MSCs. This option typically requires long-term sampling and data evaluation to establish constituent reduction and degradation by-product trends. Benzene is currently one of the primary COCs in site groundwater and is widely considered to be susceptible to natural bio-chemical degradation in subsurface environments. Based on the susceptibility of benzene to natural attenuation processes MNA appears to be a potentially viable remedial alternative for site groundwater following reduction of DPH concentrations by a more aggressive/active remedial approach and will be re-evaluated following active remediation.

10.0 PLANNED ACTIVITIES

In order to validate the current CSM and fill potential data gaps, the following activities will be completed:

- Install two additional deep overburden aquifer groundwater monitoring wells west of the retention pond to horizontally delineate DPH impacts identified in AOC 1.
- Install two additional deep overburden aquifer groundwater monitoring wells in the paved area of the site to verify DPH impacts identified in AOC 2 related to the April 2015 diesel release are confined to the shallow overburden aquifer near the dispenser islands.
- Re-install and re-construct groundwater monitoring well MW-10D to confirm that the well is monitoring the deep overburden aquifer water-bearing zone and not the bedrock aquifer.
- Perform a vapor intrusion assessment to further identify if migration of soil gas via preferential pathways is a potentially complete exposure pathway to potential receptors identified at the facility. Three to four soil gas monitoring points will be installed at the following locations:
  - near dispenser islands #1/2 and 7/8 (source areas),
  - along preferential pathways between the source areas and the diesel station building, and
  - along preferential pathways between the source areas and the motel building.
- Verify the depth and elevation of the retention pond to confirm that DPH impacts in the deep overburden aquifer are not impacting the retention pond.
- Preparation and submittal of an SCRA/RAP including results of additional site characterization activities and further evaluation/selection of options for remediation of APH and DPH impacts identified at the facility.

10.1 Schedule

Results of planned activities and further evaluation of APH and DPH impacts related to the April 2015 diesel release will be summarized in an SCRA/RAP. Installation of additional groundwater monitoring wells and soil gas points, and gauging the retention pond are anticipated to be completed in October 2016. Two additional rounds of groundwater sampling and soil gas sampling will be completed following the installation of proposed additional monitoring locations which are illustrated on **Figure 20** (Proposed Monitoring Location Map). The SCRA/RAP is currently due in November 2016; however, to allow for completion of proposed additional site characterization activities, an extension request for submittal of the SCRA/RAP may be required.

11.0 SUMMARY

United Refining Company currently operates a retail diesel station at 5574 State Route 8 in Barkeyville, Pennsylvania. A NORR was submitted for the facility in April 2015 and petroleum impacts were identified in soil and groundwater during site characterization activities completed in August and September 2015. Additional site characterization activities were performed from November 2015 through June 2016 in order to further evaluate the nature and extent of the release. The following summarizes key findings discussed in this SCR.

- A NORR was submitted by UPA on April 15, 2015 after ponded product/stained backfill was observed in diesel dispensers #1/2 and 7/8. No active leak was observed at the time of the inspection, and the source of the product was undetermined.
- Subsurface soil is composed of unconsolidated fill material consisting of clay with varying amounts of silt, sand, and gravel (weathered sandstone) underlain predominantly by clay with lenses of sand and gravel with varying amounts of clay and silt.
- Soil samples collected from soil borings SB-1, SB-5, SB-8, SB-10 and groundwater monitoring wells MW-1, MW-3, MW-4 and MW-16 identified diesel constituents in subsurface soil at concentrations above current U/NR MSCs from approximately 2 to 14 feet bgs.
- Observations during site characterization activities identified an overburden aquifer with two water-bearing zones (shallow and deep). Approximately 200 feet west of the diesel station building and 10 feet west of the asphalt-grass boundary along the western portion of the facility, the site topography decreases sharply, separating the upper portion of the site where the 2015 release occurred from the lower portion of the site near the retention pond by approximately 35 feet in elevation. The shallow overburden aquifer was observed below the upper paved portion of the site, upgradient of the retention pond at a maximum depth of 27.35 feet bgs. The deep overburden aquifer was observed at a minimum depth of approximately 39.38 feet bgs below the upper paved portion of the site and at a minimum depth of approximately 8.79 feet bgs downgradient of the paved portion of the facility near the retention pond.
- Groundwater gauging during site characterization activities identified consistent radial flow with primary flow components to the west/southwest and northwest for the shallow overburden aquifer and to the northwest for the deep overburden aquifer. During the most recent gauging event conducted in August 2016, groundwater depths in the shallow overburden aquifer ranged from 7.31 feet bgs (MW-5) to 27.35 feet bgs (MW-9) with an average depth of 14.82 feet bgs. Groundwater depths in the deep overburden aquifer ranged from 39.38 feet bgs (MW-10D) to 44.31 feet bgs (MW-10D) with an average depth of 41.72 feet bgs in the upper paved portion of the facility and from 8.79 feet bgs (MW-13) to 13.39 feet bgs (MW-16) with an average of 11.04 feet bgs downgradient near the retention pond.
- Groundwater samples collected from groundwater monitoring wells MW-1, MW-3, MW-6, MW-8, MW-10S, and MW-11 monitoring the shallow overburden aquifer confirmed the presence of diesel constituents in facility groundwater from dispenser island #1/2 to the western edge of the paved area at the facility west of the diesel station building. Based on the August 2016 sampling data, dissolved phase benzene, MTBE, and 1,2,4-trimethylbenzene are currently the only COCs identified at concentrations above current U/NR MSCs in the shallow overburden aquifer.
- Groundwater samples collected from groundwater monitoring wells MW-10D, MW-12, MW-13, and MW-16 monitoring the deep overburden aquifer confirmed the presence of diesel constituents in groundwater from the western edge of the upper paved portion of the facility west of the diesel station building downgradient to the retention pond. Based on the August 2016 sampling data, dissolved phase benzene, MTBE, naphthalene, and 1,2,4-trimethylbenzene are

currently the only COCs identified at concentrations above current U/NR MSCs in the deep overburden aquifer.

- Due to the presence of historical APH and DPH impacts remaining in facility soil and groundwater as documented in the 2006 RACR (GSC/Kleinfelder, 2006), two areas of concern were proposed based on the evaluation of site characterization activities completed to date. DPH and APH impacts identified during site characterization activities related to historical releases at the facility are generally defined as AOC 1, and impacts related to the 2015 diesel release are generally defined as AOC 2. Based on details of the April 2015 diesel release and evaluation of existing site data, APH and DPH impacts in AOC 2 appear isolated near the dispenser islands and are confined within the shallow overburden clay aquifer. APH and DPH impacts identified west of the dispenser islands and downgradient near the retention pond appear to be related to historical releases (AOC 1).
- Current maximum adsorbed phase benzene, ethylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene concentrations in soil exceed respective PADEP default vapor intrusion screening values for residential and non-residential settings. Based on APH and DPH impacts identified in facility soil and groundwater in AOC 2, further vapor intrusion assessment and mitigation will be completed to confirm potential vapor inhalation pathways are not a concern at the facility.
- The selected Act 2 standard for obtaining liability relief for diesel constituents in soil and groundwater related to the subject 2015 release is the Statewide Health Standard for a used aquifer, non-residential scenario. Historical impacts will be considered throughout the corrective action process for the 2015 diesel release as they relate to SHS attainment demonstrations.

Pending completion of proposed planned activities, additional site characterization findings and remedial options evaluation/selection will be presented to the PADEP in an SCRA/RAP.

12.0 REFERENCES

ASTM International (ASTM E1739-95) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Site.* 2002.

Berg, T.M., Geyer, A.R., Edmunds, W.E., and other, compilers. 1980. *Geologic Map of Pennsylvania.* Pennsylvania Geological Survey.

Environmental Protection Agency My Water Mapper. <https://watersgeo.epa.gov/mwm/>. Accessed September 2016.

GSC/Kleinfelder, May 2004. *Comprehensive Site Characterization/Risk Assessment Report.*

GSC/Kleinfelder, June 2006. *Remedial Action Completion Report.*

Indiana Department of Environmental Management, Office of Land Quality. 2007. *Determining the Fraction of Organic Carbon RISC Nondefault Option.* IDEM Technical Guidance Document OLQ-General ID-0119. http://www.in.gov/idem/files/Foc_Guidance_070925_Final.pdf

Pennsylvania Code Online Website (Chaper 93): <http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>. Accessed September 2016.

Pennsylvania Department of Conservation and Natural Resources (PADCNR) Website: < http://www.dcnr.state.pa.us/topogeo/>. Accessed September 2016.

Pennsylvania Department of Conservation and Natural Resources (PADCNR) and the Department of Interior – Office of Surface Mining (OSM) Website: < https://amlis.osmre.gov/Default.aspx>. Accessed September 2016.

Pennsylvania Department of Environmental Protection, December 2001. Pennsylvania Code. Title 25, Chapter 245: Administration of the Storage Tank and Spill Prevention Program, Subchapter D.

Pennsylvania Department of Environmental Protection, January 2016. Pennsylvania Code. Title 25, Chapter 50: Administration of Land Recycling Program.

Pennsylvania Department of Environmental Protection eMapPA Website: <http://www.depgis.state.pa.us/emappa/>. Accessed September 2016.

Pennsylvania Department of Environmental Protection Regulated Tank List Website: <http://www.portal.state.pa.us/portal/server.pt/community/hide_registration/20606/regulated_tank_list/1054359>. Accessed September 2016.

Pennsylvania Department of Environmental Protection Storage Tank Cleanup Locations Website: <http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1241&Q=461926&landrecwasteNav=|30816|>. Accessed September 2016.

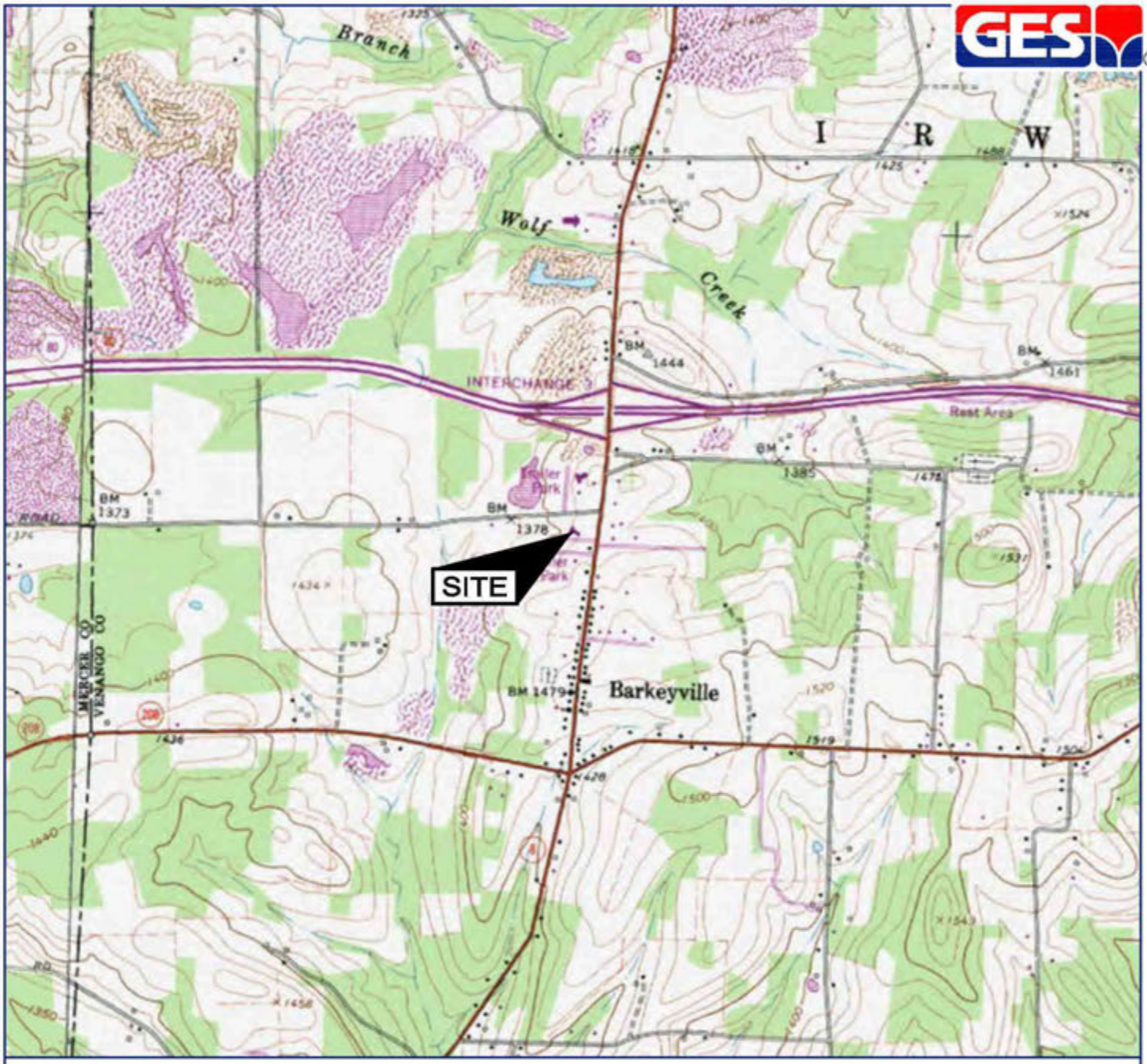
Pennsylvania Department of Environmental Protection. 2004. *Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standards*. Land Recycling Technical Guidance Manual-Section IV.A.4. Technical Document: 253-4500-601.

Pennsylvania Groundwater Well Inventory System (PaGWIS) Website: <http://www.dcnr.state.pa.us/topogeo/groundwater/pagwis/records/index.htm >. Accessed September 2016.

Shultz, Charles H., editor. 1999. *The Geology of Pennsylvania*. Pennsylvania Geological Survey.

United Refining Company of Pennsylvania. April 2015. *Notification of Reportable Release*.

United States Department of Agriculture, Natural Resources Conservation Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed September 2016.



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1980
BARKEYVILLE, PENNSYLVANIA
CONTOUR INTERVAL = 20'

QUADRANGLE LOCATION

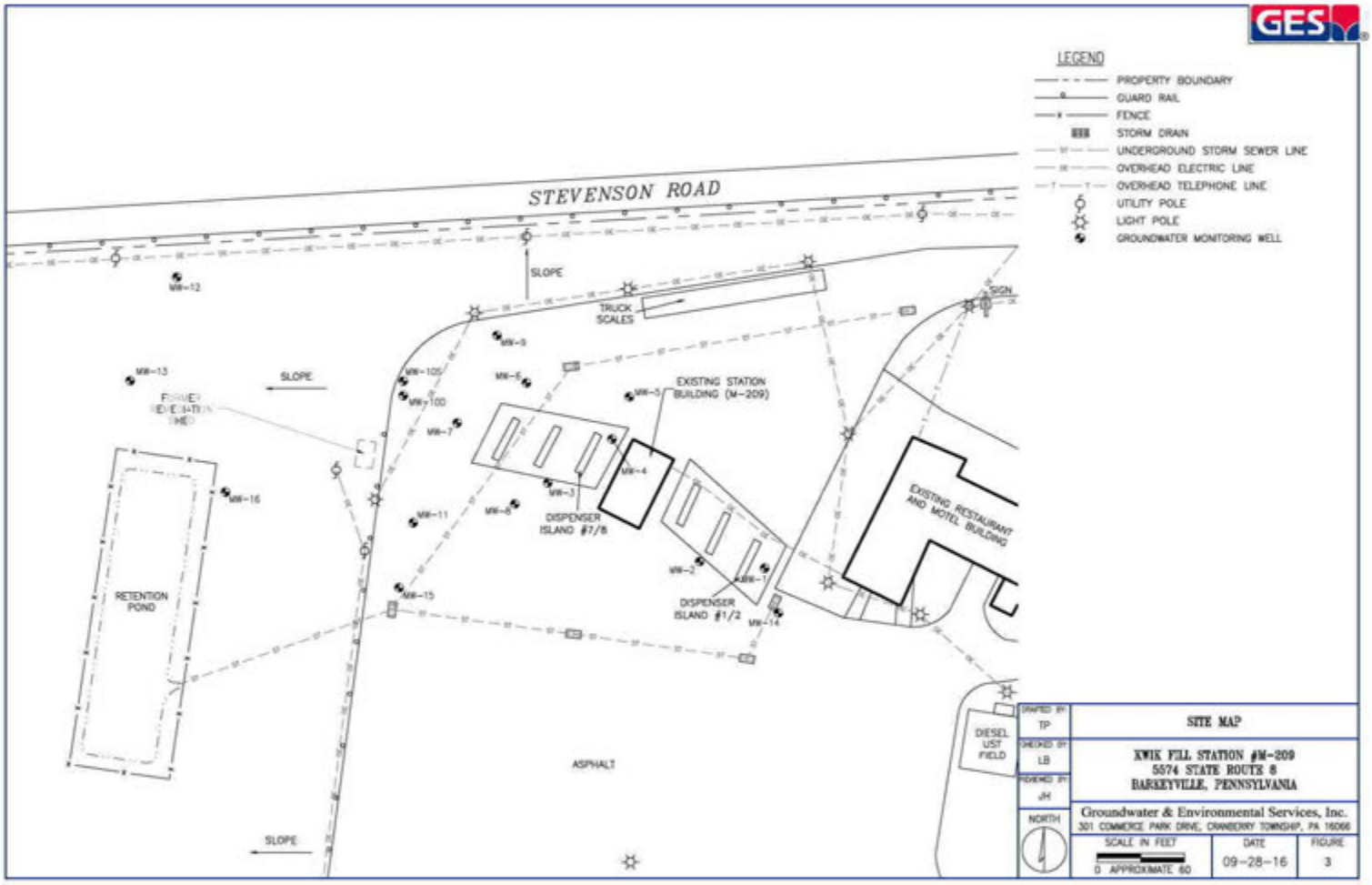
DRAFTED BY: TP (EXTON)	SITE LOCATION MAP
CHECKED BY: JH	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 — 2000 / DATE: 08-05-15 / FIGURE: 1

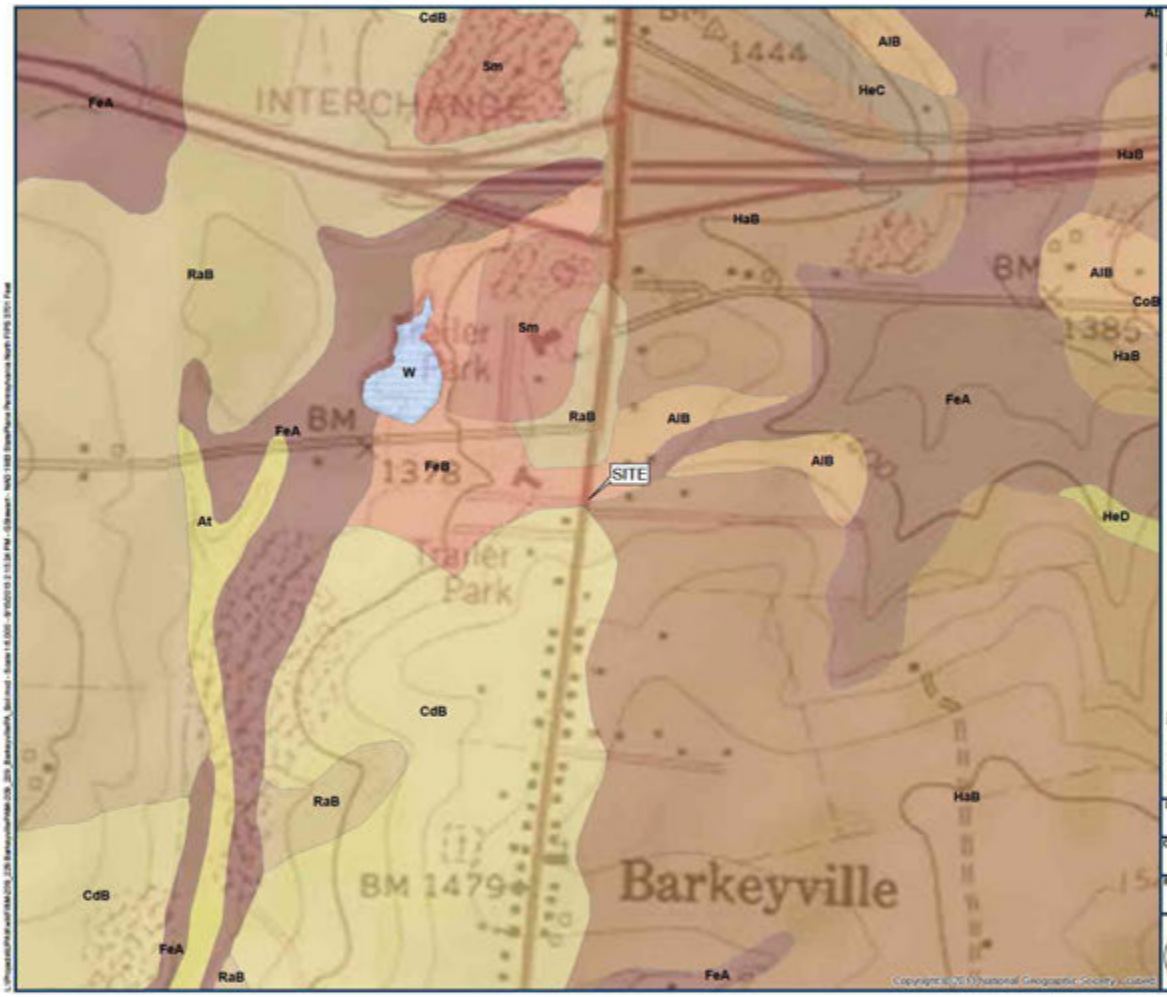
M:\Graphics\0700-Pittsburgh\URC\Kwik Fill\M-209_229 Barkeyville\M-209_229 barkeyville SLM.dwg, Layout1

LEGEND

- PROPERTY BOUNDARY (approx.)
- R RESIDENTIAL PROPERTY
- C COMMERCIAL PROPERTY
- V VACANT PROPERTY

DRAFTED BY: TP	LOCAL AREA MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 300 / DATE: 09-19-16 / FIGURE: 2


LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
MW-12
MW-13
MW-9
MW-105
MW-100
MW-7
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-4
MW-3
DISPENSER ISLAND #7/8
MW-16
MW-11
MW-8
EXISTING RESTAURANT AND MOTEL BUILDING
RETENTION POND
MW-2
MW-1
DISPENSER ISLAND #1/2
MW-15
MW-14
DIESEL UST FIELD
ASPHALT
SLOPE
SLOPE
NORTH
SITE MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
HARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
DRAFTED BY TP
CHECKED BY LB
REVIEWED BY JH
SCALE IN FEET
0 APPROXIMATE 60
DATE 09-28-16
FIGURE 3

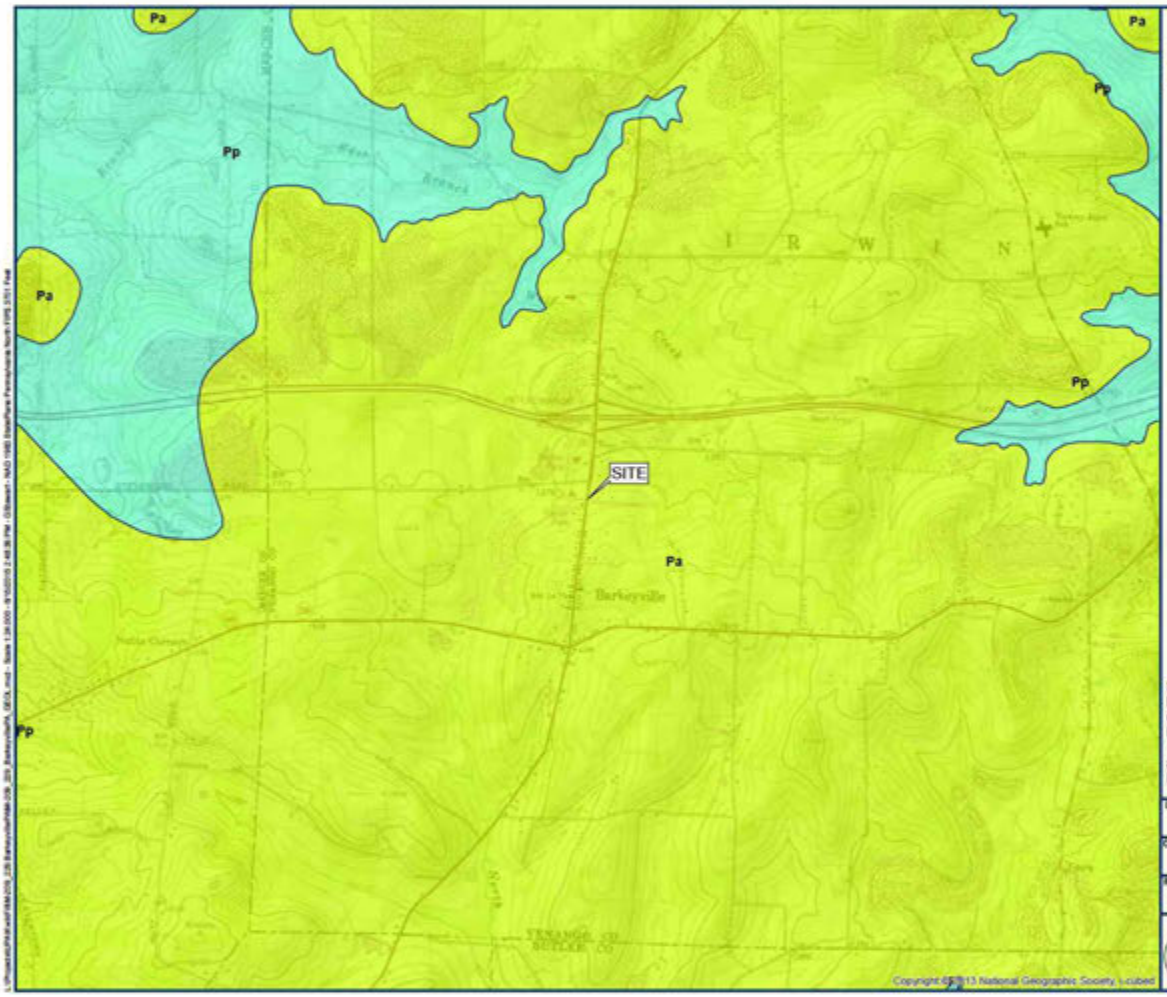


Legend

- AlB Alvira silt loam, 3 to 8 percent slopes
- At Atkins silt loam
- CdB Canfield gravelly silt loam, 3 to 8 percent slopes
- CoB Cookport loam, 3 to 8 percent slopes
- FeA Frenchtown silt loam, 0 to 3 percent slopes
- FeB Frenchtown silt loam, 3 to 8 percent slopes
- HaB Hanover silt loam, 3 to 8 percent slopes
- HeC Hazleton channery loam, 8 to 15 percent slopes
- HeD Hazleton channery loam, 15 to 25 percent slopes
- RaB Ravenna silt loam, 3 to 8 percent slopes
- Sm Strip mines
- W Water

Sources:
-Soil Survey Geographic (SSURGO) database for Venango County, Pennsylvania, USDA, 1981, scale 1:20,000
-USGS 7.5 minute topographic quadrangles, scale 1:24,000
(Shown greatly enlarged, locations considered approximate.)

DRAWN BY: GKS	SOIL SURVEY MAP
CHECKED BY: DMC	KWIK FILL STATION #M-209/229 5574 STATE ROUTE 8 BARKEYVILLE, PA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DR, CRANBERRY TOWNSHIP, PA 16066
NORTH	APPROX. SCALE IN FEET: 0 500 / DATE: 6-15-15 / FIGURE: 4



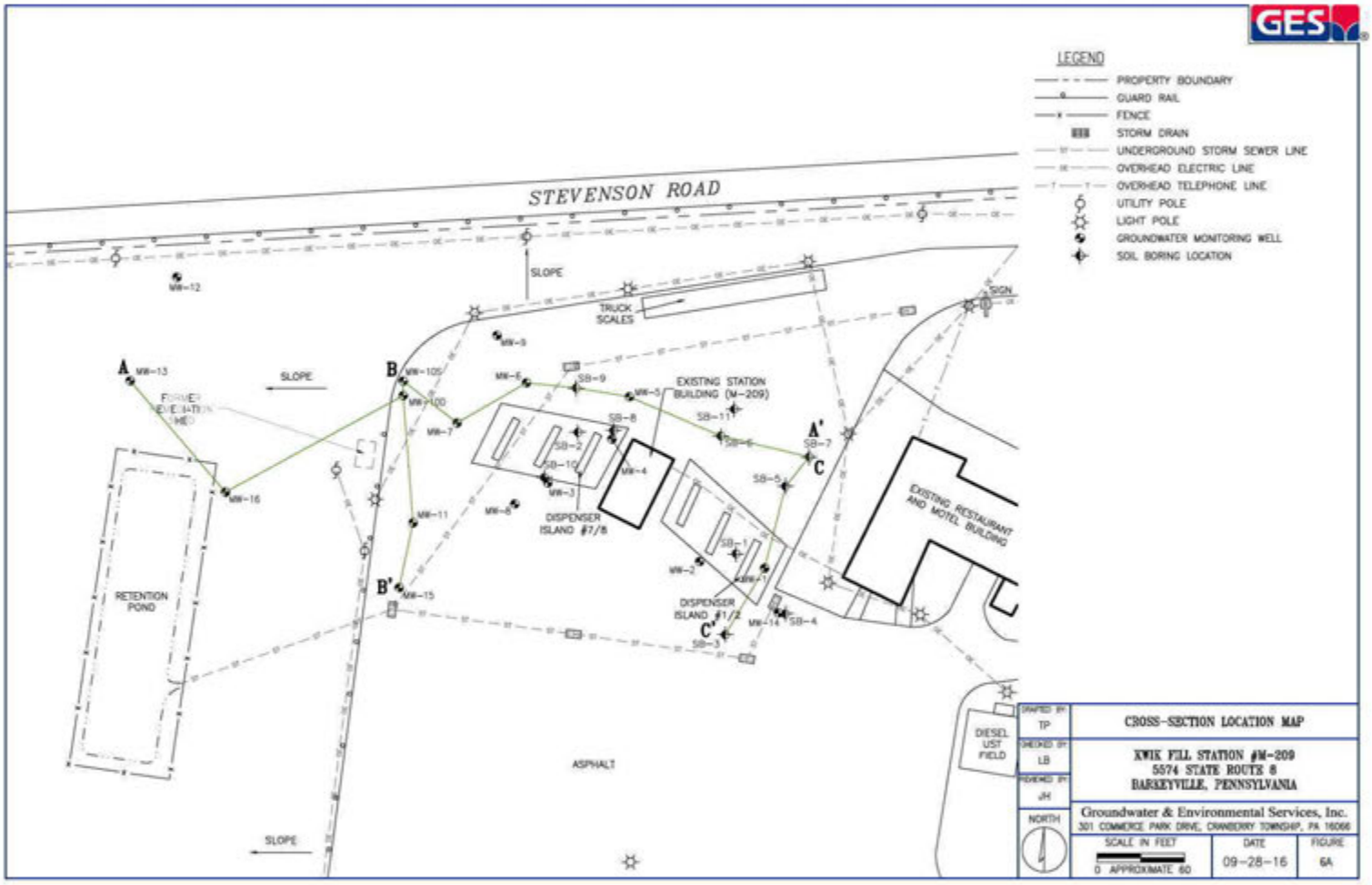
Legend

Pennsylvanian

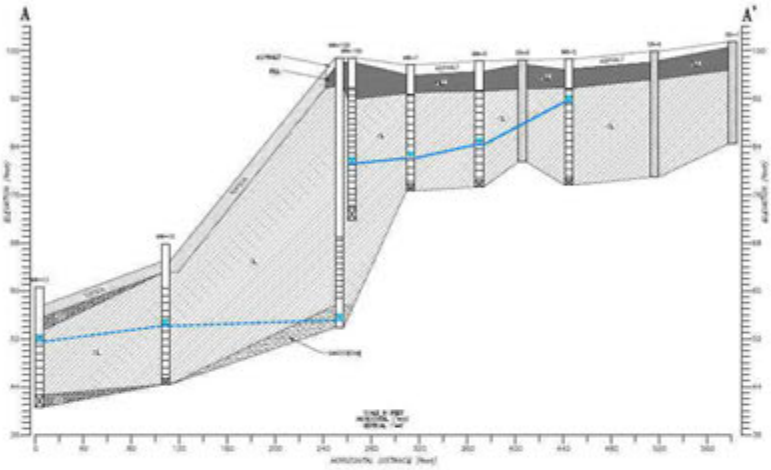
- Pa — Allegheny Formation
- Pp — Pottsville Formation

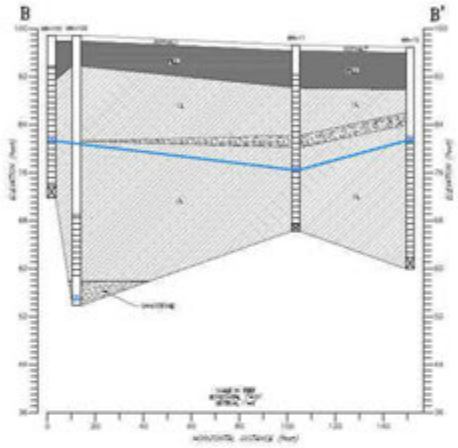
Sources:
Berg, T. M., Geyer, A. R., Edmunds, W. E., and others, compilers, 1980, Geologic map of Pennsylvania, Pennsylvania Geological Survey, 4th ser., Map 1. Scale 1:250,000.Shown greatly enlarged, locations considered approximate.
USGS 7.5 minute topographic quadrangles, scale 1:24,000

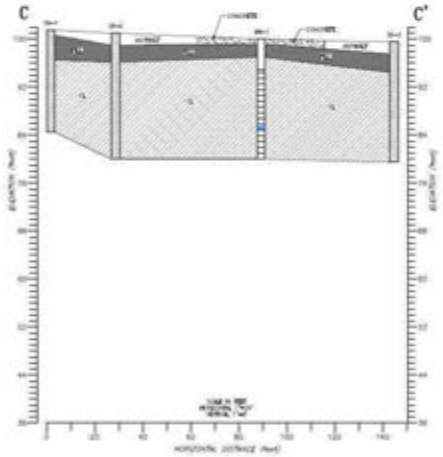
DRAWN BY: GKS	BEDROCK GEOLOGIC MAP
CHECKED BY: DMC	KWIK FILL STATION #M-209/229 5574 STATE ROUTE 8 BARKEYVILLE, PA
REVIEWED BY: EL	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DR, CRANBERRY TOWNSHIP, PA 16066
NORTH	APPROX. SCALE IN FEET: 0 — 2,000
	DATE: 6-15-15
	FIGURE: 5

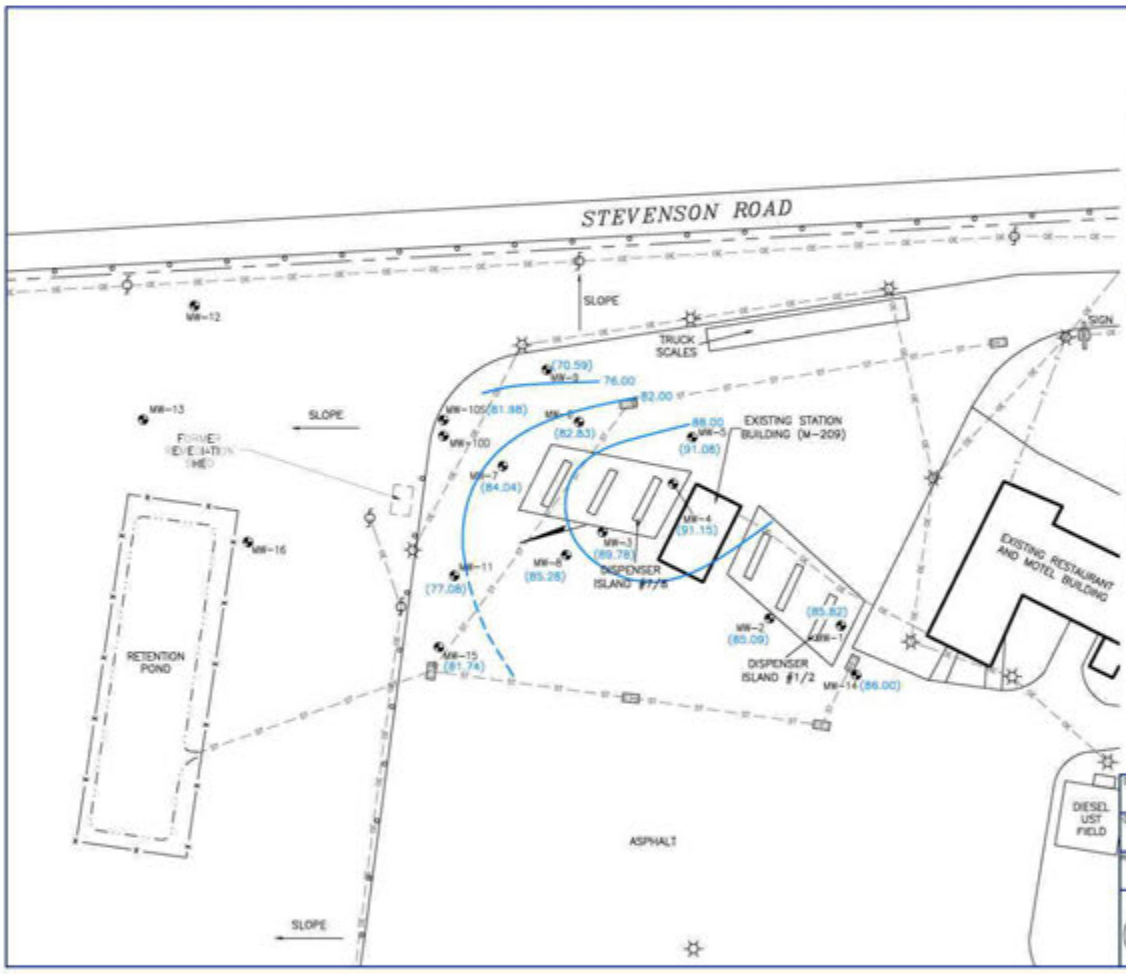


DRAFTED BY: TP	CROSS-SECTION LOCATION MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET	DATE: 09-28-16
	FIGURE: 6A


A
A'
ELEVATION (feet)
HORIZONTAL DISTANCE (feet)


B
B'
ELEVATION (feet)
HORIZONTAL DISTANCE (feet)


C
C'
ELEVATION (feet)
HORIZONTAL DISTANCE (feet)



LEGEND

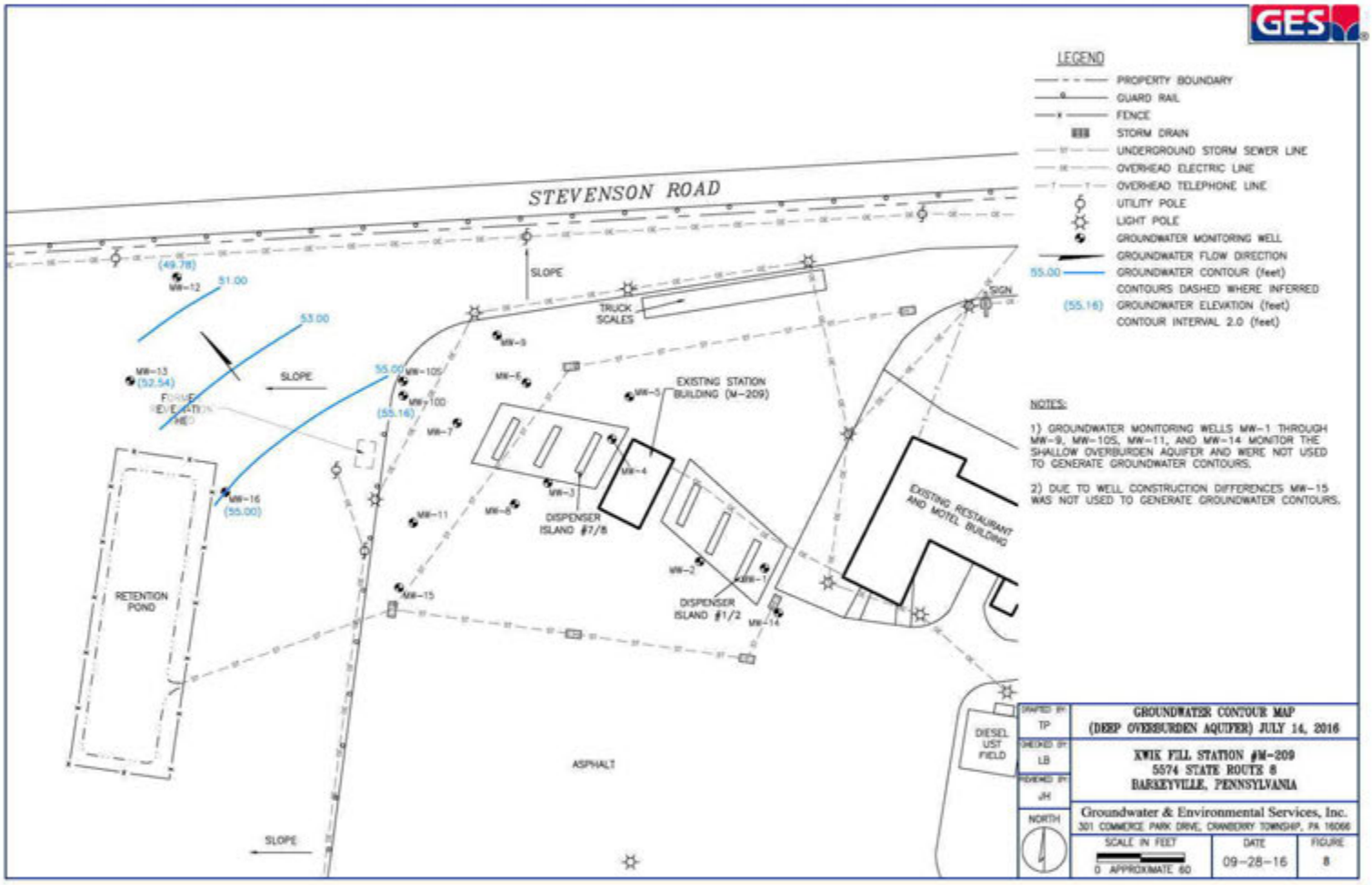
- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- 88.00 GROUNDWATER CONTOUR (feet)
- CONTOURS DASHED WHERE INFERRED
- (91.15) GROUNDWATER ELEVATION (feet)
- CONTOUR INTERVAL 6.0 (feet)

NOTES:

1) GROUNDWATER MONITORING WELLS MW-10D, MW-12, MW-13, AND MW-16 MONITOR THE DEEP OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.

DRAFTED BY: TP	GROUNDWATER CONTOUR MAP (SHALLOW OVERBURDEN AQUIFER) JULY 14, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	
NORTH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET: 0 APPROXIMATE 60	DATE: 09-28-16 — FIGURE: 7



LEGEND

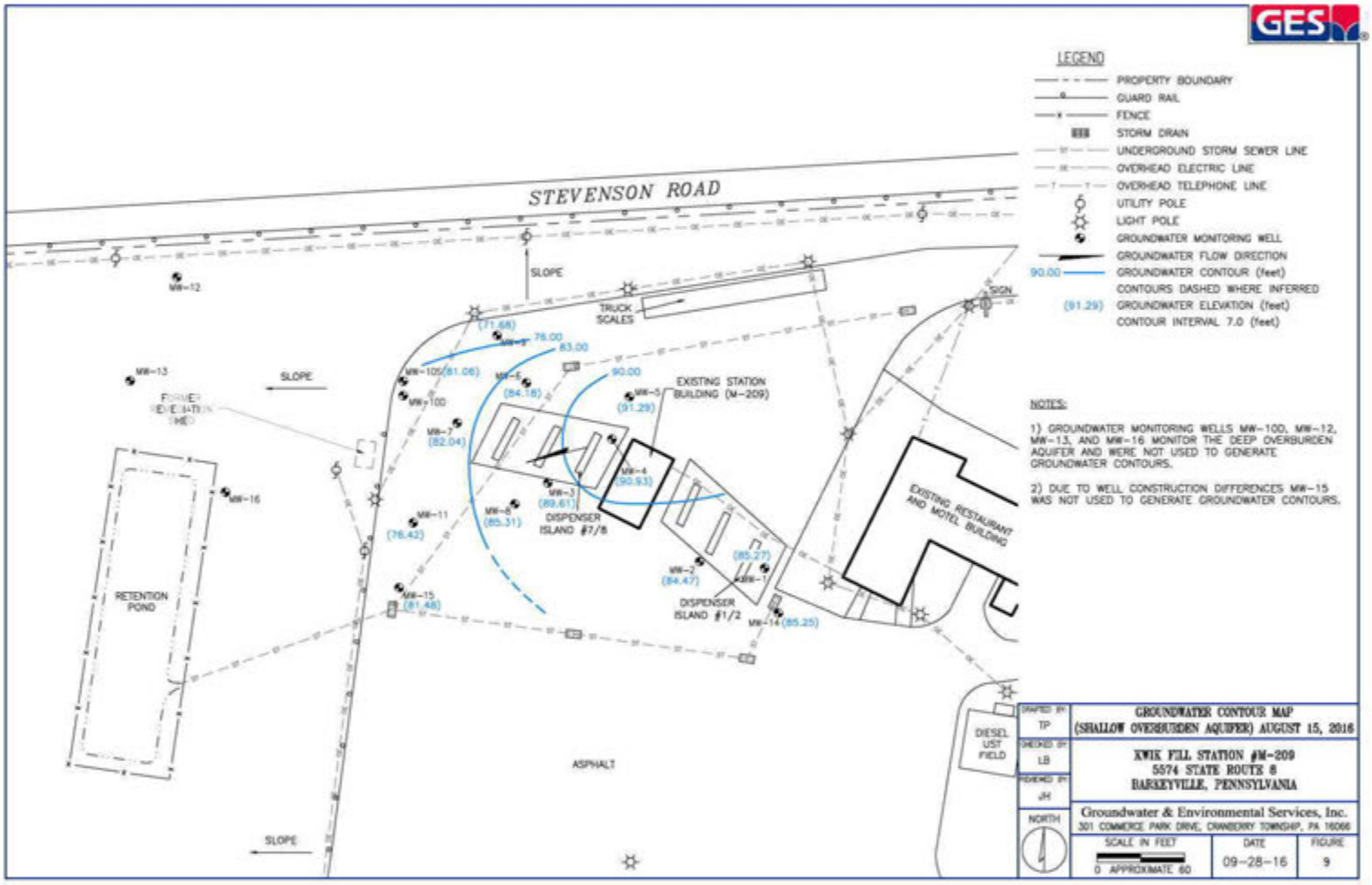
- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- 55.00 GROUNDWATER CONTOUR (feet)
  CONTOURS DASHED WHERE INFERRED
- (55.16) GROUNDWATER ELEVATION (feet)
  CONTOUR INTERVAL 2.0 (feet)

NOTES:

1) GROUNDWATER MONITORING WELLS MW-1 THROUGH MW-9, MW-10S, MW-11, AND MW-14 MONITOR THE SHALLOW OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.

DRAFTED BY: TP	GROUNDWATER CONTOUR MAP (DEEP OVERBURDEN AQUIFER) JULY 14, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 8



LEGEND

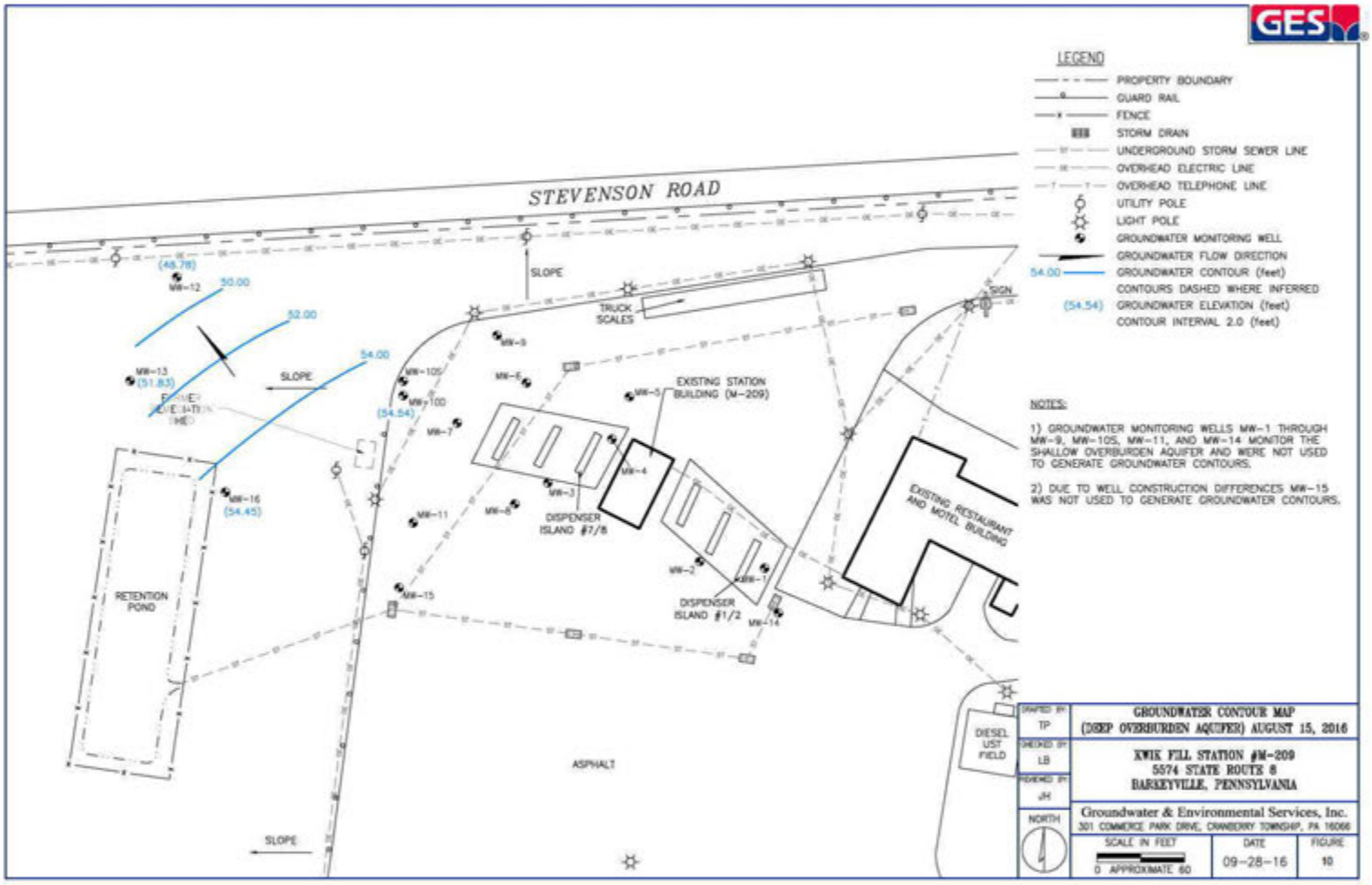
- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- 90.00 GROUNDWATER CONTOUR (feet)
- CONTOURS DASHED WHERE INFERRED
- (91.29) GROUNDWATER ELEVATION (feet)
- CONTOUR INTERVAL 7.0 (feet)

NOTES:

1) GROUNDWATER MONITORING WELLS MW-100, MW-12, MW-13, AND MW-16 MONITOR THE DEEP OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.

DRAFTED BY: TP	GROUNDWATER CONTOUR MAP (SHALLOW OVERBURDEN AQUIFER) AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 9



LEGEND

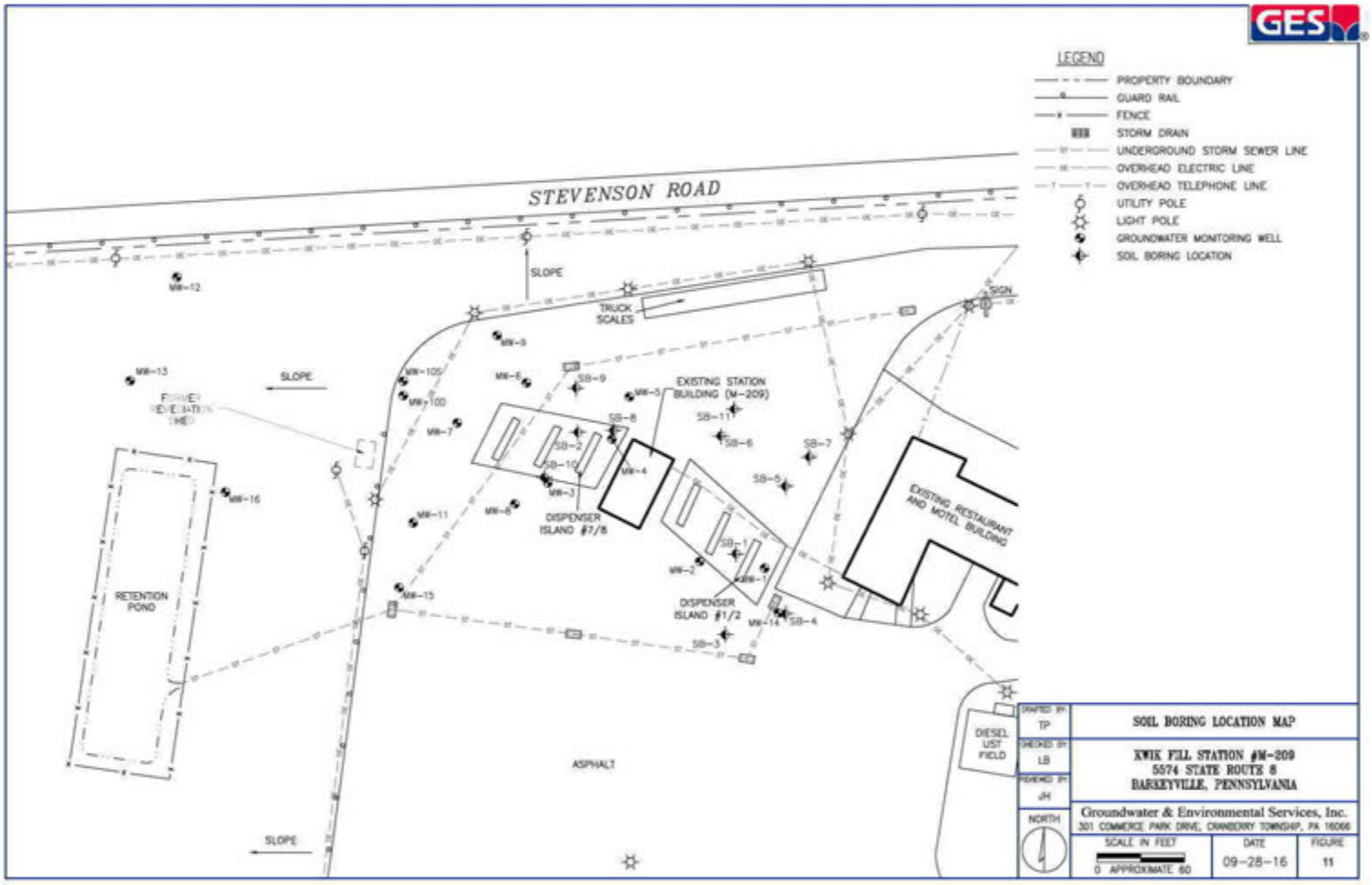
- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- 54.00 GROUNDWATER CONTOUR (feet) — CONTOURS DASHED WHERE INFERRED
- (54.54) GROUNDWATER ELEVATION (feet)
- CONTOUR INTERVAL 2.0 (feet)

NOTES:

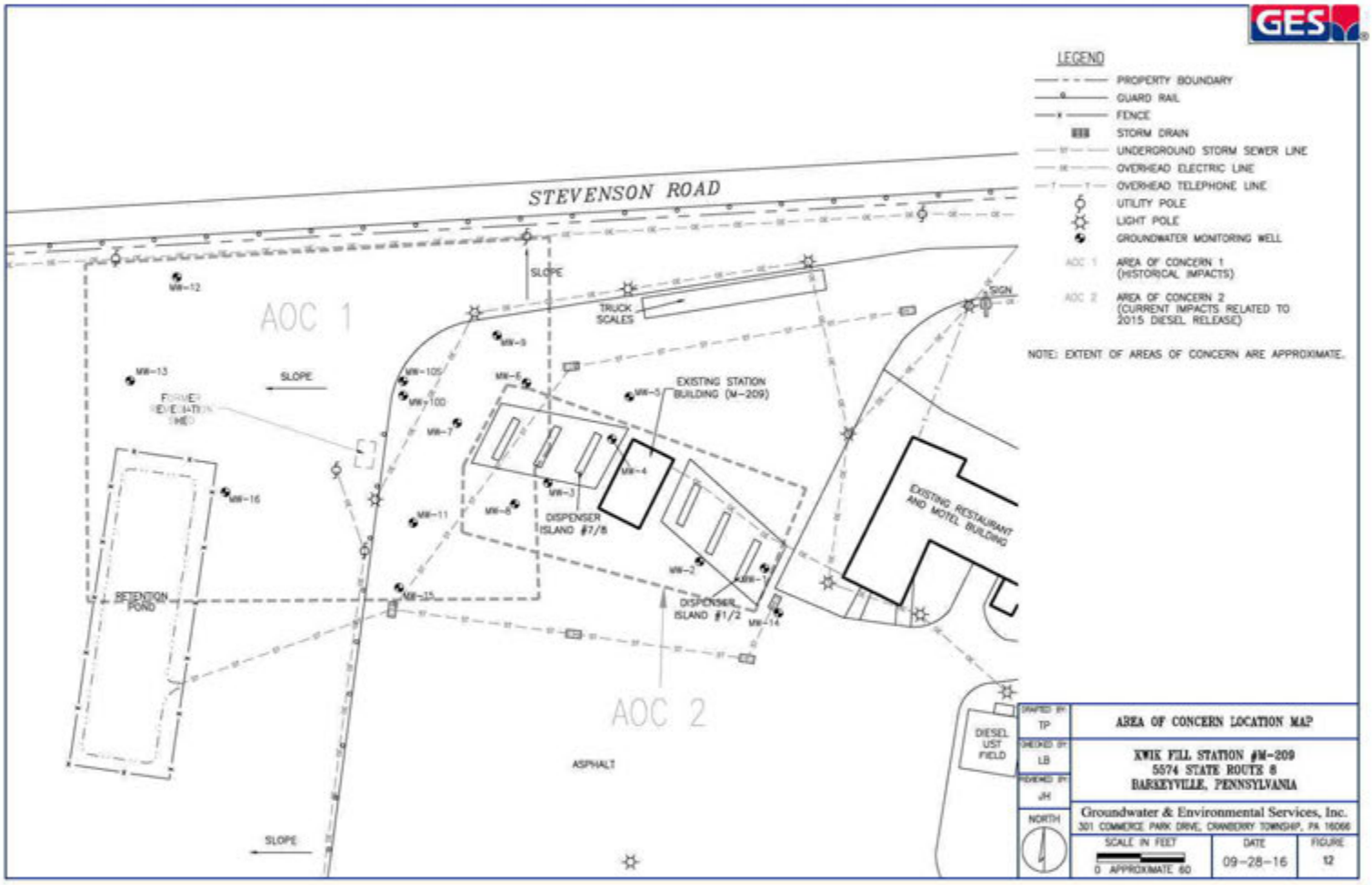
1) GROUNDWATER MONITORING WELLS MW-1 THROUGH MW-9, MW-10S, MW-11, AND MW-14 MONITOR THE SHALLOW OVERBURDEN AQUIFER AND WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

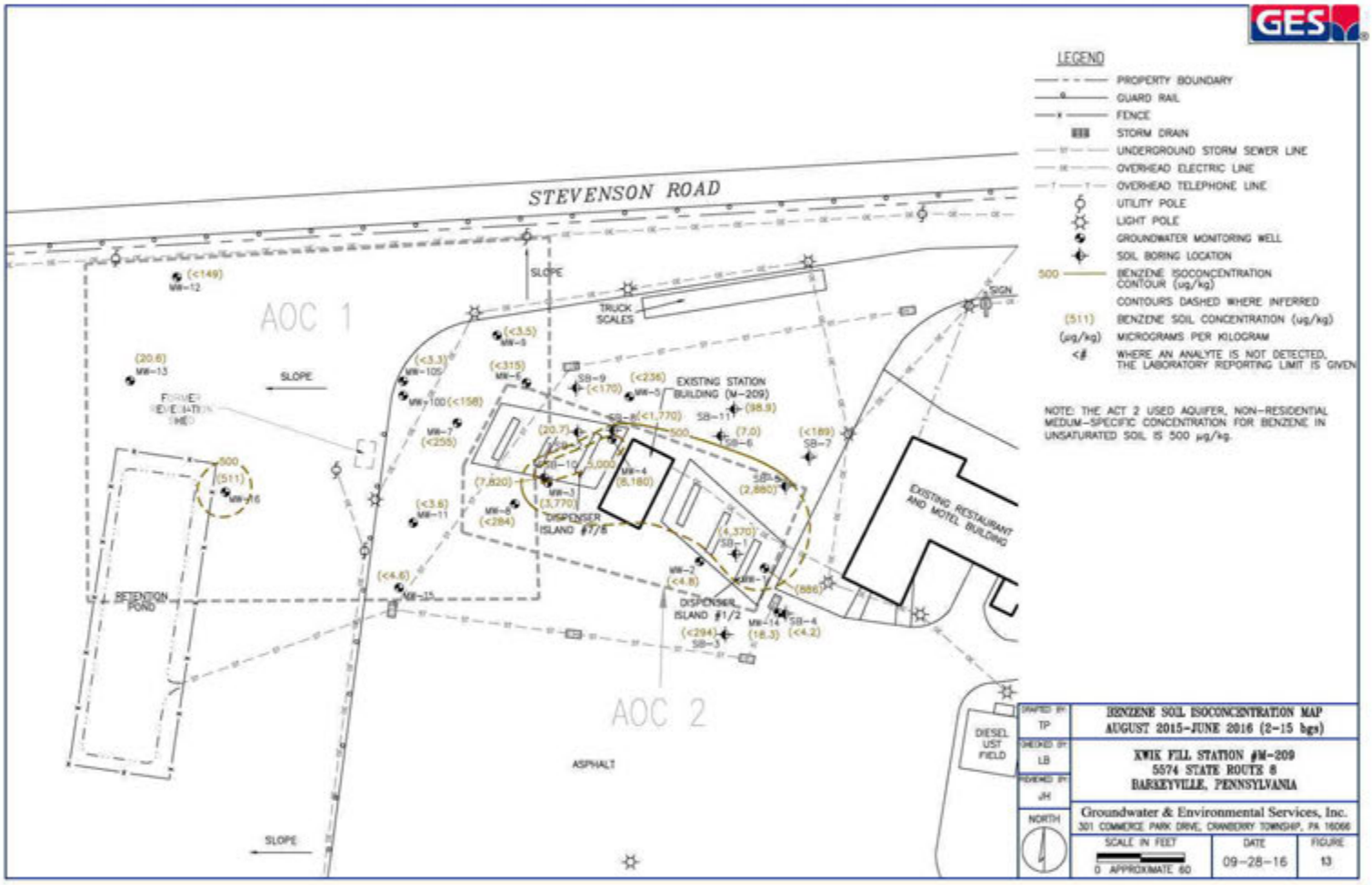
2) DUE TO WELL CONSTRUCTION DIFFERENCES MW-15 WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.

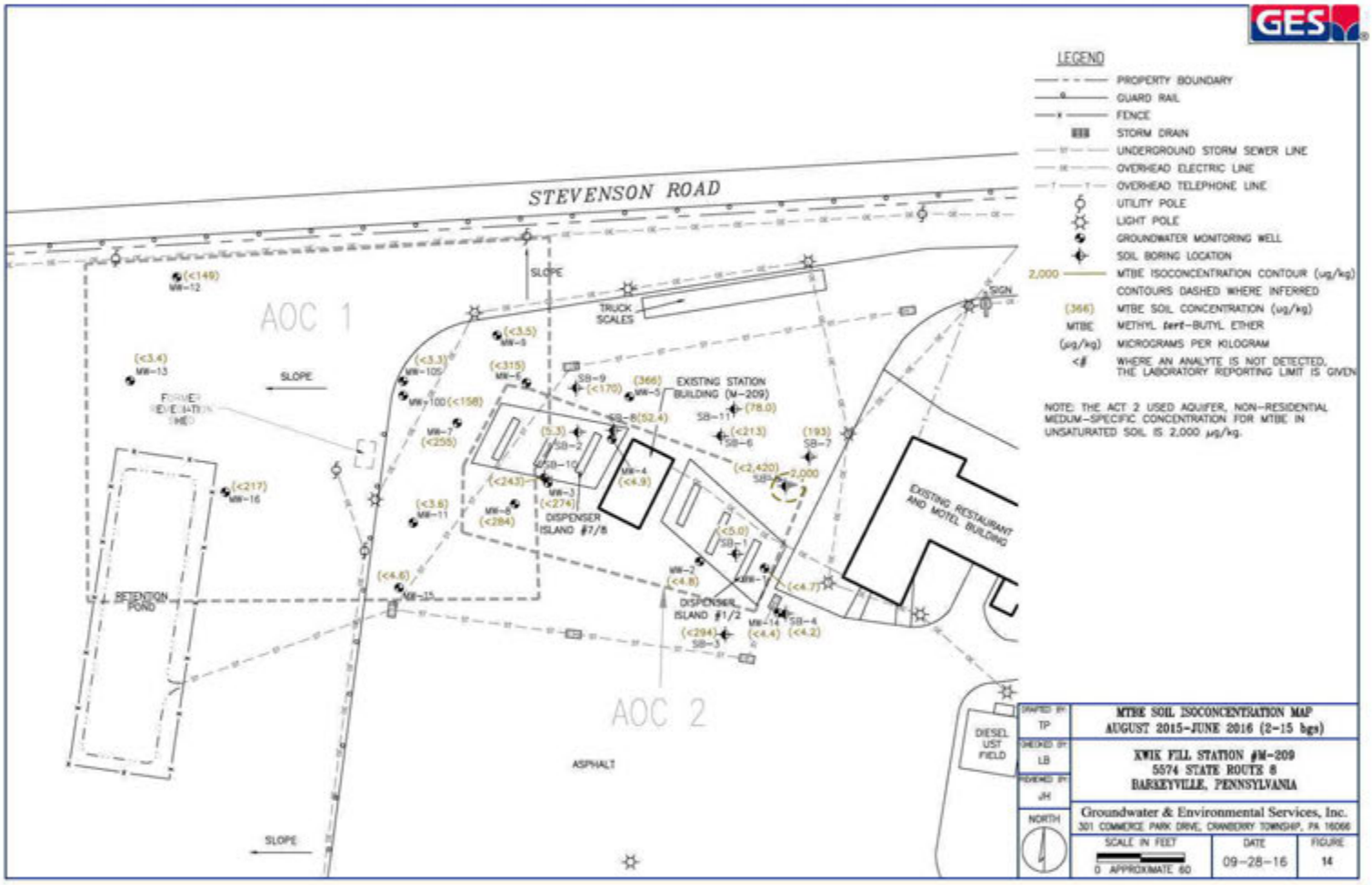
DRAFTED BY: TP	GROUNDWATER CONTOUR MAP (DEEP OVERBURDEN AQUIFER) AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 10



DRAFTED BY: TP	SOIL BORING LOCATION MAP
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 11


STEVENSON ROAD
AOC 1
AOC 2
SLOPE
TRUCK SCALES
SIGN
EXISTING STATION BUILDING (M-209)
EXISTING RESTAURANT AND MOTEL BUILDING
DISPENSER ISLAND #7/8
DISPENSER ISLAND #1/2
RETENTION POND
DIESEL UST FIELD
ASPHALT
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-10S
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
AOC 1 AREA OF CONCERN 1 (HISTORICAL IMPACTS)
AOC 2 AREA OF CONCERN 2 (CURRENT IMPACTS RELATED TO 2015 DIESEL RELEASE)
NOTE: EXTENT OF AREAS OF CONCERN ARE APPROXIMATE.
DRAFTED BY TP
CHECKED BY LB
REVIEWED BY JH
NORTH
AREA OF CONCERN LOCATION MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
HARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
12


STEVENSON ROAD
AOC 1
AOC 2
SLOPE
TRUCK SCALES
SIGN
EXISTING STATION BUILDING (M-209)
EXISTING RESTAURANT AND MOTEL BUILDING
DISPENSER ISLAND #1/2
DISPENSER ISLAND #3/4
RETENTION POND
DIESEL UST FIELD
ASPHALT
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
SOIL BORING LOCATION
500 BENZENE ISOCONCENTRATION CONTOUR (ug/kg)
CONTOURS DASHED WHERE INFERRED
(511) BENZENE SOIL CONCENTRATION (ug/kg)
(ug/kg) MICROGRAMS PER KILOGRAM
<# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN
NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR BENZENE IN UNSATURATED SOIL IS 500 µg/kg.
DRAFTED BY TP
CHECKED BY LB
REVIEWED BY JH
NORTH
BENZENE SOIL ISOCONCENTRATION MAP
AUGUST 2015-JUNE 2016 (2-15 bgs)
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
13

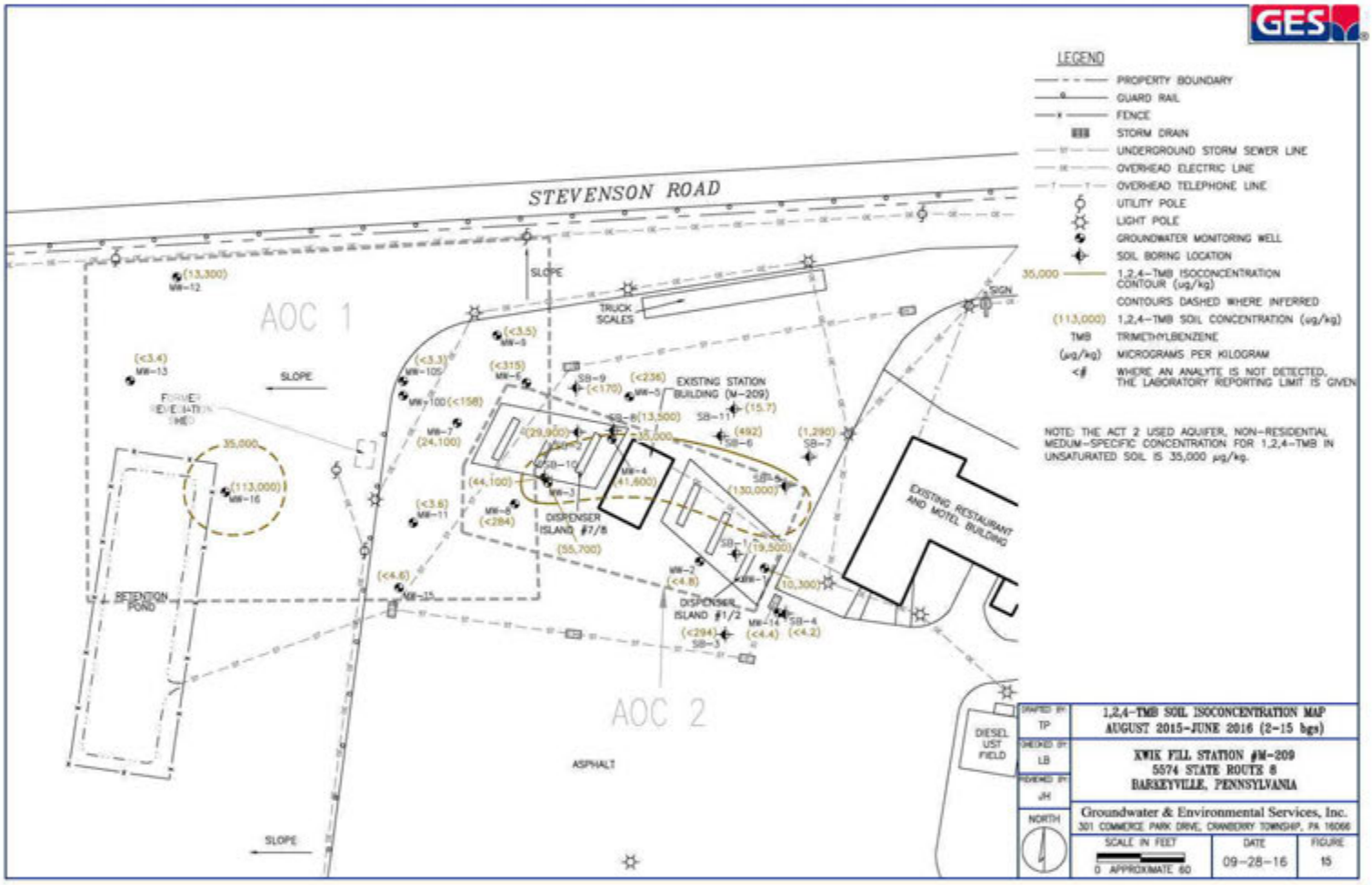


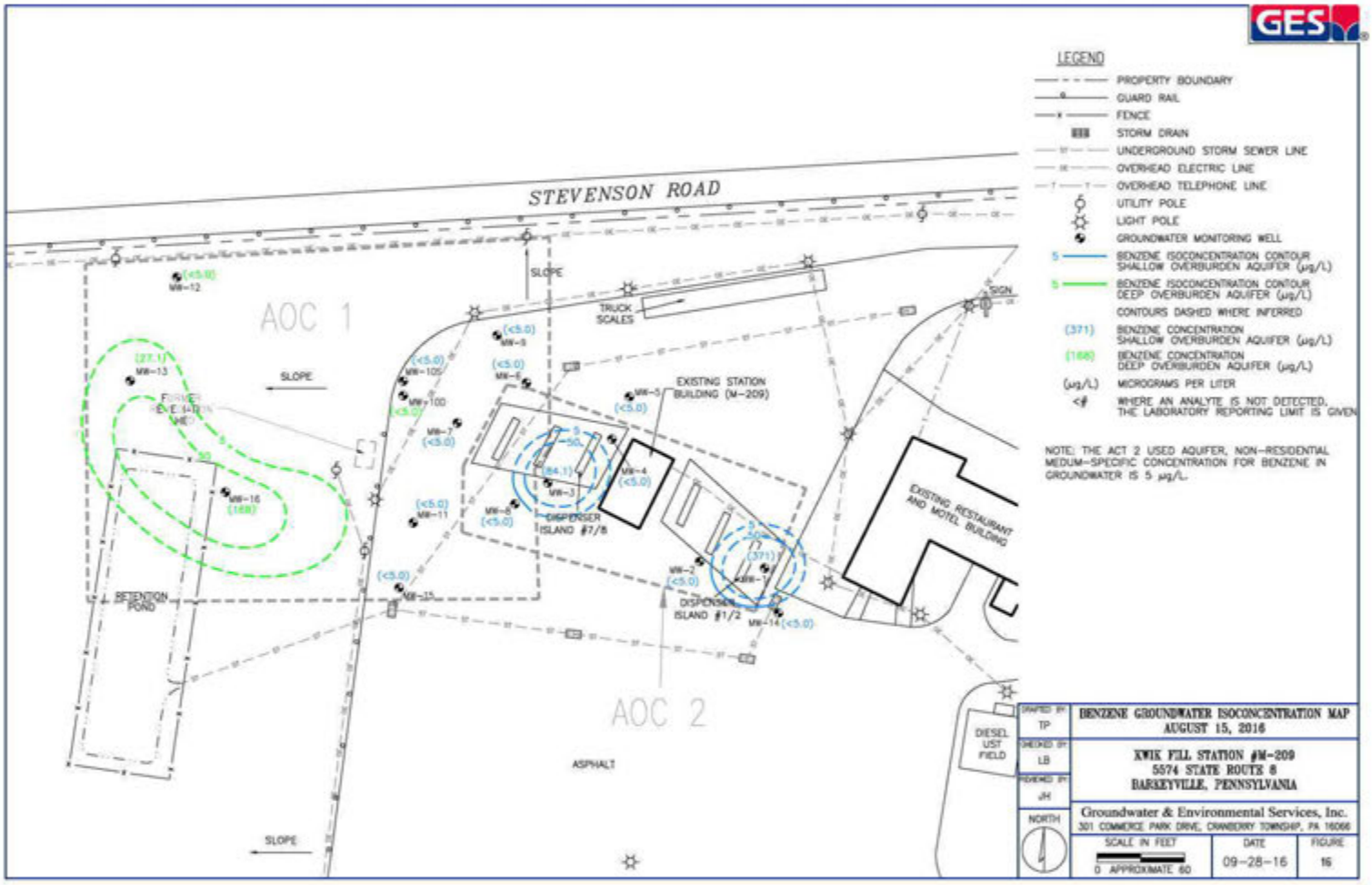
LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- SOIL BORING LOCATION
- 2,000 — MTBE ISOCONCENTRATION CONTOUR (ug/kg)
- CONTOURS DASHED WHERE INFERRED
- (366) MTBE SOIL CONCENTRATION (ug/kg)
- MTBE METHYL *tert*-BUTYL ETHER
- (µg/kg) MICROGRAMS PER KILOGRAM
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR MTBE IN UNSATURATED SOIL IS 2,000 µg/kg.

DRAFTED BY: TP	MTBE SOIL ISOCONCENTRATION MAP AUGUST 2015-JUNE 2016 (2-15 bgs)
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 14


STEVENSON ROAD
AOC 1
AOC 2
SLOPE
TRUCK SCALES
SIGN
EXISTING STATION BUILDING (M-209)
EXISTING RESTAURANT AND MOTEL BUILDING
DISPENSER ISLAND #7/8
DISPENSER ISLAND #1/2
RETENTION POND
DIESEL UST FIELD
ASPHALT
NORTH
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
SOIL BORING LOCATION
35,000 1,2,4-TMB ISOCONCENTRATION CONTOUR (ug/kg)
CONTOURS DASHED WHERE INFERRED
(113,000) 1,2,4-TMB SOIL CONCENTRATION (ug/kg)
TMB TRIMETHYLBENZENE
(ug/kg) MICROGRAMS PER KILOGRAM
<# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN
NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR 1,2,4-TMB IN UNSATURATED SOIL IS 35,000 µg/kg.
DRAFTED BY TP
CHECKED BY LB
REVIEWED BY JH
1,2,4-TMB SOIL ISOCONCENTRATION MAP
AUGUST 2015-JUNE 2016 (2-15 bgs)
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
BARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
15

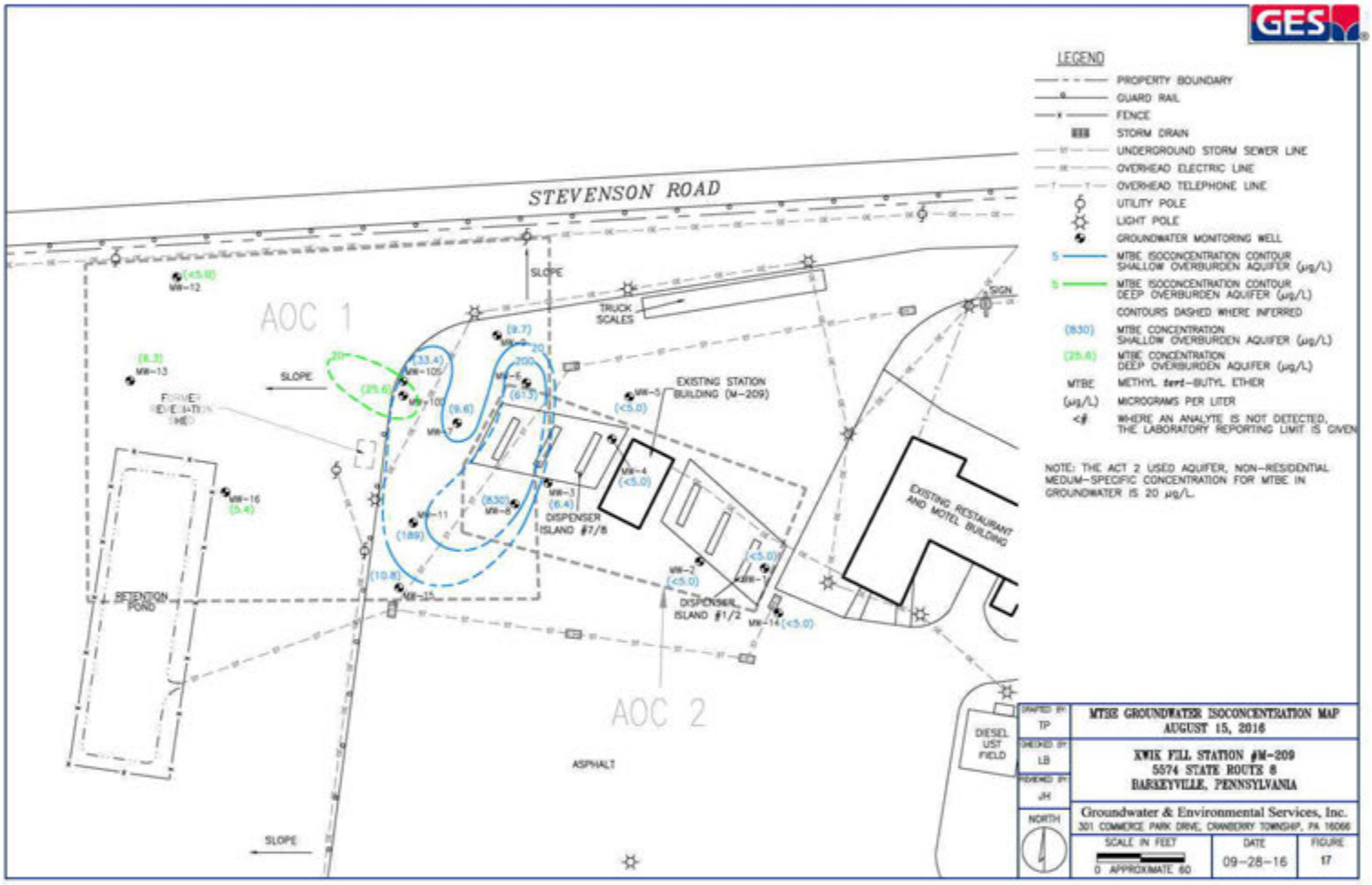


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 5 — BENZENE ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 5 — BENZENE ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (371) BENZENE CONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (188) BENZENE CONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- (µg/L) MICROGRAMS PER LITER
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR BENZENE IN GROUNDWATER IS 5 µg/L.

DRAFTED BY: TP	BENZENE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 16

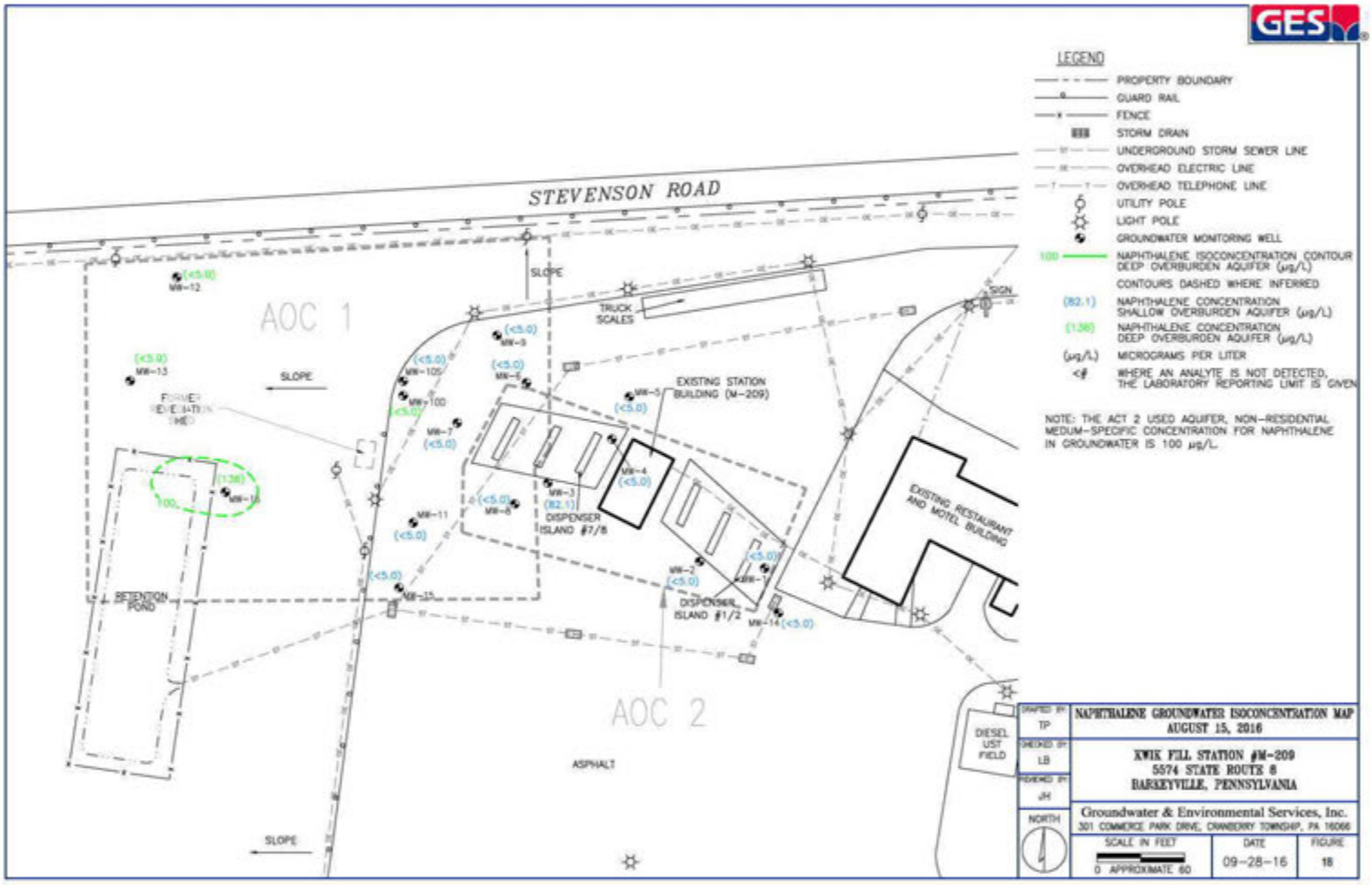


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 5 — MTBE ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 5 — MTBE ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (830) MTBE CONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (25.6) MTBE CONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- MTBE — METHYL *tert*-BUTYL ETHER
- (µg/L) — MICROGRAMS PER LITER
- <# — WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR MTBE IN GROUNDWATER IS 20 µg/L.

DRAFTED BY: TP	MTBE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 17

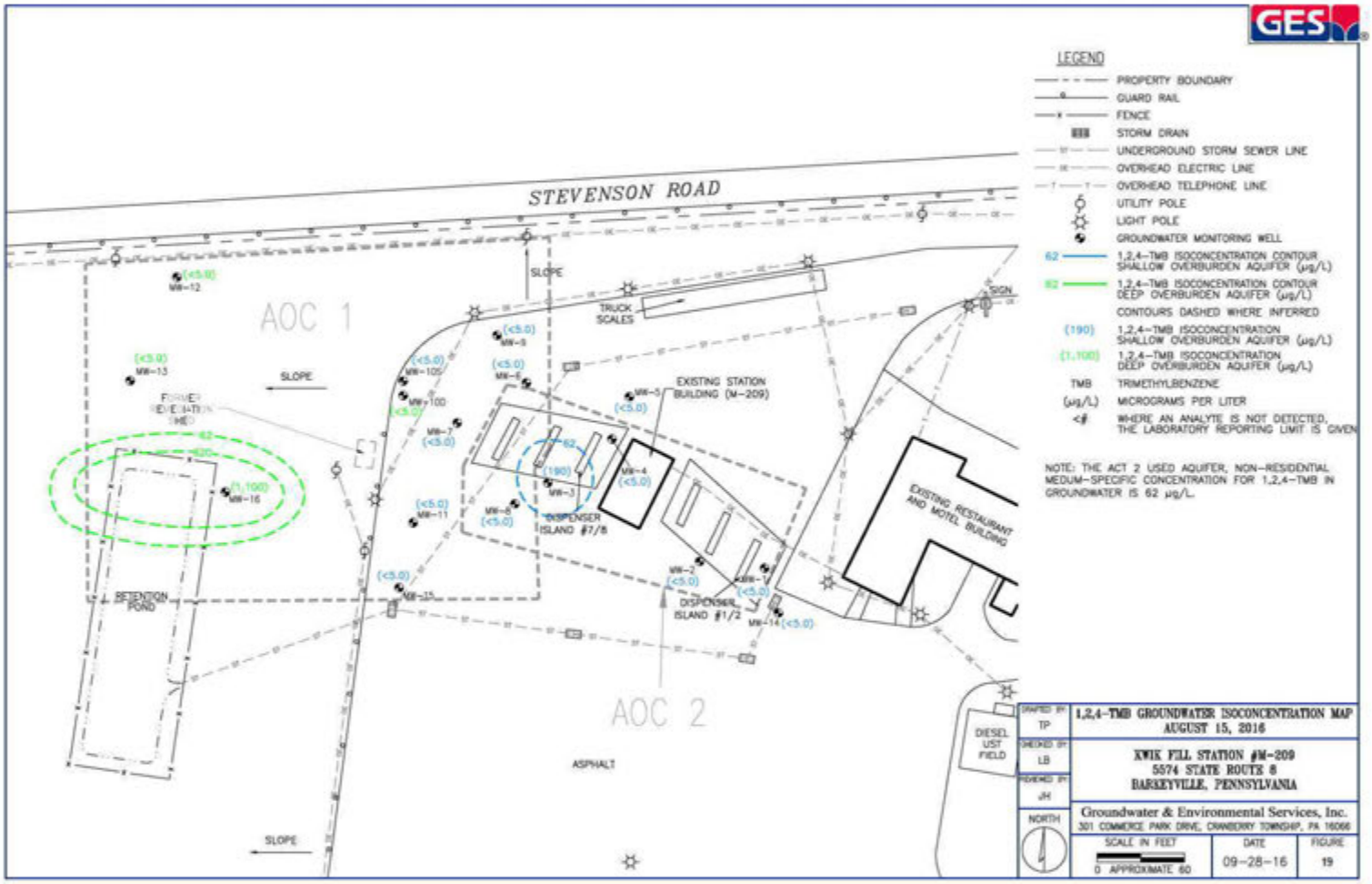


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 100 — NAPHTHALENE ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (82.1) NAPHTHALENE CONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (136) NAPHTHALENE CONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- (µg/L) MICROGRAMS PER LITER
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR NAPHTHALENE IN GROUNDWATER IS 100 µg/L.

DRAFTED BY: TP	NAPHTHALENE GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 HARRISVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 18

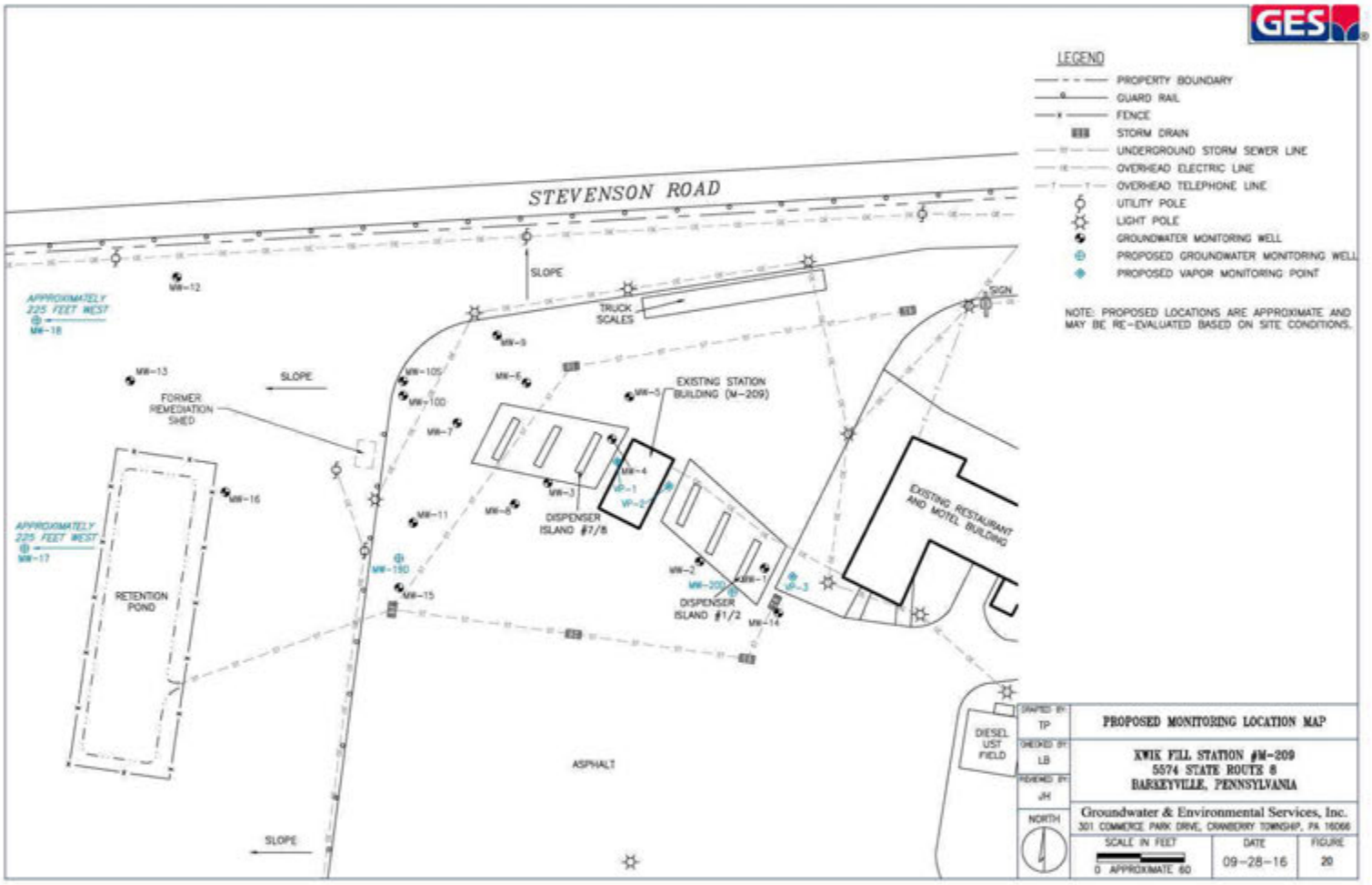


LEGEND

- PROPERTY BOUNDARY
- GUARD RAIL
- FENCE
- STORM DRAIN
- UNDERGROUND STORM SEWER LINE
- OVERHEAD ELECTRIC LINE
- OVERHEAD TELEPHONE LINE
- UTILITY POLE
- LIGHT POLE
- GROUNDWATER MONITORING WELL
- 62 — 1,2,4-TMB ISOCONCENTRATION CONTOUR SHALLOW OVERBURDEN AQUIFER (µg/L)
- 82 — 1,2,4-TMB ISOCONCENTRATION CONTOUR DEEP OVERBURDEN AQUIFER (µg/L)
- CONTOURS DASHED WHERE INFERRED
- (190) 1,2,4-TMB ISOCONCENTRATION SHALLOW OVERBURDEN AQUIFER (µg/L)
- (1,100) 1,2,4-TMB ISOCONCENTRATION DEEP OVERBURDEN AQUIFER (µg/L)
- TMB TRIMETHYLBENZENE
- (µg/L) MICROGRAMS PER LITER
- <# WHERE AN ANALYTE IS NOT DETECTED, THE LABORATORY REPORTING LIMIT IS GIVEN

NOTE: THE ACT 2 USED AQUIFER, NON-RESIDENTIAL MEDIUM-SPECIFIC CONCENTRATION FOR 1,2,4-TMB IN GROUNDWATER IS 62 µg/L.

DRAFTED BY: TP	1,2,4-TMB GROUNDWATER ISOCONCENTRATION MAP AUGUST 15, 2016
CHECKED BY: LB	KWIK FILL STATION #M-209 5574 STATE ROUTE 8 BARKEYVILLE, PENNSYLVANIA
REVIEWED BY: JH	Groundwater & Environmental Services, Inc. 301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
NORTH	SCALE IN FEET: 0 APPROXIMATE 60 / DATE: 09-28-16 / FIGURE: 19


STEVENSON ROAD
SLOPE
TRUCK SCALES
SIGN
APPROXIMATELY 225 FEET WEST
MW-18
MW-12
MW-13
SLOPE
FORMER REMEDIATION SHED
MW-105
MW-100
MW-7
MW-9
MW-6
MW-5
EXISTING STATION BUILDING (M-209)
MW-4
VP-1
VP-2
MW-3
MW-8
DISPENSER ISLAND #7/8
MW-16
MW-11
APPROXIMATELY 225 FEET WEST
MW-17
MW-19D
MW-15
RETENTION POND
MW-2
MW-20D
MW-1
DISPENSER ISLAND #1/2
VP-3
MW-14
EXISTING RESTAURANT AND MOTEL BUILDING
DIESEL UST FIELD
ASPHALT
SLOPE
LEGEND
PROPERTY BOUNDARY
GUARD RAIL
FENCE
STORM DRAIN
UNDERGROUND STORM SEWER LINE
OVERHEAD ELECTRIC LINE
OVERHEAD TELEPHONE LINE
UTILITY POLE
LIGHT POLE
GROUNDWATER MONITORING WELL
PROPOSED GROUNDWATER MONITORING WELL
PROPOSED VAPOR MONITORING POINT
NOTE: PROPOSED LOCATIONS ARE APPROXIMATE AND MAY BE RE-EVALUATED BASED ON SITE CONDITIONS.
DRAFTED BY: TP
CHECKED BY: LB
REVIEWED BY: JH
NORTH
PROPOSED MONITORING LOCATION MAP
KWIK FILL STATION #M-209
5574 STATE ROUTE 8
HARKEYVILLE, PENNSYLVANIA
Groundwater & Environmental Services, Inc.
301 COMMERCE PARK DRIVE, CRANBERRY TOWNSHIP, PA 16066
SCALE IN FEET
0 APPROXIMATE 60
DATE
09-28-16
FIGURE
20

TABLES

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		5	1,000	700	20	3,500	100	62	1,200
MW-1	10/30/15	100.00	14.15	85.85	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	12/28/15	100.00	12.06	87.94	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	100.00	13.44	86.56	**40.0 M1**	25.0 M1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	100.00	10.83	89.17	**96.4**	53.5	7.9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	100.00	13.58	86.42	**333**	21.1	36.5	< 5.0	5.3	< 5.0	14.7	< 5.0
	07/14/16	100.00	14.18	85.82	**59.7**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	100.00	14.73	85.27	**371**	< 5.0	26.8	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-2	10/30/15	99.18	14.04	85.14	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	12/28/15	99.18	13.28	85.90	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	99.18	14.28	84.90	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	99.18	12.79	86.39	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	99.18	13.64	85.54	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	99.18	14.09	85.09	< 5.0	< 5.0	< 5.0	6.0	< 5.0	< 5.0M1	< 5.0	< 5.0
	08/15/16	99.18	14.71	84.47	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-3	10/30/15	98.83	8.45	90.38	**17.2**	< 5.0	< 5.0	**113**	< 5.0	9.0	24.7	9.9
	12/28/15	98.83	8.59	90.24	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.1	< 5.0
	01/28/16	98.83	9.37	89.46	**58.5**	< 5.0	< 5.0	18.2	< 5.0	< 5.0	6.2	< 5.0
	04/14/16	98.83	8.02	90.81	**227**	48.3	36.6	17.0	< 5.0	25.5	**80.0**	28.8
	05/23/16	98.83	9.10	89.73	**260**	23.7	50.6	8.5	9.2	33.7	**140**	45.0
	07/14/16	98.83	9.05	89.78	**164**	9.0	48.9	6.3	6.4	61.8	**129**	43.5
	08/15/16	98.83	9.22	89.61	**84.1**	10.4	68.7	6.4	8.4	82.1	**190**	59.7
MW-4	10/30/15	98.86	6.63	92.23	**8.3**	< 5.0	14.9	6.7	< 5.0	9.3	< 5.0	< 5.0
	12/28/15	98.86	5.42	93.44	< 5.0	< 5.0	< 5.0	7.0	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.86	7.11	91.75	< 5.0	< 5.0	< 5.0	8.8	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.86	6.82	92.04	**10.3**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.86	7.60	91.26	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.86	7.71	91.15	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.86	7.93	90.93	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-5	12/28/15	98.60	5.98	92.62	< 5.0	< 5.0	< 5.0	**22.6**	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.60	7.95	90.65	< 5.0	< 5.0	< 5.0	**55.8**	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.60	6.44	92.16	< 5.0	< 5.0	< 5.0	**50.4**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.60	7.41	91.19	< 5.0	< 5.0	< 5.0	18.3	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.60	7.52	91.08	< 5.0	< 5.0	< 5.0	7.3	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.60	7.31	91.29	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		5	1,000	700	20	3,500	100	62	1,200
MW-6	12/28/15	98.29	17.91	80.38	< 5.0	< 5.0	< 5.0	**1,850**	< 5.0	< 5.0	< 5.0	< 5.0
	01/28/16	98.29	16.34	81.95	< 5.0	< 5.0	< 5.0	**827**	< 5.0	< 5.0	< 5.0	< 5.0
	04/14/16	98.29	15.47	82.82	< 5.0	< 5.0	< 5.0	**598**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.29	15.33	82.96	< 5.0	< 5.0	< 5.0	**484**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.29	15.46	82.83	< 5.0	< 5.0	< 5.0	**550**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.29	14.11	84.18	< 5.0	< 5.0	< 5.0	**613**	< 5.0	< 5.0	< 5.0	< 5.0
MW-7	12/28/15	97.65	15.28	82.37	**5.2**	< 5.0	< 5.0	**262**	< 5.0	< 5.0	5.1	< 5.0
	01/28/16	97.65	14.12	83.53	< 5.0	< 5.0	< 5.0	**70.7**	5.4	< 5.0	15.0	7.3
	04/14/16	97.65	13.66	83.99	< 5.0	< 5.0	8.0	9.6	13.6	< 5.0	**81.4**	< 5.0
	05/23/16	97.65	13.52	84.13	< 5.0	< 5.0	12.3	8.3	12.5	< 5.0	**74.1**	< 5.0
	07/14/16	97.65	13.61	84.04	< 5.0	< 5.0	6.3	7.5	27.5	< 5.0	**212**	< 5.0
	08/15/16	97.65	15.61	82.04	< 5.0	< 5.0	< 5.0	9.6	8.1	< 5.0	34.3	< 5.0
MW-8	12/28/15	98.13	DRY	NA	-	-	-	-	-	-	-	-
	01/28/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	04/14/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	05/23/16	98.13	DRY	NA	-	-	-	-	-	-	-	-
	07/14/16	98.13	12.85	85.28	< 5.0	< 5.0	16.1	**633**	< 5.0	8.9	< 5.0	< 5.0
	08/15/16	98.13	12.82	85.31	< 5.0	< 5.0	5.2	**830**	< 5.0	< 5.0	< 5.0	< 5.0
MW-9	04/14/16	99.03	28.16	70.87	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	99.03	28.68	70.35	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	99.03	28.44	70.59	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	99.03	27.35	71.68	< 5.0	< 5.0	< 5.0	9.7	< 5.0	< 5.0	< 5.0	< 5.0
MW-10D	04/14/16	98.85	39.38	59.47	< 5.0	< 5.0	< 5.0	**23.4**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.85	39.49	59.36	< 5.0	< 5.0	< 5.0	15.6	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.85	43.69	55.16	< 5.0	< 5.0	< 5.0	9.1	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.85	44.31	54.54	< 5.0	< 5.0	< 5.0	**25.6**	< 5.0	< 5.0	< 5.0	< 5.0
MW-10S	04/14/16	98.77	16.64	82.13	< 5.0	< 5.0	< 5.0	**146**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	98.77	16.67	82.10	< 5.0	< 5.0	< 5.0	**78.7**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	98.77	16.79	81.98	< 5.0	< 5.0	< 5.0	**281**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	98.77	17.71	81.06	< 5.0	< 5.0	< 5.0	**33.4**	< 5.0	< 5.0	< 5.0	< 5.0
MW-11	04/14/16	97.23	22.25	74.98	< 5.0	< 5.0	< 5.0	**641**	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	97.23	20.01	77.22	< 5.0	< 5.0	< 5.0	**390**	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	97.23	20.15	77.08	< 5.0	< 5.0	< 5.0	**37.7**	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	97.23	20.81	76.42	< 5.0	< 5.0	< 5.0	**189**	< 5.0	< 5.0	< 5.0	< 5.0
MW-12	04/14/16	59.71	9.62	50.09	< 5.0	< 5.0	< 5.0	9.8	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	59.71	9.86	49.85	**6.1**	< 5.0	6.5	< 5.0	13.9	< 5.0	< 5.0	5.3
	07/14/16	59.71	9.93	49.78	**5.6**	< 5.0	< 5.0	< 5.0	25.2	< 5.0	< 5.0	< 5.0
	08/15/16	59.71	10.93	48.78	< 5.0	< 5.0	< 5.0	< 5.0	26.7	< 5.0	< 5.0	< 5.0

Table 1

GROUNDWATER DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date	Casing Elevation	Depth to Water	Water Elevation	Benzene	Toluene	Ethylbenzene	MTBE	Isopropylbenzene	Naphthalene	1,2,4-TMB	1,3,5-TMB
			PA Act 2 U/NR MSCs		5	1,000	700	20	3,500	100	62	1,200
MW-13	04/14/16	60.62	7.74	52.88	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	05/23/16	60.62	8.02	52.60	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	07/14/16	60.62	8.08	52.54	**15.6**	< 5.0	< 5.0	6.4	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	60.62	8.79	51.83	**27.1**	< 5.0	< 5.0	6.3	< 5.0	< 5.0	< 5.0	< 5.0
MW-14	07/14/16	100.20	14.20	86.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	100.20	14.95	85.25	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MW-15	07/14/16	96.90	15.11	81.79	< 5.0	< 5.0	< 5.0	8.4	< 5.0	< 5.0	< 5.0	< 5.0
	08/15/16	96.90	15.42	81.48	< 5.0	< 5.0	< 5.0	10.8	< 5.0	< 5.0	< 5.0	< 5.0
MW-16	07/14/16	67.84	12.84	55.00	**226**	176	456	5.6	51.8	**165**	**1,740**	646
	08/15/16	67.84	13.39	54.45	**168**	218	423	5.4	46.5	**136**	**1,100**	329

NOTES
All laboratory results and U/NR MSCs are reported in micrograms per liter.
Elevation and depth to water measurements are reported in feet.
U/R MSC = Used Aquifer/Residential Medium-Specific Concentration
BOLD = Indicates exceedance of applicable Act 2 MSC
<# = Less than laboratory reporting limit of #
Laboratory analytical data qualifiers are referenced above, following the analytical result. Refer to laboratory report appendices for qualifier descriptions.

MTBE = Methyl tert-butyl ether
TMB = Trimethylbenzene

Table 2

WELL CONSTRUCTION SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 Route 8
Barkeyville, PA

Well	Date Installed	Current Top of Casing Elevation[1] (feet)	Well Diameter (inches)	Total Depth (feet)	Total PVC Screen Length (feet)	Total PVC Riser Length (feet)
MW-1	09/08/15	100.00	4	20	15	5
MW-2	09/08/15	99.18	4	20	15	5
MW-3	09/04/15	98.83	4	20	15	5
MW-4	09/04/15	98.86	4	20	15	5
MW-5	12/01/15	98.60	4	20	15	5
MW-6	12/01/15	98.29	4	20	15	5
MW-7	11/30/15	97.65	4	20	15	5
MW-8	11/30/15	98.13	4	20	15	5
MW-9	02/19/16	99.03	4	30	25	5
MW-10D	02/23/16	98.85	2	40	10	30
MW-10S	02/22/16	98.77	4	25	20	5
MW-11	02/22/16	97.23	4	30	25	5
MW-12	02/18/16	59.71	4	19	15	7
MW-13	02/18/16	60.62	4	15	10	8
MW-14	06/22/16	100.20	4	24	20	4
MW-15	06/22/16	96.90	4	35	20	15
MW-16	06/21/16	67.84	2	20	15	8

NOTES:
PVC - poly-vinyl chloride

1) Top of casing elevations relative to an on-site benchmark.
2) Monitoring wells MW-12, MW-13 and MW-16 were completed above ground surface.

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
MW-1	09/01/15	3-4	422	**886**	3,800	2,060	<4.7	89.0	2,940	10,300	3,210
MW-1	09/01/15	6-7	93.2	37.4	23.0	19.6	<4.2	7.6	19.1	39.8	12.2
MW-1	09/03/15	10-11	10.4	32.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9
MW-2	09/02/15	1-2	12.9	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-2	09/03/15	18-19	5.5	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-3	08/31/15	6-7	>15,000	**3,770**	10,400	12,100	<274	3,570	21,700	**55,700**	17,300
MW-3	09/03/15	8-9	559.7	**2,260**	<232	1,470	<4.4	<4.4	697	2,000	610
MW-3	09/03/15	10-11	449.5	**3,150**	31.2	1,880	<4.8	1,100	114	12,200	43.9
MW-4	08/31/15	7-8	>15,000	**1,750**	9,980	2,710	<4.4	72.2	2,840	6,550	2,070
MW-4	09/03/15	10-11	680.9	**8,180**	20,300	22,600	<4.9	3,580	10,800	**41,600**	11,800
MW-5	11/24/15	3-4	109.4	<230	<230	<230	<230	<230	<230	<230	<230
MW-5	12/01/15	10-11	172.1	<203	<203	<203	<203	<203	<203	<203	<203
MW-5	12/01/15	12-13	8.9	<236	<236	<236	366	<236	<236	<236	<236
MW-6	11/24/15	3-4	4.7	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
MW-6	12/01/15	9-10	12.8	<315	<315	702	<315	<315	<315	<315	<315
MW-6	12/01/15	14-15	1.9	<214	<214	<214	<214	<214	<214	<214	<214
MW-7	11/24/15	4-5	142.5	<233	<233	<233	<233	<233	2,630	1,860	682
MW-7	11/30/15	14-15	365.3	<255	<255	490	<255	881	1,230	24,100	8,990
MW-7	11/30/15	19-20	11.0	<256	<256	<256	356	<256	<256	<256	<256
MW-8	11/25/15	4-5	5.0	<211	<211	<211	<211	<211	<211	<211	<211
MW-8	11/30/15	10-11	324.4	<284	<284	<284	<284	<284	<284	<284	<284
MW-8	11/30/15	18-19	3.9	<248	<248	820	<248	353	999	5,980	2,150
MW-9	02/15/16	4-5	1.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
MW-9	02/18/16	15-17	15.5	<3.2	<3.2	3.6	<3.2	<3.2	4.6	69.9	20.3
MW-9	02/18/16	17-19	3.0	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-10D	02/17/16	4-5	3.8	<158	<158	<158	<158	<158	<158	<158	<158
MW-10D	02/23/16	17-19	69.2	189	262	<173	<173	<173	<173	475	<173
MW-10D	02/23/16	27-29	40.9	<3.7	<3.7	<3.7	581	<3.7	<3.7	<3.7	<3.7
MW-10D	02/23/16	29-31	10.2	<3.3	<3.3	<3.3	219	<3.3	<3.3	<3.3	<3.3
MW-10S	02/17/16	4-5	3.4	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-10S	02/22/16	23-25	40.3	23.6	<3.6	<3.6	928	<3.6	<3.6	<3.6	<3.6
MW-10S	02/22/16	25-27	32.1	36.4	<3.4	<3.4	828	<3.4	<3.4	<3.4	<3.4
MW-11	02/17/16	4-5	2.7	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6	<3.6
MW-11	02/22/16	17-19	44.2	12.5	<3.1	<3.1	3.0	<3.1	4.5	29.3	3.3
MW-11	02/22/16	23-25	27.6	6.0	<3.6	<3.6	31.6	<3.6	<3.6	<3.6	<3.6

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
MW-12	02/17/16	4-5	0.0	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8
MW-12	02/18/16	9-11	15.3	<3.3	<3.3	7.6	<3.3	6.0	4.9	49.0	9.2
MW-12	02/18/16	11-13	50.0	<149	<149	584	<149	670	754	13,300	4,410
MW-13	02/17/16	3-4	0.0	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4
MW-13	02/17/16	9-11	20.8	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1	<3.1
MW-13	02/17/16	11-13	11.3	20.6	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
MW-14	06/21/16	4-5	1.4	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
MW-14	06/22/16	14-15	3.7	18.3	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4
MW-14	06/22/16	19-20	0.8	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
MW-15	06/20/16	4-5	0.7	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
MW-15	06/22/16	15-16	78.6	<4.5	11.9	28.8	<4.5	9.7	12.5	157	44.5
MW-15	06/22/16	26-27	7.7	8.1	<3.3	<3.3	113	<3.3	<3.3	<3.3	<3.3
MW-16	06/21/16	4-5	54.5	56.0	9.4	71.6	<5.9	31.0	<5.9	36.4	134
MW-16	06/21/16	13-14	512.3	**511**	4,070	21,300	<217	4,750	9,170	**113,000**	39,600
MW-16	06/21/16	17-18	5.8	33.9	68.3	59.6	<4.1	5.5	9.7	98.7	26.6
SB-1	09/02/15	2-3	500	**4,370**	20,200	7,480	<5.0	1,060	5,890	19,500	<5.0
SB-1	09/02/15	5-6	38.1	52.2	15.7	11.3	<4.7	<4.7	10.5	25.0	9.1
SB-1	09/03/15	16-17	6.9	21.5	13.4	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9
SB-2	09/01/15	5-6	296	<270	445	2,760	<270	1,540	15,300	29,900	7,760
SB-2	09/03/15	10-11	54.1	20.7	10.9	7.2	5.3	<5.1	14.6	15.0	5.9
SB-3	11/23/15	3-4	3.8	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
SB-3	12/02/15	7-8	25.2	<294	<294	458	<294	<294	<294	<294	<294
SB-3	12/02/15	13-14	0.1	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
SB-4	11/23/15	3-4	3.8	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2	<4.2
SB-4	12/02/15	19-20	7.8	<222	<222	<222	<222	<222	<222	<222	<222
SB-5	11/24/15	3-4	1,289	**<2,420**	76,000	38,700	**<2,420**	5,350	10,400	**130,000**	46,900
SB-5	12/01/15	6-7	616.6	**2,880**	9,160	14,700	323	1,360	4,710	27,500	8,000
SB-5	12/01/15	12-13	4.0	<227	<227	<227	287	<227	<227	<227	<227
SB-6	11/24/15	4-5	14.9	7.0	<4.5	<4.5	<4.5	<4.5	4.7	<4.5	<4.5
SB-6	12/01/15	9-10	105.1	<213	<213	<213	<213	<213	<213	492	227
SB-6	12/01/15	20-21	5.3	<295	<295	<295	<295	<295	<295	<295	<295
SB-7	02/15/16	3-4	272.9	<189	674	<440	<189	<189	319	1,290	401
SB-7	02/19/16	5-7	28.3	<3.6	<3.6	58.4	<3.6	14.7	12.6	62.1	5.9
SB-7	02/19/16	9-11	16.2	<3.5	<3.5	<3.5	193	<3.5	<3.5	<3.5	<3.5

Table 3

SOIL DATA SUMMARY

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, PA

Soil Sample ID	Date	Depth (ft)	PID (ppm)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	MTBE (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)	1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)
PA Act 2 U/NR MSC (0 - 2 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
PA Act 2 U/NR MSC (2 - 15 ft) (Unsaturated)[1]				**500**	**100,000**	**70,000**	**2,000**	**2,500,000**	**25,000**	**35,000**	**210,000**
SB-8	02/17/16	5-6	423.5	**<1,770**	<1,770	<1,770	<1,770	<1,770	9,250	13,500	3,690
SB-8	02/19/16	11-13	65.5	<149	<149	<149	<149	<149	<149	985	<149
SB-8	02/19/16	13-14	49.0	39.0	<3.1	<3.1	52.4	<3.1	6.5	36.1	4.6
SB-9	02/17/16	4-5	4.0	<170	<170	<170	<170	<170	<170	<170	<170
SB-9	02/19/16	5-7	6.5	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
SB-9	02/19/16	7-9	4.5	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3	<3.3
SB-10	06/20/16	7-8	533.4	**627**	<243	969	<243	866	5,170	10,800	4,570
SB-10	06/22/16	11-12	472.3	**7,820**	1,460	14,700	<225	3,000	7,270	**44,100**	6,280
SB-10	06/22/16	15-16	3.2	<5.2	<5.2	<5.2	1,250	<5.2	<5.2	<5.2	<5.2
SB-11	06/21/16	3-4	1.5	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
SB-11	06/22/16	5-7	68.5	<4.1	<4.1	<4.1	<4.1	<4.1	<4.1	4.6	<4.1
SB-11	06/22/16	11-13	12.7	98.9	<4.9	<4.9	78.0	<4.9	<4.9	15.7	<4.9

NOTES:

BOLD	Indicates exceedance of applicable Act 2 U/NR MSC	PID	photoionization detector
<#	Less than laboratory reporting limit of #	ppm	parts per million
ft	feet below ground surface	MTBE	methyl tert-butyl ether
µg/kg	micrograms per kilogram	TMB	trimethylbenzene

[1] PADEP Act 2 Statewide Health Standard, Used Aquifer (U) /Non-Residential (NR) Medium-Specific Concentration (MSC), 25 PA Code Chapter 250, Rev. 2016

APPENDIX A

Facility Photographs

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Southwest

Date Taken:

6-11-2015

Description:

View of Kwik Fill diesel station (#M-209) building and dispensers.

Direction of View:

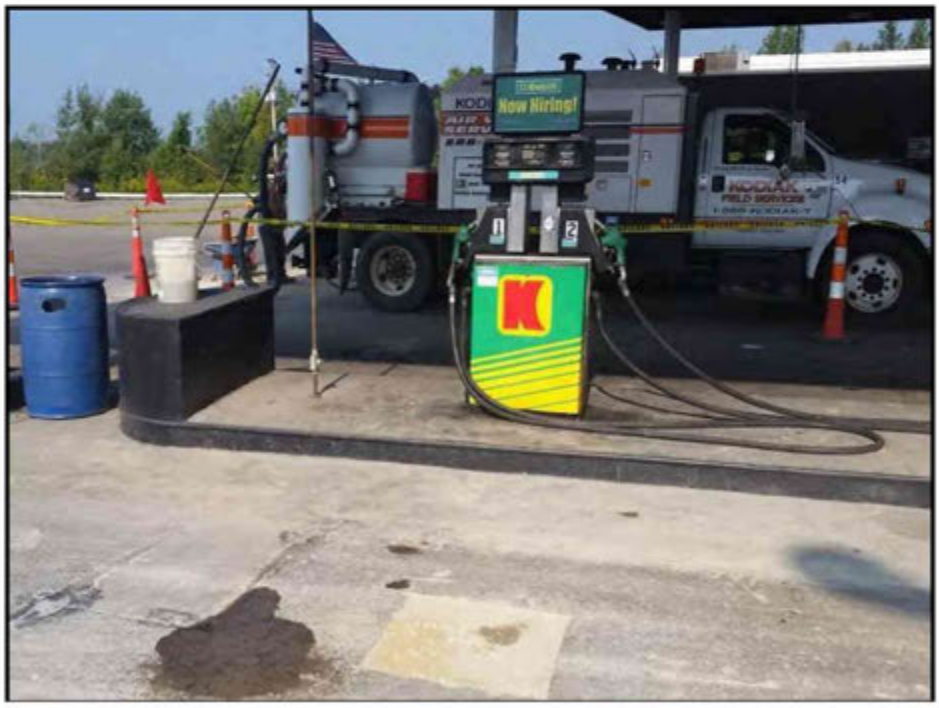
West

Date Taken:

9-8-2015

Description:

View of diesel dispensers #1/2 located east of station building.



FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

East

Date Taken:

6-11-2015

Description:

View of diesel dispensers #7/8 located immediately west of station building.

Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of diesel UST field.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of on-site Kwik Fill gas station (#M-229) along State Route 8.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of Kwik Fill motel and restaurant between Kwik Fill diesel station (#M-209) and Kwik Fill gas station (#M-229).

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

West

Date Taken:

6-11-2015

Description:

View of former remedial system shed along western parking lot boundary.

Direction of View:

Northwest

Date Taken:

6-11-2015

Description:

View of off-site unnamed pond located approximately 400 feet northwest (downgradient) of the facility.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

South

Date Taken:

6-11-2015

Description:

View of sewage treatment plant located along Stevenson Road.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of residential property east of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

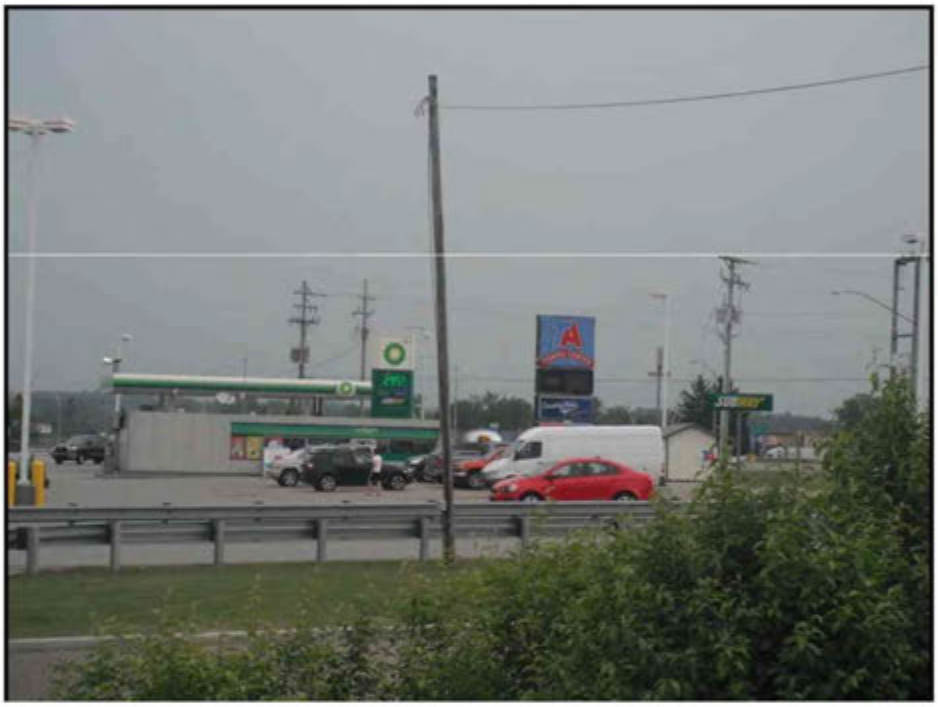
North

Date Taken:

6-11-2015

Description:

View of Barkeyville Travel Center located north of the facility beyond Stevenson Road.



Direction of View:

Northeast

Date Taken:

6-11-2015

Description:

View of Heath Oil Inc. located east of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

East

Date Taken:

6-11-2015

Description:

View of Gahr's Truck and Tire Service located east of the facility beyond State Route 8.

Direction of View:

Southeast

Date Taken:

6-11-2015

Description:

View of vacant commercial building located southeast of the facility beyond State Route 8.

FACILITY PHOTOGRAPHS

United Refining Company
Kwik Fill Station #M-209
5574 State Route 8
Barkeyville, Pennsylvania

Direction of View:

Southwest

Date Taken:

6-11-2015

Description:

View of residential property located south of the facility along State Route 8.