Remediation Management Services Company

4 Centerpointe Drive, Suite 200
La Palma, CA 90623
Room LPR 4-222
Office: (360) 594-7978
wade.melton@bp.com

October 18, 2018

Washington Department of Ecology
Southwest Regional Office
Attn: Mr. Aaren Fielder
300 Desmond Drive SE
Lacey, WA 98503

Dear Mr. Fielder:

Please find the enclosed Semi-Annual Groundwater Monitoring Report – First Half of 2018, that documents the results at ARCO Facility No. 5300 located at 710 15th Avenue, Longview, Washington.

Sincerely yours,

Wade Melton
Operations Project Manager
Remediation Management Services Company
An affiliate of Atlantic Richfield Company

cc: File, Antea Group

SEMI-ANNUAL GROUNDWATER MONITORING REPORT

First Half of 2018

ARCO Facility No. 5300

710 15th Avenue, Longview, WA

Antea® Group Project No. 05300SA181
October 18, 2018

Prepared for:
Atlantic Richfield Company
4 Centerpointe Drive
Suite 200, Room LPR-4-222
La Palma, CA 90623

Prepared by:
Antea Group
4006 148th Avenue NE
Redmond, WA 98052
800 477 7411

SEMI-ANNUAL GROUNDWATER MONITORING REPORT
First Half of 2018
October 18, 2018

ARCO Facility No.: 5300

Address: 710 15th Avenue, Longview, WA

Atlantic Richfield Project Manager: Wade Melton

Consulting Co./Contact Person: Antea Group / Megan Richard

Consultant Project Number: 05300SA181

Primary Agency/Regulatory FS ID No.: Washington State Department of Ecology / 41995646

WORK PERFORMED DURING FIRST HALF OF 2018:

· Antea®Group (Antea Group) conducted quarterly groundwater monitoring and sampling on February 26, 2018 and June 12, 2018.

· Antea Group prepared this Semi-Annual Groundwater Monitoring Report.

WORK SCHEDULED FOR SECOND HALF OF 2018:

· Antea Group will conduct quarterly groundwater monitoring and sampling.

· Antea Group will prepare a Semi-Annual Groundwater Monitoring Report.

Current Phase of Project:	**Monitoring**
Frequency of Groundwater Sampling and Monitoring:	**Quarterly**
Are LPH Present On-Site:	**No**
LPH Recovered this Reporting Period:	**None**
Cumulative LPH Recovered to Date:	**None**
Amount of Soil Removed to Date:	**9.91 tons (Dispenser Upgrades – Antea Group, December 2010)**
Current Remediation Techniques:	**Monitored Natural Attenuation**
Approximate Depth to Groundwater:	**9.92 to 11.03 ft. (2/26/2018);** **10.56 to 11.88 ft. (6/12/2018)**

Groundwater Gradient:	**Southwest (2/26/2018)** **Southwest (6/26/2018)**
	0.01 ft./linear ft. (2/26/2018) **0.01 ft./linear ft. (6/26/2018)**

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Sincerely,

Forrest Shafer
Staff Professional

Date: October 18, 2018

Reviewed by:

Megan Richard, LG
Project Manager

Date: October 18, 2018

cc: Mr. Aaren Fiedler, Washington Department of Ecology, Southwest Regional Office (Hard Copy, Electronic Copy)
Mr. Wade Melton, Remediation Management Services Company (Electronic copy, RMO upload)
File, Antea Group

Enclosures

Tables

Table 1	Groundwater Gauging Data
Table 2	Groundwater Analytical Data

Figures

Figure 1	Site Location Map
Figure 2	Site Aerial Map
Figure 3	Groundwater Analytical and Elevation Contour Map – 2/26/2018
Figure 4	Groundwater Analytical and Elevation Contour Map – 6/12/2018

Appendix

Appendix A	Analytical Lab Reports and Chain-of-Custody Documentation

Tables

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-1	9/6/2012	99.90	11.57	NP	--	88.33	--
MW-1	12/14/2012	99.90	10.45	NP	--	89.45	--
MW-1	1/9/2013	99.90	10.42	NP	--	89.48	--
MW-1	5/29/2013	99.90	10.68	NP	--	89.22	--
MW-1	8/20/2013	99.90	11.45	NP	--	88.45	--
MW-1	11/13/2013	99.90	11.08	NP	--	88.82	--
MW-1	2/19/2014	99.90	10.54	NP	--	89.36	--
MW-1	4/23/2014	99.90	10.40	NP	--	89.50	--
MW-1	8/7/2014	99.90	11.28	NP	--	88.62	--
MW-1	11/19/2014	99.90	11.12	NP	--	88.78	--
MW-1	2/25/2015	99.90	10.72	NP	--	89.18	--
MW-1	8/11/2015	99.90	11.84	NP	--	88.06	--
MW-1	2/3/2016	99.90	10.10	NP	--	89.80	--
MW-1	4/8/2016	99.90	10.20	NP	--	89.70	--
MW-1	9/20/2016	99.90	11.88	NP	--	88.02	--
MW-1	12/28/2016	99.90	10.18	NP	--	89.72	--
MW-1	3/24/2017	99.90	9.65	NP	--	90.25	--
MW-1	6/22/2017	99.90	10.42	NP	--	89.48	--
MW-1	9/29/2017	99.90	11.48	NP	--	88.42	--
MW-1	11/14/2017	99.90	10.91	NP	--	88.99	--
MW-1	2/26/2018	99.90	10.02	NP	--	89.88	--
MW-1	6/12/2018	99.90	10.61	NP	--	89.29	--

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-2	9/6/2012	99.72	11.43	NP	--	88.29	--
MW-2	12/14/2012	99.72	10.45	NP	--	89.27	--
MW-2	1/9/2013	99.72	10.38	NP	--	89.34	--
MW-2	5/29/2013	99.72	10.66	NP	--	89.06	--
MW-2	8/20/2013	99.72	11.35	NP	--	88.37	--
MW-2	11/13/2013	99.72	11.02	NP	--	88.70	--
MW-2	2/19/2014	99.72	10.49	NP	--	89.23	--
MW-2	4/23/2014	99.72	10.38	NP	--	89.34	--
MW-2	8/7/2014	99.72	11.22	NP	--	88.50	--
MW-2	11/19/2014	99.72	11.03	NP	--	88.69	--
MW-2	2/25/2015	99.72	10.72	NP	--	89.00	--
MW-2	8/11/2015	99.72	11.74	NP	--	87.98	--
MW-2	2/3/2016	99.72	9.88	NP	--	89.84	--
MW-2	4/8/2016	99.72	10.13	NP	--	89.59	--
MW-2	9/20/2016	99.72	11.80	NP	--	87.92	--
MW-2	12/28/2016	99.72	10.11	NP	--	89.61	--
MW-2	3/24/2017	99.72	9.55	NP	--	90.17	--
MW-2	6/22/2017	99.72	10.35	NP	--	89.37	--
MW-2	9/29/2017	99.72	11.41	NP	--	88.31	--
MW-2	11/14/2017	99.72	10.48	NP	--	89.24	--
MW-2	2/26/2018	99.72	9.92	NP	--	89.80	--
MW-2	6/12/2018	99.72	10.56	NP	--	89.16	--

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-3	9/6/2012	99.68	11.63	NP	--	88.05	--
MW-3	12/14/2012	99.68	10.51	NP	--	89.17	--
MW-3	1/9/2013	99.68	10.45	NP	--	89.23	--
MW-3	5/29/2013	99.68	10.81	NP	--	88.87	--
MW-3	8/20/2013	99.68	11.55	NP	--	88.13	--
MW-3	11/13/2013	99.68	11.10	NP	--	88.58	--
MW-3	2/19/2014	99.68	10.01	NP	--	89.67	--
MW-3	4/23/2014	99.68	10.47	NP	--	89.21	--
MW-3	8/7/2014	99.68	11.36	NP	--	88.32	--
MW-3	11/19/2014	99.68	11.10	NP	--	88.58	--
MW-3	2/25/2015	99.68	10.92	NP	--	88.76	--
MW-3	8/11/2015	99.68	11.94	NP	--	87.74	--
MW-3	2/3/2016	99.68	10.25	NP	--	89.43	--
MW-3	4/8/2016	99.68	10.44	NP	--	89.24	--
MW-3	9/20/2016	99.68	11.82	NP	--	87.86	--
MW-3	12/28/2016	99.68	10.20	NP	--	89.48	--
MW-3	3/24/2017	99.68	9.63	NP	--	90.05	--
MW-3	6/22/2017	99.68	10.85	NP	--	88.83	--
MW-3	9/29/2017	99.68	11.64	NP	--	88.04	--
MW-3	11/14/2017	99.68	10.81	NP	--	88.87	--
MW-3	2/26/2018	99.68	9.95	NP	--	89.73	--
MW-3	6/12/2018	99.68	10.90	NP	--	88.78	--

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-4	9/6/2012	100.00	12.02	NP	--	87.98	--
MW-4	12/14/2012	100.00	11.03	NP	--	88.97	--
MW-4	1/9/2013	100.00	10.90	NP	--	89.10	--
MW-4	5/29/2013	100.00	11.28	NP	--	88.72	--
MW-4	8/20/2013	100.00	11.95	NP	--	88.05	--
MW-4	11/13/2013	100.00	11.69	NP	--	88.31	--
MW-4	2/19/2014	100.00	10.73	NP	--	89.27	--
MW-4	4/23/2014	100.00	11.14	NP	--	88.86	--
MW-4	8/7/2014	100.00	11.88	NP	--	88.12	--
MW-4	11/19/2014	100.00	11.71	NP	--	88.29	--
MW-4	2/25/2015	100.00	11.43	NP	--	88.57	--
MW-4	8/11/2015	100.00	12.25	NP	--	87.75	--
MW-4	2/3/2016	100.00	10.65	NP	--	89.35	--
MW-4	4/8/2016	100.00	10.78	NP	--	89.22	--
MW-4	9/20/2016	100.00	12.40	NP	--	87.60	--
MW-4	12/28/2016	100.00	10.70	NP	--	89.30	--
MW-4	3/24/2017	100.00	10.11	NP	--	89.89	--
MW-4	6/22/2017	100.00	11.11	NP	--	88.89	--
MW-4	9/29/2017	100.00	12.01	NP	--	87.99	--
MW-4	11/14/2017	100.00	11.48	NP	--	88.52	--
MW-4	2/26/2018	100.00	10.48	NP	--	89.52	--
MW-4	6/12/2018	100.00	11.32	NP	--	88.68	--
MW-5	4/8/2016	--	11.13	NP	--	--	--
MW-5	9/20/2016	--	12.40	NP	--	--	--
MW-5	12/28/2016	--	11.24	NP	--	--	--
MW-5	3/24/2017	--	10.70	NP	--	--	--
MW-5	6/22/2017	--	11.41	NP	--	--	--
MW-5	9/29/2017	--	12.07	NP	--	--	--
MW-5	11/14/2017	--	11.69	NP	--	--	--
MW-5	2/26/2018	--	11.03	NP	--	--	--
MW-5	6/12/2018	--	11.50	NP	--	--	--

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-6	8/20/2013	99.76	11.63	NP	--	88.13	--
MW-6	11/13/2013	99.76	11.43	NP	--	88.33	--
MW-6	2/19/2014	99.76	10.51	NP	--	89.25	--
MW-6	4/23/2014	99.76	10.68	NP	--	89.08	--
MW-6	8/7/2014	99.76	11.60	NP	--	88.16	--
MW-6	11/19/2014	99.73	11.35	NP	--	88.38	--
MW-6	2/25/2015	99.73	11.04	NP	--	88.69	--
MW-6	8/11/2015	99.73	12.00	NP	--	87.73	--
MW-6	2/3/2016	99.73	10.13	NP	--	89.60	--
MW-6	4/8/2016	99.73	10.40	NP	--	89.33	--
MW-6	9/20/2016	99.73	12.11	NP	--	87.62	--
MW-6	12/28/2016	99.73	10.43	NP	--	89.30	--
MW-6	3/24/2017	99.73	9.76	NP	--	89.97	--
MW-6	6/22/2017	99.73	10.78	NP	--	88.95	--
MW-6	9/29/2017	99.73	11.70	NP	--	88.03	--
MW-6	11/14/2017	99.73	11.16	NP	--	88.57	--
MW-6	2/26/2018	99.73	10.11	NP	--	89.62	--
MW-6	6/12/2018	99.73	10.95	NP	--	88.78	--
MW-7	8/20/2013	100.27	12.40	NP	--	87.87	--
MW-7	11/13/2013	100.27	12.09	NP	--	88.18	--
MW-7	2/19/2014	100.27	10.91	NP	--	89.36	--
MW-7	4/23/2014	100.27	11.52	NP	--	88.75	--
MW-7	8/7/2014	100.27	12.35	NP	--	87.92	--
MW-7	11/19/2014	100.27	12.09	NP	--	88.18	--
MW-7	2/25/2015	100.27	11.83	NP	--	88.44	--
MW-7	8/11/2015	100.27	12.75	NP	--	87.52	--
MW-7	2/3/2016	100.27	11.00	NP	--	89.27	--
MW-7	4/8/2016	100.27	11.40	NP	--	88.87	--
MW-7	9/20/2016	100.27	12.73	NP	--	87.54	--
MW-7	12/28/2016	100.27	11.18	NP	--	89.09	--
MW-7	3/24/2017	100.27	10.70	NP	--	89.57	--
MW-7	6/22/2017	100.27	11.67	NP	--	88.60	--
MW-7	9/29/2017	100.27	12.50	NP	--	87.77	--
MW-7	11/14/2017	100.27	11.90	NP	--	88.37	--
MW-7	2/26/2018	100.27	10.97	NP	--	89.30	--
MW-7	6/12/2018	100.27	11.88	NP	--	88.39	--

TABLE 1
Groundwater Gauging Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-8	8/20/2013	100.00	12.04	NP	--	87.96	--
MW-8	11/13/2013	100.00	12.73	NP	--	87.27	--
MW-8	2/19/2014	100.00	10.29	NP	--	89.71	--
MW-8	4/23/2014	100.00	11.14	NP	--	88.86	--
MW-8	8/7/2014	100.00	11.94	NP	--	88.06	--
MW-8	11/19/2014	100.00	11.70	NP	--	88.30	--
MW-8	2/25/2015	100.00	11.50	NP	--	88.50	--
MW-8	8/11/2015	100.00	12.42	NP	--	87.58	--
MW-8	2/3/2016	100.00	10.65	NP	--	89.35	--
MW-8	4/8/2016	100.00	11.04	NP	--	88.96	--
MW-8	9/20/2016	100.00	12.37	NP	--	87.63	--
MW-8	12/28/2016	100.00	10.76	NP	--	89.24	--
MW-8	3/24/2017	100.00	10.26	NP	--	89.74	--
MW-8	6/22/2017	100.00	11.30	NP	--	88.70	--
MW-8	9/29/2017	100.00	12.15	NP	--	87.85	--
MW-8	11/14/2017	100.00	11.41	NP	--	88.59	--
MW-8	2/26/2018	100.00	10.55	NP	--	89.45	--
MW-8	6/12/2018	100.00	11.52	NP	--	88.48	--

Notes:
TOC - Top of Casing
ft - feet
NP - No Product
LNAPL - Light Non-Aqueous Phase Liquid
* - Corrected for LNAPL if present (assumes LNAPL specific gravity = 0.75)
-- No Information Available

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

CONSTITUENT		B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
Well ID	Date										
MW-1	9/6/2012	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50.0	**50.6**	--
MW-1	12/14/2012	< 1.0	< 1.0	< 1.0	< 3.0	--	< 0.01	< 1.0	< 100	< 3.0	--
MW-1	1/9/2013	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 80	11	--
MW-1	5/29/2013	< 0.50	< 0.50	< 0.50	< 1.00	< 0.50	< 0.0096	< 0.50	< 50	< 10	--
MW-1	8/20/2013	< 0.50	< 0.50	< 0.50	< 1.0	< 0.50	< 0.0096	< 0.50	< 50	< 10	< 10
MW-1	11/13/2013	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-1	2/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-1	4/23/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-1	8/7/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	8.1	< 2.0
MW-1	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-1	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	< 1.0	--	--	< 100	< 2.0	< 2.0
MW-1	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	190	< 2.0	< 2.0
MW-1	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0*	--	--	< 50*	< 2.0	< 2.0
MW-1	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-1	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-1	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-1	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 4.0	< 4.0
MW-1	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 2.0	--	--	< 500	< 4.0	< 4.0
MW-1	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0
MW-1	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	< 1.0 H1 L1 SS	--	--	< 100	< 10.0	< 10.0
MW-1	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0
MW-1	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

	CONSTITUENT	B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
	UNIT	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
MW-2	9/6/2012	< 1.0	< 1.0	< 1.0	< 3.0	2.6	< 0.010	< 1.0	< 50.0	**15.8**	--
MW-2	12/14/2012	< 1.0	< 1.0	< 1.0	< 3.0	--	< 0.01	< 1.0	< 100	< 3.0	--
MW-2	1/9/2013	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 80	< 1.0	--
MW-2	5/29/2013	< 0.50	< 0.50	< 0.50	< 1.00	0.66	< 0.0098	< 0.50	< 50	13.0	--
MW-2	8/20/2013	< 0.50	< 0.50	< 0.50	< 1.0	0.70	< 0.0097	< 0.50	< 50	< 10	< 10
MW-2	11/13/2013	< 1.0	2.8	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	7.8	< 2.0
MW-2	2/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-2	4/23/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-2	8/7/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-2	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-2	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	< 1.0	--	--	< 100	< 2.0	< 2.0
MW-2	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	65	< 2.0	< 2.0
MW-2	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0*	--	--	< 50*	< 2.0	< 2.0
MW-2	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-2	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-2	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-2	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 4.0	< 4.0
MW-2	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 2.0	--	--	< 500	< 4.0	< 4.0
MW-2	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0
MW-2	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	< 1.0 H1 L1	--	--	< 100	< 10.0	< 10.0
MW-2	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0
MW-2	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

	CONSTITUENT	B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
	UNIT	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
MW-3	9/6/2012	< 1.0	< 1.0	< 1.0	< 3.0	16.9	< 0.010	< 1.0	< 50.0	< 10.0	--
MW-3	12/14/2012	< 1.0	< 1.0	< 1.0	< 3.0	--	< 0.01	< 1.0	< 100	11.1	--
MW-3	1/9/2013	< 1.0	< 1.0	< 1.0	< 3.0	17	< 1.0	< 1.0	< 80	< 1.0	--
MW-3	5/29/2013	< 0.50	< 0.50	< 0.50	< 1.00	14	< 0.0097	< 0.50	< 50	10.7	--
MW-3	8/20/2013	< 0.50	< 0.50	< 0.50	< 1.0	7.9	< 0.0097	< 0.50	< 50	< 10	< 10
MW-3	11/13/2013	< 1.0	2.3	< 1.0	< 3.0	17	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-3	2/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	11	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-3	4/23/2014	< 1.0	< 1.0	< 1.0	< 3.0	14	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-3	8/7/2014	< 1.0	< 1.0	< 1.0	< 3.0	**25**	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-3	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	11	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-3	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	8.1	--	--	< 100	< 2.0	< 2.0
MW-3	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	3.8	--	--	54	< 2.0	< 2.0
MW-3	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	4.8 H	--	--	< 50*	< 2.0	< 2.0
MW-3	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	7.9	--	--	< 50	< 2.0	< 2.0
MW-3	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	8.6	--	--	< 50	< 2.0	< 2.0
MW-3	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	13	--	--	< 50	< 2.0	< 2.0
MW-3	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	4.8	--	--	< 50	< 4.0	< 4.0
MW-3	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	9.2	--	--	< 500	< 4.0	< 4.0
MW-3	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	10.3	--	--	< 100	< 10.0	< 10.0
MW-3	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	5.4 H1 L1 SS	--	--	< 100	< 10.0	< 10.0
MW-3	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	8.0	--	--	< 100	< 10.0	< 10.0
MW-3	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0	6.7	--	--	< 100	13.4	< 10.0

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

CONSTITUENT		B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
MW-4	9/6/2012	**6.1**	< 1.0	290	116	3.6	< 0.010	< 1.0	**10200**	< 10.0	--
MW-4	12/14/2012	4.8	< 1.0	208	50.7	--	< 0.01	< 1.0	**3230**	**15.8**	--
MW-4	1/9/2013	< 5.0	< 5.0	250	56	< 5.0	< 5.0	< 5.0	**4500**	6.1	--
MW-4	5/29/2013	2.1	< 0.50	220	48.8	2.6	< 0.0095	< 0.50	**4500**	14.7	--
MW-4	8/20/2013	1.6	< 0.50	240	47	< 2.4	< 0.0098	< 0.50	**4500**	< 10	< 10
MW-4	11/13/2013	1.7	1.9	270	43	1.1	< 0.010	< 1.0	**7100**	8.9	8.2
MW-4	2/19/2014	1.1	< 1.0	180	26	2.0	< 0.010	< 1.0	**5400**	5.6	5.7
MW-4	4/23/2014	< 1.0	< 1.0	130	17	< 1.0	< 0.010	< 1.0	**5800**	8.6	6.1
MW-4	8/7/2014	< 1.0	< 1.0	170	15	< 1.0	< 0.010	< 1.0	**5700**	6.6	6.0
MW-4	11/19/2014	< 1.0	< 1.0	< 1.0	7.6	< 1.0	< 0.010	< 1.0	**4900**	9.0	6.9
MW-4	2/25/2015	< 2.0*	< 2.0*	130	5.5	< 1.0	--	--	< 100	6.1	5.3
MW-4	8/11/2015	< 2.0	< 2.0	46	< 3.0	< 1.0	--	--	**3700**	5.7	5.6
MW-4	2/3/2016	< 2.0	< 2.0	53	< 3.0	< 1.0*	--	--	**3300 ***	5.8	5.5
MW-4	4/8/2016	< 2.0	< 2.0	54	< 3.0	< 1.0	--	--	**1900**	5.8	5.3
MW-4	9/20/2016	< 2.0	< 2.0	15	< 3.0	< 1.0	--	--	**2200**	5.4	4.3
MW-4	12/28/2016	< 2.0	< 2.0	39	< 3.0	< 1.0	--	--	**2300**	5.9	5.1
MW-4	3/24/2017	< 2.0	< 2.0	24	< 3.0	< 1.0	--	--	**1800**	4.8	4.8
MW-4	6/22/2017	< 2.0	< 2.0	22	< 3.0	< 2.0	--	--	**1700**	5.3	4.9
MW-4	9/29/2017	< 1.0	< 1.0	23.5	< 3.0	< 1.0	--	--	**2260**	< 10.0	< 10.0
MW-4	11/14/2017	< 1.0 H1	< 1.0 H1	24.3 H1	< 3.0	< 1.0 H1 L1	--	--	**2300**	< 10.0	< 10.0
MW-4	2/26/2018	< 1.0	< 1.0	12.4	< 3.0	< 1.0	--	--	**2240**	< 10.0	< 10.0
MW-4	6/12/2018	< 1.0	< 1.0	7.3	< 3.0	< 1.0	--	--	**2140**	< 10.0	< 10.0
MW-5	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	270	< 2.0	< 2.0
MW-5	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	270	< 2.0	< 2.0
MW-5	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	480	< 2.0	< 2.0
MW-5	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	300	< 4.0	< 4.0
MW-5	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 2.0	--	--	670	< 4.0	< 4.0
MW-5	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	483	< 10.0	< 10.0
MW-5	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	< 1.0 H1 L1	--	--	418	< 10.0	< 10.0
MW-5	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	320	< 10.0	< 10.0
MW-5	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	318	< 10.0	< 10.0

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

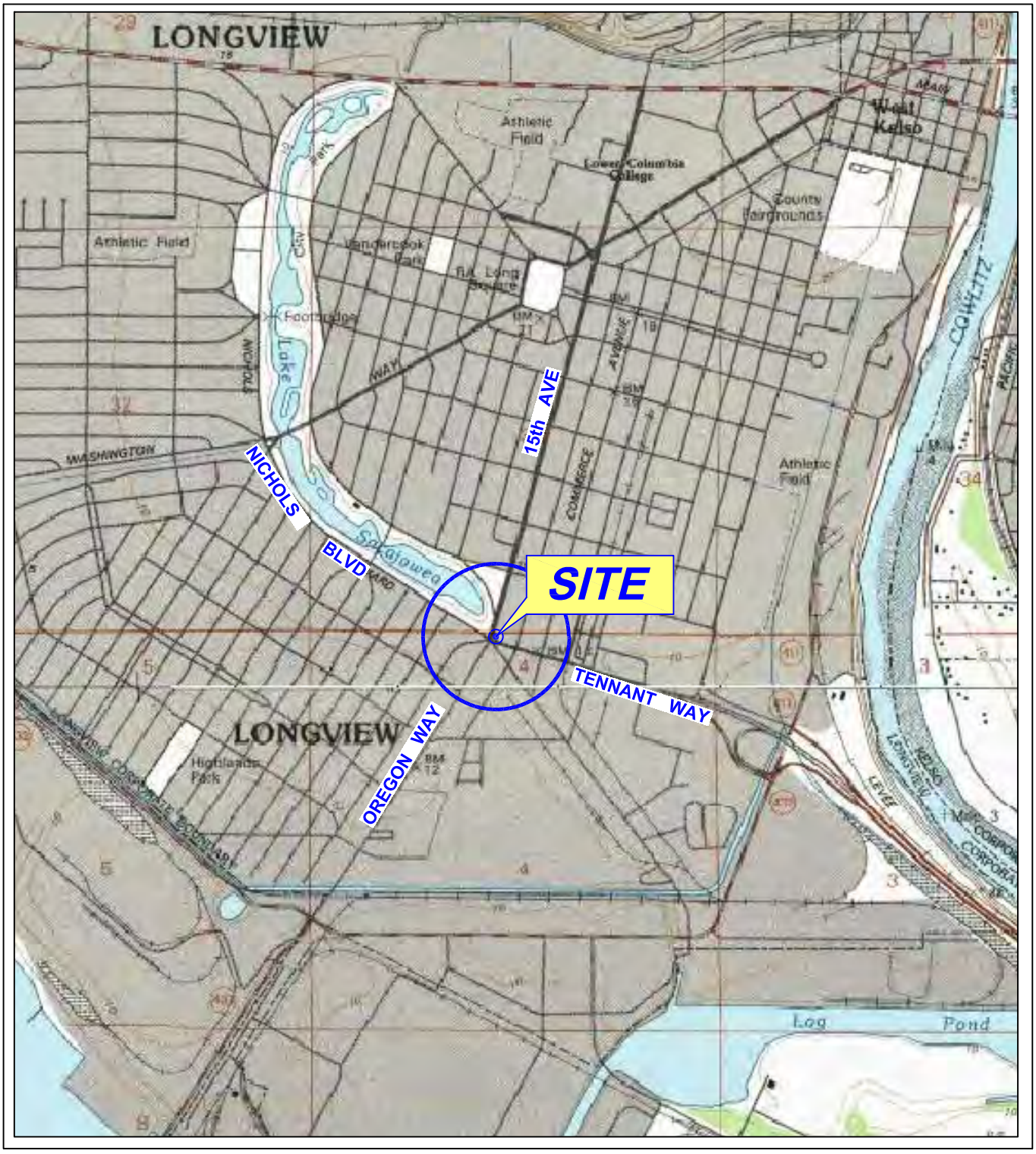
	CONSTITUENT	B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
	UNIT	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
MW-6	8/20/2013	< 0.50	< 0.50	1.9	< 1.0	4.9	< 0.0097	< 0.50	650	< 10	< 10
MW-6	11/13/2013	< 1.0	1.4	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	400	2.1	< 2.0
MW-6	2/19/2014	< 1.0	< 1.0	1.4	< 3.0	1.6	< 0.010	< 1.0	300	< 2.0	< 2.0
MW-6	4/23/2014	< 1.0	< 1.0	1.0	< 3.0	< 1.0	< 0.010	< 1.0	**830**	3.4	< 2.0
MW-6	8/7/2014	< 1.0	< 1.0	3.0	< 3.0	< 1.0	< 0.010	< 1.0	570	< 2.0	< 2.0
MW-6	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	220	< 2.0	< 2.0
MW-6	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	< 1.0	--	--	370	< 2.0	< 2.0
MW-6	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	2.2	--	--	88	< 2.0	< 2.0
MW-6	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0H	--	--	140 *	< 2.0	< 2.0
MW-6	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	230	< 2.0	< 2.0
MW-6	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	1.3	--	--	84	< 2.0	< 2.0
MW-6	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	97	< 2.0	< 2.0
MW-6	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	80	< 4.0	< 4.0
MW-6	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 2.0	--	--	< 500	< 4.0	< 4.0
MW-6	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	2.3	--	--	149	< 10.0	< 10.0
MW-6	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	1.1 H1 L1 SS	--	--	190	< 10.0	< 10.0
MW-6	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	< 100	< 10.0	< 10.0
MW-6	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	--	--	133	< 10.0	< 10.0
MW-7	8/20/2013	< 0.50	< 0.50	< 0.50	< 1.0	2.0	< 0.0096	< 0.50	< 50	< 10	< 10
MW-7	11/13/2013	< 1.0	1.2	< 1.0	< 3.0	2.2	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-7	2/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-7	4/23/2014	< 1.0	< 1.0	< 1.0	< 3.0	2.2	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-7	8/7/2014	< 1.0	< 1.0	< 1.0	< 3.0	2.9	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-7	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	3.2	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-7	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	1.8	--	--	< 100	< 2.0	< 2.0
MW-7	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	2.8	--	--	< 50	< 2.0	< 2.0
MW-7	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0*	--	--	< 50*	< 2.0	< 2.0
MW-7	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	1.8	--	--	< 50	< 2.0	< 2.0
MW-7	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	3.0	--	--	< 50	< 2.0	< 2.0
MW-7	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 2.0	< 2.0
MW-7	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 1.0	--	--	< 50	< 4.0	< 4.0
MW-7	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 2.0	--	--	< 500	< 4.0	< 4.0
MW-7	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	3.9	--	--	< 100	< 10.0	< 10.0
MW-7	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	2.6 H1 L1 SS	--	--	< 100	< 10.0	< 10.0
MW-7	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	1.3	--	--	< 100	< 10.0	< 10.0
MW-7	6/12/2018	< 1.0	< 1.0	< 1.0	< 3.0 RS	2.0	--	--	< 100	< 10.0	< 10.0

Table 2
Groundwater Analytical Data
ARCO Facility 5300
710 15th Avenue
Longview, WA

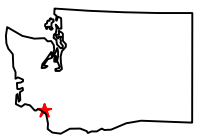
CONSTITUENT		B	T	E	X	MTBE	EDB	EDC	TPH-G	Lead (Total)	Lead (Dissolved)
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		**5**	**1000**	**700**	**1000**	**20**	**0.01**	**5**	**1000/800[1]**	**15**	**NE**
MW-8	8/20/2013	< 0.50	< 0.50	< 0.50	< 1.0	2.2	< 0.0097	< 0.50	< 50	< 10	< 10
MW-8	11/13/2013	< 1.0	1.0	< 1.0	< 3.0	2.3	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-8	2/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-8	4/23/2014	< 1.0	< 1.0	< 1.0	< 3.0	1.9	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-8	8/7/2014	< 1.0	< 1.0	< 1.0	< 3.0	1.8	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-8	11/19/2014	< 1.0	< 1.0	< 1.0	< 3.0	2.7	< 0.010	< 1.0	< 50	< 2.0	< 2.0
MW-8	2/25/2015	< 2.0*	< 2.0*	< 3.0*	< 3.0	3.0	--	--	< 100	< 2.0	< 2.0
MW-8	8/11/2015	< 2.0	< 2.0	< 3.0	< 3.0	4.6	--	--	200	< 2.0	< 2.0
MW-8	2/3/2016	< 2.0	< 2.0	< 3.0	< 3.0	9.5 *	--	--	< 50*	< 2.0	< 2.0
MW-8	4/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	4.5	--	--	< 50	< 2.0	< 2.0
MW-8	9/20/2016	< 2.0	< 2.0	< 3.0	< 3.0	8.6	--	--	< 50	< 2.0	< 2.0
MW-8	12/28/2016	< 2.0	< 2.0	< 3.0	< 3.0	1.2	--	--	< 50	< 2.0	< 2.0
MW-8	3/24/2017	< 2.0	< 2.0	< 3.0	< 3.0	4.2	--	--	< 50	< 4.0	< 4.0
MW-8	6/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	6.3	--	--	< 500	< 4.0	< 4.0
MW-8	9/29/2017	< 1.0	< 1.0	< 1.0	< 3.0	8.2	--	--	< 100	< 10.0	< 10.0
MW-8	11/14/2017	< 1.0 H1	< 1.0 H1	< 1.0 H1	< 3.0	6.6 H1 L1 SS	--	--	< 100	< 10.0	< 10.0
MW-8	2/26/2018	< 1.0	< 1.0	< 1.0	< 3.0	3.5	--	--	< 100	< 10.0	< 10.0
MW-8	6/12/2018	< 1.0	< 1.0 M1	< 1.0 M1	< 3.0	4.6	--	--	< 100	< 10.0	< 10.0

Notes:
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes, Total
MTBE = Methyl-tertiary-butyl ether
EDB = 1,2-Dibromo-ethane
EDC = 1,2-Dichloro-ethane
TPH-G = Total petroleum hydrocarbons as gasoline by Northwest Method NWTPH-Gx
TPH-D = Total petroleum hydrocarbons as diesel by Northwest Method NWTPH-Dx
TPH-O = Total petroleum hydrocarbons as oil by Northwest Method NWTPH-Dx
1,000/800[1] ug/L if no detectable levels of Benzene in the sample - otherwise 800 ug/L
NE = Not evaluated
<1.0 = Concentrations were not detected above the laboratory method reporting limit.
ug/L = Micrograms per liter (ppb)
ND = Not detected
-- = No value given/Not analyzed/Not applicable
MTCA = Model Toxics Control Act
Results in **bold** indicate concentrations in excess of MTCA Method A Cleanup Levels
* = LCS or LCSD is outside acceptance limits
L1 = Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
H1 = Analysis conducted outside the recognized method holding time.
SS = This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

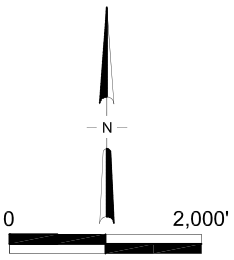
Figures



GENERAL NOTES:
BASE MAP FROM TERRAIN NAVIGATOR PRO
KELSO, WA. QUADRANGLE
7.5 MINUTE TOPOGRAPHIC MAP
1990



QUADRANGLE LOCATION



SCALE

FIGURE 1
SITE LOCATION MAP

ARCO FACILITY NO. 5300
710 15th AVENUE
LONGVIEW, WA.

PROJECT NO. 05300EA131		DRAWN BY K. MARTIN	
FILE NO. 5300-SLM		PREPARED BY M. STOCK	
DATE 04 JUN 13	REV. 0	REVIEWED BY	

antea group

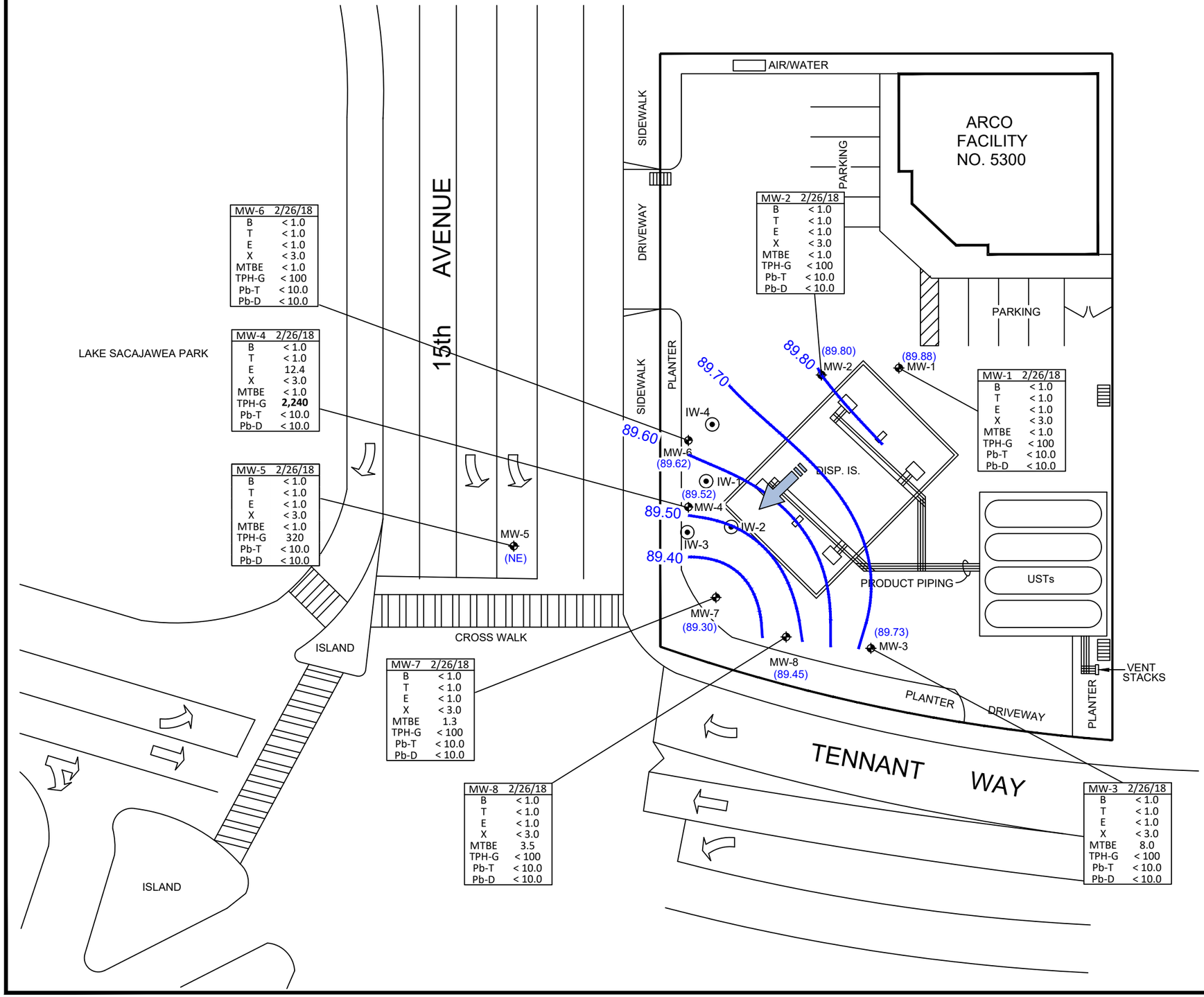
NORTH
0 200'
SCALE

SITE LOCATION

FIGURE 2
SITE AERIAL MAP
ARCO FACILITY NO. 5300
710 15th AVENUE
LONGVIEW, WASHINGTON

PROJECT NO. 5300EA121		DRN KM	
FILE NO. 5300G-Sam		PREPARED MS	
DATE 04 JUN 13	REV. 0	REVIEWED	

antea group



LEGEND

- MW-1 — GROUNDWATER MONITORING WELL LOCATION
- PIPING
- IW-1 — INJECTION WELL LOCATION
- CATCH BASIN
- (88.80) — GROUNDWATER ELEVATION IN FEET RELATIVE TO AN ARBITRARY SITE DATUM
- 89.80 — INFERRED WATER TABLE CONTOUR IN FEET RELATIVE TO AN ARBITRARY SITE DATUM (CONTOUR INTERVAL: 0.10 ft)
- INFERRED GROUNDWATER FLOW DIRECTION: SW GROUNDWATER GRADIENT: 0.01 ft/LINEAR ft
- NE — NOT ESTABLISHED

GROUNDWATER DATA

MW-1	2/26/18	
B	< 1.0	BENZENE IN µg/L
T	< 1.0	TOLUENE IN µg/L
E	< 1.0	ETHYLBENZENE IN µg/L
X	< 3.0	TOTAL XYLENES IN µg/L
MTBE	< 1.0	METHYL TERT-BUTYL ETHER IN µg/L
TPH-G	< 100	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN µg/L
Pb-T	< 10.0	TOTAL LEAD IN µg/L
Pb-D	< 10.0	DISSOLVED LEAD IN µg/L

Notes:
<1.0 = Concentrations were not detected above the laboratory method reporting limit.
ug/L = Micrograms per liter (ppb)
Results in **bold** indicate concentrations in excess of Washington State Department of Ecology's Model Toxics Control Act (MTCA) Method A Cleanup Levels

N

0 30'

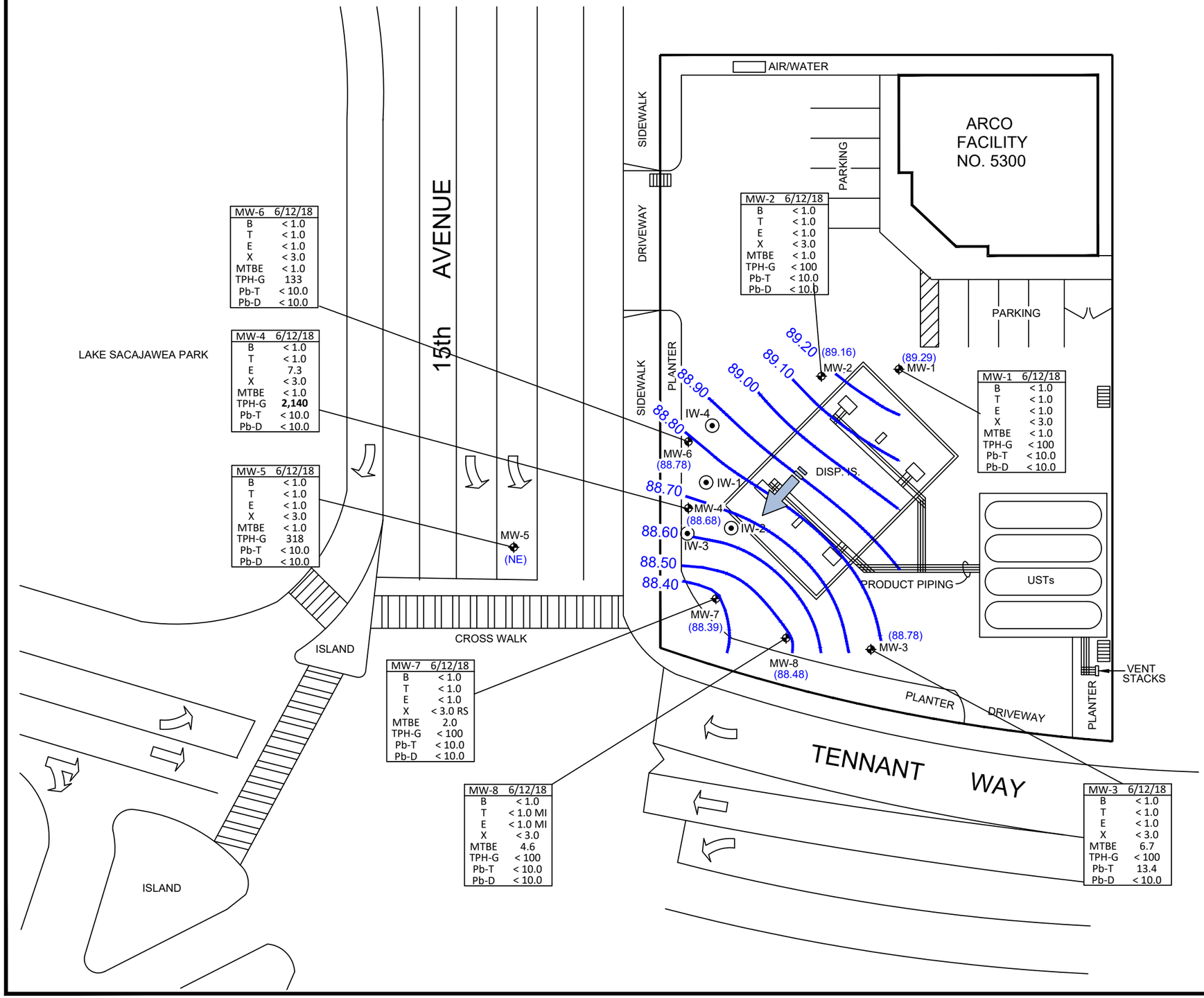
APPROX. SCALE

FIGURE 3
GROUNDWATER ANALYTICAL AND ELEVATION CONTOUR MAP - 2/26/2018

ARCO FACILITY NO. 5300
710 15th AVENUE
LONGVIEW, WA.

PROJECT NO. 05300SA271	DRAWN BY DR/LKO
FILE NO. -PROJINJ AR-5300q -1q18	PREPARED BY FS
REVISION NO. 1	REVIEWED BY MR

antea group



LEGEND

- MW-1 ◆ GROUNDWATER MONITORING WELL LOCATION
- PIPING
- IW-1 ⊙ INJECTION WELL LOCATION
- CATCH BASIN
- (89.16) GROUNDWATER ELEVATION IN FEET RELATIVE TO AN ARBITRARY SITE DATUM
- 89.20 INFERRED WATER TABLE CONTOUR IN FEET RELATIVE TO AN ARBITRARY SITE DATUM (CONTOUR INTERVAL: 0.10 ft)
- INFERRED GROUNDWATER FLOW DIRECTION: SW GROUNDWATER GRADIENT: 0.01 ft/LINEAR ft
- NE NOT ESTABLISHED

GROUNDWATER DATA

MW-1	6/12/18	
B	< 1.0	BENZENE IN µg/L
T	< 1.0	TOLUENE IN µg/L
E	< 1.0	ETHYLBENZENE IN µg/L
X	< 3.0	TOTAL XYLENES IN µg/L
MTBE	< 1.0	METHYL TERT-BUTYL ETHER IN µg/L
TPH-G	< 100	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN µg/L
Pb-T	< 10.0	TOTAL LEAD IN µg/L
Pb-D	< 10.0	DISSOLVED LEAD IN µg/L

Notes:
<1.0 = Concentrations were not detected above the laboratory method reporting limit.
ug/L = Micrograms per liter (ppb)
Results in **bold** indicate concentrations in excess of Washington State Department of Ecology's Model Toxics Control Act (MTCA) Method A Cleanup Levels

RS: The RPD value in one of the constituent analytes was outside the control limits.
M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

N

0 30'

APPROX. SCALE

FIGURE 4
GROUNDWATER ANALYTICAL AND ELEVATION CONTOUR MAP - 6/12/2018

ARCO FACILITY NO. 5300
710 15th AVENUE
LONGVIEW, WA.

PROJECT NO. 05300SA271	DRAWN BY DR/LKO
FILE NO. -PROJINJ AR-5300q -2q18	PREPARED BY FS
REVISION NO. 1	REVIEWED BY MR

antea group

Appendix A

Analytical Lab Reports and Chain-of-Custody Documentation

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 13, 2018

Megan Richard
Antea Group[
4640 SW Macadam Ave, Ste. 110
Portland, OR 97239

RE: Project: Former ARCO 5300
Pace Project No.: 10422101

Dear Megan Richard:
Enclosed are the analytical results for sample(s) received by the laboratory on February 28, 2018. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

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

Sincerely,

Shawn Davis
shawn.davis@pacelabs.com
612-607-6378
Project Manager

Enclosures

cc: AG DataView, Antea Group
Brad Jackson, Antea USA - OR
Camille Rivera, The Antea Group
Taylor Roberts, Antea Group
Jaime Sasse, Antea Group
Mackie Stock, Antea Group
Missy Tracy, The Antea Group
Todd Vanek, Antea USA
AG Data View, Antea Group

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: Former ARCO 5300
Pace Project No.: 10422101

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: Former ARCO 5300
Pace Project No.: 10422101

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10422101001	**MW-1**	Water	02/26/18 08:25	02/28/18 11:15
10422101002	**MW-2**	Water	02/26/18 08:50	02/28/18 11:15
10422101003	**MW-3**	Water	02/26/18 11:00	02/28/18 11:15
10422101004	**MW-4**	Water	02/26/18 09:40	02/28/18 11:15
10422101005	**MW-5**	Water	02/26/18 11:30	02/28/18 11:15
10422101006	**MW-6**	Water	02/26/18 09:20	02/28/18 11:15
10422101007	**MW-7**	Water	02/26/18 10:10	02/28/18 11:15
10422101008	**MW-8**	Water	02/26/18 10:25	02/28/18 11:15
10422101009	**TB**	Water	02/26/18 00:00	02/28/18 11:15

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: Former ARCO 5300
Pace Project No.: 10422101

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10422101001	**MW-1**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101002	**MW-2**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101003	**MW-3**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101004	**MW-4**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101005	**MW-5**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101006	**MW-6**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101007	**MW-7**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101008	**MW-8**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	IP	1	PASI-M
		EPA 8260B	DS2	8	PASI-M
10422101009	**TB**	NWTPH-Gx	AJR	2	PASI-M
		EPA 8260B	DS2	8	PASI-M

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: Former ARCO 5300
Pace Project No.: 10422101

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: BP-Antea Group OR
Date: March 13, 2018

General Information:
9 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: Former ARCO 5300
Pace Project No.: 10422101

Method: **EPA 6010**
Description: 6010 MET ICP
Client: BP-Antea Group OR
Date: March 13, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: Former ARCO 5300
Pace Project No.: 10422101

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: BP-Antea Group OR
Date: March 13, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: Former ARCO 5300
Pace Project No.: 10422101

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: BP-Antea Group OR
Date: March 13, 2018

General Information:
9 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-1 **Lab ID: 10422101001** Collected: 02/26/18 08:25 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 17:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	87	%.	50-150	1		03/09/18 17:21	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 13:45	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 13:20	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 11:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 11:23	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 11:23	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 11:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 11:23	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	75-125	1		03/01/18 11:23	17060-07-0	
Toluene-d8 (S)	113	%.	75-125	1		03/01/18 11:23	2037-26-5	
4-Bromofluorobenzene (S)	106	%.	75-125	1		03/01/18 11:23	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-2 **Lab ID: 10422101002** Collected: 02/26/18 08:50 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 17:04		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	50-150	1		03/09/18 17:04	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 13:48	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 13:24	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 09:38	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 09:38	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 09:38	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 09:38	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 09:38	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		03/01/18 09:38	17060-07-0	
Toluene-d8 (S)	114	%.	75-125	1		03/01/18 09:38	2037-26-5	
4-Bromofluorobenzene (S)	108	%.	75-125	1		03/01/18 09:38	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-3 **Lab ID: 10422101003** Collected: 02/26/18 11:00 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 17:38		
Surrogates								
a,a,a-Trifluorotoluene (S)	88	%.	50-150	1		03/09/18 17:38	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:02	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 13:44	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 11:40	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 11:40	100-41-4	
Methyl-tert-butyl ether	**8.0**	ug/L	1.0	1		03/01/18 11:40	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 11:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 11:40	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%.	75-125	1		03/01/18 11:40	17060-07-0	
Toluene-d8 (S)	114	%.	75-125	1		03/01/18 11:40	2037-26-5	
4-Bromofluorobenzene (S)	108	%.	75-125	1		03/01/18 11:40	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-4 **Lab ID: 10422101004** Collected: 02/26/18 09:40 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	**2240**	ug/L	100	1		03/09/18 18:29		
Surrogates								
a,a,a-Trifluorotoluene (S)	107	%.	50-150	1		03/09/18 18:29	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:05	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 13:55	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 11:57	71-43-2	
Ethylbenzene	**12.4**	ug/L	1.0	1		03/01/18 11:57	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 11:57	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 11:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 11:57	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	75-125	1		03/01/18 11:57	17060-07-0	
Toluene-d8 (S)	117	%.	75-125	1		03/01/18 11:57	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125	1		03/01/18 11:57	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-5 **Lab ID: 10422101005** Collected: 02/26/18 11:30 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	**320**	ug/L	100	1		03/09/18 18:46		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	50-150	1		03/09/18 18:46	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:17	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 13:59	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 12:15	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 12:15	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 12:15	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 12:15	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 12:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1		03/01/18 12:15	17060-07-0	
Toluene-d8 (S)	114	%.	75-125	1		03/01/18 12:15	2037-26-5	
4-Bromofluorobenzene (S)	108	%.	75-125	1		03/01/18 12:15	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-6 **Lab ID: 10422101006** Collected: 02/26/18 09:20 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 19:03		
Surrogates								
a,a,a-Trifluorotoluene (S)	90	%.	50-150	1		03/09/18 19:03	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:31	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 14:19	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 12:32	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 12:32	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 12:32	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 12:32	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 12:32	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%.	75-125	1		03/01/18 12:32	17060-07-0	
Toluene-d8 (S)	115	%.	75-125	1		03/01/18 12:32	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125	1		03/01/18 12:32	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-7 **Lab ID: 10422101007** Collected: 02/26/18 10:10 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 19:20		
Surrogates								
a,a,a-Trifluorotoluene (S)	91	%.	50-150	1		03/09/18 19:20	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:34	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 14:23	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 12:50	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 12:50	100-41-4	
Methyl-tert-butyl ether	**1.3**	ug/L	1.0	1		03/01/18 12:50	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 12:50	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 12:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	75-125	1		03/01/18 12:50	17060-07-0	
Toluene-d8 (S)	116	%.	75-125	1		03/01/18 12:50	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	75-125	1		03/01/18 12:50	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: MW-8 **Lab ID: 10422101008** Collected: 02/26/18 10:25 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 19:37		
Surrogates								
a,a,a-Trifluorotoluene (S)	86	%.	50-150	1		03/09/18 19:37	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	03/01/18 11:17	03/02/18 14:37	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	03/02/18 13:23	03/07/18 14:27	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 13:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 13:07	100-41-4	
Methyl-tert-butyl ether	**3.5**	ug/L	1.0	1		03/01/18 13:07	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 13:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 13:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	75-125	1		03/01/18 13:07	17060-07-0	
Toluene-d8 (S)	114	%.	75-125	1		03/01/18 13:07	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	75-125	1		03/01/18 13:07	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: Former ARCO 5300
Pace Project No.: 10422101

Sample: TB **Lab ID: 10422101009** Collected: 02/26/18 00:00 Received: 02/28/18 11:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		03/09/18 20:28		
Surrogates								
a,a,a-Trifluorotoluene (S)	88	%.	50-150	1		03/09/18 20:28	98-08-8	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		03/01/18 11:05	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		03/01/18 11:05	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		03/01/18 11:05	1634-04-4	
Toluene	ND	ug/L	1.0	1		03/01/18 11:05	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		03/01/18 11:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	75-125	1		03/01/18 11:05	17060-07-0	
Toluene-d8 (S)	115	%.	75-125	1		03/01/18 11:05	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	75-125	1		03/01/18 11:05	460-00-4	

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: Former ARCO 5300
Pace Project No.: 10422101

QC Batch: 526681 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008, 10422101009

METHOD BLANK: 2857704 Matrix: Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008, 10422101009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	100	03/09/18 15:21	
a,a,a-Trifluorotoluene (S)	%.	87	50-150	03/09/18 15:21	

METHOD BLANK: 2857705 Matrix: Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008, 10422101009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	100	03/09/18 15:39	
a,a,a-Trifluorotoluene (S)	%.	90	50-150	03/09/18 15:39	

LABORATORY CONTROL SAMPLE & LCSD: 2857706 2857707

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	1000	1110	1090	111	109	41-137	1	20	
a,a,a-Trifluorotoluene (S)	%.				98	99	50-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2857708 2857709

Parameter	Units	10422101002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	ug/L	ND	1000	1000	1130	1130	113	113	30-145	0	30	
a,a,a-Trifluorotoluene (S)	%.						98	98	50-150			

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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: Former ARCO 5300
Pace Project No.: 10422101

QC Batch: 525271 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008

METHOD BLANK: 2850504 Matrix: Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	10.0	03/02/18 13:39	

LABORATORY CONTROL SAMPLE: 2850505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2850506 2850507

Parameter	Units	10422101002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	1000	1000	1020	996	101	99	75-125	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2850508 2850509

Parameter	Units	10422101005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	1000	1000	1020	1000	101	100	75-125	1	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: Former ARCO 5300
Pace Project No.: 10422101

QC Batch: 525492 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008

METHOD BLANK: 2851857 Matrix: Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead, Dissolved	ug/L	ND	10.0	03/07/18 13:12	

LABORATORY CONTROL SAMPLE: 2851858

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead, Dissolved	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2851859 2851860

Parameter	Units	10422101002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2851861 2851862

Parameter	Units	10422101005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	75-125	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: Former ARCO 5300
Pace Project No.: 10422101

QC Batch: 525285 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008, 10422101009

METHOD BLANK: 2850558 Matrix: Water
Associated Lab Samples: 10422101001, 10422101002, 10422101003, 10422101004, 10422101005, 10422101006, 10422101007, 10422101008, 10422101009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	03/01/18 09:21	
Ethylbenzene	ug/L	ND	1.0	03/01/18 09:21	
Methyl-tert-butyl ether	ug/L	ND	1.0	03/01/18 09:21	
Toluene	ug/L	ND	1.0	03/01/18 09:21	
Xylene (Total)	ug/L	ND	3.0	03/01/18 09:21	
1,2-Dichloroethane-d4 (S)	%.	103	75-125	03/01/18 09:21	
4-Bromofluorobenzene (S)	%.	108	75-125	03/01/18 09:21	
Toluene-d8 (S)	%.	115	75-125	03/01/18 09:21	

LABORATORY CONTROL SAMPLE: 2850559

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.1	86	75-126	
Ethylbenzene	ug/L	20	20.5	103	75-125	
Methyl-tert-butyl ether	ug/L	20	17.1	85	73-129	
Toluene	ug/L	20	22.5	112	74-125	
Xylene (Total)	ug/L	60	61.9	103	75-125	
1,2-Dichloroethane-d4 (S)	%.			98	75-125	
4-Bromofluorobenzene (S)	%.			105	75-125	
Toluene-d8 (S)	%.			115	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2850560 2850561

Parameter	Units	10422101002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	17.1	16.6	86	83	62-140	3	30	
Ethylbenzene	ug/L	ND	20	20	20.3	19.4	102	97	75-131	5	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	16.6	16.1	82	79	65-130	3	30	
Toluene	ug/L	ND	20	20	22.4	21.2	112	106	68-132	5	30	
Xylene (Total)	ug/L	ND	60	60	61.1	58.4	102	97	69-135	5	30	
1,2-Dichloroethane-d4 (S)	%.						95	100	75-125			
4-Bromofluorobenzene (S)	%.						103	105	75-125			
Toluene-d8 (S)	%.						114	114	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: Former ARCO 5300
Pace Project No.: 10422101

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.

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-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Former ARCO 5300
Pace Project No.: 10422101

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10422101001	**MW-1**	NWTPH-Gx	526681		
10422101002	**MW-2**	NWTPH-Gx	526681		
10422101003	**MW-3**	NWTPH-Gx	526681		
10422101004	**MW-4**	NWTPH-Gx	526681		
10422101005	**MW-5**	NWTPH-Gx	526681		
10422101006	**MW-6**	NWTPH-Gx	526681		
10422101007	**MW-7**	NWTPH-Gx	526681		
10422101008	**MW-8**	NWTPH-Gx	526681		
10422101009	**TB**	NWTPH-Gx	526681		
10422101001	**MW-1**	EPA 3010	525271	EPA 6010	525388
10422101002	**MW-2**	EPA 3010	525271	EPA 6010	525388
10422101003	**MW-3**	EPA 3010	525271	EPA 6010	525388
10422101004	**MW-4**	EPA 3010	525271	EPA 6010	525388
10422101005	**MW-5**	EPA 3010	525271	EPA 6010	525388
10422101006	**MW-6**	EPA 3010	525271	EPA 6010	525388
10422101007	**MW-7**	EPA 3010	525271	EPA 6010	525388
10422101008	**MW-8**	EPA 3010	525271	EPA 6010	525388
10422101001	**MW-1**	EPA 3010	525492	EPA 6010	525651
10422101002	**MW-2**	EPA 3010	525492	EPA 6010	525651
10422101003	**MW-3**	EPA 3010	525492	EPA 6010	525651
10422101004	**MW-4**	EPA 3010	525492	EPA 6010	525651
10422101005	**MW-5**	EPA 3010	525492	EPA 6010	525651
10422101006	**MW-6**	EPA 3010	525492	EPA 6010	525651
10422101007	**MW-7**	EPA 3010	525492	EPA 6010	525651
10422101008	**MW-8**	EPA 3010	525492	EPA 6010	525651
10422101001	**MW-1**	EPA 8260B	525285		
10422101002	**MW-2**	EPA 8260B	525285		
10422101003	**MW-3**	EPA 8260B	525285		
10422101004	**MW-4**	EPA 8260B	525285		
10422101005	**MW-5**	EPA 8260B	525285		
10422101006	**MW-6**	EPA 8260B	525285		
10422101007	**MW-7**	EPA 8260B	525285		
10422101008	**MW-8**	EPA 8260B	525285		
10422101009	**TB**	EPA 8260B	525285		

10422601

Page 1 of 1

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: Former ARCO 5300 **Req Due Date (mm/dd/yy):** Standart TAT **Rush TAT:** Yes ___ No X

BP/ARC Facility No: Former ARCO Facility No. 5300 **Lab Work Order Number:**

Lab Name:	Pace Analytical	BP/ARC Facility Address:	710 15th Street	Consultant/Contractor:	Antea Group
Lab Address:	1700 Elm St. Minneapolis, MN 55414	City, State, ZIP Code:	Longview, WA	Consultant/Contractor Project No:	05300
Lab PM:	Shawn Davis	Lead Regulatory Agency:	Washington State Department of Ecology	Address:	4006 148th Ave NE, Redmond, WA 98052
Lab Phone:	612-607-6402	California Global ID No.:	NA	Consultant/Contractor PM:	Megan Richard
Lab Shipping Accnt:		Enfos Proposal No:	009V4-0007 WR321120	Phone:	425-498-7711
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ___ OOC-RM ___	Email EDD To:	megan.richard@anteagroup.com
Other Info:		Stage:	Activity:	Invoice To:	BP/ARC X Contractor ___

BP/ARC EBM: Chuck Carmel
EBM Phone: (657) 529-4503
EBM Email: charles.carmel@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	$Na_2S_2O_3$		Requested Analyses: BTEX	MTBE	NWTPH-Gx	NWTPH-Dx	NWTPH-O	Pb-T by EPA 6010	Pb-D by EPA 6010	EDB by EPA 8011	EDC by EPA 8260B		Comments
	MW-1	2/26/18	0825		x			8							x	x	x			x	x				001
	MW-2	"	0850		x			8							x	x	x			x	x				002
	MW-3	"	1100		x			8							x	x	x			x	x				003
	MW-4	"	0940		x			8							x	x	x			x	x				004
	MW-5	"	1130		x			8							x	x	x			x	x				005
	MW-6	"	0920		x			8							x	x	x			x	x				006
	MW-7	"	1010		x			8							x	x	x			x	x				007
	MW-8	2/26/18	1025		x			8							x	x	x			x	x				008
	TB				x										x		x								009

Sampler's Name:	Brad Jackson	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company:	Antea Group	Antea	2/27/18	0800	Pace	2/27/18	11:15
Shipment Method:	FedEX	Ship Date: 2/27/18					
Shipment Tracking No:							

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 2.0 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Pace Analytical	Document Name: Sample Condition Upon Receipt Form - ESI	Document Revised: 18Dec2017 Page 1 of 2
	Document No.: F-MN-L-210-rev.24	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: Atlantic Richfield Company **Project #:** **WO#: 10422101**

PM: SRD **Due Date: 03/13/18**

CLIENT: BPAnteaOR

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

Tracking Number: 7716 0083 6516

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☐ Yes ☑ No

Thermometer Used: ☑ 151401163 ☐ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 2.0 **Cooler Temp Corrected (°C):** 2.0 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ NA

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** 2/28/18 bo

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	☑ Yes	☐ No		8.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		9.
Containers Intact?	☑ Yes	☐ No		10. mD 2/28/18
Filtered Volume Received for Dissolved Tests?	☑ Yes	☐ No	☐ N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No		12. mw5 & mw2 sample recieved duplicates
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	☑ Yes ☑ Yes	☐ No ☐ No	☐ N/A ☐ N/A	Sample # 1-8 1/1 mD 2/28/18 Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☑ No	☐ N/A	14.
3 Trip Blanks Present?	☑ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present? Pace Trip Blank Lot # (if purchased): 145710	☐ Yes	☐ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time:	Temp:	Corrected Temp:
Time: 16:10	put in cooler 2.0	2.0
Time: 16:20	Temp:	Corrected Temp:

Project Manager Review: Shannon Davis **Date:** 2/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

June 26, 2018

Megan Richard
Antea Group[
4640 SW Macadam Ave, Ste. 110
Portland, OR 97239

RE: Project: BP Arco 5300
Pace Project No.: 10435487

Dear Megan Richard:
Enclosed are the analytical results for sample(s) received by the laboratory on June 14, 2018. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

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

Sincerely,

Shawn Davis
shawn.davis@pacelabs.com
612-607-6378
Project Manager

Enclosures

cc: AG DataView, Antea Group
Brad Jackson, Antea USA - OR
Camille Rivera, The Antea Group
Taylor Roberts, Antea Group
Jaime Sasse, Antea Group
Mackie Stock, Antea Group
Todd Vanek, Antea USA
AG Data View, Antea Group

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BP Arco 5300
Pace Project No.: 10435487

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BP Arco 5300
Pace Project No.: 10435487

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10435487001	**MW-1**	Water	06/12/18 08:10	06/14/18 09:30
10435487002	**MW-2**	Water	06/12/18 08:40	06/14/18 09:30
10435487003	**MW-3**	Water	06/12/18 11:30	06/14/18 09:30
10435487004	**MW-4**	Water	06/12/18 09:40	06/14/18 09:30
10435487005	**MW-5**	Water	06/12/18 12:10	06/14/18 09:30
10435487006	**MW-6**	Water	06/12/18 09:10	06/14/18 09:30
10435487007	**MW-7**	Water	06/12/18 10:15	06/14/18 09:30
10435487008	**MW-8**	Water	06/12/18 10:50	06/14/18 09:30
10435487009	**TB**	Water	06/12/18 00:00	06/14/18 09:30

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BP Arco 5300
Pace Project No.: 10435487

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10435487001	**MW-1**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487002	**MW-2**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487003	**MW-3**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487004	**MW-4**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487005	**MW-5**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487006	**MW-6**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487007	**MW-7**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487008	**MW-8**	NWTPH-Gx	AJR	2	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 6010	DM	1	PASI-M
		EPA 8260B	MJD	8	PASI-M
10435487009	**TB**	NWTPH-Gx	AJR	2	PASI-M
		EPA 8260B	MJD	8	PASI-M

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BP Arco 5300
Pace Project No.: 10435487

Method: **NWTPH-Gx**
Description: NWTPH-Gx GCV
Client: BP-Antea Group OR
Date: June 26, 2018

General Information:
9 samples were analyzed for NWTPH-Gx. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BP Arco 5300
Pace Project No.: 10435487

Method: **EPA 6010**
Description: 6010 MET ICP
Client: BP-Antea Group OR
Date: June 26, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BP Arco 5300
Pace Project No.: 10435487

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: BP-Antea Group OR
Date: June 26, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: BP Arco 5300
Pace Project No.: 10435487

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: BP-Antea Group OR
Date: June 26, 2018

General Information:
9 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 546546

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10435487008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2972228)
  - Ethylbenzene
  - Toluene

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-1 **Lab ID: 10435487001** Collected: 06/12/18 08:10 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/21/18 15:59		
Surrogates								
a,a,a-Trifluorotoluene (S)	95	%.	50-150	1		06/21/18 15:59	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:38	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:30	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/22/18 14:22	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/22/18 14:22	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/22/18 14:22	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/22/18 14:22	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/22/18 14:22	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%.	75-125	1		06/22/18 14:22	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1		06/22/18 14:22	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125	1		06/22/18 14:22	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-2 **Lab ID: 10435487002** Collected: 06/12/18 08:40 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/21/18 16:16		
Surrogates								
a,a,a-Trifluorotoluene (S)	90	%.	50-150	1		06/21/18 16:16	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:50	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:38	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 16:42	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 16:42	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/23/18 16:42	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 16:42	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 16:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1		06/23/18 16:42	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1		06/23/18 16:42	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125	1		06/23/18 16:42	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-3 **Lab ID: 10435487003** Collected: 06/12/18 11:30 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/22/18 00:31		
Surrogates								
a,a,a-Trifluorotoluene (S)	93	%.	50-150	1		06/22/18 00:31	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	**13.4**	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:51	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:40	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 16:59	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 16:59	100-41-4	
Methyl-tert-butyl ether	**6.7**	ug/L	1.0	1		06/23/18 16:59	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 16:59	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 16:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1		06/23/18 16:59	17060-07-0	HS
Toluene-d8 (S)	96	%.	75-125	1		06/23/18 16:59	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125	1		06/23/18 16:59	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-4 **Lab ID: 10435487004** Collected: 06/12/18 09:40 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	**2140**	ug/L	100	1		06/22/18 03:02		
Surrogates								
a,a,a-Trifluorotoluene (S)	107	%.	50-150	1		06/22/18 03:02	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:53	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:41	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 17:17	71-43-2	
Ethylbenzene	**7.3**	ug/L	1.0	1		06/23/18 17:17	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/23/18 17:17	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 17:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 17:17	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1		06/23/18 17:17	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1		06/23/18 17:17	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	75-125	1		06/23/18 17:17	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-5 **Lab ID: 10435487005** Collected: 06/12/18 12:10 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	**318**	ug/L	100	1		06/21/18 16:50		
Surrogates								
a,a,a-Trifluorotoluene (S)	93	%.	50-150	1		06/21/18 16:50	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:55	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:46	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 17:34	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 17:34	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/23/18 17:34	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 17:34	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 17:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%.	75-125	1		06/23/18 17:34	17060-07-0	HS
Toluene-d8 (S)	97	%.	75-125	1		06/23/18 17:34	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125	1		06/23/18 17:34	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-6 **Lab ID: 10435487006** Collected: 06/12/18 09:10 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	**133**	ug/L	100	1		06/21/18 17:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	85	%.	50-150	1		06/21/18 17:07	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:56	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:48	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 17:52	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 17:52	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/23/18 17:52	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 17:52	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 17:52	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%.	75-125	1		06/23/18 17:52	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1		06/23/18 17:52	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125	1		06/23/18 17:52	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-7 **Lab ID: 10435487007** Collected: 06/12/18 10:15 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/22/18 00:48		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	50-150	1		06/22/18 00:48	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 04:58	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:50	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 12:29	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 12:29	100-41-4	
Methyl-tert-butyl ether	**2.0**	ug/L	1.0	1		06/23/18 12:29	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 12:29	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 12:29	1330-20-7	RS
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1		06/23/18 12:29	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1		06/23/18 12:29	2037-26-5	
4-Bromofluorobenzene (S)	93	%.	75-125	1		06/23/18 12:29	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: MW-8 **Lab ID: 10435487008** Collected: 06/12/18 10:50 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/22/18 01:05		
Surrogates								
a,a,a-Trifluorotoluene (S)	84	%.	50-150	1		06/22/18 01:05	98-08-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead	ND	ug/L	10.0	1	06/18/18 17:41	06/19/18 05:00	7439-92-1	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Lead, Dissolved	ND	ug/L	10.0	1	06/20/18 14:49	06/21/18 05:51	7439-92-1	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 21:04	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 21:04	100-41-4	M1
Methyl-tert-butyl ether	**4.6**	ug/L	1.0	1		06/23/18 21:04	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 21:04	108-88-3	M1
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 21:04	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1		06/23/18 21:04	17060-07-0	
Toluene-d8 (S)	95	%.	75-125	1		06/23/18 21:04	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125	1		06/23/18 21:04	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: BP Arco 5300
Pace Project No.: 10435487

Sample: TB **Lab ID: 10435487009** Collected: 06/12/18 00:00 Received: 06/14/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx GCV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	100	1		06/22/18 03:53		HS
Surrogates								
a,a,a-Trifluorotoluene (S)	88	%.	50-150	1		06/22/18 03:53	98-08-8	
8260B MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	1.0	1		06/23/18 20:46	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		06/23/18 20:46	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		06/23/18 20:46	1634-04-4	
Toluene	ND	ug/L	1.0	1		06/23/18 20:46	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		06/23/18 20:46	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1		06/23/18 20:46	17060-07-0	HS
Toluene-d8 (S)	96	%.	75-125	1		06/23/18 20:46	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	75-125	1		06/23/18 20:46	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 546148 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water
Associated Lab Samples: 10435487001, 10435487002, 10435487005, 10435487006

METHOD BLANK: 2969379 Matrix: Water
Associated Lab Samples: 10435487001, 10435487002, 10435487005, 10435487006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	100	06/21/18 15:26	
a,a,a-Trifluorotoluene (S)	%.	97	50-150	06/21/18 15:26	

LABORATORY CONTROL SAMPLE & LCSD: 2969381 2969382

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	1000	1020	1030	102	103	41-137	2	20	
a,a,a-Trifluorotoluene (S)	%.				101	100	50-150			

SAMPLE DUPLICATE: 2969869

Parameter	Units	10435487002 Result	Dup Result	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	ND	ND		30	
a,a,a-Trifluorotoluene (S)	%.	90	90	1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 546226 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water
Associated Lab Samples: 10435487003, 10435487004, 10435487007, 10435487008, 10435487009

METHOD BLANK: 2969829 Matrix: Water
Associated Lab Samples: 10435487003, 10435487004, 10435487007, 10435487008, 10435487009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	100	06/21/18 18:54	
a,a,a-Trifluorotoluene (S)	%.	85	50-150	06/21/18 18:54	

METHOD BLANK: 2969830 Matrix: Water
Associated Lab Samples: 10435487003, 10435487004, 10435487007, 10435487008, 10435487009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	100	06/21/18 19:11	
a,a,a-Trifluorotoluene (S)	%.	88	50-150	06/21/18 19:11	

LABORATORY CONTROL SAMPLE & LCSD: 2969831 2969832

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	1000	1010	958	101	96	41-137	5	20	
a,a,a-Trifluorotoluene (S)	%.				92	101	50-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2970042 2970043

Parameter	Units	10436378002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	ug/L	ND	1000	1000	1070	1070	106	106	30-145	0	30	
a,a,a-Trifluorotoluene (S)	%.						104	103	50-150			

SAMPLE DUPLICATE: 2970040

Parameter	Units	10436156003 Result	Dup Result	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	ND	ND		30	
a,a,a-Trifluorotoluene (S)	%.	82	86	5		

SAMPLE DUPLICATE: 2970041

Parameter	Units	10436156005 Result	Dup Result	RPD	Max RPD	Qualifiers
TPH as Gas	ug/L	110	103	6	30	G-

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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

SAMPLE DUPLICATE: 2970041

Parameter	Units	10436156005 Result	Dup Result	RPD	Max RPD	Qualifiers
a,a,a-Trifluorotoluene (S)	%.	92	90	1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 544855 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 10435487001, 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007, 10435487008

METHOD BLANK: 2962851 Matrix: Water
Associated Lab Samples: 10435487001, 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007, 10435487008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	10.0	06/19/18 04:35	

LABORATORY CONTROL SAMPLE: 2962852

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	1000	975	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2962853 2962854

Parameter	Units	10435487001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	1000	1000	973	976	97	98	75-125	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 545449 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 10435487001, 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007, 10435487008

METHOD BLANK: 2965928 Matrix: Water
Associated Lab Samples: 10435487001, 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007, 10435487008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead, Dissolved	ug/L	ND	10.0	06/21/18 05:26	

LABORATORY CONTROL SAMPLE: 2965929

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2965930 2965931

Parameter	Units	10435487001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead, Dissolved	ug/L	ND	1000	1000	1020	999	102	100	75-125	3	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 546377
QC Batch Method: EPA 8260B
Analysis Method: EPA 8260B
Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10435487001

METHOD BLANK: 2970838 Matrix: Water
Associated Lab Samples: 10435487001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/22/18 11:08	
Ethylbenzene	ug/L	ND	1.0	06/22/18 11:08	
Methyl-tert-butyl ether	ug/L	ND	1.0	06/22/18 11:08	
Toluene	ug/L	ND	1.0	06/22/18 11:08	
Xylene (Total)	ug/L	ND	3.0	06/22/18 11:08	
1,2-Dichloroethane-d4 (S)	%.	90	75-125	06/22/18 11:08	
4-Bromofluorobenzene (S)	%.	95	75-125	06/22/18 11:08	
Toluene-d8 (S)	%.	96	75-125	06/22/18 11:08	

LABORATORY CONTROL SAMPLE: 2970839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.0	95	75-126	
Ethylbenzene	ug/L	20	20.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	19.8	99	73-129	
Toluene	ug/L	20	18.9	94	74-125	
Xylene (Total)	ug/L	60	59.3	99	75-125	
1,2-Dichloroethane-d4 (S)	%.			89	75-125	
4-Bromofluorobenzene (S)	%.			96	75-125	
Toluene-d8 (S)	%.			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2970881 2970882

Parameter	Units	10435487001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	20.7	18.2	104	91	62-140	13	30	
Ethylbenzene	ug/L	ND	20	20	20.9	18.4	104	92	75-131	13	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	19.4	17.1	97	86	65-130	12	30	
Toluene	ug/L	ND	20	20	19.9	17.6	100	88	68-132	12	30	
Xylene (Total)	ug/L	ND	60	60	62.1	55.3	103	92	69-135	11	30	
1,2-Dichloroethane-d4 (S)	%.						90	91	75-125			
4-Bromofluorobenzene (S)	%.						96	96	75-125			
Toluene-d8 (S)	%.						97	96	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 546525 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007

METHOD BLANK: 2972069 Matrix: Water
Associated Lab Samples: 10435487002, 10435487003, 10435487004, 10435487005, 10435487006, 10435487007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/23/18 12:11	
Ethylbenzene	ug/L	ND	1.0	06/23/18 12:11	
Methyl-tert-butyl ether	ug/L	ND	1.0	06/23/18 12:11	
Toluene	ug/L	ND	1.0	06/23/18 12:11	
Xylene (Total)	ug/L	ND	3.0	06/23/18 12:11	
1,2-Dichloroethane-d4 (S)	%.	91	75-125	06/23/18 12:11	
4-Bromofluorobenzene (S)	%.	95	75-125	06/23/18 12:11	
Toluene-d8 (S)	%.	96	75-125	06/23/18 12:11	

LABORATORY CONTROL SAMPLE: 2972070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.8	89	75-126	
Ethylbenzene	ug/L	20	18.4	92	75-125	
Methyl-tert-butyl ether	ug/L	20	19.1	95	73-129	
Toluene	ug/L	20	17.5	87	74-125	
Xylene (Total)	ug/L	60	55.5	92	75-125	
1,2-Dichloroethane-d4 (S)	%.			87	75-125	
4-Bromofluorobenzene (S)	%.			94	75-125	
Toluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2972071 2972072

Parameter	Units	10435487007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	16.3	22.1	82	111	62-140	30	30	
Ethylbenzene	ug/L	ND	20	20	16.6	22.2	83	111	75-131	29	30	
Methyl-tert-butyl ether	ug/L	2.0	20	20	18.5	24.5	82	113	65-130	28	30	
Toluene	ug/L	ND	20	20	15.8	21.4	79	107	68-132	30	30	
Xylene (Total)	ug/L	ND	60	60	48.5	65.6	81	109	69-135	30	30	RS
1,2-Dichloroethane-d4 (S)	%.						89	89	75-125			
4-Bromofluorobenzene (S)	%.						96	95	75-125			
Toluene-d8 (S)	%.						96	97	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: BP Arco 5300
Pace Project No.: 10435487

QC Batch: 546546 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10435487008, 10435487009

METHOD BLANK: 2972219 Matrix: Water
Associated Lab Samples: 10435487008, 10435487009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	06/23/18 20:29	
Ethylbenzene	ug/L	ND	1.0	06/23/18 20:29	
Methyl-tert-butyl ether	ug/L	ND	1.0	06/23/18 20:29	
Toluene	ug/L	ND	1.0	06/23/18 20:29	
Xylene (Total)	ug/L	ND	3.0	06/23/18 20:29	
1,2-Dichloroethane-d4 (S)	%.	91	75-125	06/23/18 20:29	
4-Bromofluorobenzene (S)	%.	96	75-125	06/23/18 20:29	
Toluene-d8 (S)	%.	96	75-125	06/23/18 20:29	

LABORATORY CONTROL SAMPLE: 2972220

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	18.4	92	75-126	
Ethylbenzene	ug/L	20	18.7	94	75-125	
Methyl-tert-butyl ether	ug/L	20	19.4	97	73-129	
Toluene	ug/L	20	17.8	89	74-125	
Xylene (Total)	ug/L	60	56.5	94	75-125	
1,2-Dichloroethane-d4 (S)	%.			90	75-125	
4-Bromofluorobenzene (S)	%.			95	75-125	
Toluene-d8 (S)	%.			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2972228 2972229

Parameter	Units	10435487008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	13.9	17.0	69	85	62-140	20	30	
Ethylbenzene	ug/L	ND	20	20	13.8	17.0	69	85	75-131	21	30	M1
Methyl-tert-butyl ether	ug/L	4.6	20	20	18.3	21.8	69	86	65-130	17	30	
Toluene	ug/L	ND	20	20	13.1	16.2	65	81	68-132	22	30	M1
Xylene (Total)	ug/L	ND	60	60	40.6	50.4	68	84	69-135	22	30	
1,2-Dichloroethane-d4 (S)	%.						91	94	75-125			
4-Bromofluorobenzene (S)	%.						95	94	75-125			
Toluene-d8 (S)	%.						96	96	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
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: BP Arco 5300
Pace Project No.: 10435487

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-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

G-	Early peaks present outside the GRO window.
HS	Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
RS	The RPD value in one of the constituent analytes was outside the control limits.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BP Arco 5300
Pace Project No.: 10435487

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10435487001	**MW-1**	NWTPH-Gx	546148		
10435487002	**MW-2**	NWTPH-Gx	546148		
10435487003	**MW-3**	NWTPH-Gx	546226		
10435487004	**MW-4**	NWTPH-Gx	546226		
10435487005	**MW-5**	NWTPH-Gx	546148		
10435487006	**MW-6**	NWTPH-Gx	546148		
10435487007	**MW-7**	NWTPH-Gx	546226		
10435487008	**MW-8**	NWTPH-Gx	546226		
10435487009	**TB**	NWTPH-Gx	546226		
10435487001	**MW-1**	EPA 3010	544855	EPA 6010	545444
10435487002	**MW-2**	EPA 3010	544855	EPA 6010	545444
10435487003	**MW-3**	EPA 3010	544855	EPA 6010	545444
10435487004	**MW-4**	EPA 3010	544855	EPA 6010	545444
10435487005	**MW-5**	EPA 3010	544855	EPA 6010	545444
10435487006	**MW-6**	EPA 3010	544855	EPA 6010	545444
10435487007	**MW-7**	EPA 3010	544855	EPA 6010	545444
10435487008	**MW-8**	EPA 3010	544855	EPA 6010	545444
10435487001	**MW-1**	EPA 3010	545449	EPA 6010	545981
10435487002	**MW-2**	EPA 3010	545449	EPA 6010	545981
10435487003	**MW-3**	EPA 3010	545449	EPA 6010	545981
10435487004	**MW-4**	EPA 3010	545449	EPA 6010	545981
10435487005	**MW-5**	EPA 3010	545449	EPA 6010	545981
10435487006	**MW-6**	EPA 3010	545449	EPA 6010	545981
10435487007	**MW-7**	EPA 3010	545449	EPA 6010	545981
10435487008	**MW-8**	EPA 3010	545449	EPA 6010	545981
10435487001	**MW-1**	EPA 8260B	546377		
10435487002	**MW-2**	EPA 8260B	546525		
10435487003	**MW-3**	EPA 8260B	546525		
10435487004	**MW-4**	EPA 8260B	546525		
10435487005	**MW-5**	EPA 8260B	546525		
10435487006	**MW-6**	EPA 8260B	546525		
10435487007	**MW-7**	EPA 8260B	546525		
10435487008	**MW-8**	EPA 8260B	546546		
10435487009	**TB**	EPA 8260B	546546		

WO#: 10435487

10435487

ry Management Program LaMP Chain of Custody Record

ct Name: Former ARCO 5300 | Req Due Date (mm/dd/yy): Standard TAT | Rush TAT: Yes ___ No X

ty No: 5300 | Lab Work Order Number:

Lab Name: Pace Analytical	BP/ARC Facility Address:	Consultant/Contractor: Antea Group
Lab Address: 1700 Elsm St, Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No: 5300SA181
Lab PM: Shawn Davis	Lead Regulatory Agency: ODEQ	Address: 4640 SW Macadam Ave., Suite 110, Portland, OR 97239
Lab Phone: 612-607-6402	California Global ID No.: NA	Consultant/Contractor PM: ~~Todd Vanek~~ Megan Richard
Lab Shipping Accnt: na	Enfos Proposal No: 009V4-0007 WR321180	Phone: ~~(503) 720-1450~~ 425-498-7711
Lab Bottle Order No: na	Accounting Mode: Provision X OOC-BU ___ OOC-RM ___	Email EDD To: ~~todd.vanek@anteagroup.com~~ megan.richard@anteagroup.com
Other Info:	Stage: Activity:	Invoice To: BP/ARC X Contractor ___

BP/ARC EBM: Charles Carmel

EBM Phone: (657) 529-4503

EBM Email: charles.carmel@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	SOBI	Requested Analyses: NWTPH-Gx	VOCs (8260B)	RBCA Suite VOCs (8260B)	BTEX/MTBE (8021B)	NWTPH-Dx (w/Si-gel cleanup)	LEAD (total & dissolved)	MTBE 8260B	BTEX 8260B	TBA 8260B	PAH 8270 SIM	Comments
	MW-1	6/12/18	0810		X			8	1		1	6			X					X	X	X			001
	MW-2	"	0840		"			"	"		"	"			"					"	"	"			002
	MW-3	"	1130		"			"	"		"	"			"					"	"	"			003
	MW-4	"	0940		"			"	"		"	"			"					"	"	"			004
	MW-5	"	1210		"			"	"		"	"			"					"	"	"			005
	MW-6	"	0910		"			"	"		"	"			"					"	"	"			006
	MW-7	"	1015		"			"	"		"	"			"					"	"	"			007
	MW-8	6/12/18	1050		"			8	1		1	6			X					X	X	"			008
	TB				X			4														X			009

Report Type & QC Level: Standard X; Full Data Package ___

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Brad Jackson	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Antea Group	Antea	6/13/18	1000	Fedex-PACE	6/14/18	9:30
Shipment Method: FedEx Ship Date: 6/13/18						
Shipment Tracking No:						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: 4.2 °F/C | Trip Blank Yes / No | MS/MSD Sample Submitted: Yes / No

Pace Analytical	Document Name: Sample Condition Upon Receipt Form - ESI	Document Revised: 02May2018 Page 1 of 2
	Document No.: F-MN-L-210-rev.25	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt – ESI Tech Specs

Client Name: Atlantic Richfield **Project #:** WO#: 10435487

PM: SRD Due Date: 06/21/18

CLIENT: BPAnteaOR

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

Tracking Number: 7724 7072 0670

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other:

Temp Blank? ☑ Yes ☐ No

Thermometer Used: ☐ G87A9170600254 ☑ G87A9155100842

Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 4.2 **Cooler Temp Corrected (°C):** 4.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ NA

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** 6/14/18, T-J

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	☑ Yes	☐ No		8.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		9.
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☑ No	☐ N/A	11. Note if sediment is visible in the dissolved container.
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, NaOH>9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	Sample # 1-8, VI
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin./PFAS Per method, VOA pH is checked after analysis	☐ Yes	☐ No	☑ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☑ Yes	☐ No	☐ N/A	14. See exception
3 Trip Blanks Present?	☑ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): 160946				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: 14:50 Temp: 4.2	Corrected Temp: 4.2	
Time: 1510 put in cooler		
Time: Temp:	Corrected Temp:	

Project Manager Review: Shannon V Davis **Date:** 6/14/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical	Document Name: **Headspace Exception**	Document Revised: 06Nov2017 Page 1 of 1
	Document No.: **F-MN-C-276-Rev.00**	Issuing Authority: Pace Minnesota Quality Office

Sample ID	Headspace > 6mm	Headspace < 6mm	No Headspace	Total Vials
MW-1	0	2	4	6
" -2	0	3	3	6
" -3	1	5	0	6
" -4	6	3	3	6
" -5	0	6	0	6
" -7	0	2	4	6
" -8	0	6	0	6
TB	0	3	1	4