MEMO

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From:
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Date:
October 17, 2019

Arcadis Project No.:
30003608

Subject:
Third Quarter 2019 Groundwater Sampling Summary
Northern Cold Spring Terminal
Hillside Road, Lysander, New York

Arcadis U.S., Inc. (Arcadis) is pleased to submit this groundwater monitoring memorandum and supporting attachments for the above-referenced site for the third quarter 2019 groundwater sampling event. The site location is shown on **Figure 1**.

The groundwater monitoring field event was completed by Arcadis personnel August 27 through 29, 2019. Quarterly groundwater monitoring events at the subject site began in May 2018 and are conducted in compliance with the Arcadis Supplemental Characterization and Interim Remedial Action Work Plan (Work Plan) dated February 21, 2018. Included herein are summaries of the field activities, field observations, and analytical results for groundwater sampling completed during the August 2019 event.

FIELD ACTIVITIES

During the August 2019 event, Arcadis completed groundwater monitoring and gauging. A liquid level meter, which is able to detect non-aqueous phase liquid (NAPL), was used to gauge each well for NAPL and measure groundwater levels at each monitoring well identified in the Work Plan with an accuracy of approximately 0.01 feet. The following 21 monitoring well locations were scheduled to be sampled: BMW2, BMW3, BMW5, BMW6, BMW7, BMW8, BMW9, BMW13, BMW14R, MW-201, MW-202, MW-203, MW-204, MW-205, MW-206, MW-207, MW-208, MW-209, MW-210, MW-211, PZ106S (shown on **Figure 2**). A total of 14 monitoring wells were sampled. The following two monitoring wells were not sampled because there was NAPL present: BMW5 and BMW13. The following five monitoring wells were not sampled because there was insufficient water column: BMW6, BMW7, MW-201, MW-202, and MW- 203. The remaining 14 monitoring wells were purged and sampled using disposable bailers and a three-volume purge technique. Purge water and equipment rinse water was containerized and will be sent for

off-site disposal at Covanta Environmental Solutions – Mohawk located at 120 Dry Road Oriskany, New York (Formerly Industrial Oil Services). The waste was profiled and is awaiting pick-up. Following collection, all samples were packed on ice and submitted to Pace Analytical in accordance with chain-of-custody procedures. Groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), carbon dioxide, sulfate, alkalinity, ferrous iron, and manganese.

RESULTS

Groundwater Flow Conditions

A summary of the groundwater elevation data is provided in **Table 1** and illustrated on **Figure 3**. Groundwater flow across the site was generally towards the south during the data collection event.

Groundwater Analytical Results

Current and historical groundwater laboratory analytical results for benzene, toluene, ethylbenzene, and xylenes (BTEX); total VOCs; and total SVOCs are summarized in **Table 2**. The detailed third quarter 2019 groundwater analytical data are presented in **Table 3**. Current and historical groundwater results and Total VOCs and Total SVOCs are illustrated on **Figure 4**. The complete laboratory report for the sampling event is included as **Attachment A**.

During the August 2019 sampling event, samples collected from 3 of the 14 monitoring wells sampled (BMW14R, MW-204, and MW-208) exhibited one or more VOC constituents at concentrations greater than NYSDEC ambient water quality standards and guidance values presented in NYSDEC's Technical and Operational Guidance Series (TOGS) 1.1.1. Samples collected from monitoring wells BMW2, BMW3, BMW8, BMW9, BMW14R, MW-204, MW-208, MW-210, and MW-211 exhibited concentrations of manganese greater than NYSDEC ambient water quality standards and guidance values presented in NYSDEC's TOGS 1.1.1.

The dissolved phase analytical results from the 2018 sampling events (second, third, and fourth quarters) and the 2019 sampling events (first, second, and third quarters) are generally consistent.

SUMMARY AND FUTURE PLANNED ACTIVITES

Groundwater samples were collected from a total of 14 monitoring wells during the third quarter monitoring event to provide a representation of current dissolved constituent concentrations at the subject site and to monitor NAPL thicknesses and locations across the site. One or more individual dissolved phase BTEX concentrations above TOGS 1.1.1 were detected at 3 of the 14 monitoring wells. During the pre-sampling groundwater gauging event, NAPL was detected at monitoring wells BMW5 and BMW13. No other monitoring wells gauged during this event indicated NAPL.

Groundwater sample collection and associated reporting will continue quarterly throughout 2019. Following the fourth quarter 2019 sampling event, data will be reviewed for trends and for mapping future actions at the site.

If there are any questions regarding this memorandum, please contact Vin Maresco of Arcadis at 315.671.9256.

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Attachments:

Tables

Table 1 – 2019 Groundwater Measurements
Table 2 – Historical Summary of Groundwater Constituents of Concern
Table 3 – Groundwater Analytical Data

Figures

Figure 1 – Site Location Map
Figure 2 – Northern Terminal Groundwater Monitoring Well Network
Figure 3 – Groundwater Contour – 2019 – Third Quarter
Figure 4 – Total VOC and SVOC Concentrations

Attachments

Attachment A – Laboratory Reports

TABLES

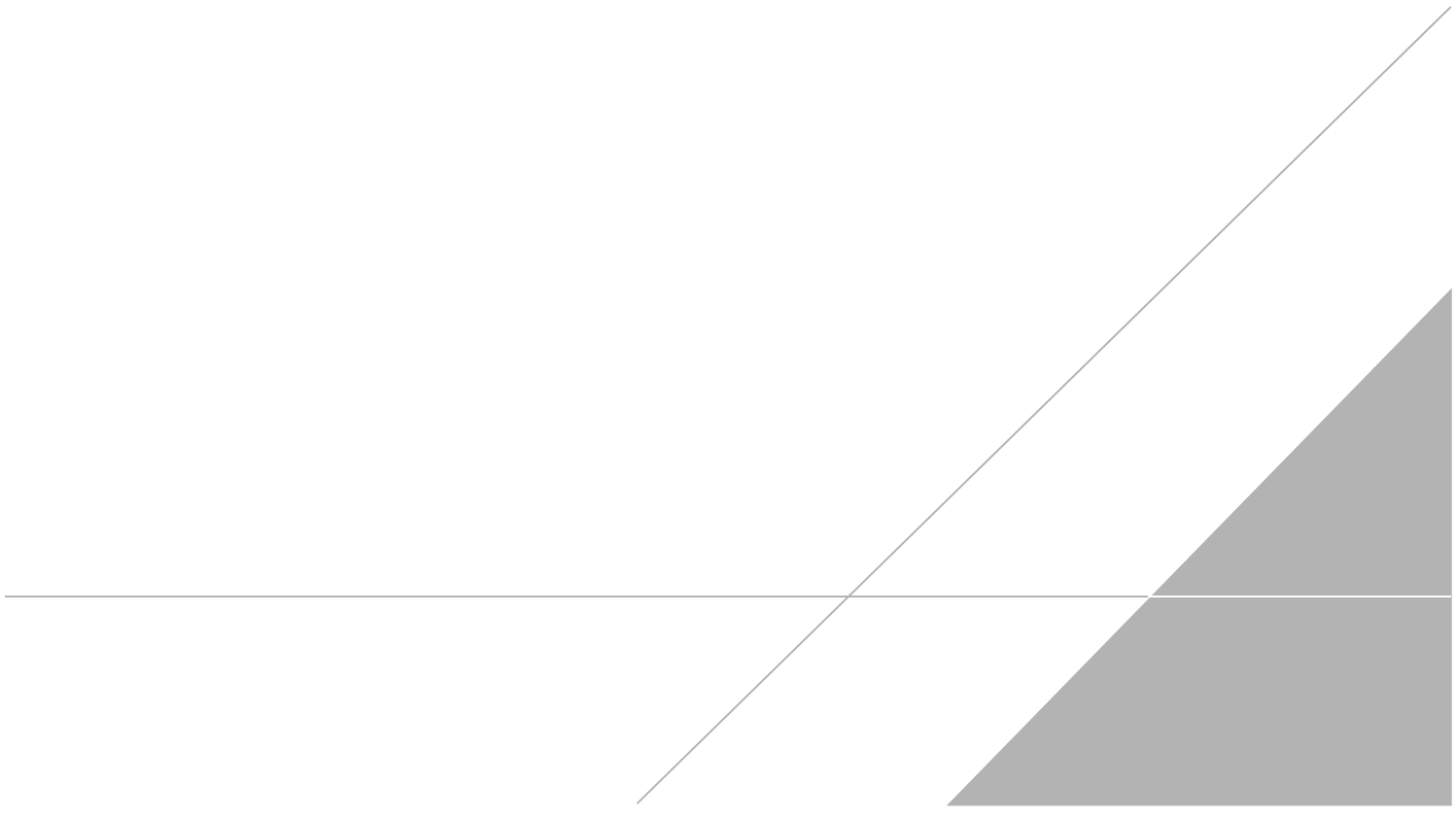


Table 1
2019 Groundwater Measurements - August 27, 2019

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Well ID	Northing	Easting	Measuring Point	Diameter (inches)	Screen Interval (ft bgs)	DTP (bmp)	DTW* (bmp)	Apparent Product Thickness	GWE	Corrected GWE	Notes
BMW2	1141472.09	909051.25	396.65	2	15.3-34.0	ND	12.42	ND	384.23	384.23	
BMW3	1141323.86	908969.02	395.30	2	3.5-29.0	ND	21.61	ND	373.69	373.69	
BMW5	1141248.92	908820.46	389.50	2	10.0-30.0	24.60	25.44	0.84	364.06	364.72	No sample collected due to the presence of NAPL.
BMW6	1141286.17	908914.24	394.88	2	10.0-30.0	ND	29.63	ND	365.25	365.25	No sample collected, insufficient water column to sample. LL collected.
BMW7	1141347.84	908824.60	397.61	2	5.0-15.0	ND	14.44	ND	383.17	383.17	No sample collected. The well purged dry and did not recharge; LL collected prior to purge.
BMW8	1141420.52	908826.55	399.86	2	5.0-20.0	ND	12.50	ND	387.36	387.36	
BMW9	1141334.24	909181.88	380.15	2	5.0-15.0	ND	8.99	ND	371.16	371.16	
BMW13	1141243.20	909014.31	382.60	4	UK	18.92	18.92	<0.01	363.68	363.68	No sample collected due to the presence of NAPL.
BMW14R	1141257.52	909096.329	379.82	2	5.0-20.0	ND	16.10	ND	363.72	363.72	
MW-201	1141290.74	908861.62	395.24	2	14.0-24.0	ND	25.23	ND	370.01	370.01	No sample collected, insufficient water column to sample. LL collected.
MW-202	1141329.17	908898.17	395.25	2	6.0-16.5	ND	16.65	ND	378.60	378.60	No sample collected, insufficient water column to sample. LL collected.
MW-203	1141307.55	909013.86	394.31	2	5.0-20.0	ND	DRY	ND	NA	NA	No sample collected, well was dry.
MW-204	1141427.24	908980.08	394.95	2	5.0-20.0	ND	9.83	ND	385.12	385.12	
MW-205	1141543.83	908866.84	397.79	2	10.0-20.0	ND	6.45	ND	391.34	391.34	
MW-206	1141541.04	908921.18	397.68	2	5.0-20.0	ND	3.14	ND	394.54	394.54	
MW-207	1141519.38	908997.73	398.50	2	5.0-20.0	ND	6.72	ND	391.78	391.78	
MW-208	1141526.88	909080.26	397.09	2	5.0-20.0	ND	11.68	ND	385.41	385.41	
MW-209	1141600.72	909076.11	399.62	2	5.0-20.0	ND	1.47	ND	398.15	398.15	
MW-210	1141345.09	909129.64	386.60	2	8.0-18.0	ND	13.4	ND	373.20	373.20	
MW-211	1141377.65	909200.72	387.45	2	5.0-15.0	ND	12.2	ND	375.25	375.25	
PZ106S	1141279.48	909152.97	374.02	2	5.5-15.5	ND	8.64	ND	365.38	365.38	

Notes:

* DTW was above the screened interval for the following wells: BMW2, MW-205, MW-206, MW-207, and MW-209.
Corrected GWE = GWE + (NAPL Specific density (0.79) x Product thickness)
bmp = Below measuring point
DTP = Depth to product
DTW = Depth to water
ft bgs = Feet below ground surface
GWE = Groundwater elevation
ID= Identification
LL = Liquid level
NA = Not applicable
NAPL = Nonaqueous phase liquid
ND = No detection
UK = Unknown

Table 2
Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m&p-Xylene (µg/L)	Total VOCs (µg/L)	Total SVOCs (µg/L)
NYSDEC TOGS 1.1.1 (GA Groundwater):		1	5	5	5	---	---
BMW2	5/17/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW2	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW2	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW2	2/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW2	5/22/2019	1 U	1 U	1 U	2 U	200 U	0.14 U
BMW2	8/28/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW3	5/15/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW3	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW3	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.11 U
BMW3	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW3	5/22/2019	1 U	1 U	1 U	2 U	200 U	0.11 U
BMW3	8/29/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW5	5/15/2018	NAPL Present					
BMW5	9/25/2018	NAPL Present					
BMW5	12/3/2018	NAPL Present					
BMW5	2/18/2019	NAPL Present					
BMW5	5/20/2019	NAPL Present					
BMW5	8/27/2019	NAPL Present					
BMW6	5/16/2018	1 U	2.2	1 U	2 U	4.8	26.2
BMW6	9/25/2018	Dry					
BMW6	12/3/2019	Dry					
BMW6	2/18/2019	Dry					
BMW6	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW6	8/27/2019	Dry					
BMW7	5/14/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW7	9/25/2018	Dry					
BMW7	12/3/2019	Dry					
BMW7	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW7	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW7	8/27/2019	Dry					
BMW8	5/14/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW8	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW8	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW8	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW8	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW8	8/28/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW9	5/17/2018	1 U	1 U	1 U	2 U	1.3	0.097 U
BMW9	9/25/2018	Dry					
BMW9	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW9	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW9	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW9	8/28/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW13	5/17/2018	**4,890**	**14,600**	**1,390**	**7,340**	25,838	8.8
BMW13	9/25/2018	NAPL Present					
BMW13	12/5/2018	**6,220**	**17,300**	**1,250**	**7,130**	38,276.9	2.05
BMW13	2/18/2019	NAPL Present					
BMW13	5/20/2019	NAPL Present					
BMW13	8/27/2019	NAPL Present					
BMW14R	8/6/2018	1 U	1.2	**229**	**843**	2,979.7	1.53
BMW14R	9/25/2018	1 U	1.1	**187**	**796**	4,757.6	6.82
BMW14R	12/5/2018	**2.5**	**17.6**	**149**	**678**	4,345.8	0.93
BMW14R	2/20/2019	1 U	1 U	**202**	**762**	4,156.0	1.92
BMW14R	5/20/2019	NAPL Present					
BMW14R	8/28/2019	1 U	1.6	**101**	**437**	3,422.8	1.24
MW-201	5/15/2018	Not Installed					
MW-201	9/25/2018	Dry					
MW-201	12/3/2018	Dry					
MW-201	2/18/2019	Dry					
MW-201	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-201	8/27/2019	Dry					

See Notes on Page 3.

Table 2
Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m&p-Xylene (µg/L)	Total VOCs (µg/L)	Total SVOCs (µg/L)
NYSDEC TOGS 1.1.1 (GA Groundwater):		1	5	5	5	---	---
MW-202	5/15/2018	Not Installed					
MW-202	9/25/2018	Dry					
MW-202	12/3/2018	Dry					
MW-202	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.11 U
MW-202	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-202	8/27/2019	Dry					
MW-203	5/15/2018	Not Installed					
MW-203	9/25/2018	Dry					
MW-203	12/3/2018	Dry					
MW-203	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.11 U
MW-203	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-203	8/27/2019	Dry					
MW-204	5/15/2018	Not Installed					
MW-204	9/25/2018	**6.3**	**11.9**	**17.3**	**42.7**	138.5	0.099 U
MW-204	12/3/2018	1 U	1 U	1.2	2.1	5.3	0.083 U
MW-204	2/18/2019	**4.6**	2.4	4.2	**8.2**	36.1	0.1 U
MW-204	5/22/2019	**1.3**	1 U	1 U	2.4	10.6	0.098 U
MW-204	8/27/2019	**2.4**	**6.1**	**16.7**	**40.5**	103.8	0.099 U
MW-205	5/15/2018	Not Installed					
MW-205	9/24/2018	1 U	1.6	1 U	2.3	6	0.1 U
MW-205	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-205	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-205	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-205	8/27/2019	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-206	5/15/2018	Not Installed					
MW-206	9/24/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-206	12/3/2018	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.1 U]
MW-206	2/18/2019	Frozen					
MW-206	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-206	8/27/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-207	5/15/2018	Not Installed					
MW-207	9/24/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-207	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-207	2/18/2019	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.12 U]
MW-207	5/21/2019	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.099 U]
MW-207	8/27/2019	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.1 U]
MW-208	5/15/2018	Not Installed					
MW-208	9/24/2018	**2**	1.3	**6.7**	**17.8**	202.1	0.099 U
MW-208	12/3/2018	1 U	1 U	4	**11.4**	58.6	0.091 U
MW-208	2/18/2019	1 U	1 U	4.7	**15.6**	94.6	0.1 U
MW-208	5/21/2019	1 U	1 U	3.9	**10.7**	86.8	0.1 U
MW-208	8/27/2019	**1.4**	1	**17.3**	**59.9**	371.5	0.1 U
MW-209	5/15/2018	Not Installed					
MW-209	9/24/2018	1 U [1 U]	1.1 [1]	1 U [1 U]	2 U [2 U]	1.1 [1]	0.099 U [0.099 U]
MW-209	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.091 U
MW-209	2/18/2019	Frozen					
MW-209	5/22/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-209	8/27/2019	1 U	1 U	1 U	2 U	200 U	0.099 UR1
MW-210	5/15/2018	Not Installed					
MW-210	9/26/2018	1 U	1 U	1 U	2 U	200 U	0.13
MW-210	12/5/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-210	2/20/2019	1 U	1 U	1 U	3.7	20.3	0.1 U
MW-210	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-210	8/28/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-211	5/15/2018	Not Installed					
MW-211	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.29 U
MW-211	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-211	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-211	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-211	8/29/2019	1 U	1 U	1 U	2 U	200 U	0.11 U

See Notes on Page 3.

Table 2
Historical Summary of Groundwater Constituents of Concern

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m&p-Xylene (µg/L)	Total VOCs (µg/L)	Total SVOCs (µg/L)
NYSDEC TOGS 1.1.1 (GA Groundwater):		**1**	**5**	**5**	**5**	**---**	**---**
PZ106S	5/17/2018	1 U	1 U	1 U	2 U	200 U	0.097 U
PZ106S	9/26/2018	1 U	1 U	1 U	2 U	200 U	0.11 U
PZ106S	12/5/2018	1 U	1 U	1 U	2 U	200 U	0.097 U
PZ106S	2/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
PZ106S	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
PZ106S	8/29/2019	1 U	1 U	1 U	2 U	200 U	0.1 U

Notes:
1. Shaded and bold values indicate a criteria exceedance.
2. Field duplicate sample results are presented in brackets.
3. Total VOCs represents all VOCs analyzed.

NAPL = Non-aqueous phase liquid
R1 = RPD value was outside control limits.
SVOC = Semivolatile organic compound
VOC = Volatile organic compound
U = Compound was analyzed for, but not detected.
ug/L = Micrograms per liter

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1.1.1 (GA Groundwater)	Units	BMW2 08/28/19 30322207	BMW3 08/29/19 30322472	BMW8 08/28/19 30322207	BMW9 08/28/19 30322207	BMW14R 08/28/19 30322472	MW-204 08/27/19 30322207	MW-205 08/27/19 30322105
VOCs (EPA 8260C)									
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**1,750**	**17.6**	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**482**	4.8	1 U
Benzene	1	ug/L	1 U	1 U	1 U	1 U	1 U	**2.4**	1 U
Ethanol	- -	ug/L	200 UCH1c	200 U3c	200 UCH1c	200 UCH1c	200 U3c	200 UCH1c	200 UCH1c
Ethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**101**	**16.7**	1 U
Isopropylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**77.7**	3.1	1 U
m&p-Xylene	5	ug/L	2 U	2 U	2 U	2 U	**437**	**40.5**	2 U
Methyl-Tert-Butyl-Ether	10	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	10	ug/L	2 U	2 U	2 U	2 U	**356**	2 U	2 U
n-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**15.3**	1 U	1 U
n-Propylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**178**	**8.1**	1 U
o-Xylene	5	ug/L	1 U	1 U	1 U	1 U	3.6	4.5	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U	1 U	1 U	**9**	1 U	1 U
sec-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**10.3**	1 U	1 U
Tert-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1.3	1 U	1 U
Toluene	5	ug/L	1 U	1 U	1 U	1 U	1.6	**6.1**	1 U
Total VOCs	- -	ug/L	200 U	200 U	200 U	200 U	3,422.8	103.8	200 U
SVOCs (EPA 8270D by SIM)									
Acenaphthene	20	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.59 1c	0.099 U	0.098 U
Acenaphthylene	- -	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Anthracene	50	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Benz(a)Anthracene	0.002	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Benzo(a)Pyrene	- -	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Benzo(b)Fluoranthene	0.002	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Benzo(g,h,i)Perylene	- -	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Benzo(k)Fluoranthene	0.002	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Chrysene	0.002	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Dibenzo(a,h)Anthracene	- -	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Fluoranthene	50	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.11 1c	0.099 U	0.098 U
Fluorene	50	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.41 1c	0.099 U	0.098 U
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Phenanthrene	50	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.1 U1c	0.099 U	0.098 U
Pyrene	50	ug/L	0.1 U	0.1 U1c	0.1 U	0.1 U	0.13 1c	0.099 U	0.098 U
Total SVOCs	- -	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	1.24	0.099 U	0.098 U
Metals (EPA 6010B)									
Manganese	300	ug/L	**406**	**7,250**	**1,390**	**346**	**480**	**1,430**	153
Dissolved Metals									
Manganese	300	ug/L	86	5 U	**1,340**	284	**437**	**1,360**	33.4
General Chemistry									
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	300	710	410	550	590	570	380
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	300	710	410	550	590	570	380
Iron, Ferrous	- -	mg/L	0.1 UH6H1	0.1 UH3H6	0.19 H6H1	1.5 H6H1	0.27 H3H6	1.5 H3H6	0.1 UH6H1
Nitrogen, NO2 plus NO3	- -	mg/L	0.1 U	0.43	0.1 U	0.1 U	0.1 U	1 UD3	0.1 U
Sulfate	- -	mg/L	44.2	100 UD3	77.6	127	100 UD3	14.7	424 ML

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1.1.1 (GA Groundwater)	Units	BMW2 08/28/19 30322207	BMW3 08/29/19 30322472	BMW8 08/28/19 30322207	BMW9 08/28/19 30322207	BMW14R 08/28/19 30322472	MW-204 08/27/19 30322207	MW-205 08/27/19 30322105
Field Parameters									
pH	- -		7.44	13.01	7.38	7.09	7.02	7.23	7.01
Temperature	- -	C	13.49	12.96	17.46	15.43	12.77	14.93	14.91
Conductivity	- -	mS/cm	0.545	0.909	0.859	0.911	0.922	0.912	0.854
Dissolved Oxygen	- -	mg/L	2.52	12.71	2.45	2.04	1.00	1.59	4.89
ORP	- -	mV	19.7	-257.2	16.6	43.9	-67.8	-72.4	47.6
Turbidity	- -	NTU	902	31.5	29.0	8.34	23.4	3.31	2.71

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: / Date Collected: / SDG:	NYSDEC TOGS 1.1.1 (GA Groundwater)	Units	MW-206 08/27/19 30322105	MW-207 08/27/19 30322207	MW-208 08/27/19 30322105	MW-209 08/27/19 30322105	MW-210 08/28/19 30322207	MW-211 08/29/19 30322472	PZ106S 08/29/19 30322472
VOCs (EPA 8260C)									
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U [1 U]	**135**	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U [1 U]	**72.9**	1 U	1 U	1 U	1 U
Benzene	1	ug/L	1 U	1 U [1 U]	**1.4**	1 U	1 U	1 U	1 U
Ethanol	- -	ug/L	200 UCH1c	200 UCH1c [200 UCH1c]	200 UCH1c	200 UCH1c	200 UCH1c	200 U3c	200 U3c
Ethylbenzene	5	ug/L	1 U	1 U [1 U]	**17.3**	1 U	1 U	1 U	1 U
Isopropylbenzene	5	ug/L	1 U	1 U [1 U]	**18**	1 U	1 U	1 U	1 U
m&p-Xylene	5	ug/L	2 U	2 U [2 U]	**59.9**	2 U	2 U	2 U	2 U
Methyl-Tert-Butyl-Ether	10	ug/L	1 U	1 U [1 U]	1 U	1 U	1 U	1 U	1 U
Naphthalene	10	ug/L	2 U	2 U [2 U]	**16.1**	2 U	2 U	2 U	2 U
n-Butylbenzene	5	ug/L	1 U	1 U [1 U]	3.4	1 U	1 U	1 U	1 U
n-Propylbenzene	5	ug/L	1 U	1 U [1 U]	**22.2**	1 U	1 U	1 U	1 U
o-Xylene	5	ug/L	1 U	1 U [1 U]	**12.2**	1 U	1 U	1 U	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U [1 U]	**6.7**	1 U	1 U	1 U	1 U
sec-Butylbenzene	5	ug/L	1 U	1 U [1 U]	3.5	1 U	1 U	1 U	1 U
Tert-Butylbenzene	5	ug/L	1 U	1 U [1 U]	1.9	1 U	1 U	1 U	1 U
Toluene	5	ug/L	1 U	1 U [1 U]	1	1 U	1 U	1 U	1 U
Total VOCs	- -	ug/L	200 U	200 U [200 U]	371.5	200 U	200 U	200 U	200 U
SVOCs (EPA 8270D by SIM)									
Acenaphthene	20	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Acenaphthylene	- -	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Anthracene	50	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Benz(a)Anthracene	0.002	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Benzo(a)Pyrene	- -	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Benzo(b)Fluoranthene	0.002	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 Uip1c2c
Benzo(g,h,i)Perylene	- -	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Benzo(k)Fluoranthene	0.002	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 Uip1c2c
Chrysene	0.002	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Dibenzo(a,h)Anthracene	- -	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Fluoranthene	50	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Fluorene	50	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Phenanthrene	50	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Pyrene	50	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U1c	0.1 U1c2c
Total SVOCs	- -	ug/L	0.1 U	0.1 U [0.1 U]	0.1 U	0.099 UR1	0.1 U	0.11 U	0.1 U
Metals (EPA 6010B)									
Manganese	300	ug/L	58.1	156 [157]	**1,030**	159	**4,040**	**10,800**	271
Dissolved Metals									
Manganese	300	ug/L	5 U	5 U [5 U]	**449**	5 U	**731**	**972**	22.1
General Chemistry									
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	260	300 [300]	350	350	540	500	520
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	260	300 [300]	350	350 ML	540	500	520
Iron, Ferrous	- -	mg/L	0.1 UH6H1	0.1 UH3H6 [0.1 UH3H6]	1.3 H6H1	0.1 UH6H1	0.1 UH6H1	0.1 UH3H6	0.1 UH3H6
Nitrogen, NO2 plus NO3	- -	mg/L	0.54	0.87 [0.88]	0.1 U	0.86	0.1 UML	0.1 U	0.1 U
Sulfate	- -	mg/L	28.2	21.4 [20.4]	10 U	20.9	60.2	100 UD3	100 UD3

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1.1.1 (GA Groundwater)	Units	MW-206 08/27/19 30322105	MW-207 08/27/19 30322207	MW-208 08/27/19 30322105	MW-209 08/27/19 30322105	MW-210 08/28/19 30322207	MW-211 08/29/19 30322472	PZ106S 08/29/19 30322472
Field Parameters									
pH	- -		7.61	7.45	7.61	7.32	7.20	7.23	7.38
Temperature	- -	C	15.45	14.43	14.36	14.53	15.08	13.51	14.74
Conductivity	- -	mS/cm	0.405	0.431	0.560	0.534	0.912	0.819	0.931
Dissolved Oxygen	- -	mg/L	5.70	6.69	4.21	5.89	1.19	3.88	5.09
ORP	- -	mV	-56.8	-93.1	-81.6	72.4	23.6	63.9	58.1
Turbidity	- -	NTU	2.88	14.4	4.49	7.98	47.4	41.8	82.2

See Notes on Page 5.

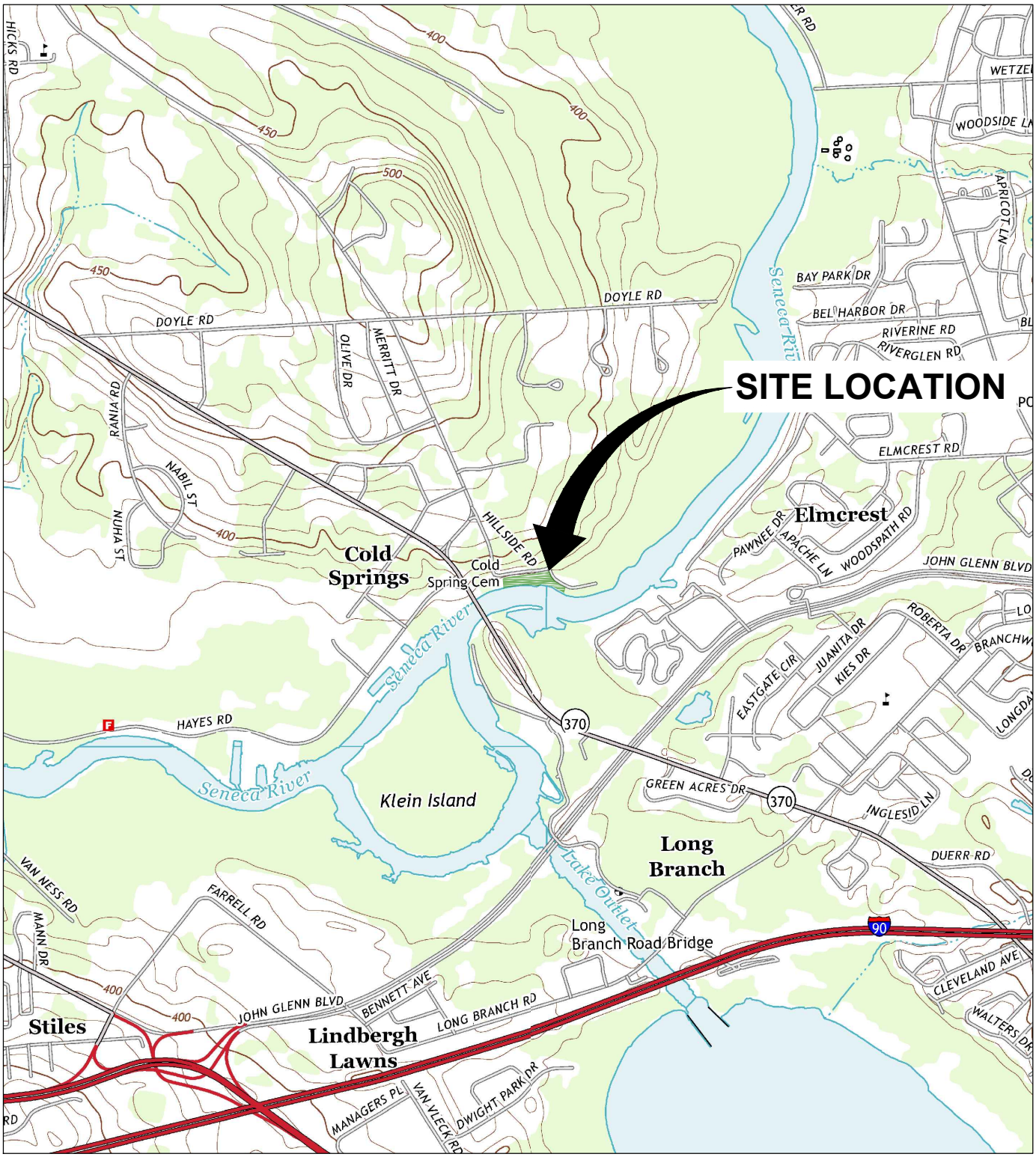
Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Third Quarter
Northern Cold Springs Terminal
Lysander, New York

Notes:
1. Field parameters measurements were taken prior to sampling.
2. Shaded and bold values indicate a criteria exceedance.
3. Field duplicate sample results are presented in brackets.
USEPA = United States Environmental Protection Agency
mg/L = Milligrams per liter
RPD = Relative Percent Difference
SVOC = Semivolatile organic compound
VOC = Volatile organic compound
ug/L = Micrograms per liter

Lab Qualifiers	Definition
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
2c	Sample pH adjusted to <2 in the lab.
3c	RF below method recommended limit.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
H1	Analysis conducted outside the USEPA method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15-minute USEPA required holding time.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
U	Indicates the compound was analyzed for, but not detected.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
ip	Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria in SW846 Method 8270D. Whereas sample results included are reported as individual isomers, the lab and the customer must recognize them as an isomeric pair.
R1	RPD value was outside control limits.

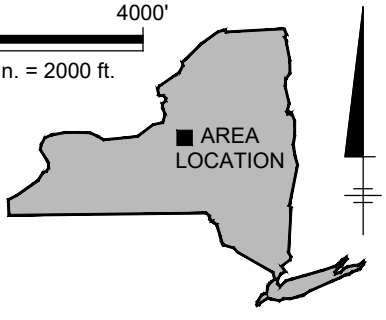
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., BALDWINSVILLE, BREWERTON, CAMILLUS & SYRACUSE WEST, NY, 2013.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



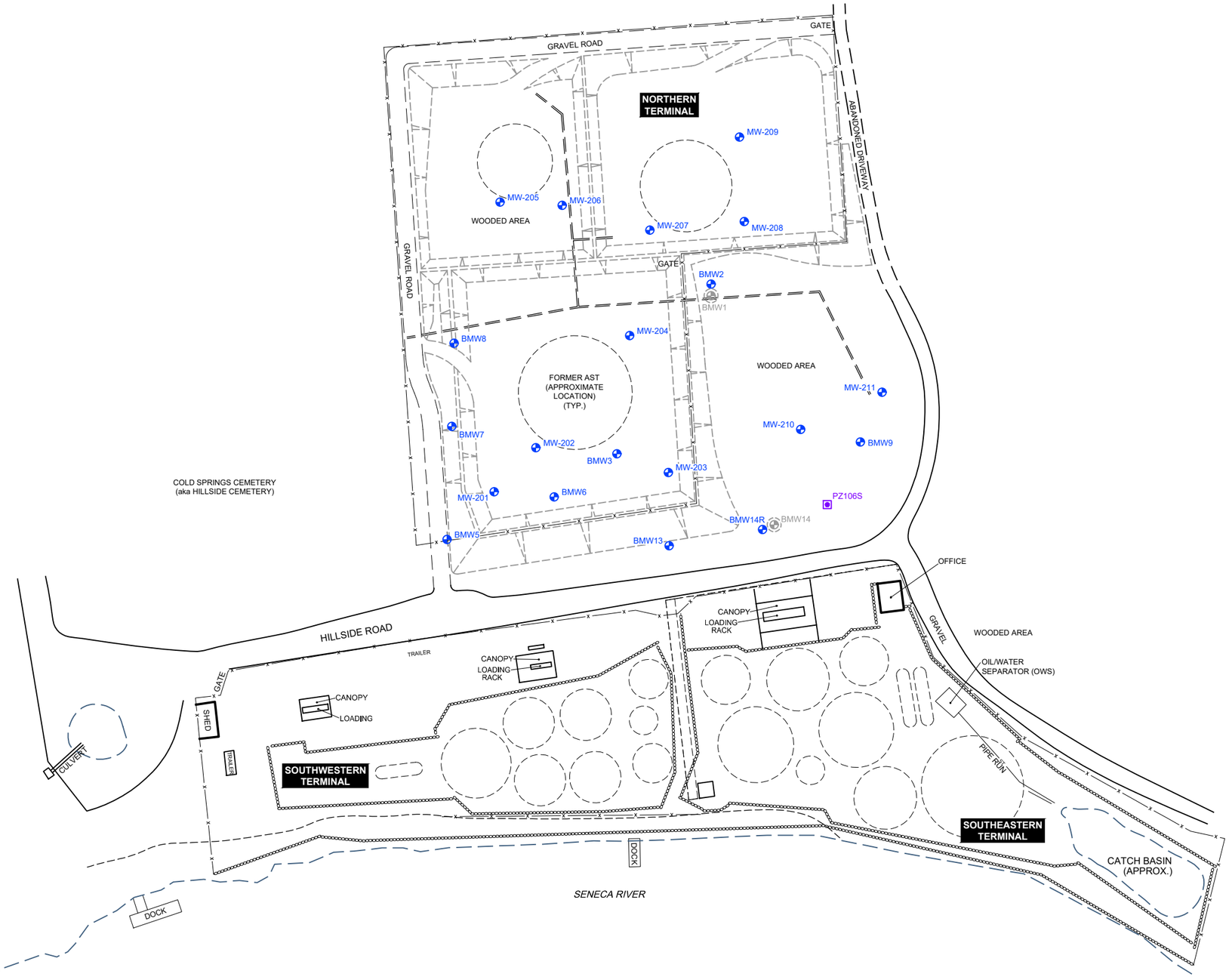
NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY
2019 - THIRD QUARTER

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1



LEGEND:

- MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
2. LOCATION OF PIEZOMETER (PZ106S) WAS SURVEYED ON APRIL 26, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

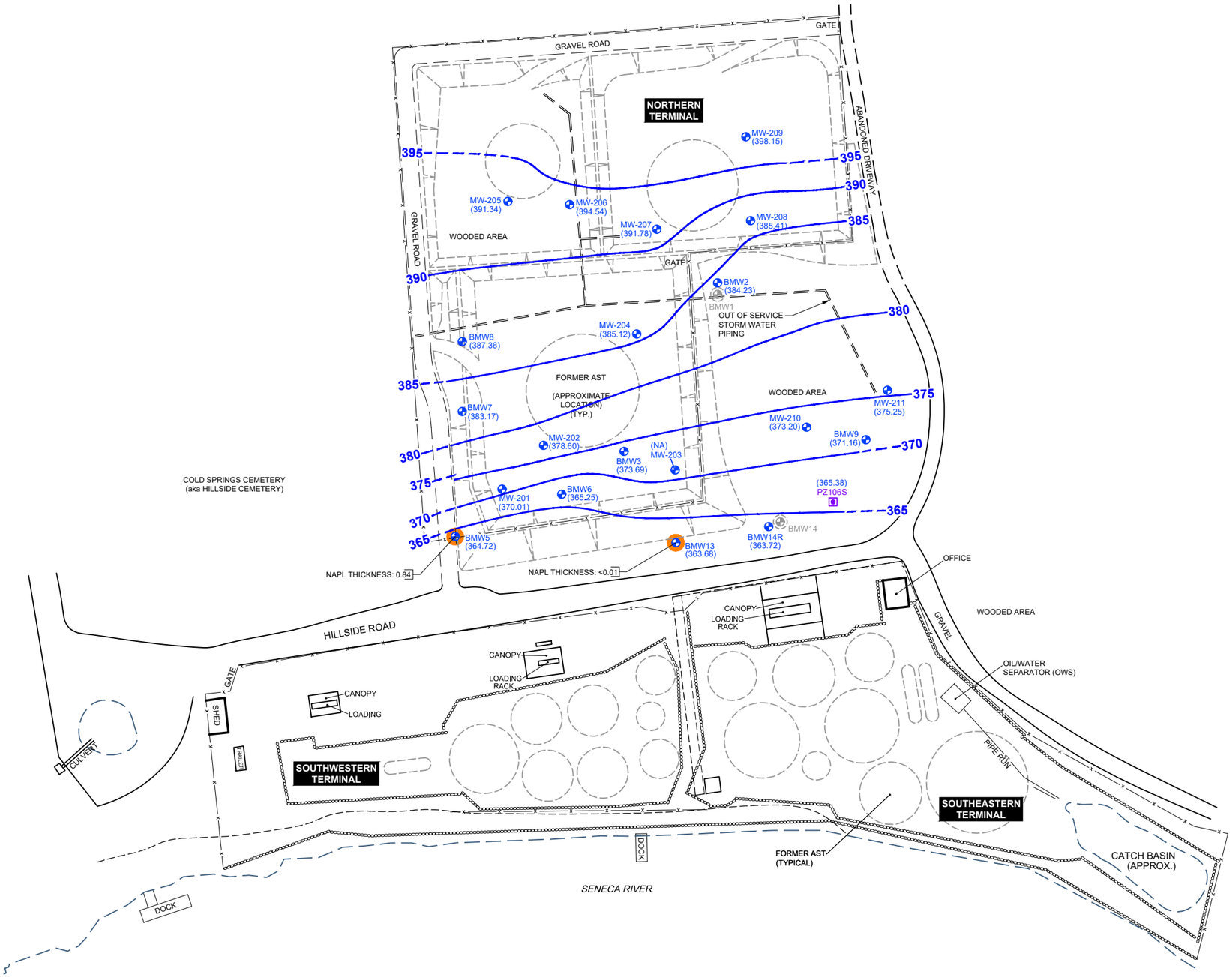
NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
GROUNDWATER SAMPLING SUMMARY
2019 - THIRD QUARTER

NORTHERN TERMINAL GROUNDWATER MONITORING WELL NETWORK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: N. GRIFFITH LYR:(On)ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ANA - BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B009004.0011\01-DWG\2019Q3_Fig2_Site Map.dwg LAYOUT: 2 SAVED: 9/26/2019 3:37 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED:
9/26/2019 3:38 PM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2019Q3-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- PIEZOMETER
- DECOMMISSIONED MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK
- 375 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (371.16) GROUNDWATER ELEVATION (FT AMSL)
- NAPL DETECTED

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
2. LOCATION OF PIEZOMETER PZ106S WAS SURVEYED ON APRIL 16, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS MW-201 - MW-210 WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
4. GROUNDWATER ELEVATION WAS CORRECTED, IF APPROPRIATE, USING THE FOLLOWING CALCULATION: CORRECTED GROUNDWATER ELEVATION = GROUNDWATER ELEVATION + (NAPL SPECIFIC DENSITY (0.79) x PRODUCT THICKNESS).

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY 2019 - THIRD QUARTER

GROUNDWATER CONTOUR

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: K. ROSKOFF LYR:(Opt)ON=*;OFF=*REF*
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PLOTTED: 10/2/2019 3:34 PM BY: KRAHMER, ERIC PROJECTNAME: ----
XREFS: IMAGES:
2019Q3-Title Block
X-Base Map

MW-206

Date	12/3/2018	2/18/219	5/21/2019	8/27/2019
Total VOC (ppb)	200 U [200 U]	Frozen	200 U	200 U
Total SVOC (ppb)	0.1 U [0.1 U]	Frozen	0.1 U	0.1 U

MW-205

Date	12/3/2018	2/18/2019	5/21/2019	8/27/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.1 U	0.1 U	0.1 U	0.098 U

BMW8

Date	12/4/2018	2/19/2019	5/20/2019	8/28/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.099 U	0.1 U	0.099 U	0.1 U

MW-202

Date	12/3/2018	2/19/2019	5/20/2019	8/27/2019
Total VOC (ppb)	Dry	200 U	200 U	Dry
Total SVOC (ppb)	Dry	0.11 U	0.098 U	Dry

BMW7

Date	12/3/2018	2/19/2019	5/20/2019	8/27/2019
Total VOC (ppb)	Dry	200 U	200 U	Dry
Total SVOC (ppb)	Dry	0.1 U	0.1 U	Dry

MW-201

Date	12/3/2018	2/18/2019	5/20/2019	8/27/2019
Total VOC (ppb)	Dry	Dry	200 U	Dry
Total SVOC (ppb)	Dry	Dry	0.1 U	Dry

MW-207

Date	12/3/2018	2/18/2019	5/21/2019	8/27/2019
Total VOC (ppb)	200 U	200 U [200 U]	200 U [200 U]	200 U [200 U]
Total SVOC (ppb)	0.1 U	0.1 U [0.12 U]	0.1 U [0.099 U]	0.1 U [0.1 U]

MW-209

Date	12/3/2018	2/18/2019	5/22/2019	8/27/2019
Total VOC (ppb)	200 U	Frozen	200 U	200 U
Total SVOC (ppb)	0.091 U	Frozen	0.1 U	0.1 UR1

MW-208

Date	12/3/2018	2/18/2019	5/21/2019	8/27/2019
Total VOC (ppb)	58.6	94.6	86.8	371.5
Total SVOC (ppb)	0.091 U	0.1 U	0.1 U	0.1 U

BMW2

Date	12/4/2018	2/20/2019	5/22/2019	8/29/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.098 U	0.1 U	0.14 U	0.1 U

MW-210

Date	12/4/2018	2/20/2019	5/21/2019	8/28/2019
Total VOC (ppb)	200 U	20.3	200 U	200 U
Total SVOC (ppb)	0.098 U	0.1 U	0.1 U	0.1 U

MW-211

Date	12/4/2018	2/18/2019	5/21/2019	8/29/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.098 U	0.1 U	0.1 U	0.11 U

BMW9

Date	12/4/2018	2/18/2019	5/21/2019	8/28/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.098 U	0.1 U	0.1 U	0.1 U

PZ106S

Date	12/5/2018	2/20/2019	5/21/2019	8/29/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.097 U	0.1 U	0.1 U	0.1 U

BMW14R

Date	12/5/2018	2/20/2019	5/20/2019	8/28/2019
Total VOC (ppb)	4,345.8	4,156.0	NP	3,422.8
Total SVOC (ppb)	0.93	1.92	NP	1.24

BMW5

Date	12/3/2018	2/18/2019	5/20/2019	8/27/2019
Total VOC (ppb)	NP	NP	NP	NP
Total SVOC (ppb)	NP	NP	NP	NP

BMW6

Date	12/3/2018	2/18/2019	5/20/2019	8/27/2019
Total VOC (ppb)	Dry	Dry	200 U	Dry
Total SVOC (ppb)	Dry	Dry	0.1 U	Dry

BMW3

Date	12/4/2018	2/19/2020	5/22/2019	8/29/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.11 U	0.1 U	0.11 U	0.1 U

MW-203

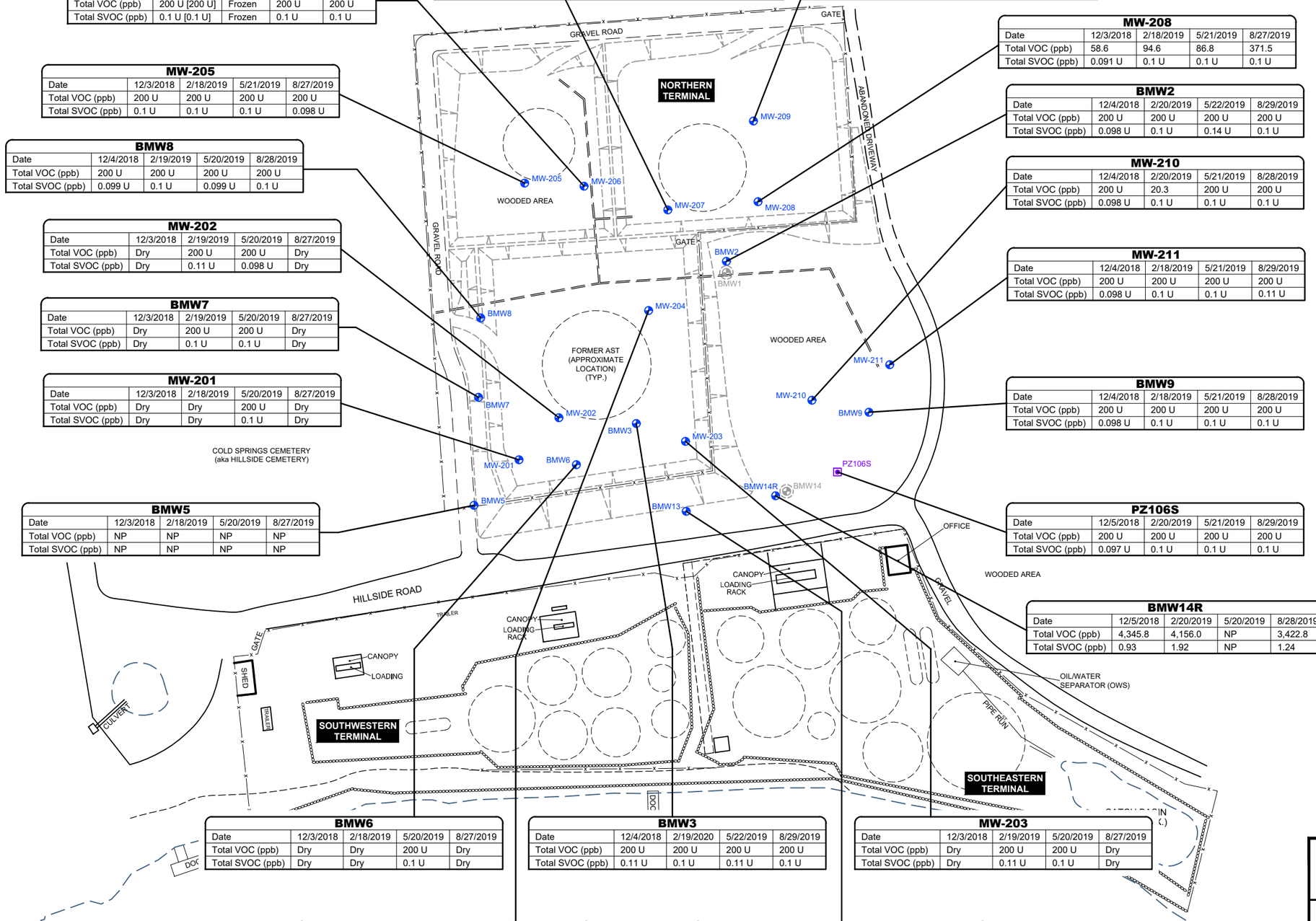
Date	12/3/2018	2/19/2019	5/20/2019	8/27/2019
Total VOC (ppb)	Dry	200 U	200 U	Dry
Total SVOC (ppb)	Dry	0.11 U	0.1 U	Dry

MW-204

Date	12/3/2018	2/18/2019	5/22/2019	8/27/2019
Total VOC (ppb)	5.3	36.1	10.6	103.8
Total SVOC (ppb)	0.083 U	0.1 U	0.098 U	0.099 U

BMW13

Date	12/5/2018	2/18/2019	5/20/2019	8/27/2019
Total VOC (ppb)	38,276.9	NP	NP	NP
Total SVOC (ppb)	2.05	NP	NP	NP



LEGEND:

- MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. ALL CONCENTRATIONS ARE SHOWN IN PARTS PER BILLION (ppb) WHICH IS EQUIVALENT TO MICROGRAMS PER LITER (µg/L).
2. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
3. LOCATION OF PIEZOMETER (PZ106S) WAS SURVEYED ON APRIL 26, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
4. AST = ABOVE GROUND STORAGE TANK.
5. U = INDICATES THE COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED.
6. NP = NAPL PRESENT.
7. Dry/Frozen = INSUFFICIENT WATER TO COLLECT A SAMPLE.
8. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY 2019 - THIRD QUARTER

TOTAL VOC AND SVOC CONCENTRATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

ATTACHMENT A

Laboratory Reports

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

September 12, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on August 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

The samples were subcontracted to Pace Analytical Energy Services, 220 William Pitt Way, Pittsburgh, PA 15238 for RSK-175 Methane, Carbon Dioxide analysis.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
724-850-5611
Project Manager

Enclosures

cc: Mr. P.J. Hart, Arcadis
Mr. Edward Mason, Arcadis
Mr. Mike Teeling, Woodard & Curran
Mr. Andrew Zoanetti, Arcadis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30322105001	**MW-209**	Water	08/27/19 11:30	08/28/19 09:30
30322105002	**MW-208**	Water	08/27/19 14:15	08/28/19 09:30
30322105003	**trip blank**	Water	08/27/19 00:01	08/28/19 09:30
30322105004	**MW-206**	Water	08/27/19 14:15	08/28/19 09:30
30322105005	**MW-205**	Water	08/27/19 11:55	08/28/19 09:30
30322105006	**MW-209 (MS)**	Water	08/27/19 11:30	08/28/19 09:30
30322105007	**MW-209 (MSD)**	Water	08/27/19 11:30	08/28/19 09:30

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30322105001	**MW-209**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322105002	**MW-208**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322105003	**trip blank**	EPA 8260C	LEL	20	PASI-PA
30322105004	**MW-206**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322105005	**MW-205**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322105006	**MW-209 (MS)**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322105007	**MW-209 (MSD)**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-209 **Lab ID: 30322105001** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**159**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:09	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:13	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.099	0.028	1	09/03/19 14:59	09/04/19 14:39	83-32-9	R1
Acenaphthylene	ND	ug/L	0.099	0.033	1	09/03/19 14:59	09/04/19 14:39	208-96-8	R1
Anthracene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 14:39	120-12-7	R1
Benzo(a)anthracene	ND	ug/L	0.099	0.038	1	09/03/19 14:59	09/04/19 14:39	56-55-3	R1
Benzo(a)pyrene	ND	ug/L	0.099	0.012	1	09/03/19 14:59	09/04/19 14:39	50-32-8	R1
Benzo(b)fluoranthene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 14:39	205-99-2	R1
Benzo(g,h,i)perylene	ND	ug/L	0.099	0.035	1	09/03/19 14:59	09/04/19 14:39	191-24-2	R1
Benzo(k)fluoranthene	ND	ug/L	0.099	0.023	1	09/03/19 14:59	09/04/19 14:39	207-08-9	R1
Chrysene	ND	ug/L	0.099	0.039	1	09/03/19 14:59	09/04/19 14:39	218-01-9	R1
Dibenz(a,h)anthracene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 14:39	53-70-3	R1
Fluoranthene	ND	ug/L	0.099	0.032	1	09/03/19 14:59	09/04/19 14:39	206-44-0	R1
Fluorene	ND	ug/L	0.099	0.030	1	09/03/19 14:59	09/04/19 14:39	86-73-7	R1
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.099	0.030	1	09/03/19 14:59	09/04/19 14:39	193-39-5	R1
Phenanthrene	ND	ug/L	0.099	0.043	1	09/03/19 14:59	09/04/19 14:39	85-01-8	R1
Pyrene	ND	ug/L	0.099	0.035	1	09/03/19 14:59	09/04/19 14:39	129-00-0	R1
Surrogates									
2-Fluorobiphenyl (S)	49	%.	19-97		1	09/03/19 14:59	09/04/19 14:39	321-60-8	
Terphenyl-d14 (S)	75	%.	47-105		1	09/03/19 14:59	09/04/19 14:39	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 13:09	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 13:09	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 13:09	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 13:09	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 13:09	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 13:09	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 13:09	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 13:09	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 13:09	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 13:09	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 13:09	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 13:09	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 13:09	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 13:09	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 13:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 13:09	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 13:09	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		08/30/19 13:09	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		08/30/19 13:09	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-209 **Lab ID: 30322105001** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	100	%.	80-120		1		08/30/19 13:09	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**350**	mg/L	10.0	10.0	1		09/03/19 15:45		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:45		
Alkalinity,Total (CaCO3 pH4.5)	**350**	mg/L	10.0	1.0	1		09/03/19 15:45		ML
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/28/19 21:28		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.86**	mg/L	0.10	0.024	1		08/30/19 11:37		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**20.9**	mg/L	10.0	4.7	1		08/29/19 18:07	14808-79-8	

Sample: MW-208 **Lab ID: 30322105002** Collected: 08/27/19 14:15 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**1030**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:18	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**449**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:22	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	09/03/19 14:59	09/04/19 14:57	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/03/19 14:59	09/04/19 14:57	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/04/19 14:57	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/03/19 14:59	09/04/19 14:57	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	09/03/19 14:59	09/04/19 14:57	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/03/19 14:59	09/04/19 14:57	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/04/19 14:57	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/03/19 14:59	09/04/19 14:57	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/04/19 14:57	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/04/19 14:57	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/04/19 14:57	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/04/19 14:57	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/04/19 14:57	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	09/03/19 14:59	09/04/19 14:57	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/04/19 14:57	129-00-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-208 **Lab ID: 30322105002** Collected: 08/27/19 14:15 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	34	%.	19-97		1	09/03/19 14:59	09/04/19 14:57	321-60-8	
Terphenyl-d14 (S)	52	%.	47-105		1	09/03/19 14:59	09/04/19 14:57	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**1.4**	ug/L	1.0	0.34	1		08/30/19 18:06	71-43-2	
n-Butylbenzene	**3.4**	ug/L	1.0	0.84	1		08/30/19 18:06	104-51-8	
sec-Butylbenzene	**3.5**	ug/L	1.0	0.57	1		08/30/19 18:06	135-98-8	
tert-Butylbenzene	**1.9**	ug/L	1.0	0.60	1		08/30/19 18:06	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 18:06	64-17-5	1c,CH
Ethylbenzene	**17.3**	ug/L	1.0	0.40	1		08/30/19 18:06	100-41-4	
Isopropylbenzene (Cumene)	**18.0**	ug/L	1.0	0.47	1		08/30/19 18:06	98-82-8	
p-Isopropyltoluene	**6.7**	ug/L	1.0	0.66	1		08/30/19 18:06	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 18:06	1634-04-4	
Naphthalene	**16.1**	ug/L	2.0	0.82	1		08/30/19 18:06	91-20-3	
n-Propylbenzene	**22.2**	ug/L	1.0	0.51	1		08/30/19 18:06	103-65-1	
Toluene	**1.0**	ug/L	1.0	0.32	1		08/30/19 18:06	108-88-3	
1,2,4-Trimethylbenzene	**135**	ug/L	1.0	0.63	1		08/30/19 18:06	95-63-6	
1,3,5-Trimethylbenzene	**72.9**	ug/L	1.0	0.45	1		08/30/19 18:06	108-67-8	
m&p-Xylene	**59.9**	ug/L	2.0	0.94	1		08/30/19 18:06	179601-23-1	
o-Xylene	**12.2**	ug/L	1.0	0.41	1		08/30/19 18:06	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 18:06	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%.	80-120		1		08/30/19 18:06	17060-07-0	
Toluene-d8 (S)	104	%.	80-120		1		08/30/19 18:06	2037-26-5	
Dibromofluoromethane (S)	87	%.	80-120		1		08/30/19 18:06	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**350**	mg/L	10.0	10.0	1		09/03/19 15:48		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:48		
Alkalinity,Total (CaCO3 pH4.5)	**350**	mg/L	10.0	1.0	1		09/03/19 15:48		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.3**	mg/L	0.10	0.020	1		08/28/19 21:32		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 11:41		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	10.0	4.7	1		08/29/19 18:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: trip blank **Lab ID: 30322105003** Collected: 08/27/19 00:01 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 12:20	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 12:20	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 12:20	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 12:20	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 12:20	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 12:20	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 12:20	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 12:20	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 12:20	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 12:20	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 12:20	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 12:20	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 12:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 12:20	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 12:20	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 12:20	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		08/30/19 12:20	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%.	80-120		1		08/30/19 12:20	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		08/30/19 12:20	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		08/30/19 12:20	1868-53-7	

Sample: MW-206 **Lab ID: 30322105004** Collected: 08/27/19 14:15 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**58.1**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:20	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:24	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/04/19 15:14	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	09/03/19 14:59	09/04/19 15:14	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/04/19 15:14	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/04/19 15:14	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/03/19 14:59	09/04/19 15:14	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/04/19 15:14	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/04/19 15:14	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	09/03/19 14:59	09/04/19 15:14	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	09/03/19 14:59	09/04/19 15:14	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/04/19 15:14	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	09/03/19 14:59	09/04/19 15:14	206-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-206 **Lab ID: 30322105004** Collected: 08/27/19 14:15 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Fluorene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/04/19 15:14	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/04/19 15:14	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	09/03/19 14:59	09/04/19 15:14	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/04/19 15:14	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	30	%.	19-97		1	09/03/19 14:59	09/04/19 15:14	321-60-8	
Terphenyl-d14 (S)	48	%.	47-105		1	09/03/19 14:59	09/04/19 15:14	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 13:34	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 13:34	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 13:34	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 13:34	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 13:34	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 13:34	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 13:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 13:34	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 13:34	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 13:34	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 13:34	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 13:34	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 13:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 13:34	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 13:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 13:34	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 13:34	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%.	80-120		1		08/30/19 13:34	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		08/30/19 13:34	2037-26-5	
Dibromofluoromethane (S)	103	%.	80-120		1		08/30/19 13:34	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**260**	mg/L	10.0	10.0	1		09/03/19 15:49		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:49		
Alkalinity,Total (CaCO3 pH4.5)	**260**	mg/L	10.0	1.0	1		09/03/19 15:49		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/28/19 21:33		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.54**	mg/L	0.10	0.024	1		08/30/19 11:42		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**28.2**	mg/L	10.0	4.7	1		08/29/19 18:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-205 **Lab ID: 30322105005** Collected: 08/27/19 11:55 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**153**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:22	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**33.4**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:31	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.098	0.028	1	09/03/19 14:59	09/04/19 15:32	83-32-9	
Acenaphthylene	ND	ug/L	0.098	0.033	1	09/03/19 14:59	09/04/19 15:32	208-96-8	
Anthracene	ND	ug/L	0.098	0.027	1	09/03/19 14:59	09/04/19 15:32	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	09/03/19 14:59	09/04/19 15:32	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	09/03/19 14:59	09/04/19 15:32	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	09/03/19 14:59	09/04/19 15:32	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	09/03/19 14:59	09/04/19 15:32	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.098	0.023	1	09/03/19 14:59	09/04/19 15:32	207-08-9	
Chrysene	ND	ug/L	0.098	0.039	1	09/03/19 14:59	09/04/19 15:32	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	09/03/19 14:59	09/04/19 15:32	53-70-3	
Fluoranthene	ND	ug/L	0.098	0.031	1	09/03/19 14:59	09/04/19 15:32	206-44-0	
Fluorene	ND	ug/L	0.098	0.030	1	09/03/19 14:59	09/04/19 15:32	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	09/03/19 14:59	09/04/19 15:32	193-39-5	
Phenanthrene	ND	ug/L	0.098	0.043	1	09/03/19 14:59	09/04/19 15:32	85-01-8	
Pyrene	ND	ug/L	0.098	0.035	1	09/03/19 14:59	09/04/19 15:32	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	50	%.	19-97		1	09/03/19 14:59	09/04/19 15:32	321-60-8	
Terphenyl-d14 (S)	76	%.	47-105		1	09/03/19 14:59	09/04/19 15:32	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 13:58	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 13:58	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 13:58	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 13:58	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 13:58	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 13:58	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 13:58	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 13:58	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 13:58	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 13:58	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 13:58	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 13:58	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 13:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 13:58	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 13:58	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 13:58	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		08/30/19 13:58	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%.	80-120		1		08/30/19 13:58	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		08/30/19 13:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-205 **Lab ID: 30322105005** Collected: 08/27/19 11:55 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	102	%.	80-120		1		08/30/19 13:58	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**380**	mg/L	10.0	10.0	1		09/03/19 15:50		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:50		
Alkalinity,Total (CaCO3 pH4.5)	**380**	mg/L	10.0	1.0	1		09/03/19 15:50		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/28/19 21:35		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 11:44		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**424**	mg/L	100	46.7	10		08/30/19 16:19	14808-79-8	ML

Sample: MW-209 (MS) **Lab ID: 30322105006** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**773**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:13	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**493**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:18	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**1.4**	ug/L	0.099	0.028	1	09/03/19 14:59	09/04/19 15:50	83-32-9	
Acenaphthylene	**1.4**	ug/L	0.099	0.033	1	09/03/19 14:59	09/04/19 15:50	208-96-8	
Anthracene	**1.6**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 15:50	120-12-7	
Benzo(a)anthracene	**1.8**	ug/L	0.099	0.038	1	09/03/19 14:59	09/04/19 15:50	56-55-3	
Benzo(a)pyrene	**1.5**	ug/L	0.099	0.012	1	09/03/19 14:59	09/04/19 15:50	50-32-8	
Benzo(b)fluoranthene	**1.5**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 15:50	205-99-2	
Benzo(g,h,i)perylene	**1.3**	ug/L	0.099	0.035	1	09/03/19 14:59	09/04/19 15:50	191-24-2	
Benzo(k)fluoranthene	**1.4**	ug/L	0.099	0.023	1	09/03/19 14:59	09/04/19 15:50	207-08-9	
Chrysene	**1.7**	ug/L	0.099	0.039	1	09/03/19 14:59	09/04/19 15:50	218-01-9	
Dibenz(a,h)anthracene	**1.4**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 15:50	53-70-3	
Fluoranthene	**1.9**	ug/L	0.099	0.032	1	09/03/19 14:59	09/04/19 15:50	206-44-0	
Fluorene	**1.6**	ug/L	0.099	0.030	1	09/03/19 14:59	09/04/19 15:50	86-73-7	
Indeno(1,2,3-cd)pyrene	**1.1**	ug/L	0.099	0.030	1	09/03/19 14:59	09/04/19 15:50	193-39-5	
Phenanthrene	**1.8**	ug/L	0.099	0.043	1	09/03/19 14:59	09/04/19 15:50	85-01-8	
Pyrene	**1.9**	ug/L	0.099	0.035	1	09/03/19 14:59	09/04/19 15:50	129-00-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-209 (MS) **Lab ID: 30322105006** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	60	%.	19-97		1	09/03/19 14:59	09/04/19 15:50	321-60-8	
Terphenyl-d14 (S)	78	%.	47-105		1	09/03/19 14:59	09/04/19 15:50	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**18.0**	ug/L	1.0	0.34	1		08/30/19 18:55	71-43-2	
n-Butylbenzene	**17.5**	ug/L	1.0	0.84	1		08/30/19 18:55	104-51-8	
sec-Butylbenzene	**18.2**	ug/L	1.0	0.57	1		08/30/19 18:55	135-98-8	
tert-Butylbenzene	**18.4**	ug/L	1.0	0.60	1		08/30/19 18:55	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 18:55	64-17-5	1c,CH
Ethylbenzene	**19.1**	ug/L	1.0	0.40	1		08/30/19 18:55	100-41-4	
Isopropylbenzene (Cumene)	**17.8**	ug/L	1.0	0.47	1		08/30/19 18:55	98-82-8	
p-Isopropyltoluene	**18.2**	ug/L	1.0	0.66	1		08/30/19 18:55	99-87-6	
Methyl-tert-butyl ether	**16.6**	ug/L	1.0	0.25	1		08/30/19 18:55	1634-04-4	
Naphthalene	**18.1**	ug/L	2.0	0.82	1		08/30/19 18:55	91-20-3	
n-Propylbenzene	**18.1**	ug/L	1.0	0.51	1		08/30/19 18:55	103-65-1	
Toluene	**18.4**	ug/L	1.0	0.32	1		08/30/19 18:55	108-88-3	
1,2,4-Trimethylbenzene	**18.4**	ug/L	1.0	0.63	1		08/30/19 18:55	95-63-6	
1,3,5-Trimethylbenzene	**17.4**	ug/L	1.0	0.45	1		08/30/19 18:55	108-67-8	
m&p-Xylene	**38.2**	ug/L	2.0	0.94	1		08/30/19 18:55	179601-23-1	
o-Xylene	**19.0**	ug/L	1.0	0.41	1		08/30/19 18:55	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		08/30/19 18:55	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%.	80-120		1		08/30/19 18:55	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		08/30/19 18:55	2037-26-5	
Dibromofluoromethane (S)	103	%.	80-120		1		08/30/19 18:55	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**350**	mg/L	10.0	10.0	1		09/03/19 15:52		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:52		
Alkalinity,Total (CaCO3 pH4.5)	**350**	mg/L	10.0	1.0	1		09/03/19 15:52		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.0**	mg/L	0.10	0.020	1		08/29/19 16:19		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.91**	mg/L	0.10	0.024	1		08/30/19 11:48		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**41.7**	mg/L	10.0	4.7	1		08/29/19 18:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-209 (MSD) **Lab ID: 30322105007** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**721**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:16	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**507**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:20	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**0.74**	ug/L	0.099	0.029	1	09/03/19 14:59	09/04/19 16:08	83-32-9	
Acenaphthylene	**0.88**	ug/L	0.099	0.033	1	09/03/19 14:59	09/04/19 16:08	208-96-8	
Anthracene	**0.96**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 16:08	120-12-7	
Benzo(a)anthracene	**1.1**	ug/L	0.099	0.038	1	09/03/19 14:59	09/04/19 16:08	56-55-3	
Benzo(a)pyrene	**1.0**	ug/L	0.099	0.012	1	09/03/19 14:59	09/04/19 16:08	50-32-8	
Benzo(b)fluoranthene	**1.0**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 16:08	205-99-2	
Benzo(g,h,i)perylene	**0.93**	ug/L	0.099	0.035	1	09/03/19 14:59	09/04/19 16:08	191-24-2	
Benzo(k)fluoranthene	**0.93**	ug/L	0.099	0.023	1	09/03/19 14:59	09/04/19 16:08	207-08-9	
Chrysene	**0.98**	ug/L	0.099	0.040	1	09/03/19 14:59	09/04/19 16:08	218-01-9	
Dibenz(a,h)anthracene	**0.92**	ug/L	0.099	0.027	1	09/03/19 14:59	09/04/19 16:08	53-70-3	
Fluoranthene	**1.2**	ug/L	0.099	0.032	1	09/03/19 14:59	09/04/19 16:08	206-44-0	
Fluorene	**0.87**	ug/L	0.099	0.031	1	09/03/19 14:59	09/04/19 16:08	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.89**	ug/L	0.099	0.030	1	09/03/19 14:59	09/04/19 16:08	193-39-5	
Phenanthrene	**1.1**	ug/L	0.099	0.043	1	09/03/19 14:59	09/04/19 16:08	85-01-8	
Pyrene	**1.2**	ug/L	0.099	0.036	1	09/03/19 14:59	09/04/19 16:08	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	30	%.	19-97		1	09/03/19 14:59	09/04/19 16:08	321-60-8	
Terphenyl-d14 (S)	45	%.	47-105		1	09/03/19 14:59	09/04/19 16:08	1718-51-0	S5,SR
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**18.6**	ug/L	1.0	0.34	1		08/30/19 19:20	71-43-2	
n-Butylbenzene	**17.7**	ug/L	1.0	0.84	1		08/30/19 19:20	104-51-8	
sec-Butylbenzene	**18.1**	ug/L	1.0	0.57	1		08/30/19 19:20	135-98-8	
tert-Butylbenzene	**18.7**	ug/L	1.0	0.60	1		08/30/19 19:20	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 19:20	64-17-5	1c,CH
Ethylbenzene	**19.5**	ug/L	1.0	0.40	1		08/30/19 19:20	100-41-4	
Isopropylbenzene (Cumene)	**18.3**	ug/L	1.0	0.47	1		08/30/19 19:20	98-82-8	
p-Isopropyltoluene	**18.4**	ug/L	1.0	0.66	1		08/30/19 19:20	99-87-6	
Methyl-tert-butyl ether	**17.8**	ug/L	1.0	0.25	1		08/30/19 19:20	1634-04-4	
Naphthalene	**18.7**	ug/L	2.0	0.82	1		08/30/19 19:20	91-20-3	
n-Propylbenzene	**18.3**	ug/L	1.0	0.51	1		08/30/19 19:20	103-65-1	
Toluene	**18.7**	ug/L	1.0	0.32	1		08/30/19 19:20	108-88-3	
1,2,4-Trimethylbenzene	**18.0**	ug/L	1.0	0.63	1		08/30/19 19:20	95-63-6	
1,3,5-Trimethylbenzene	**17.7**	ug/L	1.0	0.45	1		08/30/19 19:20	108-67-8	
m&p-Xylene	**38.9**	ug/L	2.0	0.94	1		08/30/19 19:20	179601-23-1	
o-Xylene	**19.3**	ug/L	1.0	0.41	1		08/30/19 19:20	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 19:20	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%.	80-120		1		08/30/19 19:20	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		08/30/19 19:20	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Sample: MW-209 (MSD) **Lab ID: 30322105007** Collected: 08/27/19 11:30 Received: 08/28/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	101	%.	80-120		1		08/30/19 19:20	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**310**	mg/L	10.0	10.0	1		09/03/19 15:53		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 15:53		
Alkalinity,Total (CaCO3 pH4.5)	**310**	mg/L	10.0	1.0	1		09/03/19 15:53		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.2**	mg/L	1.0	0.20	10		08/29/19 16:42		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.64**	mg/L	0.10	0.024	1		08/30/19 11:49		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**39.7**	mg/L	10.0	4.7	1		08/29/19 18:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359121 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1743470 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	08/30/19 08:05	

LABORATORY CONTROL SAMPLE: 1743471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	516	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743473 1743474

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	159	500	500	773	721	123	112	75-125	7	20	

MATRIX SPIKE SAMPLE: 1743476

Parameter	Units	30322207007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	346	500	838	98	75-125	

SAMPLE DUPLICATE: 1743472

Parameter	Units	30322105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	159	162	2	20	

SAMPLE DUPLICATE: 1743475

Parameter	Units	30322207007 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	346	333	4	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359128 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1743496 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	08/30/19 07:05	

METHOD BLANK: 1743509 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	08/30/19 07:09	

LABORATORY CONTROL SAMPLE: 1743497

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	462	92	80-120	

LABORATORY CONTROL SAMPLE: 1743510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	481	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743499 1743500

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	500	500	493	507	98	101	75-125	3	20	

MATRIX SPIKE SAMPLE: 1743502

Parameter	Units	30322207007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	284	500	781	99	75-125	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

SAMPLE DUPLICATE: 1743498

Parameter	Units	30322105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	1.6J		20	

SAMPLE DUPLICATE: 1743501

Parameter	Units	30322207007 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	284	283	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359280 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30322105001, 30322105002, 30322105003, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1744295 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105003, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.63	08/30/19 11:55	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.45	08/30/19 11:55	
Benzene	ug/L	ND	1.0	0.34	08/30/19 11:55	
Ethanol	ug/L	ND	200	73.5	08/30/19 11:55	1c,CH
Ethylbenzene	ug/L	ND	1.0	0.40	08/30/19 11:55	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.47	08/30/19 11:55	
m&p-Xylene	ug/L	ND	2.0	0.94	08/30/19 11:55	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.25	08/30/19 11:55	
n-Butylbenzene	ug/L	ND	1.0	0.84	08/30/19 11:55	
n-Propylbenzene	ug/L	ND	1.0	0.51	08/30/19 11:55	
Naphthalene	ug/L	ND	2.0	0.82	08/30/19 11:55	
o-Xylene	ug/L	ND	1.0	0.41	08/30/19 11:55	
p-Isopropyltoluene	ug/L	ND	1.0	0.66	08/30/19 11:55	
sec-Butylbenzene	ug/L	ND	1.0	0.57	08/30/19 11:55	
tert-Butylbenzene	ug/L	ND	1.0	0.60	08/30/19 11:55	
Toluene	ug/L	ND	1.0	0.32	08/30/19 11:55	
1,2-Dichloroethane-d4 (S)	%.	100	80-120		08/30/19 11:55	
4-Bromofluorobenzene (S)	%.	103	78-122		08/30/19 11:55	
Dibromofluoromethane (S)	%.	102	80-120		08/30/19 11:55	
Toluene-d8 (S)	%.	99	80-120		08/30/19 11:55	

LABORATORY CONTROL SAMPLE: 1744296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.5	103	70-130	
1,3,5-Trimethylbenzene	ug/L	20	20.3	101	70-130	
Benzene	ug/L	20	20.2	101	70-130	
Ethanol	ug/L	200	247	123	10-175	1c,CH
Ethylbenzene	ug/L	20	21.7	108	70-130	
Isopropylbenzene (Cumene)	ug/L	20	20.3	101	70-130	
m&p-Xylene	ug/L	40	42.9	107	70-130	
Methyl-tert-butyl ether	ug/L	20	19.9	99	70-130	
n-Butylbenzene	ug/L	20	19.6	98	71-138	
n-Propylbenzene	ug/L	20	19.9	100	70-130	
Naphthalene	ug/L	20	23.1	115	69-135	
o-Xylene	ug/L	20	21.6	108	70-130	
p-Isopropyltoluene	ug/L	20	20.9	105	70-130	
sec-Butylbenzene	ug/L	20	20.3	101	70-130	
tert-Butylbenzene	ug/L	20	20.8	104	70-130	
Toluene	ug/L	20	20.9	104	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

LABORATORY CONTROL SAMPLE: 1744296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%.			97	80-120	
4-Bromofluorobenzene (S)	%.			106	78-122	
Dibromofluoromethane (S)	%.			100	80-120	
Toluene-d8 (S)	%.			100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744297 1744298

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	18.4	18.0	92	90	70-130	2	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	17.4	17.7	87	89	70-130	2	30	
Benzene	ug/L	ND	20	20	18.0	18.6	90	93	67-119	3	30	
Ethanol	ug/L	ND	200	200	160J	196J	80	98	10-175		30	1c,CH
Ethylbenzene	ug/L	ND	20	20	19.1	19.5	96	97	69-127	2	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	17.8	18.3	89	92	70-130	3	30	
m&p-Xylene	ug/L	ND	40	40	38.2	38.9	95	97	70-129	2	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	16.6	17.8	83	89	70-130	7	30	
n-Butylbenzene	ug/L	ND	20	20	17.5	17.7	87	89	54-128	2	30	
n-Propylbenzene	ug/L	ND	20	20	18.1	18.3	90	92	62-127	1	30	
Naphthalene	ug/L	ND	20	20	18.1	18.7	90	94	60-136	4	30	
o-Xylene	ug/L	ND	20	20	19.0	19.3	95	96	68-126	1	30	
p-Isopropyltoluene	ug/L	ND	20	20	18.2	18.4	91	92	60-125	1	30	
sec-Butylbenzene	ug/L	ND	20	20	18.2	18.1	91	90	63-125	1	30	
tert-Butylbenzene	ug/L	ND	20	20	18.4	18.7	92	93	64-124	2	30	
Toluene	ug/L	ND	20	20	18.4	18.7	92	93	70-130	1	30	
1,2-Dichloroethane-d4 (S)	%.						98	98	80-120			
4-Bromofluorobenzene (S)	%.						103	104	78-122			
Dibromofluoromethane (S)	%.						103	101	80-120			
Toluene-d8 (S)	%.						99	99	80-120			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359452 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1745438 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	09/04/19 14:03	
Acenaphthylene	ug/L	ND	0.10	0.034	09/04/19 14:03	
Anthracene	ug/L	ND	0.10	0.028	09/04/19 14:03	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	09/04/19 14:03	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	09/04/19 14:03	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	09/04/19 14:03	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	09/04/19 14:03	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	09/04/19 14:03	
Chrysene	ug/L	ND	0.10	0.040	09/04/19 14:03	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	09/04/19 14:03	
Fluoranthene	ug/L	ND	0.10	0.032	09/04/19 14:03	
Fluorene	ug/L	ND	0.10	0.031	09/04/19 14:03	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	09/04/19 14:03	
Phenanthrene	ug/L	ND	0.10	0.044	09/04/19 14:03	
Pyrene	ug/L	ND	0.10	0.036	09/04/19 14:03	
2-Fluorobiphenyl (S)	%.	44	19-97		09/04/19 14:03	
Terphenyl-d14 (S)	%.	73	47-105		09/04/19 14:03	

LABORATORY CONTROL SAMPLE: 1745439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.4	68	34-105	
Acenaphthylene	ug/L	2	1.4	69	30-121	
Anthracene	ug/L	2	1.6	80	39-113	
Benzo(a)anthracene	ug/L	2	1.9	95	51-115	
Benzo(a)pyrene	ug/L	2	2.0	98	46-117	
Benzo(b)fluoranthene	ug/L	2	1.9	94	50-126	
Benzo(g,h,i)perylene	ug/L	2	1.8	91	48-117	
Benzo(k)fluoranthene	ug/L	2	1.9	93	52-118	
Chrysene	ug/L	2	1.7	87	55-107	
Dibenz(a,h)anthracene	ug/L	2	1.8	92	53-118	
Fluoranthene	ug/L	2	1.8	92	45-122	
Fluorene	ug/L	2	1.5	74	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.8	91	52-117	
Phenanthrene	ug/L	2	1.6	82	40-109	
Pyrene	ug/L	2	1.8	90	45-122	
2-Fluorobiphenyl (S)	%.			56	19-97	
Terphenyl-d14 (S)	%.			81	47-105	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745440 1745441

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	ND	2	2	1.4	0.74	71	37	10-111	61	20	R1
Acenaphthylene	ug/L	ND	2	2	1.4	0.88	73	44	14-121	49	20	R1
Anthracene	ug/L	ND	2	2	1.6	0.96	83	48	23-108	52	20	R1
Benzo(a)anthracene	ug/L	ND	2	2	1.8	1.1	91	53	30-118	52	20	R1
Benzo(a)pyrene	ug/L	ND	2	2	1.5	1.0	75	52	10-126	37	20	R1
Benzo(b)fluoranthene	ug/L	ND	2	2	1.5	1.0	75	50	17-127	39	20	R1
Benzo(g,h,i)perylene	ug/L	ND	2	2	1.3	0.93	66	46	10-122	34	20	R1
Benzo(k)fluoranthene	ug/L	ND	2	2	1.4	0.93	72	47	22-118	41	20	R1
Chrysene	ug/L	ND	2	2	1.7	0.98	86	49	29-110	54	20	R1
Dibenz(a,h)anthracene	ug/L	ND	2	2	1.4	0.92	69	46	10-124	40	20	R1
Fluoranthene	ug/L	ND	2	2	1.9	1.2	94	57	15-134	46	20	R1
Fluorene	ug/L	ND	2	2	1.6	0.87	78	44	16-113	56	20	R1
Indeno(1,2,3-cd)pyrene	ug/L	ND	2	2	1.1	0.89	56	45	10-125	23	20	R1
Phenanthrene	ug/L	ND	2	2	1.8	1.1	88	53	20-112	46	20	R1
Pyrene	ug/L	ND	2	2	1.9	1.2	92	56	25-125	47	20	R1
2-Fluorobiphenyl (S)	%.						60	30	19-97		20	R1
Terphenyl-d14 (S)	%.						78	45	47-105		20	R1,S5, SR

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359370 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1744760 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 15:42	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 15:42	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	09/03/19 15:42	

LABORATORY CONTROL SAMPLE: 1744761

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744762 1744763

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	350	50	50	380	380	60	60	85-115	0	20	ML

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 358920 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005

METHOD BLANK: 1742779 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	08/28/19 21:25	H6

LABORATORY CONTROL SAMPLE: 1742780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	1.0	103	90-110	H6

MATRIX SPIKE SAMPLE: 1742781

Parameter	Units	30322105001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	0.99	95	85-115	H1,H6

SAMPLE DUPLICATE: 1742782

Parameter	Units	30322105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	ND	.035J		20	H1,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359103 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30322105006, 30322105007

METHOD BLANK: 1743411 Matrix: Water
Associated Lab Samples: 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	08/29/19 15:45	H6

LABORATORY CONTROL SAMPLE: 1743412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	0.97	97	90-110	H6

MATRIX SPIKE SAMPLE: 1743414

Parameter	Units	30322243011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	13.8	1	13.3	-47	85-115	H3,H6,ML

SAMPLE DUPLICATE: 1743415

Parameter	Units	30322243011 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	13.8	13.7	1	20	H3,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359226 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

METHOD BLANK: 1744193 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004, 30322105005, 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.024	08/30/19 11:23	

LABORATORY CONTROL SAMPLE: 1744194

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	3.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744195 1744196

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.86	5	5	5.7	5.7	98	97	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359104 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004

METHOD BLANK: 1743416 Matrix: Water
Associated Lab Samples: 30322105001, 30322105002, 30322105004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/29/19 18:05	

LABORATORY CONTROL SAMPLE: 1743417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	28.9	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743418 1743420

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	20.9	20	20	39.0	41.4	91	102	85-115	6	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359162 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322105006, 30322105007

METHOD BLANK: 1743661 Matrix: Water
Associated Lab Samples: 30322105006, 30322105007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/29/19 18:32	

LABORATORY CONTROL SAMPLE: 1743662

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	28.5	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743663 1743664

Parameter	Units	30322031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	10.4	20	20	19.5	30.5	45	100	85-115	44	20	ML,R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

QC Batch: 359328 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322105005

METHOD BLANK: 1744507 Matrix: Water
Associated Lab Samples: 30322105005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/30/19 16:17	

LABORATORY CONTROL SAMPLE: 1744508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	30.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744509 1744510

Parameter	Units	30322105005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	424	1000	1000	672	628	25	20	85-115	7	20	ML

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744511 1744512

Parameter	Units	30322243003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	281	200	200	485	479	102	99	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

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.

TNTC - Too Numerous To Count

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

LABORATORIES

PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

1c	The analyte did not meet the method recommended minimum RF.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
H1	Analysis conducted outside the EPA method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
R1	RPD value was outside control limits.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SR	Surrogate recovery was below laboratory control limits. Results may be biased low.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30322105001	**MW-209**	EPA 3005A	359121	EPA 6010C	359191
30322105002	**MW-208**	EPA 3005A	359121	EPA 6010C	359191
30322105004	**MW-206**	EPA 3005A	359121	EPA 6010C	359191
30322105005	**MW-205**	EPA 3005A	359121	EPA 6010C	359191
30322105006	**MW-209 (MS)**	EPA 3005A	359121	EPA 6010C	359191
30322105007	**MW-209 (MSD)**	EPA 3005A	359121	EPA 6010C	359191
30322105001	**MW-209**	EPA 3005A	359128	EPA 6010C	359193
30322105002	**MW-208**	EPA 3005A	359128	EPA 6010C	359193
30322105004	**MW-206**	EPA 3005A	359128	EPA 6010C	359193
30322105005	**MW-205**	EPA 3005A	359128	EPA 6010C	359193
30322105006	**MW-209 (MS)**	EPA 3005A	359128	EPA 6010C	359193
30322105007	**MW-209 (MSD)**	EPA 3005A	359128	EPA 6010C	359193
30322105001	**MW-209**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105002	**MW-208**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105004	**MW-206**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105005	**MW-205**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105006	**MW-209 (MS)**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105007	**MW-209 (MSD)**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322105001	**MW-209**	EPA 8260C	359280		
30322105002	**MW-208**	EPA 8260C	359280		
30322105003	**trip blank**	EPA 8260C	359280		
30322105004	**MW-206**	EPA 8260C	359280		
30322105005	**MW-205**	EPA 8260C	359280		
30322105006	**MW-209 (MS)**	EPA 8260C	359280		
30322105007	**MW-209 (MSD)**	EPA 8260C	359280		
30322105001	**MW-209**	SM 2320B-2011	359370		
30322105002	**MW-208**	SM 2320B-2011	359370		
30322105004	**MW-206**	SM 2320B-2011	359370		
30322105005	**MW-205**	SM 2320B-2011	359370		
30322105006	**MW-209 (MS)**	SM 2320B-2011	359370		
30322105007	**MW-209 (MSD)**	SM 2320B-2011	359370		
30322105001	**MW-209**	SM 3500-FeB-2011	358920		
30322105002	**MW-208**	SM 3500-FeB-2011	358920		
30322105004	**MW-206**	SM 3500-FeB-2011	358920		
30322105005	**MW-205**	SM 3500-FeB-2011	358920		
30322105006	**MW-209 (MS)**	SM 3500-FeB-2011	359103		
30322105007	**MW-209 (MSD)**	SM 3500-FeB-2011	359103		
30322105001	**MW-209**	SM 4500NO3F-2011	359226		
30322105002	**MW-208**	SM 4500NO3F-2011	359226		
30322105004	**MW-206**	SM 4500NO3F-2011	359226		
30322105005	**MW-205**	SM 4500NO3F-2011	359226		
30322105006	**MW-209 (MS)**	SM 4500NO3F-2011	359226		
30322105007	**MW-209 (MSD)**	SM 4500NO3F-2011	359226		
30322105001	**MW-209**	ASTM D516-90,02	359104		
30322105002	**MW-208**	ASTM D516-90,02	359104		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322105

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30322105004	**MW-206**	ASTM D516-90,02	359104		
30322105005	**MW-205**	ASTM D516-90,02	359328		
30322105006	**MW-209 (MS)**	ASTM D516-90,02	359162		
30322105007	**MW-209 (MSD)**	ASTM D516-90,02	359162		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fie

WO# : 30322105

30322105

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Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Arcadis	Report To: nicholle.griffith@arcadis	Attention: PJ Hart
Address: 110 W Fayette St Syracuse, NY 13202	Copy To: vin.maresco@arcadis	Company Name: Arcadis
Email To: PJ.hart@arcadis	Purchase Order No.:	Address:
Phone: Fax:	Project Name: Cold Spring Tcmina	Pace Quote Reference:
Requested Due Date/TAT: Standard	Project Number:	Pace Project Manager:
		Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NY

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	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	VOC 8260	SVOC 8270	Nitrate, Nitrite	Sulfide, Alk, Rchlor	Manganese, unfiltered	Manganese Lab filter	Methane, EtO	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-209					8/27/19	13:30		11	4	1	1	3				2		3	2	1	1	1	1	2		
2	MW-209 MS					8/27/19	13:30		11	4	1	1	3				2		3	2	1	1	1	1	2		001
3	MW-209 MSD					8/27/19	13:30		11	4	1	1	3				2		3	2	1	1	1	1	2		
4	MW-208					8/27/19	14:15		11	4	1	1	3				2		3	2	1	1	1	1	2		002
5	trip blank								2				3						2								003
6	MW-~~20~~ 206					8/27/19	14:15		11	4	1	1	2				2		3	2	1	1	1	1	2		004
7	MW-205					8/27/19	11:55		11	4	1	1	3				2		3	2	1	1	1	1	2		005 MS
8																											005 MSD
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		8-27-19	1513		8-27-19	1513				
		8-27	1200		8-28-19	0930		Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Nicholle Griffith

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 08/27/19

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

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Arcadis Project #: 30322105

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label ET
LIMS Login ET

Tracking #: 7760 9198 9041

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.8, 5.8 °C Correction Factor: 0.0 °C Final Temp: 4.8, 5.8 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D4281 / Date and Initials of person examining contents: ET 8-28-19
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 Matrix: WT	✓			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: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:	✓			14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: (VOA), coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16.
All containers meet method preservation requirements.	✓			Initial when completed: ET Date/time of preservation:
				Lot # of added preservative:
Headspace in VOA Vials (>6mm):		✓		17.
Trip Blank Present:	✓			18.
Trip Blank Custody Seals Present	✓			
Rad Samples Screened < 0.5 mrem/hr			✓	Initial when completed: Date:

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: BAK vials are ~~in DG9P~~ in LIMS as VG9P
ET 8-28-19

☐ **A check in this box indicates that additional information has been stored in ereports.**

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.

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

September 12, 2019

Rachel Christner
Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601
USA

RE: **30322105**

Pace Workorder: 31327

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, September 03, 2019. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh 09/12/2019
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 18

Pace Analytical Energy Services LLC
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LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 31327 30322105

Lab ID	Sample ID	Matrix	Date Collected	Date Received
313270001	30322105 001	Water	8/27/2019 11:30	9/3/2019 12:00
313270002	30322105 002	Water	8/27/2019 14:15	9/3/2019 12:00
313270003	30322105 004	Water	8/27/2019 14:15	9/3/2019 12:00
313270004	30322105 005	Water	8/27/2019 11:55	9/3/2019 12:00
313270005	30322105 006 (MS)	Water	8/27/2019 11:30	9/3/2019 12:00
313270006	30322105 007 (MSD)	Water	8/27/2019 11:30	9/3/2019 12:00

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PROJECT SUMMARY

Workorder: 31327 30322105

Workorder Comments

The samples 31327 (0001-0006) were collected in an alternate container type, than that assigned to PAES method RSK175, for the analysis of light hydrocarbons. The container specified in the method is preserved with TSP and capped with butyl septa, however the sample container provided was BAK preserved and capped with butyl septa.

Only one vial was provided for analysis of method RSK175. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution.

Batch Comments

Batch: DISG/7757 - RSK175 QC

The samples were not evaluated against duplicate due to insufficient volume available for those analyses. Batch acceptance based on laboratory control sample relative percent difference.

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270001** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 001** Date Collected: 8/27/2019 11:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**21**	mg/l	5.0	0.47	1	9/6/2019 10:23	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	9/6/2019 12:16	MM	d

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270002** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 002** Date Collected: 8/27/2019 14:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**57**	mg/l	5.0	0.47	1	9/6/2019 10:38	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**510**	ug/l	2.5	0.34	5	9/6/2019 12:27	MM	d

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270003** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 004** Date Collected: 8/27/2019 14:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**17**	mg/l	5.0	0.47	1	9/6/2019 10:51	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	9/6/2019 13:00	MM	d

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270004** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 005** Date Collected: 8/27/2019 11:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**47**	mg/l	5.0	0.47	1	9/6/2019 11:03	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.5J**	ug/l	2.5	0.34	5	9/6/2019 13:42	MM	d

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270005** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 006 (MS)** Date Collected: 8/27/2019 11:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**160**	mg/l	5.0	0.47	1	9/6/2019 11:29	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**49**	ug/l	2.5	0.34	5	9/6/2019 13:53	MM	d

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ANALYTICAL RESULTS

Workorder: 31327 30322105

Lab ID: **313270006** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322105 007 (MSD)** Date Collected: 8/27/2019 11:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**150**	mg/l	5.0	0.47	1	9/6/2019 11:42	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**49**	ug/l	2.5	0.34	5	9/6/2019 14:03	MM	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 31327 30322105

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 31327 30322105

QC Batch: DISG/7755 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 313270001, 313270002, 313270003, 313270004, 313270005, 313270006

METHOD BLANK: 62985

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.47U	0.47	n

LABORATORY CONTROL SAMPLE & LCSD: 62986 62987

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	130	130	114	110	80-120	2.9	20	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 63006 63007 Original: 313270001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Carbon Dioxide	mg/l	21	120	160	150	119	114	70-130	3.4	20	n

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QUALITY CONTROL DATA

Workorder: 31327 30322105

QC Batch: DISG/7757 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 313270001, 313270002, 313270003, 313270004, 313270005, 313270006

METHOD BLANK: 63012

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 63013 63014

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	46	46	100	100	85-115	0.16	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 63015 63016 Original: 313270001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Methane	ug/l	0.17	44	49	49	110	110	70-130	1.2	20	d

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 31327 30322105

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 31327 30322105

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
313270001	30322105 001			AM20GAX	DISG/7755
313270002	30322105 002			AM20GAX	DISG/7755
313270003	30322105 004			AM20GAX	DISG/7755
313270004	30322105 005			AM20GAX	DISG/7755
313270005	30322105 006 (MS)			AM20GAX	DISG/7755
313270006	30322105 007 (MSD)			AM20GAX	DISG/7755
313270001	30322105 001			EPA RSK175	DISG/7757
313270002	30322105 002			EPA RSK175	DISG/7757
313270003	30322105 004			EPA RSK175	DISG/7757
313270004	30322105 005			EPA RSK175	DISG/7757
313270005	30322105 006 (MS)			EPA RSK175	DISG/7757
313270006	30322105 007 (MSD)			EPA RSK175	DISG/7757

Chain of Custody

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C	1	
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 31327
P.O. No: ASR- 30322105

Request Date: 8/29/19 Analysis Due Date: 9/5/2019
Shipped By: Courier

Certification Required: NY

Pace Project No.: 30322105
Report/Invoice to: Rachel Christner

Page 1 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30322105 001	WT	8/27/19	11:30	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3	30322105 002	WT	8/27/19	14:15	Methane	RSK-175	BAK
4					Carbon Dioxide	AM20GAX	BAK
5	30322105 003	WT	8/27/19	00:01	Methane	RSK-175	BAK
6					Carbon Dioxide	AM20GAX	BAK
7	30322105 004	WT	8/27/19	14:15	Methane	RSK-175	BAK
8					Carbon Dioxide	AM20GAX	BAK
9	30322105 005	WT	8/27/19	11:15	Methane	RSK-175	BAK
10					Carbon Dioxide	AM20GAX	BAK
11	30322105 006	WT	8/27/19	11:30	Methane	RSK-175	BAK
12					Carbon Dioxide	AM20GAX	BAK

Special Requirements:

****Please supply a method blank and LCS QC information on the final report****
Sample 001 is an Original, sample 006 is MS, 007 is MSD

Subcontract Lab: Pace Analytical Energy Services PA (Microseep
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel D Christner (Pace Agent Name) Project Manager (Title)

Acceptance of Terms By: (Subcontract Lab Agent) (Title)

Relinquished By: PACE 8/29/19 2130 (Signature & Affiliation) (Date) (Time)
Received By: PACE 9-2-19 815 (Signature & Affiliation) (Date) (Time)

Relinquished By: PACE 9-2-19 1600 (Signature & Affiliation) (Date) (Time)
Received By: 9.3.19 1202 (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Chain of Custody

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www.pacelabs.com

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1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C		
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 31327
P.O. No: ASR- 30322105

Request Date: 8/29/19 Analysis Due Date: 9/5/2019
Shipped By: Courier

Certification Required: NY

Pace Project No.: 30322105
Report/Invoice to: Rachel Christner

Page 2 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30322105 007	WT	8/27/19	11:30	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Special Requirements: ****Please supply a method blank and LCS QC information on the final report****
Sample 001 is an Original, sample 006 is MS, 007 is MSD

Subcontract Lab: Pace Analytical Energy Services PA (Microseep
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel D Christner Project Manager
Pace Agent Name Title

Acceptance of Terms By:
Subcontract Lab Agent Title

Relinquished By: (Signature & Affiliation) (Date) (Time)

Relinquished By: (Signature & Affiliation) (Date) (Time)

Received By: (Signature & Affiliation) 9.3.19 1200 (Date) (Time)

Received By: (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler Receipt Form

Client Name: Pace Project: 30322105 Lab Work Order: 31327

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx UPS USPS (Client) Other:_____ **Air bill Present:** Yes No

Tracking Number:_____

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 1°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected		✓		
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)		✓		
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?		✓		

Comments:_____

_____

Cooler contents examined/received by : LG **Date:** 9.3.19

Project Manager Review : ERF **Date:** 9/5/19

F-PAE-Q-009-rev.01, 3Oct2017

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

September 12, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on August 29, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

The samples were subcontracted to Pace Analytical Energy Services, 220 William Pitt Way, Pittsburgh, PA 15238 for RSK-175 Methane,Carbon Dioxide analysis.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
724-850-5611
Project Manager

Enclosures

cc: Mr. P.J. Hart, Arcadis
Mr. Edward Mason, Arcadis
Mr. Mike Teeling, Woodard & Curran
Mr. Andrew Zoanetti, Arcadis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30322207001	**MW-210**	Water	08/28/19 11:15	08/29/19 09:30
30322207002	**BMW-2**	Water	08/28/19 11:00	08/29/19 09:30
30322207003	**BMW-8**	Water	08/28/19 11:00	08/29/19 09:30
30322207004	**MW-204**	Water	08/27/19 16:30	08/29/19 09:30
30322207005	**MW-207**	Water	08/27/19 16:00	08/29/19 09:30
30322207006	**Dup-082719**	Water	08/27/19 00:01	08/29/19 09:30
30322207007	**BMW-9**	Water	08/28/19 12:20	08/29/19 09:30
30322207008	**Trip Blank**	Water	08/28/19 00:01	08/29/19 09:30

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SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30322207001	**MW-210**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207002	**BMW-2**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207003	**BMW-8**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207004	**MW-204**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207005	**MW-207**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207006	**Dup-082719**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207007	**BMW-9**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322207008	**Trip Blank**	EPA 8260C	LEL	21	PASI-PA

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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: MW-210 **Lab ID: 30322207001** Collected: 08/28/19 11:15 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**4040**	ug/L	25.0	5.9	1	08/29/19 15:17	08/30/19 08:24	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**731**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:33	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 18:43	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	09/03/19 14:59	09/05/19 18:43	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 18:43	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/05/19 18:43	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/03/19 14:59	09/05/19 18:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 18:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 18:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	09/03/19 14:59	09/05/19 18:43	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	09/03/19 14:59	09/05/19 18:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 18:43	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	09/03/19 14:59	09/05/19 18:43	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 18:43	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 18:43	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	09/03/19 14:59	09/05/19 18:43	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/05/19 18:43	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	46	%.	19-97		1	09/03/19 14:59	09/05/19 18:43	321-60-8	
Terphenyl-d14 (S)	57	%.	47-105		1	09/03/19 14:59	09/05/19 18:43	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 14:23	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 14:23	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 14:23	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 14:23	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 14:23	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 14:23	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 14:23	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 14:23	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 14:23	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 14:23	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 14:23	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 14:23	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 14:23	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 14:23	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 14:23	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 14:23	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 14:23	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		08/30/19 14:23	17060-07-0	
Toluene-d8 (S)	95	%.	80-120		1		08/30/19 14:23	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: MW-210 **Lab ID: 30322207001** Collected: 08/28/19 11:15 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	100	%.	80-120		1		08/30/19 14:23	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**540**	mg/L	10.0	10.0	1		09/03/19 16:08		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:08		
Alkalinity,Total (CaCO3 pH4.5)	**540**	mg/L	10.0	1.0	1		09/03/19 16:08		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/29/19 15:48		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 13:28		ML
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**60.2**	mg/L	10.0	4.7	1		08/29/19 18:12	14808-79-8	

Sample: BMW-2 **Lab ID: 30322207002** Collected: 08/28/19 11:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**406**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:31	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**86.0**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:35	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 19:01	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	09/03/19 14:59	09/05/19 19:01	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:01	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/05/19 19:01	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/03/19 14:59	09/05/19 19:01	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:01	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 19:01	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	09/03/19 14:59	09/05/19 19:01	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	09/03/19 14:59	09/05/19 19:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:01	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	09/03/19 14:59	09/05/19 19:01	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 19:01	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 19:01	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	09/03/19 14:59	09/05/19 19:01	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/05/19 19:01	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: BMW-2 **Lab ID: 30322207002** Collected: 08/28/19 11:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	62	%.	19-97		1	09/03/19 14:59	09/05/19 19:01	321-60-8	
Terphenyl-d14 (S)	82	%.	47-105		1	09/03/19 14:59	09/05/19 19:01	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 14:48	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 14:48	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 14:48	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 14:48	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 14:48	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 14:48	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 14:48	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 14:48	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 14:48	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 14:48	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 14:48	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 14:48	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 14:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 14:48	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 14:48	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 14:48	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%.	78-122		1		08/30/19 14:48	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		08/30/19 14:48	17060-07-0	
Toluene-d8 (S)	96	%.	80-120		1		08/30/19 14:48	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		08/30/19 14:48	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**300**	mg/L	10.0	10.0	1		09/03/19 16:09		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:09		
Alkalinity,Total (CaCO3 pH4.5)	**300**	mg/L	10.0	1.0	1		09/03/19 16:09		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/29/19 15:50		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 13:33		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**44.2**	mg/L	10.0	4.7	1		08/29/19 18:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: BMW-8 **Lab ID: 30322207003** Collected: 08/28/19 11:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**1390**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:33	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1340**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:37	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	09/03/19 14:59	09/05/19 19:18	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/03/19 14:59	09/05/19 19:18	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:18	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/03/19 14:59	09/05/19 19:18	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	09/03/19 14:59	09/05/19 19:18	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/03/19 14:59	09/05/19 19:18	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 19:18	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/03/19 14:59	09/05/19 19:18	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	09/03/19 14:59	09/05/19 19:18	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:18	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 19:18	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 19:18	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 19:18	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	09/03/19 14:59	09/05/19 19:18	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/05/19 19:18	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	45	%.	19-97		1	09/03/19 14:59	09/05/19 19:18	321-60-8	
Terphenyl-d14 (S)	67	%.	47-105		1	09/03/19 14:59	09/05/19 19:18	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 15:13	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 15:13	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 15:13	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 15:13	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 15:13	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 15:13	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 15:13	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 15:13	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 15:13	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 15:13	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 15:13	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 15:13	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 15:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 15:13	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 15:13	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 15:13	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 15:13	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		08/30/19 15:13	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		08/30/19 15:13	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: BMW-8 **Lab ID: 30322207003** Collected: 08/28/19 11:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	100	%.	80-120		1		08/30/19 15:13	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**410**	mg/L	10.0	10.0	1		09/03/19 16:10		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:10		
Alkalinity,Total (CaCO3 pH4.5)	**410**	mg/L	10.0	1.0	1		09/03/19 16:10		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**0.19**	mg/L	0.10	0.020	1		08/29/19 15:50		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 13:34		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**77.6**	mg/L	10.0	4.7	1		08/29/19 18:16	14808-79-8	

Sample: MW-204 **Lab ID: 30322207004** Collected: 08/27/19 16:30 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**1430**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:35	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1360**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:39	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.099	0.029	1	09/03/19 14:59	09/05/19 19:36	83-32-9	
Acenaphthylene	ND	ug/L	0.099	0.033	1	09/03/19 14:59	09/05/19 19:36	208-96-8	
Anthracene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/05/19 19:36	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.099	0.038	1	09/03/19 14:59	09/05/19 19:36	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.099	0.012	1	09/03/19 14:59	09/05/19 19:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/05/19 19:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.099	0.035	1	09/03/19 14:59	09/05/19 19:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.099	0.023	1	09/03/19 14:59	09/05/19 19:36	207-08-9	
Chrysene	ND	ug/L	0.099	0.040	1	09/03/19 14:59	09/05/19 19:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.099	0.027	1	09/03/19 14:59	09/05/19 19:36	53-70-3	
Fluoranthene	ND	ug/L	0.099	0.032	1	09/03/19 14:59	09/05/19 19:36	206-44-0	
Fluorene	ND	ug/L	0.099	0.031	1	09/03/19 14:59	09/05/19 19:36	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.099	0.030	1	09/03/19 14:59	09/05/19 19:36	193-39-5	
Phenanthrene	ND	ug/L	0.099	0.043	1	09/03/19 14:59	09/05/19 19:36	85-01-8	
Pyrene	ND	ug/L	0.099	0.036	1	09/03/19 14:59	09/05/19 19:36	129-00-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: MW-204 **Lab ID: 30322207004** Collected: 08/27/19 16:30 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	56	%.	19-97		1	09/03/19 14:59	09/05/19 19:36	321-60-8	
Terphenyl-d14 (S)	79	%.	47-105		1	09/03/19 14:59	09/05/19 19:36	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**2.4**	ug/L	1.0	0.34	1		08/30/19 18:30	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 18:30	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 18:30	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 18:30	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 18:30	64-17-5	1c,CH
Ethylbenzene	**16.7**	ug/L	1.0	0.40	1		08/30/19 18:30	100-41-4	
Isopropylbenzene (Cumene)	**3.1**	ug/L	1.0	0.47	1		08/30/19 18:30	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 18:30	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 18:30	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 18:30	91-20-3	
n-Propylbenzene	**8.1**	ug/L	1.0	0.51	1		08/30/19 18:30	103-65-1	
Toluene	**6.1**	ug/L	1.0	0.32	1		08/30/19 18:30	108-88-3	
1,2,4-Trimethylbenzene	**17.6**	ug/L	1.0	0.63	1		08/30/19 18:30	95-63-6	
1,3,5-Trimethylbenzene	**4.8**	ug/L	1.0	0.45	1		08/30/19 18:30	108-67-8	
m&p-Xylene	**40.5**	ug/L	2.0	0.94	1		08/30/19 18:30	179601-23-1	
o-Xylene	**4.5**	ug/L	1.0	0.41	1		08/30/19 18:30	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%.	78-122		1		08/30/19 18:30	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%.	80-120		1		08/30/19 18:30	17060-07-0	
Toluene-d8 (S)	102	%.	80-120		1		08/30/19 18:30	2037-26-5	
Dibromofluoromethane (S)	94	%.	80-120		1		08/30/19 18:30	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**570**	mg/L	10.0	10.0	1		09/03/19 16:12		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:12		
Alkalinity,Total (CaCO3 pH4.5)	**570**	mg/L	10.0	1.0	1		09/03/19 16:12		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.5**	mg/L	0.10	0.020	1		08/29/19 15:52		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	1.0	0.24	10		08/30/19 13:35		D3
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**14.7**	mg/L	10.0	4.7	1		08/29/19 18:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: MW-207 **Lab ID: 30322207005** Collected: 08/27/19 16:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**156**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:37	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:42	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 19:53	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	09/03/19 14:59	09/05/19 19:53	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:53	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/05/19 19:53	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/03/19 14:59	09/05/19 19:53	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:53	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 19:53	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	09/03/19 14:59	09/05/19 19:53	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	09/03/19 14:59	09/05/19 19:53	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 19:53	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	09/03/19 14:59	09/05/19 19:53	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 19:53	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 19:53	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	09/03/19 14:59	09/05/19 19:53	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/05/19 19:53	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	50	%.	19-97		1	09/03/19 14:59	09/05/19 19:53	321-60-8	
Terphenyl-d14 (S)	77	%.	47-105		1	09/03/19 14:59	09/05/19 19:53	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 15:37	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 15:37	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 15:37	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 15:37	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 15:37	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 15:37	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 15:37	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 15:37	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 15:37	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 15:37	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 15:37	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 15:37	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 15:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 15:37	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 15:37	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 15:37	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		08/30/19 15:37	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%.	80-120		1		08/30/19 15:37	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		08/30/19 15:37	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: MW-207 **Lab ID: 30322207005** Collected: 08/27/19 16:00 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	101	%.	80-120		1		08/30/19 15:37	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**300**	mg/L	10.0	10.0	1		09/03/19 16:16		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:16		
Alkalinity,Total (CaCO3 pH4.5)	**300**	mg/L	10.0	1.0	1		09/03/19 16:16		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/29/19 15:53		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.87**	mg/L	0.10	0.024	1		08/30/19 13:37		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**21.4**	mg/L	10.0	4.7	1		08/29/19 18:18	14808-79-8	

Sample: Dup-082719 **Lab ID: 30322207006** Collected: 08/27/19 00:01 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**157**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:40	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:44	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 20:11	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	09/03/19 14:59	09/05/19 20:11	208-96-8	
Anthracene	ND	ug/L	0.10	0.029	1	09/03/19 14:59	09/05/19 20:11	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/05/19 20:11	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/03/19 14:59	09/05/19 20:11	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 20:11	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.037	1	09/03/19 14:59	09/05/19 20:11	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	09/03/19 14:59	09/05/19 20:11	207-08-9	
Chrysene	ND	ug/L	0.10	0.042	1	09/03/19 14:59	09/05/19 20:11	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.029	1	09/03/19 14:59	09/05/19 20:11	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	09/03/19 14:59	09/05/19 20:11	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 20:11	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 20:11	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.046	1	09/03/19 14:59	09/05/19 20:11	85-01-8	
Pyrene	ND	ug/L	0.10	0.038	1	09/03/19 14:59	09/05/19 20:11	129-00-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: Dup-082719 **Lab ID: 30322207006** Collected: 08/27/19 00:01 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	61	%.	19-97		1	09/03/19 14:59	09/05/19 20:11	321-60-8	
Terphenyl-d14 (S)	77	%.	47-105		1	09/03/19 14:59	09/05/19 20:11	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 16:02	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 16:02	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 16:02	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 16:02	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 16:02	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 16:02	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 16:02	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 16:02	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 16:02	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 16:02	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 16:02	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 16:02	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 16:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 16:02	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 16:02	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 16:02	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%.	78-122		1		08/30/19 16:02	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		08/30/19 16:02	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		08/30/19 16:02	2037-26-5	
Dibromofluoromethane (S)	102	%.	80-120		1		08/30/19 16:02	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**300**	mg/L	10.0	10.0	1		09/03/19 16:18		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:18		
Alkalinity,Total (CaCO3 pH4.5)	**300**	mg/L	10.0	1.0	1		09/03/19 16:18		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/29/19 15:55		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.88**	mg/L	0.10	0.024	1		08/30/19 13:38		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**20.4**	mg/L	10.0	4.7	1		08/29/19 18:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: BMW-9 **Lab ID: 30322207007** Collected: 08/28/19 12:20 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**346**	ug/L	5.0	1.2	1	08/29/19 15:17	08/30/19 08:42	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**284**	ug/L	5.0	1.2	1	08/29/19 15:22	08/30/19 07:46	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	09/03/19 14:59	09/05/19 20:29	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/03/19 14:59	09/05/19 20:29	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 20:29	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/03/19 14:59	09/05/19 20:29	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	09/03/19 14:59	09/05/19 20:29	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/03/19 14:59	09/05/19 20:29	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 20:29	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/03/19 14:59	09/05/19 20:29	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	09/03/19 14:59	09/05/19 20:29	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/03/19 14:59	09/05/19 20:29	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	09/03/19 14:59	09/05/19 20:29	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	09/03/19 14:59	09/05/19 20:29	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	09/03/19 14:59	09/05/19 20:29	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	09/03/19 14:59	09/05/19 20:29	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	09/03/19 14:59	09/05/19 20:29	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	63	%.	19-97		1	09/03/19 14:59	09/05/19 20:29	321-60-8	
Terphenyl-d14 (S)	78	%.	47-105		1	09/03/19 14:59	09/05/19 20:29	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 16:27	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 16:27	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 16:27	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 16:27	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 16:27	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 16:27	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 16:27	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 16:27	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 16:27	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 16:27	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 16:27	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 16:27	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 16:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 16:27	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 16:27	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 16:27	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	78-122		1		08/30/19 16:27	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%.	80-120		1		08/30/19 16:27	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		08/30/19 16:27	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
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(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: BMW-9 **Lab ID: 30322207007** Collected: 08/28/19 12:20 Received: 08/29/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	102	%.	80-120		1		08/30/19 16:27	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**550**	mg/L	10.0	10.0	1		09/03/19 16:18		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:18		
Alkalinity,Total (CaCO3 pH4.5)	**550**	mg/L	10.0	1.0	1		09/03/19 16:18		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.5**	mg/L	0.10	0.020	1		08/29/19 15:55		H1,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		08/30/19 13:40		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**127**	mg/L	100	46.7	10		08/30/19 16:21	14808-79-8	

Sample: Trip Blank **Lab ID: 30322207008** Collected: 08/28/19 00:01 Received: 08/29/19 09:30 Matrix: Water

Comments: • Trip Blank was not listed on the chain of custody.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		08/30/19 12:44	71-43-2	
tert-Butyl Alcohol	ND	ug/L	5.0	4.3	1		08/30/19 12:44	75-65-0	CH
n-Butylbenzene	ND	ug/L	1.0	0.84	1		08/30/19 12:44	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		08/30/19 12:44	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		08/30/19 12:44	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		08/30/19 12:44	64-17-5	1c,CH
Ethylbenzene	ND	ug/L	1.0	0.40	1		08/30/19 12:44	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		08/30/19 12:44	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		08/30/19 12:44	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		08/30/19 12:44	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		08/30/19 12:44	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		08/30/19 12:44	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		08/30/19 12:44	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		08/30/19 12:44	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		08/30/19 12:44	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		08/30/19 12:44	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		08/30/19 12:44	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		08/30/19 12:44	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%.	80-120		1		08/30/19 12:44	17060-07-0	
Toluene-d8 (S)	96	%.	80-120		1		08/30/19 12:44	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Sample: Trip Blank **Lab ID: 30322207008** Collected: 08/28/19 00:01 Received: 08/29/19 09:30 Matrix: Water

Comments: • Trip Blank was not listed on the chain of custody.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	103	%.	80-120		1		08/30/19 12:44	1868-53-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359121 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1743470 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	08/30/19 08:05	

LABORATORY CONTROL SAMPLE: 1743471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	516	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743473 1743474

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	159	500	500	773	721	123	112	75-125	7	20	

MATRIX SPIKE SAMPLE: 1743476

Parameter	Units	30322207007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	346	500	838	98	75-125	

SAMPLE DUPLICATE: 1743472

Parameter	Units	30322105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	159	162	2	20	

SAMPLE DUPLICATE: 1743475

Parameter	Units	30322207007 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	346	333	4	20	

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

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359128 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1743496 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	08/30/19 07:05	

METHOD BLANK: 1743509 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	08/30/19 07:09	

LABORATORY CONTROL SAMPLE: 1743497

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	462	92	80-120	

LABORATORY CONTROL SAMPLE: 1743510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	481	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743499 1743500

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	500	500	493	507	98	101	75-125	3	20	

MATRIX SPIKE SAMPLE: 1743502

Parameter	Units	30322207007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	284	500	781	99	75-125	

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

Pace Analytical Services, LLC
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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

SAMPLE DUPLICATE: 1743498

Parameter	Units	30322105001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	1.6J		20	

SAMPLE DUPLICATE: 1743501

Parameter	Units	30322207007 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	284	283	0	20	

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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359280 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007, 30322207008

METHOD BLANK: 1744295 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007, 30322207008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.63	08/30/19 11:55	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.45	08/30/19 11:55	
Benzene	ug/L	ND	1.0	0.34	08/30/19 11:55	
Ethanol	ug/L	ND	200	73.5	08/30/19 11:55	1c,CH
Ethylbenzene	ug/L	ND	1.0	0.40	08/30/19 11:55	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.47	08/30/19 11:55	
m&p-Xylene	ug/L	ND	2.0	0.94	08/30/19 11:55	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.25	08/30/19 11:55	
n-Butylbenzene	ug/L	ND	1.0	0.84	08/30/19 11:55	
n-Propylbenzene	ug/L	ND	1.0	0.51	08/30/19 11:55	
Naphthalene	ug/L	ND	2.0	0.82	08/30/19 11:55	
o-Xylene	ug/L	ND	1.0	0.41	08/30/19 11:55	
p-Isopropyltoluene	ug/L	ND	1.0	0.66	08/30/19 11:55	
sec-Butylbenzene	ug/L	ND	1.0	0.57	08/30/19 11:55	
tert-Butyl Alcohol	ug/L	ND	5.0	4.3	08/30/19 11:55	CH
tert-Butylbenzene	ug/L	ND	1.0	0.60	08/30/19 11:55	
Toluene	ug/L	ND	1.0	0.32	08/30/19 11:55	
1,2-Dichloroethane-d4 (S)	%.	100	80-120		08/30/19 11:55	
4-Bromofluorobenzene (S)	%.	103	78-122		08/30/19 11:55	
Dibromofluoromethane (S)	%.	102	80-120		08/30/19 11:55	
Toluene-d8 (S)	%.	99	80-120		08/30/19 11:55	

LABORATORY CONTROL SAMPLE: 1744296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	20.5	103	70-130	
1,3,5-Trimethylbenzene	ug/L	20	20.3	101	70-130	
Benzene	ug/L	20	20.2	101	70-130	
Ethanol	ug/L	200	247	123	10-175	1c,CH
Ethylbenzene	ug/L	20	21.7	108	70-130	
Isopropylbenzene (Cumene)	ug/L	20	20.3	101	70-130	
m&p-Xylene	ug/L	40	42.9	107	70-130	
Methyl-tert-butyl ether	ug/L	20	19.9	99	70-130	
n-Butylbenzene	ug/L	20	19.6	98	71-138	
n-Propylbenzene	ug/L	20	19.9	100	70-130	
Naphthalene	ug/L	20	23.1	115	69-135	
o-Xylene	ug/L	20	21.6	108	70-130	
p-Isopropyltoluene	ug/L	20	20.9	105	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

LABORATORY CONTROL SAMPLE: 1744296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
sec-Butylbenzene	ug/L	20	20.3	101	70-130	
tert-Butyl Alcohol	ug/L	100	139	139	63-147	CH
tert-Butylbenzene	ug/L	20	20.8	104	70-130	
Toluene	ug/L	20	20.9	104	70-130	
1,2-Dichloroethane-d4 (S)	%.			97	80-120	
4-Bromofluorobenzene (S)	%.			106	78-122	
Dibromofluoromethane (S)	%.			100	80-120	
Toluene-d8 (S)	%.			100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744297 1744298

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	18.4	18.0	92	90	70-130	2	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	17.4	17.7	87	89	70-130	2	30	
Benzene	ug/L	ND	20	20	18.0	18.6	90	93	67-119	3	30	
Ethanol	ug/L	ND	200	200	160J	196J	80	98	10-175		30	1c,CH
Ethylbenzene	ug/L	ND	20	20	19.1	19.5	96	97	69-127	2	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	17.8	18.3	89	92	70-130	3	30	
m&p-Xylene	ug/L	ND	40	40	38.2	38.9	95	97	70-129	2	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	16.6	17.8	83	89	70-130	7	30	
n-Butylbenzene	ug/L	ND	20	20	17.5	17.7	87	89	54-128	2	30	
n-Propylbenzene	ug/L	ND	20	20	18.1	18.3	90	92	62-127	1	30	
Naphthalene	ug/L	ND	20	20	18.1	18.7	90	94	60-136	4	30	
o-Xylene	ug/L	ND	20	20	19.0	19.3	95	96	68-126	1	30	
p-Isopropyltoluene	ug/L	ND	20	20	18.2	18.4	91	92	60-125	1	30	
sec-Butylbenzene	ug/L	ND	20	20	18.2	18.1	91	90	63-125	1	30	
tert-Butyl Alcohol	ug/L	5.0	100	100	96.1	105	91	100	65-152	9	30	CH
tert-Butylbenzene	ug/L	ND	20	20	18.4	18.7	92	93	64-124	2	30	
Toluene	ug/L	ND	20	20	18.4	18.7	92	93	70-130	1	30	
1,2-Dichloroethane-d4 (S)	%.						98	98	80-120			
4-Bromofluorobenzene (S)	%.						103	104	78-122			
Dibromofluoromethane (S)	%.						103	101	80-120			
Toluene-d8 (S)	%.						99	99	80-120			

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359452 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1745438 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	09/04/19 14:03	
Acenaphthylene	ug/L	ND	0.10	0.034	09/04/19 14:03	
Anthracene	ug/L	ND	0.10	0.028	09/04/19 14:03	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	09/04/19 14:03	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	09/04/19 14:03	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	09/04/19 14:03	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	09/04/19 14:03	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	09/04/19 14:03	
Chrysene	ug/L	ND	0.10	0.040	09/04/19 14:03	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	09/04/19 14:03	
Fluoranthene	ug/L	ND	0.10	0.032	09/04/19 14:03	
Fluorene	ug/L	ND	0.10	0.031	09/04/19 14:03	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	09/04/19 14:03	
Phenanthrene	ug/L	ND	0.10	0.044	09/04/19 14:03	
Pyrene	ug/L	ND	0.10	0.036	09/04/19 14:03	
2-Fluorobiphenyl (S)	%.	44	19-97		09/04/19 14:03	
Terphenyl-d14 (S)	%.	73	47-105		09/04/19 14:03	

LABORATORY CONTROL SAMPLE: 1745439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.4	68	34-105	
Acenaphthylene	ug/L	2	1.4	69	30-121	
Anthracene	ug/L	2	1.6	80	39-113	
Benzo(a)anthracene	ug/L	2	1.9	95	51-115	
Benzo(a)pyrene	ug/L	2	2.0	98	46-117	
Benzo(b)fluoranthene	ug/L	2	1.9	94	50-126	
Benzo(g,h,i)perylene	ug/L	2	1.8	91	48-117	
Benzo(k)fluoranthene	ug/L	2	1.9	93	52-118	
Chrysene	ug/L	2	1.7	87	55-107	
Dibenz(a,h)anthracene	ug/L	2	1.8	92	53-118	
Fluoranthene	ug/L	2	1.8	92	45-122	
Fluorene	ug/L	2	1.5	74	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.8	91	52-117	
Phenanthrene	ug/L	2	1.6	82	40-109	
Pyrene	ug/L	2	1.8	90	45-122	
2-Fluorobiphenyl (S)	%.			56	19-97	
Terphenyl-d14 (S)	%.			81	47-105	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745440 1745441

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	ND	2	2	1.4	0.74	71	37	10-111	61	20	R1
Acenaphthylene	ug/L	ND	2	2	1.4	0.88	73	44	14-121	49	20	R1
Anthracene	ug/L	ND	2	2	1.6	0.96	83	48	23-108	52	20	R1
Benzo(a)anthracene	ug/L	ND	2	2	1.8	1.1	91	53	30-118	52	20	R1
Benzo(a)pyrene	ug/L	ND	2	2	1.5	1.0	75	52	10-126	37	20	R1
Benzo(b)fluoranthene	ug/L	ND	2	2	1.5	1.0	75	50	17-127	39	20	R1
Benzo(g,h,i)perylene	ug/L	ND	2	2	1.3	0.93	66	46	10-122	34	20	R1
Benzo(k)fluoranthene	ug/L	ND	2	2	1.4	0.93	72	47	22-118	41	20	R1
Chrysene	ug/L	ND	2	2	1.7	0.98	86	49	29-110	54	20	R1
Dibenz(a,h)anthracene	ug/L	ND	2	2	1.4	0.92	69	46	10-124	40	20	R1
Fluoranthene	ug/L	ND	2	2	1.9	1.2	94	57	15-134	46	20	R1
Fluorene	ug/L	ND	2	2	1.6	0.87	78	44	16-113	56	20	R1
Indeno(1,2,3-cd)pyrene	ug/L	ND	2	2	1.1	0.89	56	45	10-125	23	20	R1
Phenanthrene	ug/L	ND	2	2	1.8	1.1	88	53	20-112	46	20	R1
Pyrene	ug/L	ND	2	2	1.9	1.2	92	56	25-125	47	20	R1
2-Fluorobiphenyl (S)	%.						60	30	19-97		20	R1
Terphenyl-d14 (S)	%.						78	45	47-105		20	R1,S5, SR

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359370 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30322207001, 30322207002, 30322207003

METHOD BLANK: 1744760 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 15:42	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 15:42	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	09/03/19 15:42	

LABORATORY CONTROL SAMPLE: 1744761

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744762 1744763

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	350	50	50	380	380	60	60	85-115	0	20	ML

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359371 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1744766 Matrix: Water
Associated Lab Samples: 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 16:11	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 16:11	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	09/03/19 16:11	

LABORATORY CONTROL SAMPLE: 1744767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744768 1744769

Parameter	Units	30322207004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	570	50	50	620	620	100	100	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359103 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1743411 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	08/29/19 15:45	H6

LABORATORY CONTROL SAMPLE: 1743412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	0.97	97	90-110	H6

MATRIX SPIKE SAMPLE: 1743414

Parameter	Units	30322243011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	13.8	1	13.3	-47	85-115	H3,H6,ML

SAMPLE DUPLICATE: 1743415

Parameter	Units	30322243011 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	13.8	13.7	1	20	H3,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359229 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

METHOD BLANK: 1744205 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006, 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.024	08/30/19 13:26	

LABORATORY CONTROL SAMPLE: 1744206

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	3.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744207 1744208

Parameter	Units	30322207001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	5	5	3.5	3.5	69	70	85-115	1	20	ML

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359104 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006

METHOD BLANK: 1743416 Matrix: Water
Associated Lab Samples: 30322207001, 30322207002, 30322207003, 30322207004, 30322207005, 30322207006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/29/19 18:05	

LABORATORY CONTROL SAMPLE: 1743417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	28.9	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743418 1743420

Parameter	Units	30322105001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	20.9	20	20	39.0	41.4	91	102	85-115	6	20	

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

QC Batch: 359328 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322207007

METHOD BLANK: 1744507 Matrix: Water
Associated Lab Samples: 30322207007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/30/19 16:17	

LABORATORY CONTROL SAMPLE: 1744508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	30.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744509 1744510

Parameter	Units	30322105005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	424	1000	1000	672	628	25	20	85-115	7	20	ML

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744511 1744512

Parameter	Units	30322243003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	281	200	200	485	479	102	99	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

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.

TNTC - Too Numerous To Count

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

LABORATORIES

PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

1c	The analyte did not meet the method recommended minimum RF.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H1	Analysis conducted outside the EPA method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
R1	RPD value was outside control limits.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SR	Surrogate recovery was below laboratory control limits. Results may be biased low.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30322207001	**MW-210**	EPA 3005A	359121	EPA 6010C	359191
30322207002	**BMW-2**	EPA 3005A	359121	EPA 6010C	359191
30322207003	**BMW-8**	EPA 3005A	359121	EPA 6010C	359191
30322207004	**MW-204**	EPA 3005A	359121	EPA 6010C	359191
30322207005	**MW-207**	EPA 3005A	359121	EPA 6010C	359191
30322207006	**Dup-082719**	EPA 3005A	359121	EPA 6010C	359191
30322207007	**BMW-9**	EPA 3005A	359121	EPA 6010C	359191
30322207001	**MW-210**	EPA 3005A	359128	EPA 6010C	359193
30322207002	**BMW-2**	EPA 3005A	359128	EPA 6010C	359193
30322207003	**BMW-8**	EPA 3005A	359128	EPA 6010C	359193
30322207004	**MW-204**	EPA 3005A	359128	EPA 6010C	359193
30322207005	**MW-207**	EPA 3005A	359128	EPA 6010C	359193
30322207006	**Dup-082719**	EPA 3005A	359128	EPA 6010C	359193
30322207007	**BMW-9**	EPA 3005A	359128	EPA 6010C	359193
30322207001	**MW-210**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207002	**BMW-2**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207003	**BMW-8**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207004	**MW-204**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207005	**MW-207**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207006	**Dup-082719**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207007	**BMW-9**	EPA 3510C	359452	EPA 8270D by SIM	359614
30322207001	**MW-210**	EPA 8260C	359280		
30322207002	**BMW-2**	EPA 8260C	359280		
30322207003	**BMW-8**	EPA 8260C	359280		
30322207004	**MW-204**	EPA 8260C	359280		
30322207005	**MW-207**	EPA 8260C	359280		
30322207006	**Dup-082719**	EPA 8260C	359280		
30322207007	**BMW-9**	EPA 8260C	359280		
30322207008	**Trip Blank**	EPA 8260C	359280		
30322207001	**MW-210**	SM 2320B-2011	359370		
30322207002	**BMW-2**	SM 2320B-2011	359370		
30322207003	**BMW-8**	SM 2320B-2011	359370		
30322207004	**MW-204**	SM 2320B-2011	359371		
30322207005	**MW-207**	SM 2320B-2011	359371		
30322207006	**Dup-082719**	SM 2320B-2011	359371		
30322207007	**BMW-9**	SM 2320B-2011	359371		
30322207001	**MW-210**	SM 3500-FeB-2011	359103		
30322207002	**BMW-2**	SM 3500-FeB-2011	359103		
30322207003	**BMW-8**	SM 3500-FeB-2011	359103		
30322207004	**MW-204**	SM 3500-FeB-2011	359103		
30322207005	**MW-207**	SM 3500-FeB-2011	359103		
30322207006	**Dup-082719**	SM 3500-FeB-2011	359103		
30322207007	**BMW-9**	SM 3500-FeB-2011	359103		
30322207001	**MW-210**	SM 4500NO3F-2011	359229		
30322207002	**BMW-2**	SM 4500NO3F-2011	359229		

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322207

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30322207003	**BMW-8**	SM 4500NO3F-2011	359229		
30322207004	**MW-204**	SM 4500NO3F-2011	359229		
30322207005	**MW-207**	SM 4500NO3F-2011	359229		
30322207006	**Dup-082719**	SM 4500NO3F-2011	359229		
30322207007	**BMW-9**	SM 4500NO3F-2011	359229		
30322207001	**MW-210**	ASTM D516-90,02	359104		
30322207002	**BMW-2**	ASTM D516-90,02	359104		
30322207003	**BMW-8**	ASTM D516-90,02	359104		
30322207004	**MW-204**	ASTM D516-90,02	359104		
30322207005	**MW-207**	ASTM D516-90,02	359104		
30322207006	**Dup-082719**	ASTM D516-90,02	359104		
30322207007	**BMW-9**	ASTM D516-90,02	359328		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB U

WO# : 30322207

30322207

Number or

Company: Arcadis	Billing Information:
Address: 110 w Fayette St, Syracuse, NY	
Report To: PJ Hart	Email To: vin.maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander, NY
Customer Project Name/Number: Cold Springs Terminal	State: NY County/City: Onondaga Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Sarah Tuttle	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature): Sarah Tutt	Turnaround Date Required: Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Conta

3 | 2 | 1 | C

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other Benzalkonium chloride

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	VOCs 8260	SVOCs 8270	Nitrate / Nitrite	Sulfate & Alkalinity, Ferrous Iron	Manganese, Unfiltered	Manganese, Lab-Filtered	Methane, CO_2				Lab Sample # / Comments
																			ET/ET
MW-210	GW	G	8/28/19	11:15				11	3	2	1	1	1	1	2				001
BMW-2	GW	G	8/28/19	11:00				11	3	2	1	1	1	1	2				002
BMW-8	GW	G	8/28/19	11:00				11	3	2	1	1	1	1	2				003
MW-204	GW	G	8/27/19	16:30				11	3	2	1	1	1	1	2				004
MW-207	GW	G	8/27/19	16:00				11	3	2	1	1	1	1	2				005
DUP-082719	GW	G	8/27/19	[redacted]				11	3	2	1	1	1	1	2				006
BMW-9	GW	G	8/28/19	12:20				11	3	2	1	1	1	1	2				007
																			008 TB

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	(Y)	N	NA
Custody Signatures Present	(Y)	N	NA
Collector Signature Present	(Y)	N	NA
Bottles Intact	(Y)	N	NA
Correct Bottles	(Y)	N	NA
Sufficient Volume	(Y)	N	NA
Samples Received on Ice	(Y)	N	NA
VOA - Headspace Acceptable	(Y)	N	NA
USDA Regulated Soils	Y	N	(NA)
Samples in Holding Time	(Y)	N	NA
Residual Chlorine Present	Y	(N)	NA
Cl Strips:			
Sample pH Acceptable	(Y)	N	NA
pH Strips: 10D3581			
Sulfide Present	Y	N	(NA)
Lead Acetate Strips:			

LAB USE ONLY:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Bubble bags + Ice

Radchem sample(s) screened (<500 cpm): Y N (NA)

SHORT HOLDS PRESENT (<72 hours): Y N (N/A)

Lab Tracking #: 2431058

Samples received via: (FEDEX) UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N (NA)

Therm ID#: 11

Cooler 1 Temp Upon Receipt: 2.7, 3.3oC, 2.2

Cooler 1 Therm Corr. Factor: 0.0 oC

Cooler 1 Corrected Temp: 2.7, 3.3oC 2.2

Comments: ET 8-29-19

Relinquished by/Company: (Signature) Sarah Tutt / Arcadis	Date/Time: 8-28-19 15:00	Received by/Company: (Signature)	Date/Time: 8-28-19 13:00	MTJL LAB USE ONLY
Relinquished by/Company: (Signature)	Date/Time: 8-28 17:00	Received by/Company: (Signature)	Date/Time: 8-29-19 0830	Table #: Acctnum: Template: Prelogin: PM: PB:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	

Trip Blank Received: (Y) N NA (HCL) MeOH TSP Other

Non Conformance(s): ~~YES~~ / (NO)

Page: 1 of:

ET 8-29-19

Pace Analytical Energy Services LLC
220 William Pitt Way
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September 12, 2019

Rachel Christner
Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601
USA

RE: **30322207**

Pace Workorder: 31315

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, September 03, 2019. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh 09/12/2019
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 22

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 31315 30322207

Lab ID	Sample ID	Matrix	Date Collected	Date Received
313150001	30322207 001	Water	8/28/2019 11:15	9/3/2019 12:00
313150002	30322207 002	Water	8/28/2019 11:00	9/3/2019 12:00
313150003	30322207 003	Water	8/28/2019 11:00	9/3/2019 12:00
313150004	30322207 004	Water	8/28/2019 16:30	9/3/2019 12:00
313150005	30322207 005	Water	8/27/2019 16:00	9/3/2019 12:00
313150006	30322207 006	Water	8/27/2019 00:01	9/3/2019 12:00
313150007	30322207 007	Water	8/28/2019 12:20	9/3/2019 12:00

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PROJECT SUMMARY

Workorder: 31315 30322207

Workorder Comments

The samples 31315 (0001-0007) were collected in an alternate container type, than that assigned to PAES method RSK175, for the analysis of light hydrocarbons. The container specified in the method is preserved with TSP and capped with butyl septa, however the sample container provided was BAK preserved and capped with butyl septa.

Only one vial was provided for analysis of method RSK175. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution.

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150001** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 001** Date Collected: 8/28/2019 11:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**88**	mg/l	5.0	0.45	1	9/6/2019 10:06	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.1J**	ug/l	2.5	0.34	5	9/5/2019 09:07	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150002** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 002** Date Collected: 8/28/2019 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**1.1J**	mg/l	5.0	0.45	1	9/6/2019 10:16	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.58J**	ug/l	2.5	0.34	5	9/5/2019 09:17	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150003** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 003** Date Collected: 8/28/2019 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**150**	mg/l	5.0	0.45	1	9/6/2019 10:25	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**3.2**	ug/l	2.5	0.34	5	9/5/2019 09:27	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150004** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 004** Date Collected: 8/28/2019 16:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**150**	mg/l	5.0	0.45	1	9/6/2019 10:35	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**720**	ug/l	2.5	0.34	5	9/5/2019 09:38	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150005** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 005** Date Collected: 8/27/2019 16:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**18**	mg/l	5.0	0.45	1	9/6/2019 10:45	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.5J**	ug/l	2.5	0.34	5	9/5/2019 09:48	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150006** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 006** Date Collected: 8/27/2019 00:01

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**12**	mg/l	5.0	0.45	1	9/6/2019 10:55	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	9/5/2019 09:58	AK	d

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ANALYTICAL RESULTS

Workorder: 31315 30322207

Lab ID: **313150007** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322207 007** Date Collected: 8/28/2019 12:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**99**	mg/l	5.0	0.45	1	9/6/2019 11:07	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**35**	ug/l	2.5	0.34	5	9/5/2019 10:09	AK	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 31315 30322207

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 31315 30322207

QC Batch: DISG/7753 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 313150001, 313150002, 313150003, 313150004, 313150005, 313150006, 313150007

METHOD BLANK: 62971

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 62972 62973

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	46	46	100	100	85-115	1.4	20	

SAMPLE DUPLICATE: 62980 Original: 313080001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	26000	25000	4.3	20	d

SAMPLE DUPLICATE: 62981 Original: 313090001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	3300	3300	0.81	20	d

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QUALITY CONTROL DATA

Workorder: 31315 30322207

QC Batch: DISG/7754 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 313150001, 313150002, 313150003, 313150004, 313150005, 313150006, 313150007

METHOD BLANK: 62975

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.45U	0.45	n

LABORATORY CONTROL SAMPLE & LCSD: 62977 62979

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	110	120	94	100	80-120	6.6	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 31315 30322207

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

Pace Analytical Energy Services LLC
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Phone: (412) 826-5245
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 31315 30322207

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
313150001	30322207 001			EPA RSK175	DISG/7753
313150002	30322207 002			EPA RSK175	DISG/7753
313150003	30322207 003			EPA RSK175	DISG/7753
313150004	30322207 004			EPA RSK175	DISG/7753
313150005	30322207 005			EPA RSK175	DISG/7753
313150006	30322207 006			EPA RSK175	DISG/7753
313150007	30322207 007			EPA RSK175	DISG/7753
313150001	30322207 001			AM20GAX	DISG/7754
313150002	30322207 002			AM20GAX	DISG/7754
313150003	30322207 003			AM20GAX	DISG/7754
313150004	30322207 004			AM20GAX	DISG/7754
313150005	30322207 005			AM20GAX	DISG/7754
313150006	30322207 006			AM20GAX	DISG/7754
313150007	30322207 007			AM20GAX	DISG/7754

Chain of Custody

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C	6.1	
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 31315
P.O. No: ASR- ~~3022207~~ 3032207

Request Date: 8/29/19
Shipped By: Courier
Analysis Due Date: 9/10/2019

Certification Required: NY

Pace Project No.: ~~3022207~~ 3032207
Report/Invoice to: Rachel Christner

Page 1 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30322207 001	WT	8/28/19	11:15	Methane	RSK-175	BAK
2	3032207				Carbon Dioxide	AM20GAX	BAK
3	~~3022207~~ 002	WT	8/28/19	11:00	Methane	RSK-175	BAK
4	3032207				Carbon Dioxide	AM20GAX	BAK
5	~~3022207~~ 003	WT	8/28/19	11:00	Methane	RSK-175	BAK
6	3032207				Carbon Dioxide	AM20GAX	BAK
7	~~3022207~~ 004	WT	8/28/19	16:30	Methane	RSK-175	BAK
8	3032207				Carbon Dioxide	AM20GAX	BAK
9	~~3022207~~ 005	WT	8/28/19	16:00	Methane	RSK-175	BAK
10	3032207				Carbon Dioxide	AM20GAX	BAK
11	~~3022207~~ 006	WT	8/28/19	00:01	Methane	RSK-175	BAK
12					Carbon Dioxide	AM20GAX	BAK

Special Requirements: ****Please supply a method blank and LCS QC information on the final report****

Subcontract Lab: Pace Analytical Energy Services PA (Microsee
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel D Christner (Pace Agent Name) Project Manager (Title)
Acceptance of Terms By: (Subcontract Lab Agent) (Title)

Relinquished By: PACE 08/29/19 1630 (Signature & Affiliation) (Date) (Time)
Received By: PACE 9-2-19 1800 (Signature & Affiliation) (Date) (Time)
Relinquished By: PACE 9-2-19 1200 (Signature & Affiliation) (Date) (Time)
Received By: 9.3.19 1200 (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Chain of Custody

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C	0.1	
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 31315
P.O. No: ASR-~~3022207~~ 30322207

Request Date: 8/29/19 Analysis Due Date: 9/10/2019
Shipped By: Courier

Certification Required: NY

Pace Project No.: ~~3022207~~ 30322207
Report/Invoice to: Rachel Christner

Page 2 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30322207 007	WT	8/28/19	12:20	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Special Requirements: ****Please supply a method blank and LCS QC information on the final report****

Subcontract Lab: Pace Analytical Energy Services PA (Microsee
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel Christner (Pace Agent Name) Project Manager (Title)
Acceptance of Terms By: (Subcontract Lab Agent) (Title)

Relinquished By: (Signature & Affiliation) (Date) (Time)
Relinquished By: (Signature & Affiliation) (Date) (Time)

Received By: [signature] 9.3.19 1200 (Signature & Affiliation) (Date) (Time)
Received By: (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler Receipt Form

Client Name: Pace Project: 30372207 Lab Work Order: 31315

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx UPS USPS (Client) Other:_____ **Air bill Present:** Yes No

Tracking Number:_____

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 1°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected		✓		
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)		✓		
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?	✓			

Comments:_____

Cooler contents examined/received by : LG **Date:** 9.3.19

Project Manager Review : ERF **Date:** 9/4/19

F-PAE-Q-009-rev.01, 3Oct2017

NON-CONFORMANCE FORM

PAES Work Order #: 31315

Date: 9.3.19 Time of Receipt: 1200 Receiver: LG

Client: Pace-G

REASON FOR NON-CONFORMANCE:

1. Headspace in 1 vial @ 001 & 2 vials @ 002 & 003.
2. 005 & 006: Vials ~~&~~ date was 08/27/19.
3. 005: Vials time was 16:30
4. Requested RSK175 on BAK vials.

ACTION TAKEN:

Client name: Pace-G Date: 9/4/19 Time: _____

Emailed client to notify & confirm dates/times.

Customer Service Initials: DZ Date: 9/4/19

F-PAE-Q-014-rev.00, 20 Nov2014

Emma Louis - Re: 3032207 Samples

From: Rachel Christner
To: Louis, Emma
Date: 9/4/2019 10:03 AM
Subject: Re: 3032207 Samples

No problem, here is the information:

005 - Collection date 8/27 - Time 16:00
006 - Collection date 8/27

Thanks,
Rachel

Rachel Christner
Project Manager
Pace Analytical Services
1638 Roseytown Road, Greensburg, PA 15601

Office: 724-850-5611 | General: 724-850-5600

www.pacelabs.com

>>> On 9/4/2019 at 9:40 AM, in message <5D6FBECB.7FA : 88 : 62167>, Emma Louis wrote:
It is 30322207, sorry about that.

Emma Louis
Project Coordinator
Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
412-826-2378 (Direct) | 412-826-5245 (Main)
www.pacelabs.com

Check out our latest article on the use of CSIA in Groundwater Forensics!
Hold down your Ctrl key and click the link below:
https://doi.org/10.1002/rem.21588

Emma Louis - 3032207 Samples

From: Emma Louis
To: Rachel Christner
Subject: 3032207 Samples

Hi Rachel,

During login the following was noted for this project:

1. Head space was found in 1 vial of 001, 2 vials of 002 & 003.
2. 005 & 006: vials date was 8/27/19, while the COC states 8/28/19. Please confirm correct date.
3. 005: Vials time was 16:30, while the COC states 16:00.
4. The vials received for the RSK-175 method do not meet the method requirements for preservation. We are able to run the samples with BAK preservative, but to meet the method requirements they need to be preserved with TSP.

Thank you

Emma Louis
Project Coordinator
Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
412-826-2378 (Direct) | 412-826-5245 (Main)
www.pacelabs.com

Check out our latest article on the use of CSIA in Groundwater Forensics!
Hold down your Ctrl key and click the link below:
https://doi.org/10.1002/rem.21588

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

September 12, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
724-850-5611
Project Manager

Enclosures

cc: Mr. P.J. Hart, Arcadis
Mr. Edward Mason, Arcadis
Mr. Mike Teeling, Woodard & Curran
Mr. Andrew Zoanetti, Arcadis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30322472001	**PZ-106S**	Water	08/29/19 09:00	08/30/19 09:30
30322472002	**MW-211**	Water	08/29/19 08:20	08/30/19 09:30
30322472003	**BMW-3**	Water	08/29/19 08:00	08/30/19 09:30
30322472004	**BMW-14R**	Water	08/28/19 14:45	08/30/19 09:30
30322472005	**Trip Blank**	Water	08/29/19 00:01	08/30/19 09:30

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(724)850-5600

SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30322472001	**PZ-106S**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322472002	**MW-211**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322472003	**BMW-3**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322472004	**BMW-14R**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	RTB	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30322472005	**Trip Blank**	EPA 8260C	LEL	20	PASI-PA

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: PZ-106S **Lab ID: 30322472001** Collected: 08/29/19 09:00 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**271**	ug/L	5.0	1.2	1	09/03/19 15:41	09/04/19 09:55	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**22.1**	ug/L	5.0	1.2	1	09/03/19 15:40	09/04/19 09:17	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	09/04/19 15:42	09/06/19 13:37	83-32-9	1c,2c
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/04/19 15:42	09/06/19 13:37	208-96-8	1c,2c
Anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 13:37	120-12-7	1c,2c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/04/19 15:42	09/06/19 13:37	56-55-3	1c,2c
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/04/19 15:42	09/06/19 13:37	50-32-8	1c,2c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/04/19 15:42	09/06/19 13:37	205-99-2	1c,2c,ip
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/04/19 15:42	09/06/19 13:37	191-24-2	1c,2c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/04/19 15:42	09/06/19 13:37	207-08-9	1c,2c,ip
Chrysene	ND	ug/L	0.10	0.041	1	09/04/19 15:42	09/06/19 13:37	218-01-9	1c,2c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 13:37	53-70-3	1c,2c
Fluoranthene	ND	ug/L	0.10	0.033	1	09/04/19 15:42	09/06/19 13:37	206-44-0	1c,2c
Fluorene	ND	ug/L	0.10	0.032	1	09/04/19 15:42	09/06/19 13:37	86-73-7	1c,2c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/04/19 15:42	09/06/19 13:37	193-39-5	1c,2c
Phenanthrene	ND	ug/L	0.10	0.045	1	09/04/19 15:42	09/06/19 13:37	85-01-8	1c,2c
Pyrene	ND	ug/L	0.10	0.037	1	09/04/19 15:42	09/06/19 13:37	129-00-0	1c,2c
Surrogates									
2-Fluorobiphenyl (S)	51	%.	19-97		1	09/04/19 15:42	09/06/19 13:37	321-60-8	
Terphenyl-d14 (S)	51	%.	47-105		1	09/04/19 15:42	09/06/19 13:37	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		09/04/19 13:22	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		09/04/19 13:22	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		09/04/19 13:22	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		09/04/19 13:22	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		09/04/19 13:22	64-17-5	3c
Ethylbenzene	ND	ug/L	1.0	0.40	1		09/04/19 13:22	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		09/04/19 13:22	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		09/04/19 13:22	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		09/04/19 13:22	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		09/04/19 13:22	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		09/04/19 13:22	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		09/04/19 13:22	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		09/04/19 13:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		09/04/19 13:22	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		09/04/19 13:22	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		09/04/19 13:22	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	106	%.	78-122		1		09/04/19 13:22	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%.	80-120		1		09/04/19 13:22	17060-07-0	
Toluene-d8 (S)	101	%.	80-120		1		09/04/19 13:22	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: PZ-106S **Lab ID: 30322472001** Collected: 08/29/19 09:00 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	101	%.	80-120		1		09/04/19 13:22	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**520**	mg/L	10.0	10.0	1		09/03/19 16:27		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:27		
Alkalinity,Total (CaCO3 pH4.5)	**520**	mg/L	10.0	1.0	1		09/03/19 16:27		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/30/19 18:45		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		09/05/19 13:42		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	100	46.7	10		08/30/19 16:22	14808-79-8	D3

Sample: MW-211 **Lab ID: 30322472002** Collected: 08/29/19 08:20 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**10800**	ug/L	5.0	1.2	1	09/03/19 15:41	09/04/19 09:57	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**972**	ug/L	5.0	1.2	1	09/03/19 15:40	09/04/19 09:19	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.11	0.031	1	09/04/19 15:42	09/06/19 13:55	83-32-9	1c
Acenaphthylene	ND	ug/L	0.11	0.037	1	09/04/19 15:42	09/06/19 13:55	208-96-8	1c
Anthracene	ND	ug/L	0.11	0.030	1	09/04/19 15:42	09/06/19 13:55	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.11	0.042	1	09/04/19 15:42	09/06/19 13:55	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.11	0.013	1	09/04/19 15:42	09/06/19 13:55	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.11	0.029	1	09/04/19 15:42	09/06/19 13:55	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.11	0.038	1	09/04/19 15:42	09/06/19 13:55	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.11	0.025	1	09/04/19 15:42	09/06/19 13:55	207-08-9	1c
Chrysene	ND	ug/L	0.11	0.043	1	09/04/19 15:42	09/06/19 13:55	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.11	0.030	1	09/04/19 15:42	09/06/19 13:55	53-70-3	1c
Fluoranthene	ND	ug/L	0.11	0.035	1	09/04/19 15:42	09/06/19 13:55	206-44-0	1c
Fluorene	ND	ug/L	0.11	0.034	1	09/04/19 15:42	09/06/19 13:55	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.11	0.033	1	09/04/19 15:42	09/06/19 13:55	193-39-5	1c
Phenanthrene	ND	ug/L	0.11	0.048	1	09/04/19 15:42	09/06/19 13:55	85-01-8	1c
Pyrene	ND	ug/L	0.11	0.039	1	09/04/19 15:42	09/06/19 13:55	129-00-0	1c

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: MW-211 **Lab ID: 30322472002** Collected: 08/29/19 08:20 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Surrogates									
2-Fluorobiphenyl (S)	53	%.	19-97		1	09/04/19 15:42	09/06/19 13:55	321-60-8	
Terphenyl-d14 (S)	80	%.	47-105		1	09/04/19 15:42	09/06/19 13:55	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		09/04/19 14:37	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		09/04/19 14:37	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		09/04/19 14:37	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		09/04/19 14:37	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		09/04/19 14:37	64-17-5	3c
Ethylbenzene	ND	ug/L	1.0	0.40	1		09/04/19 14:37	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		09/04/19 14:37	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		09/04/19 14:37	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		09/04/19 14:37	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		09/04/19 14:37	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		09/04/19 14:37	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		09/04/19 14:37	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		09/04/19 14:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		09/04/19 14:37	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		09/04/19 14:37	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		09/04/19 14:37	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	106	%.	78-122		1		09/04/19 14:37	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		09/04/19 14:37	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		09/04/19 14:37	2037-26-5	
Dibromofluoromethane (S)	102	%.	80-120		1		09/04/19 14:37	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**500**	mg/L	10.0	10.0	1		09/03/19 16:29		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:29		
Alkalinity,Total (CaCO3 pH4.5)	**500**	mg/L	10.0	1.0	1		09/03/19 16:29		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/30/19 18:47		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		09/05/19 13:43		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	100	46.7	10		08/30/19 16:25	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: BMW-3 **Lab ID: 30322472003** Collected: 08/29/19 08:00 Received: 08/30/19 09:30 Matrix: Water

Comments: • Post-analysis pH measurement indicates pH > 2.
• The pH of the VOA vial used for analysis was 5.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**7250**	ug/L	5.0	1.2	1	09/03/19 15:41	09/04/19 09:59	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	09/03/19 15:40	09/04/19 09:21	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	09/04/19 15:42	09/06/19 14:13	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/04/19 15:42	09/06/19 14:13	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 14:13	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/04/19 15:42	09/06/19 14:13	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	09/04/19 15:42	09/06/19 14:13	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/04/19 15:42	09/06/19 14:13	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/04/19 15:42	09/06/19 14:13	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/04/19 15:42	09/06/19 14:13	207-08-9	1c
Chrysene	ND	ug/L	0.10	0.041	1	09/04/19 15:42	09/06/19 14:13	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 14:13	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.033	1	09/04/19 15:42	09/06/19 14:13	206-44-0	1c
Fluorene	ND	ug/L	0.10	0.032	1	09/04/19 15:42	09/06/19 14:13	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	09/04/19 15:42	09/06/19 14:13	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.045	1	09/04/19 15:42	09/06/19 14:13	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.037	1	09/04/19 15:42	09/06/19 14:13	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	47	%.	19-97		1	09/04/19 15:42	09/06/19 14:13	321-60-8	
Terphenyl-d14 (S)	68	%.	47-105		1	09/04/19 15:42	09/06/19 14:13	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		09/04/19 15:01	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		09/04/19 15:01	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		09/04/19 15:01	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		09/04/19 15:01	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		09/04/19 15:01	64-17-5	3c
Ethylbenzene	ND	ug/L	1.0	0.40	1		09/04/19 15:01	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		09/04/19 15:01	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		09/04/19 15:01	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		09/04/19 15:01	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		09/04/19 15:01	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		09/04/19 15:01	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		09/04/19 15:01	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		09/04/19 15:01	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		09/04/19 15:01	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		09/04/19 15:01	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		09/04/19 15:01	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	107	%.	78-122		1		09/04/19 15:01	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: BMW-3 **Lab ID: 30322472003** Collected: 08/29/19 08:00 Received: 08/30/19 09:30 Matrix: Water

Comments: • Post-analysis pH measurement indicates pH > 2.
• The pH of the VOA vial used for analysis was 5.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		09/04/19 15:01	17060-07-0	
Toluene-d8 (S)	100	%.	80-120		1		09/04/19 15:01	2037-26-5	
Dibromofluoromethane (S)	102	%.	80-120		1		09/04/19 15:01	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**710**	mg/L	10.0	10.0	1		09/03/19 16:30		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:30		
Alkalinity,Total (CaCO3 pH4.5)	**710**	mg/L	10.0	1.0	1		09/03/19 16:30		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		08/30/19 18:47		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.43**	mg/L	0.10	0.024	1		09/05/19 13:45		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	100	46.7	10		08/30/19 16:26	14808-79-8	D3

Sample: BMW-14R **Lab ID: 30322472004** Collected: 08/28/19 14:45 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**480**	ug/L	5.0	1.2	1	09/03/19 15:41	09/04/19 10:01	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**437**	ug/L	5.0	1.2	1	09/03/19 15:40	09/04/19 09:09	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**0.59**	ug/L	0.10	0.029	1	09/04/19 15:42	09/06/19 14:31	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	09/04/19 15:42	09/06/19 14:31	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 14:31	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	09/04/19 15:42	09/06/19 14:31	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	09/04/19 15:42	09/06/19 14:31	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	09/04/19 15:42	09/06/19 14:31	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	09/04/19 15:42	09/06/19 14:31	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	09/04/19 15:42	09/06/19 14:31	207-08-9	1c
Chrysene	ND	ug/L	0.10	0.041	1	09/04/19 15:42	09/06/19 14:31	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	09/04/19 15:42	09/06/19 14:31	53-70-3	1c
Fluoranthene	**0.11**	ug/L	0.10	0.032	1	09/04/19 15:42	09/06/19 14:31	206-44-0	1c
Fluorene	**0.41**	ug/L	0.10	0.031	1	09/04/19 15:42	09/06/19 14:31	86-73-7	1c

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: BMW-14R **Lab ID: 30322472004** Collected: 08/28/19 14:45 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	09/04/19 15:42	09/06/19 14:31	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.044	1	09/04/19 15:42	09/06/19 14:31	85-01-8	1c
Pyrene	**0.13**	ug/L	0.10	0.037	1	09/04/19 15:42	09/06/19 14:31	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	56	%.	19-97		1	09/04/19 15:42	09/06/19 14:31	321-60-8	
Terphenyl-d14 (S)	76	%.	47-105		1	09/04/19 15:42	09/06/19 14:31	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		09/04/19 21:12	71-43-2	
n-Butylbenzene	**15.3**	ug/L	1.0	0.84	1		09/04/19 21:12	104-51-8	
sec-Butylbenzene	**10.3**	ug/L	1.0	0.57	1		09/04/19 21:12	135-98-8	
tert-Butylbenzene	**1.3**	ug/L	1.0	0.60	1		09/04/19 21:12	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		09/04/19 21:12	64-17-5	3c
Ethylbenzene	**101**	ug/L	1.0	0.40	1		09/04/19 21:12	100-41-4	
Isopropylbenzene (Cumene)	**77.7**	ug/L	1.0	0.47	1		09/04/19 21:12	98-82-8	
p-Isopropyltoluene	**9.0**	ug/L	1.0	0.66	1		09/04/19 21:12	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		09/04/19 21:12	1634-04-4	
Naphthalene	**356**	ug/L	2.0	0.82	1		09/04/19 21:12	91-20-3	
n-Propylbenzene	**178**	ug/L	1.0	0.51	1		09/04/19 21:12	103-65-1	
Toluene	**1.6**	ug/L	1.0	0.32	1		09/04/19 21:12	108-88-3	
1,2,4-Trimethylbenzene	**1750**	ug/L	10.0	6.3	10		09/04/19 21:36	95-63-6	
1,3,5-Trimethylbenzene	**482**	ug/L	10.0	4.5	10		09/04/19 21:36	108-67-8	
m&p-Xylene	**437**	ug/L	2.0	0.94	1		09/04/19 21:12	179601-23-1	
o-Xylene	**3.6**	ug/L	1.0	0.41	1		09/04/19 21:12	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	108	%.	78-122		1		09/04/19 21:12	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%.	80-120		1		09/04/19 21:12	17060-07-0	
Toluene-d8 (S)	104	%.	80-120		1		09/04/19 21:12	2037-26-5	
Dibromofluoromethane (S)	88	%.	80-120		1		09/04/19 21:12	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**590**	mg/L	10.0	10.0	1		09/03/19 16:31		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		09/03/19 16:31		
Alkalinity,Total (CaCO3 pH4.5)	**590**	mg/L	10.0	1.0	1		09/03/19 16:31		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**0.27**	mg/L	0.10	0.020	1		08/30/19 18:49		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.024	1		09/05/19 13:46		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	100	46.7	10		08/30/19 16:26	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Sample: Trip Blank **Lab ID: 30322472005** Collected: 08/29/19 00:01 Received: 08/30/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.34	1		09/04/19 13:47	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.84	1		09/04/19 13:47	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.57	1		09/04/19 13:47	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.60	1		09/04/19 13:47	98-06-6	
Ethanol	ND	ug/L	200	73.5	1		09/04/19 13:47	64-17-5	3c
Ethylbenzene	ND	ug/L	1.0	0.40	1		09/04/19 13:47	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.47	1		09/04/19 13:47	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.66	1		09/04/19 13:47	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.25	1		09/04/19 13:47	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		09/04/19 13:47	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.51	1		09/04/19 13:47	103-65-1	
Toluene	ND	ug/L	1.0	0.32	1		09/04/19 13:47	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.63	1		09/04/19 13:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.45	1		09/04/19 13:47	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.94	1		09/04/19 13:47	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.41	1		09/04/19 13:47	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%.	78-122		1		09/04/19 13:47	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		09/04/19 13:47	17060-07-0	
Toluene-d8 (S)	102	%.	80-120		1		09/04/19 13:47	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		09/04/19 13:47	1868-53-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359592 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1745921 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	09/04/19 09:29	

LABORATORY CONTROL SAMPLE: 1745922

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	517	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745924 1745925

Parameter	Units	30322453001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	302	500	500	786	802	97	100	75-125	2	20	

SAMPLE DUPLICATE: 1745923

Parameter	Units	30322453001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	302	295	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359589 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1745911 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	09/04/19 09:04	

LABORATORY CONTROL SAMPLE: 1745912

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	478	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745914 1745915

Parameter	Units	30322472004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	437	500	500	959	941	104	101	75-125	2	20	

SAMPLE DUPLICATE: 1745913

Parameter	Units	30322472004 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	437	438	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359725 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004, 30322472005

METHOD BLANK: 1746424 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004, 30322472005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.63	09/04/19 12:57	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.45	09/04/19 12:57	
Benzene	ug/L	ND	1.0	0.34	09/04/19 12:57	
Ethanol	ug/L	ND	200	73.5	09/04/19 12:57	3c
Ethylbenzene	ug/L	ND	1.0	0.40	09/04/19 12:57	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.47	09/04/19 12:57	
m&p-Xylene	ug/L	ND	2.0	0.94	09/04/19 12:57	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.25	09/04/19 12:57	
n-Butylbenzene	ug/L	ND	1.0	0.84	09/04/19 12:57	
n-Propylbenzene	ug/L	ND	1.0	0.51	09/04/19 12:57	
Naphthalene	ug/L	ND	2.0	0.82	09/04/19 12:57	
o-Xylene	ug/L	ND	1.0	0.41	09/04/19 12:57	
p-Isopropyltoluene	ug/L	ND	1.0	0.66	09/04/19 12:57	
sec-Butylbenzene	ug/L	ND	1.0	0.57	09/04/19 12:57	
tert-Butylbenzene	ug/L	ND	1.0	0.60	09/04/19 12:57	
Toluene	ug/L	ND	1.0	0.32	09/04/19 12:57	
1,2-Dichloroethane-d4 (S)	%.	96	80-120		09/04/19 12:57	
4-Bromofluorobenzene (S)	%.	104	78-122		09/04/19 12:57	
Dibromofluoromethane (S)	%.	103	80-120		09/04/19 12:57	
Toluene-d8 (S)	%.	99	80-120		09/04/19 12:57	

LABORATORY CONTROL SAMPLE: 1746425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.7	108	70-130	
1,3,5-Trimethylbenzene	ug/L	20	21.6	108	70-130	
Benzene	ug/L	20	20.2	101	70-130	
Ethanol	ug/L	200	208	104	10-175	3c
Ethylbenzene	ug/L	20	22.2	111	70-130	
Isopropylbenzene (Cumene)	ug/L	20	21.6	108	70-130	
m&p-Xylene	ug/L	40	44.6	112	70-130	
Methyl-tert-butyl ether	ug/L	20	20.6	103	70-130	
n-Butylbenzene	ug/L	20	22.5	112	71-138	
n-Propylbenzene	ug/L	20	21.2	106	70-130	
Naphthalene	ug/L	20	22.1	110	69-135	
o-Xylene	ug/L	20	22.0	110	70-130	
p-Isopropyltoluene	ug/L	20	22.4	112	70-130	
sec-Butylbenzene	ug/L	20	22.2	111	70-130	
tert-Butylbenzene	ug/L	20	22.4	112	70-130	
Toluene	ug/L	20	21.5	107	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

LABORATORY CONTROL SAMPLE: 1746425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%.			96	80-120	
4-Bromofluorobenzene (S)	%.			106	78-122	
Dibromofluoromethane (S)	%.			102	80-120	
Toluene-d8 (S)	%.			103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746426 1746427

Parameter	Units	30322472001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	20.3	19.0	102	95	70-130	6	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	18.9	18.8	94	94	70-130	0	30	
Benzene	ug/L	ND	20	20	17.2	17.0	86	85	67-119	1	30	
Ethanol	ug/L	ND	200	200	160J	154J	80	77	10-175		30	3c
Ethylbenzene	ug/L	ND	20	20	18.2	18.9	91	94	69-127	4	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	18.5	18.5	92	92	70-130	0	30	
m&p-Xylene	ug/L	ND	40	40	37.4	37.6	93	94	70-129	1	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	19.8	17.6	99	88	70-130	12	30	
n-Butylbenzene	ug/L	ND	20	20	18.4	18.0	92	90	54-128	3	30	
n-Propylbenzene	ug/L	ND	20	20	18.6	18.0	93	90	62-127	3	30	
Naphthalene	ug/L	ND	20	20	19.7	18.2	98	91	60-136	8	30	
o-Xylene	ug/L	ND	20	20	18.4	18.5	92	93	68-126	1	30	
p-Isopropyltoluene	ug/L	ND	20	20	18.6	18.6	93	93	60-125	0	30	
sec-Butylbenzene	ug/L	ND	20	20	18.0	18.4	90	92	63-125	2	30	
tert-Butylbenzene	ug/L	ND	20	20	18.9	19.1	95	96	64-124	1	30	
Toluene	ug/L	ND	20	20	18.4	18.8	92	94	70-130	2	30	
1,2-Dichloroethane-d4 (S)	%.						97	100	80-120			
4-Bromofluorobenzene (S)	%.						107	107	78-122			
Dibromofluoromethane (S)	%.						100	99	80-120			
Toluene-d8 (S)	%.						103	103	80-120			

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359542 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1745798 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	09/06/19 13:02	
Acenaphthylene	ug/L	ND	0.10	0.034	09/06/19 13:02	
Anthracene	ug/L	ND	0.10	0.028	09/06/19 13:02	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	09/06/19 13:02	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	09/06/19 13:02	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	09/06/19 13:02	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	09/06/19 13:02	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	09/06/19 13:02	
Chrysene	ug/L	ND	0.10	0.040	09/06/19 13:02	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	09/06/19 13:02	
Fluoranthene	ug/L	ND	0.10	0.032	09/06/19 13:02	
Fluorene	ug/L	ND	0.10	0.031	09/06/19 13:02	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	09/06/19 13:02	
Phenanthrene	ug/L	ND	0.10	0.044	09/06/19 13:02	
Pyrene	ug/L	ND	0.10	0.036	09/06/19 13:02	
2-Fluorobiphenyl (S)	%.	58	19-97		09/06/19 13:02	
Terphenyl-d14 (S)	%.	77	47-105		09/06/19 13:02	

LABORATORY CONTROL SAMPLE: 1745799

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.0	52	34-105	
Acenaphthylene	ug/L	2	1.2	58	30-121	
Anthracene	ug/L	2	1.2	59	39-113	
Benzo(a)anthracene	ug/L	2	1.4	71	51-115	
Benzo(a)pyrene	ug/L	2	1.4	72	46-117	
Benzo(b)fluoranthene	ug/L	2	1.4	72	50-126	
Benzo(g,h,i)perylene	ug/L	2	1.3	67	48-117	
Benzo(k)fluoranthene	ug/L	2	1.4	69	52-118	
Chrysene	ug/L	2	1.3	66	55-107	
Dibenz(a,h)anthracene	ug/L	2	1.6	78	53-118	
Fluoranthene	ug/L	2	1.4	70	45-122	
Fluorene	ug/L	2	1.1	57	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.5	73	52-117	
Phenanthrene	ug/L	2	1.2	58	40-109	
Pyrene	ug/L	2	1.4	69	45-122	
2-Fluorobiphenyl (S)	%.			46	19-97	
Terphenyl-d14 (S)	%.			65	47-105	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359371 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1744766 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 16:11	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	09/03/19 16:11	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	09/03/19 16:11	

LABORATORY CONTROL SAMPLE: 1744767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744768 1744769

Parameter	Units	30322207004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	570	50	50	620	620	100	100	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359384 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1744875 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	08/30/19 18:42	H6

LABORATORY CONTROL SAMPLE: 1744876

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	0.92	92	90-110	H6

MATRIX SPIKE SAMPLE: 1744877

Parameter	Units	30322453005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	1.1	109	85-115	H1,H6

SAMPLE DUPLICATE: 1744878

Parameter	Units	30322453005 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	ND	ND		20	H1,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359969 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1747393 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.024	09/05/19 13:13	

METHOD BLANK: 1747402 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.024	09/05/19 13:16	

LABORATORY CONTROL SAMPLE: 1747394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	4.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1747395 1747396

Parameter	Units	30322417002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	22.1	5	5	26.5	26.9	87	96	85-115	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

QC Batch: 359328 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

METHOD BLANK: 1744507 Matrix: Water
Associated Lab Samples: 30322472001, 30322472002, 30322472003, 30322472004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	08/30/19 16:17	

LABORATORY CONTROL SAMPLE: 1744508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	30.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744509 1744510

Parameter	Units	30322105005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	424	1000	1000	672	628	25	20	85-115	7	20	ML

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744511 1744512

Parameter	Units	30322243003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	281	200	200	485	479	102	99	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

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.

TNTC - Too Numerous To Count

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

LABORATORIES

PASI-PA	Pace Analytical Services - Greensburg

BATCH QUALIFIERS

Batch: 359542

[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.
2c	De-Chlorinated
3c	The analyte did not meet the method recommended minimum RF.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H1	Analysis conducted outside the EPA method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
ip	Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria in SW846 Method 8270D. Whereas sample results included are reported as individual isomers, the lab and the customer must recognize them as an isomeric pair.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30322472

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30322472001	**PZ-106S**	EPA 3005A	359592	EPA 6010C	359633
30322472002	**MW-211**	EPA 3005A	359592	EPA 6010C	359633
30322472003	**BMW-3**	EPA 3005A	359592	EPA 6010C	359633
30322472004	**BMW-14R**	EPA 3005A	359592	EPA 6010C	359633
30322472001	**PZ-106S**	EPA 3005A	359589	EPA 6010C	359632
30322472002	**MW-211**	EPA 3005A	359589	EPA 6010C	359632
30322472003	**BMW-3**	EPA 3005A	359589	EPA 6010C	359632
30322472004	**BMW-14R**	EPA 3005A	359589	EPA 6010C	359632
30322472001	**PZ-106S**	EPA 3510C	359542	EPA 8270D by SIM	359839
30322472002	**MW-211**	EPA 3510C	359542	EPA 8270D by SIM	359839
30322472003	**BMW-3**	EPA 3510C	359542	EPA 8270D by SIM	359839
30322472004	**BMW-14R**	EPA 3510C	359542	EPA 8270D by SIM	359839
30322472001	**PZ-106S**	EPA 8260C	359725		
30322472002	**MW-211**	EPA 8260C	359725		
30322472003	**BMW-3**	EPA 8260C	359725		
30322472004	**BMW-14R**	EPA 8260C	359725		
30322472005	**Trip Blank**	EPA 8260C	359725		
30322472001	**PZ-106S**	SM 2320B-2011	359371		
30322472002	**MW-211**	SM 2320B-2011	359371		
30322472003	**BMW-3**	SM 2320B-2011	359371		
30322472004	**BMW-14R**	SM 2320B-2011	359371		
30322472001	**PZ-106S**	SM 3500-FeB-2011	359384		
30322472002	**MW-211**	SM 3500-FeB-2011	359384		
30322472003	**BMW-3**	SM 3500-FeB-2011	359384		
30322472004	**BMW-14R**	SM 3500-FeB-2011	359384		
30322472001	**PZ-106S**	SM 4500NO3F-2011	359969		
30322472002	**MW-211**	SM 4500NO3F-2011	359969		
30322472003	**BMW-3**	SM 4500NO3F-2011	359969		
30322472004	**BMW-14R**	SM 4500NO3F-2011	359969		
30322472001	**PZ-106S**	ASTM D516-90,02	359328		
30322472002	**MW-211**	ASTM D516-90,02	359328		
30322472003	**BMW-3**	ASTM D516-90,02	359328		
30322472004	**BMW-14R**	ASTM D516-90,02	359328		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE | **WO# : 30322472** | mber or

30322472

Company: Arcadis	Billing Information:
Address: 110 W Fayette St, Syracuse, NY	
Report To: PJ Hart	Email To: vin.maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander, NY
Customer Project Name/Number: Cold Springs Terminal	State: NY County/City: Onondaga Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Sarah Jattle	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature): Sarah Jattle	Turnaround Date Required: Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Container: 3 | 2 | 1 | 0

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other BENZALKONIUM CHLORIDE

Lab Project Manager:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: VOCs 8260	SVOCs 8270	Nitrate / Nitrite	Sulfate & Alkalinity, Ferrous Iron	Σ Manganese, Unfiltered	Manganese, Lab-Filtered	Methane, CO2			Lab Profile/Line: Lab Sample # / Comments:
																		ET / ET
PZ-106S	GW	G	8-29-19	09:00				11	3	2	1	1	1	1	2			001
MW-211	GW	G	8-29-19	08:20				11	3	2	1	1	1	1	2			002
BMW-3	GW	G	8-29-19	08:00				11	3	2	1	1	1	1	2			003
BMW-14R	GW	G	8-28-19	14:45				11	3	2	1	1	1	1	2			004
Trip Blank								2										005 TB

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N	NA
Custody Signatures Present	Y N	NA
Collector Signature Present	Y N	NA
Bottles Intact	Y N	NA
Correct Bottles	Y N	NA
Sufficient Volume	Y N	NA
Samples Received on Ice	Y N	NA
VOA - Headspace Acceptable	Y N	NA
USDA Regulated Soils	Y N	NA
Samples in Holding Time	Y N	NA
Residual Chlorine Present	Y N	NA
Cl Strips:		
Sample pH Acceptable	Y N	NA
pH Strips: 10035581		
Sulfide Present	Y N	NA
Lead Acetate Strips:		

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used: bubble bags / bubble wrap

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2431060

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: 11
Cooler 1 Temp Upon Receipt: 5.4 oC
Cooler 1 Therm Corr. Factor: 0 oC
Cooler 1 Corrected Temp: 5.4 oC
Comments:

	Date/Time		Date/Time
Relinquished by/Company: (Signature) Sarah Jattle / Arcadis	8-29-19 10:53	Received by/Company: (Signature) PACE	8/29/19 10:55
Relinquished by/Company: (Signature) PACE	8/29/19 17:00	Received by/Company: (Signature) PACE	08/30/19 0930
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: of:

Rev 8.2 8/8/2011

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30322472

Sample Receiving Non-Conformance Form (NCF)

Date: 08/30/19	Evaluated by: JD3
Client: Arcadis	

Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

1. If Chain-of-Custody (COC) is not received: contact client and if necessary, fill out a COC and indicate that it was filled out by lab personnel. Note issues on this NCF.

2. If COC is incomplete, check applicable issues below and add details where appropriate:

	Collection date/time missing or incorrect		Analyses or analytes: missing or clarification needed		Samples listed on COC do not match samples received (missing, additional, etc.)
	Sample IDs on COC do not match sample labels		Required trip blanks were not received		Required signatures are missing

Comments/Details/Other Issues not listed above:

3. Sample integrity issues: check applicable issues below and add details where appropriate:

	Samples: Past holding time		Samples: Condition needs to be brought to lab personnel's attention (details below)	✓	Preservation: Improper
	Samples: Not field filtered		Containers: Broken or compromised		Temperature: not within acceptance criteria (typically 0-6C)
	Samples: Insufficient volume received		Containers: Incorrect		Temperature: Samples arrived frozen
	Samples: Cooler damaged or compromised		Custody Seals: Missing or compromised on samples, trip blanks or coolers		Vials received with improper headspace
✓	Samples: contain chlorine or sulfides		Packing Material: Insufficient/Improper		Other:

Comments/Details:

-P2-1065 organics have Res Cl.

-250 mL nitric bottle for BMW-14R

4. If Samples not preserved properly and Sample Receiving adjusts pH, add details below:

Sample ID: BMW-14R	Date/Time: 08/30/19 1245	Amount/type pres added: 2.5 mL HNO_3
Preserved by: JD3	Initial and Final pH: 5 / <2	Lot # of pres added: DH9-0653
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:

5. Client Contact: If client is contacted for any issue listed above, fill in details below:

Client:	Contacted per:	
PM Initials:	Date/Time:	

Client Comments/Instructions:

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

September 12, 2019

Rachel Christner
Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601
USA

RE: **30322472**

Pace Workorder: 31316

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, September 03, 2019. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh 09/12/2019
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 17

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 31316 30322472

Lab ID	Sample ID	Matrix	Date Collected	Date Received
313160001	30322472 001	Water	8/29/2019 09:00	9/3/2019 12:00
313160002	30322472 002	Water	8/29/2019 08:20	9/3/2019 12:00
313160003	30322472 003	Water	8/29/2019 08:00	9/3/2019 12:00
313160004	30322472 004	Water	8/28/2019 14:45	9/3/2019 12:00

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PROJECT SUMMARY

Workorder: 31316 30322472

Workorder Comments

The samples 31316 (0001-0004) were collected in an alternate container type, than that assigned to PAES method RSK175, for the analysis of light hydrocarbons. The container specified in the method is preserved with TSP and capped with butyl septa, however the sample container provided was BAK preserved and capped with butyl septa.

Only one vial was provided for analysis of method RSK175. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution.

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ANALYTICAL RESULTS

Workorder: 31316 30322472

Lab ID: **313160001** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322472 001** Date Collected: 8/29/2019 09:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**95**	mg/l	5.0	0.45	1	9/6/2019 11:17	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.38J**	ug/l	2.5	0.34	5	9/5/2019 10:19	AK	d

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ANALYTICAL RESULTS

Workorder: 31316 30322472

Lab ID: **313160002** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322472 002** Date Collected: 8/29/2019 08:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**52**	mg/l	5.0	0.45	1	9/6/2019 12:36	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**6.9**	ug/l	2.5	0.34	5	9/5/2019 10:29	AK	d

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ANALYTICAL RESULTS

Workorder: 31316 30322472

Lab ID: **313160003** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322472 003** Date Collected: 8/29/2019 08:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**110**	mg/l	5.0	0.45	1	9/6/2019 12:48	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.7J**	ug/l	2.5	0.34	5	9/5/2019 10:40	AK	d

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ANALYTICAL RESULTS

Workorder: 31316 30322472

Lab ID: **313160004** Date Received: 9/3/2019 12:00 Matrix: Water

Sample ID: **30322472 004** Date Collected: 8/28/2019 14:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**84**	mg/l	5.0	0.45	1	9/6/2019 12:59	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**350**	ug/l	2.5	0.34	5	9/5/2019 11:11	AK	d

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 31316 30322472

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.

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QUALITY CONTROL DATA

Workorder: 31316 30322472

QC Batch: DISG/7753 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 313160001, 313160002, 313160003, 313160004

METHOD BLANK: 62971

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 62972 62973

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	46	46	100	100	85-115	1.4	20	

SAMPLE DUPLICATE: 62980 Original: 313080001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	26000	25000	4.3	20	d

SAMPLE DUPLICATE: 62981 Original: 313090001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	3300	3300	0.81	20	d

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QUALITY CONTROL DATA

Workorder: 31316 30322472

QC Batch: DISG/7754 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 313160001, 313160002, 313160003, 313160004

METHOD BLANK: 62975

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.45U	0.45	n

LABORATORY CONTROL SAMPLE & LCSD: 62977 62979

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	110	120	94	100	80-120	6.6	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 31316 30322472

QUALITY CONTROL PARAMETER QUALIFIERS

d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 31316 30322472

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
313160001	30322472 001			EPA RSK175	DISG/7753
313160002	30322472 002			EPA RSK175	DISG/7753
313160003	30322472 003			EPA RSK175	DISG/7753
313160004	30322472 004			EPA RSK175	DISG/7753
313160001	30322472 001			AM20GAX	DISG/7754
313160002	30322472 002			AM20GAX	DISG/7754
313160003	30322472 003			AM20GAX	DISG/7754
313160004	30322472 004			AM20GAX	DISG/7754

Chain of Custody

Pace Analytical™
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Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C	1	
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 31316
P.O. No: ASR- 30322472

Request Date: 8/30/19 Analysis Due Date: 9/9/2019
Shipped By: Courier

Certification Required: WV

Pace Project No.: 30322472
Report/Invoice to: Rachel Christner

Page 1 of 1

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30322472001	WT	8/29/19	9:00	Carbon Dioxide	AM20GAX	HCl BAK
2	30322472001	WT	8/29/19	9:00	Methane	RSK-175	HCl
3	30322472002	WT	8/29/19	8:20	Carbon Dioxide	AM20GAX	HCl
4	30322472002	WT	8/29/19	8:20	Methane	RSK-175	HCl
5	30322472003	WT	8/29/19	8:00	Carbon Dioxide	AM20GAX	HCl
6	30322472003	WT	8/29/19	8:00	Methane	RSK-175	HCl
7	30322472004	WT	8/28/19	14:45	Carbon Dioxide	AM20GAX	HCl
8	30322472004	WT	8/28/19	14:45	Methane	RSK-175	HCl
9							
10							
11							
12							

LP 8/30/19

Special Requirements: ****Please supply a method blank and LCS QC information on the final report****

Subcontract Lab: Pace Analytical Energy Services PA (Microseep
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel S Christner (Pace Agent Name) Project Manager (Title)
Acceptance of Terms By: (Subcontract Lab Agent) (Title)

Relinquished By: (Signature & Affiliation) DAVE 08/31/19 (Date) 1020 (Time)
Relinquished By: PACE 9-2-19 (Date) 1200 (Time)

Received By: PACE (Signature & Affiliation) 9-2-19 (Date) 515 (Time)
Received By: (Signature & Affiliation) 9.3.19 (Date) 1200 (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Cooler Receipt Form

Client Name: Pace Project: 30322472 Lab Work Order: 31316

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx UPS USPS (Client) Other:_____ **Air bill Present:** Yes No

Tracking Number:_____

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 1°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected		✓		
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)		✓		
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?	✓			

Comments:_____

_____

Cooler contents examined/received by : CJ **Date:** 9.3.19

Project Manager Review : ERG **Date:** 9/4/19

F-PAE-Q-009-rev.01, 3Oct2017

NON-CONFORMANCE FORM

PAES Work Order #: 31316

Date: 9.3.19 Time of Receipt: 1200 Receiver: LY

Client: Pace.

REASON FOR NON-CONFORMANCE:

1. 004. Vials time was 14:04.
2. Requested RSK 175 on BAK vials.
3. Headspace in 1 vial of 002.

ACTION TAKEN:

Client name: Pace G Date: 9/4/19 Time: _____

Emailed client to notify & confirm correct time.

Customer Service Initials: ERG Date: 9/4/19

F-PAE-Q-014-rev.00, 20 Nov2014

Emma Louis - Re: 30322472

From: Rachel Christner
To: Louis, Emma
Date: 9/4/2019 9:20 AM
Subject: Re: 30322472

Hi Emma,

The correct time for 004 is 14:45.

Thanks,
Rachel

Rachel Christner
Project Manager
Pace Analytical Services
1638 Roseytown Road, Greensburg, PA 15601

Office: 724-850-5611 | General: 724-850-5600

www.pacelabs.com

>>> On 9/4/2019 at 9:06 AM, in message <5D6FB6DE.DD2 : 88 : 62167>, Emma Louis wrote:
Hi Rachel,

The following was noted during login for this project:

1. 004: vials time was 14:04, while the COC states 14:45. Please confirm the correct time.
2. The vials for the RSK-175 method do not meet the method requirements for preservation. We are able to run the BAK for this method, but they need to be TSP to meet the method requirements.
3. Head space was found in 1 vial of 002.

Thank you