Second Quarter 2015 Remedial Systems Operations and Maintenance (O&M) Report

TOC Holdings Co. Facility No. 01-176
24205, 24225, 24309 56th Avenue West
Mountlake Terrace, WA

Prepared for:
TOC Holdings Co.
2737 W. Commodore Way
Seattle, WA 98199

October 7, 2015

Prepared by:

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Remedial Systems O&M Report

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TOC Holdings Co.
2737 West Commodore Way
Seattle, Washington 98199

TOC Holdings Co. Facility No. 01-176
24205, 24225, 24309 56th Avenue West
Mountlake Terrace, WA

Washington State Department of Ecology
Agreed Order No. DE 8661

HydroCon Project No: 01-176

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October 7, 2015

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1 INTRODUCTION

This report was prepared by HydroCon Environmental, LLC (HydroCon) on behalf of TOC Holdings Co. (TOC) to document the Second Quarter 2015 (Q2 2015) remedial systems operation and maintenance (O&M) activities performed by both Stantec Consulting Services Inc. (Stantec; as a sub consultant to HydroCon) and HydroCon. Field activities associated with interim remedial actions were conducted from April through June 2015 at Facility No. 01-176 located in Mountlake Terrace, Snohomish County, Washington (Figure 1).

1.1 SCOPE OF WORK

Ongoing interim remedial actions are conducted under Agreed Order (AO) No. DE 8661, between TOC and the Washington State Department of Ecology[1] entered in October 2011 for TOC's Facility No. 01-176. The O&M scope of work is defined in the *Interim Remedial Action Work Plan*[2] (IRAWP). Per the requirements of the IRAWP, the O&M scope of work includes monthly and quarterly monitoring events.

As described in the IRAWP, the TOC Facility No. 01-176 is termed the "Interim Remedial Project Area" (IRPA) and consists of the following four properties located in Mountlake Terrace, Washington (Figure 2):

- TOC Property: 24205 56th Avenue West
- TOC/Farmasonis Property: 24225 56th Avenue West
- Drake Property: 24309 56th Avenue West
- Portions of the 56th Avenue West Right-of-Way (ROW): adjacent to the TOC, TOC/Farmasonis and Drake properties

O&M activities are conducted to monitor the performance of three multi-phase extraction (MPE) remediation systems currently operating at the IRPA. The MPE remediation systems were installed to remediate petroleum hydrocarbon-contaminated groundwater, soil vapor, and free product (where present). Unit 1 is located on the TOC Property; Units 2 and 3 are located on the TOC/Farmasonis Property. Unit 1 is associated with the operation of remediation wells installed on that property; Units 2 and 3 are associated with the operation of wells installed on the TOC/Farmasonis and Drake Properties, respectively.

Details on remediation well identification and locations are provided in the description of remedial systems in Appendix A.

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[1] *Washington State Department of Ecology (Ecology). 2011. Agreed Order No. DE 8661, TOC Facility No. 01-176. October 28.*

[2] *SoundEarth Strategies, Inc. (SES) 2011. Interim Remedial Action Work Plan. TOC Holdings Co. Facility No. 01-176; 24205 56th Avenue West, Mountlake Terrace, WA, Prepared for TOC Holdings Co. July 28.*

1.2 SUMMARY OF Q2 2015 O&M ACTIVITIES

This report includes a description of permit compliance and remedial system performance and optimization efforts. A summary of the remedial system performance and maintenance activities performed by Stantec and HydroCon from April through June 2015 is provided below.

- O&M consisted of routine, scheduled maintenance activities (as described in the O&M Manual), as well as the following activities:
  - Installation of automatic feed system for biocide and sequestering agent for the Unit 1 groundwater treatment system
  - Temporary shutdown of the Unit 3 air compressor to evaluate an oil/water leak discovered during the April visit.
- A combined total of 12.2 pounds of vapor-phase hydrocarbons were removed during this reporting period. A cumulative total of approximately 4,370 pounds have been removed since startup in October 2012.
- A combined total volume of 515,805 gallons of groundwater were extracted, treated and discharged during this period. The total volume of water processed since system startup is approximately 3,385,362 gallons.
- Light nonaqueous-phase liquids (LNAPL) were not observed or recovered from the three MPE systems during this quarter. Also, the oil/water separator (OWS) for each system was inspected, and no LNAPL was visible.

System optimization activities during this reporting period focused on installing the biocide feed system for Unit 1. These activities are described in more detail in the following sections.

2 REMEDIAL SYSTEMS MODIFICATIONS

System modifications performed during this quarter included the installation of the biocide treatment for Unit 1. Prior to the installation, Stantec coordinated with Ecology's Water Quality Division to establish appropriate discharge thresholds for the active biocide ingredient: 20% Tetrakis-Hydroxymethyl Phosphonium Sulfate (THPS, or Tolcide®) and a sequestering compound AN-400, and to modify the State Waste Discharge (SWD) permit to include these limits. Ecology approved modification of the permit to include discharge limits of 10 milligrams per liter (mg/L) for THPS and 3.2 mg/L for AN-400. An addendum to the permit to authorize these modifications was issued by Ecology on May 11, 2015[3].

Approximately 55-gallons of Tolcide® and AN-400 are stored within a single drum located in the OWS secondary containment tray. A chemical metering pump is secured on top of the drum lid and used to inject Tolcide® (70 ppm) and AN-400 (10 ppm) into influent system water. The metering pump is electrically connected to the system, and will only operate during groundwater extraction (the metering pump will not operate during a system shutdown) to prevent overdosing of the system. The metering pump is manually adjustable and the injection rate checked routinely and periodically adjusted, as necessary, based on the system influent groundwater flow rate. In the event of a spill/leak, a float switch in the OWS secondary containment tray will shut down the system and chemical metering pump.

Per the requirements in the SWD Permit, the concentrations of Tolcide® and AN-400 will be monitored using titration field test kits on a quarterly basis from the effluent sample ports of the first carbon drum and third carbon drum.

[3] *Ecology. 2015. Addendum to Fact Sheet; Permit No. ST0007384, TOC Holdings Co. May 11.*

3 SYSTEM PERFORMANCE

The most recent annual groundwater sampling event conducted in First Quarter 2015[4] showed that benzene, toluene, ethylbenzene, and total xylenes (BTEX) and/or gasoline-range petroleum hydrocarbons (GRPH) concentrations in groundwater have decreased and currently exceed the Model Toxics Control Act (MTCA) Method A levels in five of the 75 active wells installed in the Intermediate Zone, or wells that intersect shallow-intermediate and intermediate-deep zone conditions:

- Wells MW27 and MW90, located on the TOC Property;
- Well MW57, located on the TOC Farmasonis Property
- Well MW48, located in the 56th Avenue West ROW at the boundary of the TOC Farmasonis and Drake Properties, and
- Well MW69, located on the Drake Property.

3.1 TOC PROPERTY (UNIT 1)

The following is a summary of the Second Quarter 2015 system O&M at the TOC Property:

- The MPE operation time this quarter was approximately 87 percent (Table 1-1). System down time was attributable to bag filter change outs and installation of the biocide metering system.
- An automatic biocide and sequestering agent injection system was installed for the Unit 1 groundwater treatment system. More details on the installation are provided in Section 4.1.
- The vapor-phase hydrocarbon mass removal associated with the soil vapor extraction (SVE) system was approximately 4.9 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was approximately 0.07 pounds for this reporting period. The cumulative vapor- and aqueous-phase hydrocarbon removal to date is approximately 3,129 and 15.9 pounds, respectively (Tables 1-1, 1-2 and 1-3).
- The volume of groundwater extracted during this reporting period was 133,855 gallons (Tables 1-1 and 1-3). The average daily groundwater recovery flow rate during this quarter was 1,504 gallons (Tables 1-1 and 1-3).
- No LNAPL was recovered from the OWS. Also, the OWS was inspected, and no LNAPL or sheen was visible on the liquid contents.
- The SVE daily mass removal rate ranged from 0.05 to 0.07 pounds during this quarter (Table 1-2).
- Air flow through the catalytic oxidizer (CATOX) from the SVE blower was bypassed in

[4] *Stantec Consulting Services, Inc. (Stantec) 2015a. Groundwater Monitoring Report, 2015 Annual Event. TOC Holdings Co. Facility No. 01-176; 24205 56th Avenue West, Mountlake Terrace, WA 98043.*

February 2015 because permit conditions for bypass were achieved. According to the Puget Sound Clean Air Agency (PSCAA) Notice of Construction (NOC) permit for each unit (1, 2, and 3), the CATOX may be removed or bypassed and directly vented to the atmosphere if benzene and GRPH concentrations in the untreated air remain below 0.5 and 50 parts per million by volume (ppmv), respectively, for a period of 3 consecutive months (refer to Appendix B for other permit conditions).

The concentrations of GRPH exiting the stack during this quarter were below the laboratory's lower reporting limit of 10 milligrams per cubic meter [10 mg/m^3] which is equivalent to 3.37 ppmv using the estimated molecular weight of 72.5 as representative of the composite molecular weight of gasoline[5]. The conversion to ppmv from mg/m^3 assumes a temperature of 25°C and standard pressure (1 atmosphere) (Table 1-4).

The concentrations of benzene exiting the stack during this quarter were below the laboratory's lower reporting limit of 0.1 mg/m^3 which is equivalent to 0.03 ppmv at 25°C and standard pressure. Laboratory analytical reports are provided in Appendix C.

- All system operations were in compliance with the SWD and PSCAA Permit limits (Tables 1-3, 1-4, and 1-5).

3.2 TOC/FARMASONIS PROPERTY (UNIT 2)

The following is a summary of the Second Quarter 2015 system O&M at the TOC/Farmasonis Property:

- The MPE operational time this quarter was approximately 91 percent (Table 2-1). System down time was mostly attributable to bag filter change out and blower maintenance. However, the groundwater extraction and treatment portion of the system at Unit 2 was fully operational during the blower down-time.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 1.6 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was 0.07 pounds for this reporting period. The cumulative vapor- and aqueous-phase hydrocarbon removal to date is approximately 1,015 pounds and 0.8 pounds, respectively (Tables 2-1, 2-2, and 2-3).
- The volume of groundwater extracted during this quarter was approximately 160,177 gallons (Tables 2-1 and 2-3). The average daily groundwater recovery flow rate during this quarter was 1,800 gallons (Tables 2-1 and 2-3).
- No LNAPL was recovered from the OWS. Also, the OWS was inspected, and no LNAPL or sheen was visible on the liquid contents.

[5] *Fremont Analytical. 2015. Personal Communication. Response to email inquiry from Mark Selman. September 23.*

- The daily vapor mass removal rate ranged from 0.03 to 0.1 pounds during this quarter (Table 2-2).
- Air flow through the CATOX from the SVE blower had been bypassed in September 2014 because permit conditions for bypass had been achieved. Effluent concentrations of benzene and GRPH exiting the stack during this quarter were below the laboratory's lower reporting limits of 0.1 and 10 mg/m^3, respectively (Table 2-4). Laboratory analytical reports are provided in Appendix C.
- All system operations were in compliance with the SWD and PSCAA Permit limits (Tables 2-3, 2-4, and 2-5).

3.3 DRAKE PROPERTY (UNIT 3)

The following is a summary of the Second Quarter 2015 system O&M at the Drake Property:

- The MPE operation time this quarter was approximately 89 percent (Table 3-1). System down time was mostly attributable to blower maintenance and bag filter changes.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 5.7 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was 0.09 pounds for this reporting period. The cumulative vapor- and aqueous-phase hydrocarbon removal to date is approximately 226 and 2 pounds, respectively (Tables 3-1, 3-2 and 3-3).
- The volume of groundwater extracted during this reporting period was approximately 221,773 gallons (Tables 3-1 and 3-3). The average daily groundwater recovery flow rate was 2,492 gallons (Tables 3-1 and 3-3).
- No LNAPL was recovered from the OWS. Also, the OWS was inspected, and no LNAPL or sheen was visible on the liquid contents.
- The daily vapor mass removal rate was constant at 0.07 pounds during this quarter (Table 3-2).
- Air flow through the CATOX from the SVE blower had been bypassed in September 2014 because permit conditions for bypass had been achieved. Effluent concentrations of benzene and GRPH exiting the stack during this quarter were below the laboratory's lower reporting limits of 0.1 and 10 mg/m^3, respectively (Table 3-4). Laboratory analytical reports are provided in Appendix C.
- All system operations were in compliance with the State Waste Discharge and PSCAA Permit limits (Tables 3-3, 3-4, and 3-5).

4 SYSTEM OPTIMIZATION & FUTURE RECOMMENDATIONS

The following is a summary of the Second Quarter 2015 system optimization and future recommendations for operation of the MPE systems.

The MPE remediation systems will continue to operate until the terms and conditions of the AO have been satisfied in accordance with Section IX (Satisfaction of Order), or until the work to be performed has been amended in accordance with Section VIII.L (Amendment of Order). Specifically, "the provisions of [the Agreed] Order shall be deemed satisfied upon TOC's receipt of written notification from Ecology that TOC has completed the remedial activity required by the [Agreed] Order, as amended by any modifications, and that TOC has complied with all other provisions of the [Agreed] Order."

Operational activities during this quarter continued to focus on dewatering the formation to optimize recovery of dissolved- and vapor-phase hydrocarbons.

4.1 OPTIMIZATION COMPLETED

Prior to this reporting period there were ongoing problems experienced with the Unit 1 groundwater treatment components and filters fouling with mineral fines and biological slimes. Stantec installed a biocide injection system during this quarter to control the formation of the biological slimes to reduce the accompanying maintenance problems. As a result of the installation of the system, slimes and filter clogging have been eliminated and the system maintenance has shown substantial improvement. The majority of these problems were experienced at the TOC Property (Unit 1) system; however, similar problems were also experienced at the Drake Property system (Unit 3). Unit 3 problems improved following the installation of a bag filter in 2013.

Stantec observed an oil/water mixture leaking from the Unit 3 compressor into the compressor containment area during the April 2015 O&M visit. The Unit 3 compressor was temporarily shut down to avoid further leaks and damage. Stantec's follow up consultation with the compressor repair company (Beckwith and Kuffel, Seattle) suggested draining the water and restarting the compressor. This apparently solved the leak because no leaks were observed in subsequent weekly and monthly inspections for this reporting period.

4.2 OPTIMIZATION RECOMMENDED

This section describes recommended methods to assess the effectiveness of each system and provides recommendations to optimizing system performance.

4.2.1 Remediation Well Evaluation

Recent groundwater monitoring results (Stantec 2015a) revealed that the MPE systems installed on the TOC Farmasonis and Drake properties (Units 2 and 3) have reduced contaminant levels in the

Intermediate Zone groundwater in the majority of the wells located on these parcels. In response, it is recommended that the operation of specific remediation wells currently connected to Units 2 and 3 be discontinued insofar as these wells have achieved the desired remedial objective and appear to no longer provide a discernable remedial benefit for these parcels. However, prior to disconnecting any wells, it is recommended that individual wells be evaluated for vapor and aqueous phase mass removal performance during the coming weekly and quarterly system checks. The reason is that the performance of an individual remediation well cannot be assessed solely by concentrations of contaminants detected in the combined influent vapor (SVE) and groundwater recovered at each remedial compound. Wells that produce high flows and low concentrations of contaminants will mask, through dilution, the mass recovery from other wells that generate lower flows and concentrations.

Assessing the vapor phase remedial performance of individual remediation wells involves measuring air flow and VOC, oxygen, and carbon dioxide concentrations using real-time monitoring instruments. The evaluation of the aqueous phase mass recovery of individual wells involves collecting samples of and analyzing contaminant concentrations in groundwater extracted from each well. Data generated by these evaluations would be used to justify the elimination of specific remediation wells from continued operation if it is confirmed they are not providing a discernable remedial benefit.

The advantages of this approach include cost savings from reductions in power consumption and maintenance, a better understanding of where residual contamination levels remain above remediation goals, and where to focus and maximize the existing remedial infrastructure to remediate those areas still needing remediation. For example, wells MW57 (a remediation well located on the TOC Farmasonis property connected to Unit 2) and MW96 (a remediation well located on the Drake property connected to Unit 3) exhibit GRPH concentrations in groundwater below the MTCA Method A cleanup level. However, these wells are in close proximity to well MW48 located on the 56th Avenue ROW that exhibits a high GRPH concentration, well above the cleanup level. Continued operation of Units 2 and 3 to maximize the mass recovery from wells MW57 and 96, respectively, is expected to hasten the remediation of the still high contaminant concentrations in well MW48. A similar evaluation is recommended for the performance of individual remediation wells connected to Unit 1.

4.2.2 Enhanced Fluid Recovery

Enhanced fluid recovery (EFR) events are recommended for wells where contaminant levels remain elevated above cleanup levels. EFR involves connecting a high capacity vacuum pump to a well to rapidly evacuate all fluids for the purpose of recovering accumulated contaminated media: groundwater, separate phase hydrocarbons, and/or contaminated formation materials that have entered the well through the well screen, or contaminated soil vapor within the vicinity of a contaminated well. The objective is to extract any residual source contaminants from the well to prevent those sources from continuing to generate detectable contaminants in the groundwater and soil vapor. Additionally, the vacuum will induce airflow from unsaturated soil within its radius of influence so that volatile vapor recovery can be achieved. The contaminated media that is recovered from the mobile vacuum unit would be transported to a pretreatment facility permitted by King County Industrial Waste prior to

discharge to the King County sewer system for additional treatment. Wells that currently exceed the cleanup levels include:

- Wells MW27 and MW90, located on the TOC Property;
- Well MW57, located on the TOC Farmasonis Property
- Well MW48, located in the 56th Avenue West ROW at the boundary of the TOC Farmasonis and Drake Properties, and
- Well MW69, located on the Drake Property.

EFR is recommended initially at well MW48 because it is not connected to any of the remediation systems and exhibits the highest contaminant concentrations compared to the other wells currently exceeding the cleanup levels. EFR at this well affords the opportunity to remove contaminated source material from the well and to evaluate contaminant concentrations in both recovered groundwater and soil vapor. Samples of contaminated groundwater and soil vapor would be collected for analysis of GRPH and BTEX prior to and immediately after each EFR event to evaluate the magnitude of residual contamination still sourcing from the well. Groundwater sampling would be performed using the low-flow protocol employed during quarterly and annual sampling events. Grab samples of vapor would be collected using Tedlar bags.

Upon approval by Ecology with this concept, a work plan will be developed to implement an EFR program.

4.2.3 Future Optimization Efforts

The results of the remediation well evaluation and EFR events will be critically reviewed to determine the operating configuration for each system (i.e., unit) that will produce the optimum mass recovery rates and thus achieve the remedial objectives as quickly as possible. If the recommended optimization efforts do not provide adequate and timely results, other remedial approaches and technologies to complement and/or replace existing technology will be evaluated.

5 LIMITATIONS

This document entitled, *Second Quarter 2015 Remedial Systems Operations & Maintenance Report,* was prepared by HydroCon Environmental, LLC exclusively for and on behalf of TOC Holdings Co. Material contained in this document reflects HydroCon's best judgments regarding the information available at the time of preparation and in accordance with industry-standard practices. Reliance on this document by a third party is the responsibility of the third party; therefore, HydroCon provides no warranty or guarantee related the unauthorized third party use of the information and findings presented herein. Finally, HydroCon accepts no responsibility for damages, if any, claimed by a third party as a result of the unauthorized use of this document.

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SCALE IN FEET
1" = 400'

SOURCE: STANTEC, JBR - 2014

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W E
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HydroCon
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DATE: 9-14-15
DWN: JJT
CHK: MS
APPROVED: MS
PRJ. MGR: CH
PROJECT NO: 01-176

FIGURE 1
SITE LOCATION MAP

TOC HOLDINGS CO, FACILITY NO. 01-176
24205 56TH AVENUE WEST
MOUNTLAKE TERRACE, WA.

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0 100 200

SCALE IN FEET
1" = 100'

SOURCE: STANTEC, JBR - 2014

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Hydro Con
510 Allen St. Suite B Kelso, Wa 98626. Ph(360)-703-6086

DATE: 9-14-15
DWN: JJT
CHK: MS
APPROVED: MS
PRJ. MGR: CH
PROJECT NO:
01-176

FIGURE 2
SITE MAP

TOC HOLDINGS CO, FACILITY NO. 01-176
24205 56TH AVENUE WEST
MOUNTLAKE TERRACE, WA.

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TABLES

HydroCon

Table 1-1
Summary of System Performance
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

Reporting Period		Days In Reporting Period	Days In Operation	System Run Time (%)	Volume of Treated Groundwater Discharged (gallons)	Average Daily Groundwater Recovery Rate (gallons per day)	GRPH Aqueous-Phase Removal (lb)	GRPH Vapor-Phase Removal (lb)
Start Date	End Date							
10/02/12	12/05/12	64	29.6	46%	34,569	540.1	3.67	1,353.0
12/05/12	03/04/13	89	35.6	40%	7,655.9	86.0	0.938	50.6
03/04/13	06/05/13	93	29.1	31%	4,915.8	52.9	0.604	7.2
06/05/13	09/04/13	91	69.0	76%	83,540.3	918.0	3.580	265.4
09/04/13	12/03/13	90	90.0	100%	75,825.2	842.5	1.226	1,061.1
12/03/13	01/31/14	59	26.1	44%	1,166.2	19.8	0.033	158.9
01/31/14	03/19/14	47	29.4	63%	29,991.7	638.1	0.872	35.1
03/19/14	06/16/14	89	69.7	78%	101,082.0	1,135.8	3.328	5.4
06/16/14	09/18/14	94	86.6	92%	101,780.0	1,082.8	1.097	51.2
09/18/14	12/09/14	82	68.7	84%	53,355.0	650.7	0.022	132.0
12/09/14	03/11/15	92	62.0	67%	103,289.0	1,122.7	0.470	4.2
03/11/15	06/08/15	89	77.7	87%	133,855.0	1,504.0	0.072	4.9
Total		**979**	**674**	**69%**	**731,024.7**	**716.1**	**15.908**	**3,129.0**

NOTES:

= data for current reporting period

% = percent
GRPH = gasoline-range petroleum hydrocarbons
lb = pounds
SVE = soil vapor extraction

Table 1-2
Vapor Stream - System Performance Monitoring Data
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
10/02/12	5.0	0.2	70	146.8	330	380	1,600	21.12	0.000
10/10/12	70.2	2.9	69	149.2	330	419	2,600	45.24	132.3
10/17/12	237.7	9.9	69	149.2	330	410	3,400	63.04	572.3
10/24/12	406.9	17.0	68	144.4	330	385	2,400	54.11	953.8
11/07/12	638.2	26.6	73	140.7	330	384	1,700	37.16	1311.9
12/05/12	714.2	29.8	67	148.0	330	344	150	12.98	1353.0
01/08/13	1,482.9	61.8	65	153.8	330	342	35	1.49	1400.8
01/17/13	1,533.7	63.9	76	153.0	330	350	--		
02/05/13	1,537.6	64.1	64	148.6	330	342	53	0.96	1403.0
03/04/13	1,569.4	65.4	27	173.0	330	342	<10	0.46	1403.6
04/03/13	1,587.2	66.1	60	157.4	330	342	14	0.25	1403.8
05/08/13	1,595.4	66.5	17	175.2	330	341	22	0.43	1403.9
06/05/13	2,267.7	94.5	36	166.0	330	340	<10	0.25	1410.8
07/02/13	2,789.8	116.2	39	168.0	330	340	26	0.43	1420.1
08/06/13	3,227.4	134.5	47	162.1	330	341	31	0.65	1432.0
08/09/13	3,302.8	137.6	64	157.1	330	345	--		
09/04/13	3,924.4	163.5	66	152.0	330	351	580	8.41	1676.2
10/07/13	4,715.2	196.5	66	153.1	330	356	710	13.71	2128.1
10/14/13	4,888.3	203.7	72	155.4	330	354	--		
10/15/13	4,913.7	204.7	70	154.7	330	355	--		
10/16/13	4,936.9	205.7	66	154.4	330	364	--		
11/06/13	5,434.8	226.5	45	173.7	330	349	240	8.74	2390.2
11/07/13	5,460.5	227.5	45	168.1	330	346	--		
12/03/13	6,084.2	253.5	74	158.2	330	355	740	12.83	2737.3
01/13/14	6,710.4	279.6	0	0.0	--	--	--		
01/31/14	6,711.6	279.7	47	174.0	330	342	37	6.08	2896.2
02/06/14	6,854.2	285.6	47	173.4	330	343	--		
02/07/14	6,877.1	286.5	47	174.9	330	342	110	2.02	2910.1
03/19/14	7,416.7	309.0	48	174.0	330	340	<10	0.94	2931.2
04/18/14	7,919.8	330.0	48	173.1	330	340	<10	0.08	2932.9
05/19/14	8,420.1	350.8	47	172.8	330	345	<10	0.08	2934.5
06/16/14	9,088.9	378.7	50	172.2	330	345	<10	0.08	2936.7
07/09/14	9,571.0	398.8	50	169.8	330	344	<10	0.08	2938.2
08/12/14	10,287.5	428.6	49	167.4	330	339	19	0.18	2943.6
09/18/14	11,168.4	465.4	48	170.1	330	341	140	1.21	2987.9
10/22/14	11,881.3	495.1	48	166.5	330	342	220	2.72	3068.8
11/17/14	12,301.8	512.6	52	175.0	330	341	63	2.17	3106.9
12/09/14	12,817.3	534.1	52	171.5	330	340	15	0.61	3119.9
01/13/15	13,215.2	550.6	54	174.6	330	340	<10	0.16	3122.5
02/18/15	13,815.2	575.6	57	40.7	CATOX OFF		<10	0.05	3123.7
03/11/15	14,305.9	596.1	59	50.9	CATOX OFF		<10	0.02	3124.1

Table 1-2
Vapor Stream - System Performance Monitoring Data
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
04/22/15	15,074.4	628.1	67	165.6	CATOX OFF		<10	0.05	3125.7
05/19/15	15,691.6	653.8	60	163.4	CATOX OFF		<10	0.07	3127.6
06/08/15	16,171.3	673.8	60	163.7	CATOX OFF		<10	0.07	3129.0
PSCAA NOC- 10384 Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

[1]Air flow rates calculated using an averaging flow sensor (Dwyer Model DS). Air flow rates between 2/7/14 and 12/09/14 calculated from data. Air flow rates from 1/12/15 forward calculated from averaging flow sensor.

[2]Influent vapor samples collected from SVE sample port prior to air treatment.

[3]Daily mass removal rate (lb/day) = average concentration (mg/m^3) x average flow rate (scfm) x conversion (8.99x10-5 lb-m^3-min/mg-ft^3-day).

[4]Cumulative mass of benzene removed (lb) = daily removal rate (lb/day) x time in operation (days) + previous cumulative total (lb).

-- = not analyzed, measured, or calculated
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
mg/m^3 = milligrams per cubic meter
NOC - Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per minute
SVE = soil vapor extraction

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Table 1-3
Liquid Stream - System Performance Monitoring Data
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
				GRPH Recovery - Aqueous-Phase		
Date	Discharge Flow Totalizer (gallons)	Treated Between Visits (gallons)	Average Daily Flow Rate Between Visits (gallons per day)	Influent GRPH Concentration[1] (µg/L)	GRPH Removed[2][3] (lb)	Cumulative GRPH Removed[3][4] (lb)
10/02/12	636	0	0		--	--
10/10/12	5,761	5,125	641	18,000	0.770	0.77
10/17/12	14,898	9,137	1,305	--		
10/24/12	21,888	6,990	999	--		
11/07/12	31,362	9,473	677	6,100	*2.574*	*3.34*
12/05/12	35,205	3,843	137	14,000	0.322	3.67
01/08/13	38,077	2,872	84	19,000	0.395	4.06
01/17/13	40,712	2,636	293			
02/05/13	41,363	651	34	8,200	0.373	4.43
03/04/13	42,861	1,497	55	19,000	*0.170*	*4.60*
04/03/13	44,190	1,329	44	11,000	*0.166*	*4.77*
05/08/13	46,980	2,790	80	20,000	*0.361*	*5.13*
06/05/13	47,777	797	28	3,200	*0.077*	*5.21*
07/02/13	63,870	16,093	596	17,000	*1.356*	*6.57*
08/06/13	89,988	26,118	746	<100	*1.858*	*8.42*
08/09/13	95,563	5,575	1,858	--	--	
09/04/13	131,317	35,754	1,375	2,400	0.4	8.79
10/07/13	174,445	43,128	1,307	1,100	0.6	9.42
10/14/13	184,152	9,707	1,387	--	--	
10/15/13	184,982	831	831	--	--	
10/16/13	185,955	973	973	--	--	
11/06/13	187,065	1,110	53	3,800	0.3	9.68
11/07/13	188,072	1,007	1,007	--	--	
12/03/13	207,142	19,070	733	240	0.34	10.01
01/13/14	208,154	1,012	25	--	--	
01/31/14	208,308	155	9	6,600	0.03	10.05
02/06/14	214,154	5,846	974	--	--	
02/07/14	214,841	686	686	760	0.20	10.25
03/19/14	238,300	23,460	586	6,100	0.67	10.92
04/18/14	273,331	35,031	1,168	4,300	1.52	12.44
05/19/14	303,504	30,173	973	2,700	0.88	13.32
06/16/14	339,382	35,878	1,281	3,500	0.93	14.25
07/09/14	367,276	27,894	1,213	2,500	0.70	14.94
08/12/14	399,903	32,627	960	180	0.36	15.31
09/18/14	441,162	41,259	1,115	<100	0.03	*15.34*
10/22/14	464,280	23,118	680	<100	*0.010*	*15.35*
11/17/14	478,016	13,736	528	<100	*0.006*	*15.36*
12/09/14	494,517	16,501	750	<100	*0.007*	*15.37*
01/13/15	516,310	21,793	623	1,500	*0.141*	*15.51*
02/18/15	559,454	43,144	1,198	150	*0.297*	*15.80*
03/11/15	597,806	38,352	1,826	<100	*0.032*	*15.84*
04/23/15	658,574	60,768	1,413	<100	*0.025*	*15.86*
05/19/15	702,217	43,643	1,679	<100	*0.018*	*15.88*
06/08/15	731,661	29,444	1,472	180	*0.028*	*15.91*
State Waste Discharge Permit ST0007384 Limits			**7,000**			

NOTES:
Sample Analysis conducted by Friedman & Bruya, Inc.
[1]Influent samples collected prior to treatment with liquid-phase granular activated carbon.
[2] Mass removal weight (lb) = gallons recovered x concentration (µg/L)
x conversion factor (8.344E-9 lb-L/µg-gallon).
[3]Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit.
[4]Cumulative mass (lb) = mass removal between sampling visits (lb) + previous cumulative total (lb).

DEFINITIONS:
-- = not analyzed, measured, or calculated
< = not detected at the concentration indicated
µg/L = micrograms per liter
GRPH = gasoline-range petroleum hydrocarbons
lb = pound

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Table 1-4
Vapor Stream Analytical Results
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
10/02/12	1,600	2.0	10.0	5.5	26	<10	<0.1	<0.1	<0.1	<0.3	99.7
10/10/12	2,600	2.3	13.0	8.7	37	<10	<0.1	0.20	<0.1	<0.3	99.8
10/17/12	3,400	3.0	9.4	11.0	42	<10	<0.1	<0.1	<0.1	<0.3	99.9
10/24/12	2,400	1.5	7.0	9.4	39	<10	<0.1	<0.1	<0.1	<0.3	99.8
11/07/12	1,700	<0.5	7.0	7.3	37	<10	<0.1	<0.1	<0.1	<0.3	99.7
12/05/12	150	<0.1	0.23	<0.1	3.5	<10	<0.1	<0.1	<0.1	<0.3	96.7
01/08/13	35	<0.1	0.19	0.18	0.86	<10	<0.1	0.16	<0.1	<0.3	85.7
02/05/13	53	<0.1	0.30	0.13	0.78	<10	<0.1	<0.1	<0.1	<0.3	90.6
03/04/13	<10	<0.1	0.10	0.10	0.69	<10	<0.1	<0.1	<0.1	<0.3	--
04/03/13	14	<0.1	0.18	0.14	0.90	<10	<0.1	<0.1	<0.1	<0.3	64.3
05/08/13	22	<0.1	0.23	<0.1	0.35	<10	<0.1	<0.1	<0.1	<0.3	77.3
06/05/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/02/13	26	<0.1	0.24	<0.1	0.48	<10	<0.1	<0.1	<0.1	<0.3	80.8
08/06/13	31	<0.1	0.21	0.14	0.79	<10	<0.1	<0.1	<0.1	<0.3	83.9
09/04/13	580	<0.1	5.00	<0.1	22	<10	<0.1	<0.1	<0.1	<0.3	99.1
10/07/13	710	<0.1	5.70	<0.1	22	<10	<0.1	<0.1	<0.1	<0.3	99.3
11/06/13	240	<0.1	1.60	<0.1	6.4	<10	<0.1	<0.1	<0.1	<0.3	97.9
12/03/13	740	<0.1	6.30	<0.1	19.0	<10	<0.1	<0.1	<0.1	<0.3	99.3
01/31/14	37	<0.1	0.40	<0.1	0.75	<10	<0.1	<0.1	<0.1	<0.3	86.5
02/07/14	110	<0.1	0.77	<0.1	2.2	<10	<0.1	<0.1	<0.1	<0.3	95.5
03/19/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
04/18/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
05/19/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
06/16/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/09/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
08/11/14	19	<0.1	0.12	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	73.7
09/17/14	140	<0.1	0.23	0.54	1.6	<10	<0.1	<0.1	<0.1	<0.3	96.4
10/22/14	220	<0.1	3.00	<0.1	3.3	<10	<0.1	<0.1	<0.1	<0.3	97.7
11/18/14	63	<0.1	0.57	<0.1	0.72	<10	<0.1	<0.1	<0.1	<0.3	92.1
12/09/14	15	<0.1	0.29	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	66.7

Table 1-4
Vapor Stream Analytical Results
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
01/13/15	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
02/18/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
03/11/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
04/23/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
05/19/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
06/08/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
PSCAA NOC-10384 Restrictions and Conditions						**max 214.7[5]**					**95%[5][6]**

NOTES:

Sample analysis conducted by Fremont Analytical in Seattle, Washington.

[1]Influent vapor samples collected from SVE port on the pressure side of the blower

[2]Effluent vapor samples collected from the sample port on the effluent stack

[3]Analyzed by Northwest Total Petroleum Hydrocarbon Method NWTPH-Gx

[4]Analyzed by U.S. EPA Method 8021B.

[5]DRE shall be at least 95% unless the effluent GRPH concentration does not exceed 50 ppmv (or 214.7 mg/m^3 assuming an average molecular weight for GRPH of 105)

DRE is calculated by [GRPH inf-GRPH eff]/[GRPH inf] x 100. For results below detection limit, 50% of the value of the detection limit is used in the calculation.

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

mg/m^3 = milligrams per cubic meter

CATOX = catalytic oxidizer

DRE = destruction removal efficiency

GRPH = gasoline-range petroleum hydrocarbons

NOC = Notice of Construction

ppmv = parts per million by volume

PSCAA = Puget Sound Clean Air Agency

SVE = soil vapor extraction

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Table 1-5
Liquid Stream Analytical Results
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 1WINF)					Sample ID: 1GAC1					Effluent (1WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
10/10/12	18,000	25.0	370.0	280	4,500	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.59
11/07/12	6,100	8.4	99.0	24	1,200	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.61
12/05/12	14,000	12.0	250.0	200	2,700	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	19.40	7.19
01/08/13	19,000	60.0	400.0	520	3,600	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.71
02/05/13	8,200	11.0	83.0	61	1,200	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.86
03/04/13	19,000	20.0	200.0	460	3,900	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.88
04/03/13	11,000	27.0	83.0	<40	2,500	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.68
05/08/13	20,000	11.0	450.0	<10	3,400	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.06
06/05/13	3,200	4.0	35.0	<1	350	<100	<1	<1	<1	<3	<100	<1	<1	<1	3.1	<6	3.33	6.80
07/02/13	17,000	9.9	290.0	190	3,200	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.74
08/06/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.89
09/04/13	2,400	1.1	18.0	<1	230	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.41
10/07/13	1,100	1.1	12.0	<1	86	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.89
11/06/13	3,800	27.0	150.0	26	810	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.94
12/03/13	240	<1	3.7	<1	19	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	7.05	6.98
01/31/14	6,600	19.0	370.0	<1	1,000	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	--
02/07/14	760	1.0	6.6	<1	54	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.71
03/19/14	6,100	2.9	160.0	<1	1,100	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	8.49
04/18/14	4,300	<1	100.0	<1	650	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.65
05/19/14	2,700	2.5	62.0	<1	310	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.90
06/16/14	3,500	2.0	86.0	<1	520	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.04	6.59
07/09/14	2,500	1.7	358.0	<1	350	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.20
08/12/14	180	<1	1.5	<1	15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.29
09/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.25
10/22/14	<100	<1	1.4	<1	4.0	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.19
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.56
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	13.30	7.29
01/13/15	1,500	<1	35.0	<1	270	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.37
02/18/15	150	<1	3.3	<1	25	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.25
03/11/15	<100	<1	<1	<1	8.5	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.15

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Table 1-5
Liquid Stream Analytical Results
Unit 1 - TOC Property
TOC Holdings Co. Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 1WINF)					Sample ID: 1GAC1					Effluent (1WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
04/23/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.25
05/19/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.38
06/08/15	180	<1	2.8	<1	28	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	5.64	6.5
State Waste Discharge Permit Number ST0007384 Effluent Limits											**1,000**	**5**	**NS**	**NS**	**NS**	**100**	**1,090**	**6 to 10**

NOTES:

Sample analysis conducted by Friedman & Bruya, Inc. in Seattle, Washington.

[1] Three GAC vessels are operated in series mode. 1WINF sample is collected prior to first GAC vessel in series

[2] 1GAC1 sample is collected downstream of GAC-1 and upstream of GAC-2 vessels in series

[3] Effluent sample collected downstream of third GAC vessel in series, which represents the quality of water discharged to the POTW

[4] Analyzed by Method NWTPH-Gx.

[5] Analyzed by U.S. EPA Method 8021B

[6] Analyzed by U.S. EPA Method 200.8

[7] Analyzed by field instrumentation

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

BTEX = benzene, toluene, ethylbenzene, total xylenes

EB = ethylbenzene

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

µg/L = micrograms per liter

NS = no standard

NWTPH = Northwest Total Petroleum Hydrocarbon

POTW = publicly-owned treatment works

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Table 2-1
Summary of System Performance
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

Reporting Period		Days In Reporting Period	Days In Operation	System Run Time (%)	Volume of Treated Groundwater Discharged (gallons)	Average Daily Groundwater Recovery Rate (gallons per day)	GRPH Aqueous-Phase Removal (lb)	GRPH Vapor-Phase Removal (lb)
Start Date	End Date							
10/03/12	12/05/12	63	51.7	82%	12,461	197.8	0.01	671.8
12/05/12	03/04/13	89	52.5	59%	5,900	66.3	0.002	12.8
03/04/13	06/05/13	93	67.1	72%	106,670	1,147	0.356	7.4
06/05/13	09/04/13	91	82.2	90%	123,303	1,355	0.157	9.3
09/04/13	12/03/13	90	89.9	100%	89,204	991.2	0.037	163.5
12/03/13	01/13/14	41	41.1	100%	29,087	709	0.012	73.0
01/13/14	03/18/14	64	41.8	65%	29,578	462.2	0.012	49.7
03/18/14	06/16/14	90	85.4	95%	167,292	1,858.8	0.070	9.7
06/16/14	09/18/14	94	90.7	97%	120,848	1,285.6	0.050	6.2
09/18/14	12/09/14	82	53.9	66%	19,301	235.4	0.008	3.3
12/09/14	03/11/15 [1]	92	43.8	48%	39,860	433.3	0.017	7.1
03/11/15	06/08/15 [1]	89	81.1	91%	160,177	1,799.7	0.067	1.6
Total		**978**	**781**	**80%**	**903,680.2**	**878.5**	**0.794**	**1,015.4**

NOTES:

= data for current reporting period

[1] An air sample was not collected during the March 11, 2015 site visit because the blower was not operational. Removal is estimated based on extrapolation to April vapor sample

% = percent
GRPH = gasoline-range petroleum hydrocarbons
lb = pounds
SVE = soil vapor extraction

Table 2-2
Vapor Stream - System Performance Monitoring Data
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
10/03/12	15.6	0.7	68	149.1	330	350	340	4.56	0.000
10/10/12	73.7	3.1	86	134.1	330	363	1,300	18.71	57.5
10/17/12	242.0	10.1	76	135.8	330	376	1,300	23.66	223.4
10/24/12	410.7	17.1	72	137.2	330	355	1,100	21.47	374.3
10/25/12	434.7	18.1	73	139.2	330	354	--	--	--
11/06/12	722.8	30.1	74	137.8	330	358	--	--	
11/07/12	748.2	31.2	74	138.6	330	352	660	15.00	585.3
12/05/12	1,257.4	52.4	74	124.3	330	338	15	4.08	671.8
12/06/12	1,266.4	52.8	75	135.6	--	--	--	--	
01/08/13	1,989.7	82.9	27	164.7	330	344	15	0.29	680.7
01/09/13	2,012.1	83.8	32	163.5	330	336	--	--	--
01/17/13	2,037.9	84.9	27	166.5	331	336	--	--	--
02/05/13	2,490.2	103.8	33	159.5	330	335	<10	0.18	684.5
02/06/13	2,514.5	104.8	38	157.5	330	335	--	--	--
03/04/13	2,517.2	104.9	31	162.9	330	335	<10	0.11	684.6
03/12/13	2,705.4	112.7	32	161.7	330	335	--	--	--
04/03/13	3,230.7	134.6	33	166.8	330	335	<10	0.11	687.9
05/08/13	3,454.7	143.9	33	164.5	330	338	<10	0.11	688.9
06/05/13	4,127.1	172.0	36	158.9	330	335	<10	0.11	692.0
06/19/13	4,438.7	184.9	34	166.7	330	335	--	--	--
07/02/13	4,746.1	197.8	32	164.2	330	335	<10	0.11	694.8
08/06/13	5,403.6	225.2	10	175.5	330	335	<10	0.11	697.9
08/09/13	5,475.4	228.1	20	168.6	330	335	--	--	--
09/04/13	6,098.7	254.1	20	170.1	330	335	<10	0.12	701.3
10/07/13	6,890.0	287.1	34	163.9	330	336	41	0.65	722.9
10/14/13	7,062.9	294.3	35	165.2	330	336	--	--	--
10/15/13	7,088.0	295.3	74	146.5	330	342	--	--	--
10/16/13	7,111.3	296.3	67	147.6	330	340	--	--	--
11/06/13	7,610.8	317.1	73	150.7	330	338	140	2.27	791.0
11/07/13	7,635.3	318.1	65	148.2	330	338	--	--	--
12/03/13	8,257.0	344.0	65	154.2	330	337	130	2.74	864.8
12/04/13	8,287.9	345.3	66	154.2	330	337	--	--	--
01/13/14	9,242.4	385.1	71	147.8	330	336	66	1.78	937.8
01/23/14	9,485.7	395.2	69	--	--	--	--	--	--
01/31/14	9,675.8	403.2	68	147.3	330	335	--	--	--
02/07/14	9,694.4	403.9	74	144.7	330	335	82	1.51	966.3
03/18/14	10,246.4	--	74	--	330	334	26	0.87	987.5
04/17/14	10,859.0	452.5	68	146.6	330	336	<10	0.23	993.2
05/20/14	11,645.2	485.2	72	146.9	330	338	<10	0.07	995.4

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Table 2-2
Vapor Stream - System Performance Monitoring Data
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
06/16/14	12,296.4	512.4	62	152.4	330	338	<10	0.07	997.2
07/10/14	12,799.7	533.3	62	150.2	330	338	<10	0.07	998.6
08/12/14	13,588.2	566.2	61	149.4	330	338	<10	0.07	1000.9
09/18/14	14,474.1	603.1	48	158.3	CATOX OFF		<10	0.07	1003.4
10/22/14	14,721.8	613.4	45	72.7	CATOX OFF		<10	0.05	1004.0
11/17/14	15,242.7	635.1	47	166.6	CATOX OFF		<10	0.05	1005.1
12/09/14	15,767.5	657.0	49	156.5	CATOX OFF		<10	0.07	1006.7
01/13/15	16,495.6	687.3	56	156.0	CATOX OFF		<10	0.07	1008.8
02/18/15	16,818.0	700.8	--	--	BLOWER DOWN		--	--	--
03/11/15	16,818.0	700.8	--	--	BLOWER DOWN		--	--	--
04/22/15	17,642.7	735.1	59	149.5	CATOX OFF		<10	0.10	1013.8
05/19/15	18,284.4	761.9	57	159.5	CATOX OFF		<10	0.03	1014.7
06/08/15	18,764.9	781.9	65	158.8	CATOX OFF		<10	0.04	1015.4
PSCAA NOC- 10384 Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

[1]Air flow rates calculated using an averaging flow sensor (Dwyer Model DS). Air flow rates between 2/7/14 and 12/09/14 calculated from data. Air flow rates from 1/12/15 forward calculated from averaging flow sensor.

[2]Influent vapor samples collected from SVE sample port prior to air treatment.

[3]Daily mass removal rate (lb/day) = average concentration (mg/m^3) x average flow rate (scfm) x conversion (8.99x10-5 lb-m^3-min/mg-ft^3-day).

[4]Cumulative mass of benzene removed (lb) = daily removal rate (lb/day) x time in operation (days) + previous cumulative total (lb).

-- = not analyzed, measured, or calculated
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
mg/m^3 = milligrams per cubic meter
NOC - Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per minute
SVE = soil vapor extraction

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Table 2-3
Liquid Stream - System Performance Monitoring Data
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
				GRPH Recovery - Aqueous-Phase		
Date	Discharge Flow Totalizer (gallons)	Treated Between Visits (gallons)	Average Daily Flow Rate Between Visits (gallons per day)	Influent GRPH Concentration[1] (µg/L)	GRPH Removed[2][3] (lb)	Cumulative GRPH Removed[3][4] (lb)
10/03/12	397.8	0	0	--	--	--
10/10/12	562.6	165	24	<100	0.000	0.000
10/17/12	5,392.6	4,830	690	--	--	--
10/24/12	8,170.9	2,778	397	--	--	--
10/25/12	8,580.4	410	410	--	--	--
11/06/12	10,624.2	2,044	170	--	--	--
11/07/12	10,630.5	6	6	<100	0.004	0.004
12/05/12	12,858.4	2,228	80	<100	0.001	0.005
12/06/12	14,221.5	1,363	1,363	--	--	--
01/08/13	18,643.2	4,422	134	<100	0.002	0.008
01/09/13	18,651.6	8	8	--	--	--
01/17/13	18,753.9	102	13	--	--	--
02/05/13	18,753.9	0	0	<100	0.000	0.008
03/12/13	18,758.0	4	0	--	--	--
03/13/13	18,758.0	0	0	1,100	0.000	0.008
04/03/13	24,667.4	5,909	281	740	0.045	0.053
05/08/13	90,733.6	66,066	1,888	<100	0.218	0.27
06/05/13	125,427.8	34,694	1,239	590	0.093	0.36
06/19/13	131,990.5	6,563	469	--	--	--
07/02/13	172,454.5	40,464	3,113	<100	0.126	0.49
08/06/13	223,496.3	51,042	1,458	<100	0.021	0.51
08/09/13	226,651.9	3,156	1,052	--	--	
09/04/13	248,730.9	22,079	849	<100	0.011	0.52
10/07/13	269,136.3	20,405	618	<100	0.009	0.53
10/14/13	273,636.3	4,500	643	--	--	--
10/15/13	275,837.1	2,201	2,201	--	--	--
10/16/13	277,480.5	1,643	1,643	--	--	--
11/06/13	308,993.4	31,513	1,501	<100	0.017	0.55
11/07/13	310,249.2	1,256	1,256	--	--	--
12/03/13	337,935.2	27,686	1,065	<100	0.012	0.56
12/04/13	339,243.0	1,308	1,308	--	--	--
01/13/14	367,022.0	27,779	694	<100	0.012	0.57
01/31/14	376,637.4	9,615	534	--	--	--
02/07/14	376,875.7	238	34	<100	0.004	0.57
03/18/14	396,600.0	19,724	506	<100	0.008	0.58
04/17/14	424,646.0	28,046	935	<100	0.012	0.59
05/20/14	497,115.0	72,469	2,196	<100	0.030	0.62
06/16/14	563,892.0	66,777	2,473	<100	0.028	0.65
07/09/14	603,616.0	39,724	1,727	<100	0.017	0.67
08/12/14	652,922.0	49,306	1,450	<100	0.021	0.69
09/17/14	684,740.0	31,818	884	<100	0.013	0.70
10/22/14	687,370.0	2,630	75	<100	0.001	0.70
11/17/14	695,157.0	7,787	300	<100	0.003	0.71
12/09/14	704,041.0	8,884	404	<100	0.004	0.71
01/13/15	725,601.0	21,560	616	<100	0.009	0.72
02/18/15	736,017.0	10,416	289	<100	0.004	0.72
03/11/15	743,901.0	7,884	375	<100	0.003	0.73
04/23/15	816,311.0	72,410	1,684	<100	0.030	0.76
05/19/15	867,016.0	50,705	1,950	<100	0.021	0.78
06/08/15	904,078.0	37,062	1,853	<100	0.015	0.79
State Waste Discharge Permit ST0007384 Limits			**7,000**			

NOTES:
Sample Analysis conducted by Friedman & Bruya, Inc.

[1] Influent samples collected prior to treatment with liquid-phase granular activated carbon.

[2] Mass removal weight (lb) = gallons recovered x concentration (µg/L) x conversion factor (8.344E-9 lb-L/µg-gallon).

[3] Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit.

[4] Cumulative mass (lb) = mass removal between sampling visits (lb) + previous cumulative total (lb).

DEFINITIONS:
-- = not analyzed, measured, or calculated
< = not detected at the concentration indicated
µg/L = micrograms per liter
GRPH = gasoline-range petroleum hydrocarbons
lb = pound

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Table 2-4
Vapor Stream Analytical Results
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
10/03/12	340	0.44	1.6	0.96	1.7	<10	<0.1	0.17	<0.1	<0.3	98.5
10/10/12	1,300	0.77	<0.5	4.0	9.6	<10	<0.1	0.21	<0.1	<0.3	99.6
10/17/12	1,300	0.55	<0.5	3.7	7.9	<10	<0.1	<0.1	<0.1	<0.3	99.6
10/24/12	1,100	0.50	3.1	<0.1	11.0	<10	<0.1	<0.1	<0.1	<0.3	99.5
11/07/12	660	<0.1	2.7	<0.1	7.1	<10	<0.1	<0.1	<0.1	<0.3	99.2
12/05/12	15	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	66.7
01/08/13	15	<0.1	<0.1	<0.1	<0.3	<10	<0.1	0.10	<0.1	<0.3	66.7
02/05/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
03/04/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
04/03/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
05/08/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
06/05/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/02/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
08/06/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
09/04/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
10/07/13	41	<0.1	0.19	<0.1	0	<10	<0.1	<0.1	<0.1	<0.3	87.8
11/06/13	140	<0.1	0.52	<0.1	1.4	<10	<0.1	<0.1	<0.1	<0.3	96.4
12/03/13	130	<0.1	0.44	0.73	1.3	<10	<0.1	<0.1	<0.1	<0.3	96.2
01/13/14	66	<0.1	0.31	0.38	0.51	<10	<0.1	<0.1	<0.1	<0.3	92.4
02/07/14	82	<0.1	<0.1	0.73	0.65	<10	<0.1	<0.1	<0.1	<0.3	93.9
03/18/14	26	<0.1	<0.1	0.20	<0.3	<10	<0.1	<0.1	0.2	<0.3	80.8
04/17/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
05/20/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
06/16/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/09/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
08/11/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
09/17/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
10/22/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
11/18/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
12/09/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--

Table 2-4
Vapor Stream Analytical Results
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)									
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
01/13/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
02/18/15	BLOWER DOWN - NO SAMPLE					--	--	--	--	--	--
03/11/15	BLOWER DOWN - NO SAMPLE					--	--	--	--	--	--
04/23/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
05/19/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
06/08/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
PSCAA NOC-10384 Restrictions and Conditions						**max 214.7[5]**					**95%[5][6]**

NOTES:

Sample analysis conducted by Fremont Analytical in Seattle, Washington.

[1]Influent vapor samples collected from SVE port on the pressure side of the blower

[2]Effluent vapor samples collected from the sample port on the effluent stack

[3]Analyzed by Northwest Total Petroleum Hydrocarbon Method NWTPH-Gx

[4]Analyzed by U.S. EPA Method 8021B.

[5]DRE shall be at least 95% unless the effluent GRPH concentration does not exceed 50 ppmv (or 214.7 mg/m^3 assuming an average molecular weight for GRPH of 105)

DRE is calculated by [GRPH inf-GRPH eff]/[GRPH inf] x 100. For results below detection limit, 50% of the value of the detection limit is used in the calculation.

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

mg/m^3 = milligrams per cubic meter

CATOX = catalytic oxidizer

DRE = destruction removal efficiency

GRPH = gasoline-range petroleum hydrocarbons

NOC = Notice of Construction

ppmv = parts per million by volume

PSCAA = Puget Sound Clean Air Agency

SVE = soil vapor extraction

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Table 2-5
Liquid Stream Analytical Results
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 2WINF)					Sample ID: 2GAC1					Effluent (2WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
10/10/12	<100	<1	<1	<1	3.1	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.59
11/07/12	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.71
12/05/12	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	76.5	8.05
01/08/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.29
02/05/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.31
03/13/13	1,100	2.9	<1	<1	27	--	--	--	--	--	<100	<1	<1	<1	<3	<6	--	7.59
04/03/13	740	<1	<1	<1	7.9	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.08
05/08/13	<100	<1	<1	<1	5.1	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.51
06/05/13	590	2.0	1.8	14.0	120	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	4.51	6.68
07/02/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.97
08/06/13	<100	<1	<1	<1	5.2	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.10
09/04/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.96
10/07/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.17
11/06/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.92
12/03/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.59	7.04
01/13/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.13
02/07/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.45
03/18/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.86
04/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.87
05/20/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.18
06/16/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	<1	6.91
07/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.82
08/12/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.12
09/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.04
10/22/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	5.92
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.83
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	<1	7.29
01/13/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.45
02/18/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.07
03/11/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.26

Table 2-5
Liquid Stream Analytical Results
Unit 2 - TOC Farmasonis Property
TOC Holdings Co. Facility No. 01-176
24225 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 2WINF)					Sample ID: 2GAC1					Effluent (2WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
04/23/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.97
05/19/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.25
06/08/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	<1	7.0
State Waste Discharge Permit Number ST0007384 Effluent Limits											**1,000**	**5**	**NS**	**NS**	**NS**	**100**	**1,090**	**6 to 10**

NOTES:

Sample analysis conducted by Friedman & Bruya, Inc. in Seattle, Washington.

[1]Three GAC vessels are operated in series mode. 2WINF sample is collected prior to first GAC vessel in series

[2]2GAC1 sample is collected downstream of GAC-1 and upstream of GAC-2 vessels in series

[3] Effluent sample collected downstream of third GAC vessel in series, which represents the quality of water discharged to the POTW

[4]Analyzed by Method NWTPH-Gx.

[5]Analyzed by U.S. EPA Method 8021B

[6]Analyzed by U.S. EPA Method 200.8

[7]Analyzed by field instrumentation

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

BTEX = benzene, toluene, ethylbenzene, total xylenes

EB = ethylbenzene

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

µg/L = micrograms per liter

NS = no standard

NWTPH = Northwest Total Petroleum Hydrocarbon

POTW = publicly-owned treatment works

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Table 3-1
Summary of System Performance
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

Reporting Period		Days In Reporting Period	Days In Operation	System Run Time (%)	Volume of Treated Groundwater Discharged (gallons)	Average Daily Groundwater Recovery Rate (gallons per day)	GRPH Aqueous-Phase Removal (lb)	GRPH Vapor-Phase Removal (lb)
Start Date	End Date							
10/02/12	12/05/12	64	58.6	92%	69,982	1,093	0.03	60.8
12/05/12	03/04/13	89	73.3	82%	30,269	340	0.14	40.0
03/04/13	06/05/13	93	39.6	43%	74,016	796	0.49	4.1
06/05/13	09/04/13	91	58.1	64%	68,179	749	0.73	7.0
09/04/13	12/03/13	90	75.8	84%	211,043	2,345	0.09	9.4
12/03/13	01/13/14	41	41.0	100%	40,410	986	0.02	5.1
01/13/14	03/18/14	64	58.0	91%	132,724	2,074	0.06	68.3
03/18/14	06/16/14	90	71.3	79%	206,572	2,295	0.09	6.7
06/16/14	09/18/14	94	85.2	91%	225,458	2,398	0.09	7.0
09/18/14	12/09/14	82	70.8	86%	203,925	2,487	0.09	5.9
12/09/14	03/11/15	92	70.6	77%	266,301	2,895	0.11	5.7
03/11/15	**06/08/15**	**89**	**79.5**	**89%**	**221,773**	**2,492**	**0.09**	**5.7**
Cumulative Total or Average		**979**	**782**	**80%**	**1,750,651**	**1,746**	**2.02**	**225.7**

NOTES:

= data for current reporting period

% = percent
GRPH = gasoline-range petroleum hydrocarbons
lb = pounds
SVE = soil vapor extraction

Table 3-2
Vapor Stream - System Performance Monitoring Data
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
10/03/12	11.2	0.5	70	143.8	330	340	13	0.17	0.000
10/10/12	75.7	3.2	73	140.4	330	338	12	0.24	0.75
10/17/12	243.7	10.2	74	141.7	330	337	<10	0.14	1.7
10/24/12	411.9	17.2	74	139.9	330	338	<10	0.09	2.4
10/25/12	436.7	18.2	74	142.8	330	338	<10	0.10	2.5
11/06/12	724.8	30.2	77	137.6	330	337	--	--	--
11/07/12	750.3	31.3	76	139.1	330	338	<10	0.10	3.7
12/05/12	1,417.6	59.1	76	141.9	330	340	160	2.05	60.8
01/08/13	2,231.8	93.0	83	137.3	330	337	<10	1.07	97.0
02/05/13	2,731.0	113.8	70	144.2	330	337	<10	0.09	99.0
03/04/13	3,177.5	132.4	71	144.6	330	338	<10	0.10	100.8
04/03/13	3,894.4	162.3	64	152.4	330	338	<10	0.10	103.8
05/15/13	4,059.7	169.2	27	173.5	330	301	<10	0.11	104.5
06/05/13	4,126.8	172.0	27	172.9	330	338	<10	0.12	104.8
07/02/13	4,400.3	183.3	17	171.7	330	338	<10	0.12	106.2
08/06/13	5,055.3	210.6	10	182.6	330	338	<10	0.12	109.4
09/04/13	5,520.0	230.0	13	181.6	330	338	<10	0.12	111.8
10/07/13	6,311.3	263.0	13	183.7	330	337	<10	0.12	115.9
10/14/13	6,484.1	270.2	14	185.6	330	337	--	--	--
10/15/13	6,509.2	271.2	15	184.9	330	337	--	--	--
11/06/13	7,031.9	293.0	18	185.6	330	338	<10	0.12	119.6
11/07/13	7,056.6	294.0	18	172.7	330	337	--	--	--
12/03/13	7,339.5	305.8	20	186.4	330	338	<10	0.13	121.2
12/04/13	7,368.7	307.0	25	185.1	330	338	<10	0.13	121.4
01/13/14	8,323.6	346.8	24	186.6	330	337	<10	0.13	126.4
01/31/14	8,620.1	359.2	26	186.1	330	338	--	--	--
02/06/14	8,786.4	366.1	20	186.0	330	340	--	--	--
02/07/14	8,796.0	366.5	20	188.9	330	340	98	1.70	159.7
03/18/14	9,715.1	404.8	24	187	330	338	<10	0.91	194.7
04/18/14	10,370.2	432.1	27	183.5	330	340	<10	0.12	197.7
05/19/14	10,942.5	455.9	22	184.9	330	342	<10	0.08	199.7
06/16/14	11,425.1	476.0	26	181.8	330	342	<10	0.08	201.3
07/09/14	11,846.3	493.6	24	182.7	330	341	<10	0.08	202.8
08/13/14	12,607.6	525.3	26	181.7	330	337	<10	0.08	205.4
09/18/14	13,470.3	561.3	17	185.0	CATOX OFF		<10	0.08	208.3
10/22/14	14,047.2	585.3	18	185.2	CATOX OFF		<10	0.08	210.3
11/17/14	14,646.6	610.3	19	189.1	CATOX OFF		<10	0.08	212.4
12/09/14	15,168.6	632.0	19	185.6	CATOX OFF		<10	0.08	214.3
01/12/15	15,889.0	662.0	8	197.3	CATOX OFF		<10	0.09	216.9

Table 3-2
Vapor Stream - System Performance Monitoring Data
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

Date	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hours	Total Time in Operation	SVE-Prefilter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Removal Rate[3]	Cumulative Mass Recovered[4]
	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
02/18/15	16,369.4	682.1	64	160.8	CATOX OFF		<10	0.08	218.5
03/11/15	16,862.8	702.6	70	157.8	CATOX OFF		<10	0.07	219.9
04/22/15	17,667.5	736.1	67	160.9	CATOX OFF		<10	0.07	222.3
05/19/15	18,290.8	762.1	61	160.1	CATOX OFF		<10	0.07	224.2
06/08/15	18,770.7	782.1	60	159.2	CATOX OFF		<10	0.07	225.7
PSCAA NOC- 10384 Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

[1] Air flow rates calculated using an averaging flow sensor (Dwyer Model DS). Air flow rates between 2/7/14 and 12/09/14 calculated from data. Air flow rates from 1/12/15 forward calculated from averaging flow sensor.

[2] Influent vapor samples collected from SVE sample port prior to air treatment.

[3] Daily mass removal rate (lb/day) = average concentration (mg/m^3) x average flow rate (scfm) x conversion (8.99x10-5 lb-m^3-min/mg-ft^3-day).

[4] Cumulative mass of benzene removed (lb) = daily removal rate (lb/day) x time in operation (days) + previous cumulative total (lb).

-- = not analyzed, measured, or calculated
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
mg/m^3 = milligrams per cubic meter
NOC - Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per minute
SVE = soil vapor extraction

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Table 3-3
Liquid Stream - System Performance Monitoring Data
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
				GRPH Recovery - Aqueous-Phase		
Date	Discharge Flow Totalizer (gallons)	Treated Between Visits (gallons)	Average Daily Flow Rate Between Visits (gallons per day)	Influent GRPH Concentration[1] (µg/L)	GRPH Removed[2][3] (lb)	Cumulative GRPH Removed[3][4] (lb)
10/02/12	1,178.0	0	0	--	--	--
10/10/12	5,075.9	3,898	487	<100	0.001	0.001
10/17/12	15,755.8	10,680	1,526	--	--	--
10/24/12	27,288.0	11,532	1,647	--	--	--
10/25/12	28,809.6	1,522	1,522	--	--	--
11/06/12	36,298.8	7,489	624	--	--	--
11/07/12	38,565.1	2,266	2,266	<100	0.014	0.014
12/05/12	71,160.2	32,595	1,164	<100	0.014	0.028
01/08/13	71,627.1	467	14	<100	0.000	0.028
02/06/13	84,429.4	12,802	441	160	0.011	0.039
03/04/13	101,429.0	17,000	654	1,700	0.132	0.171
04/03/13	119,013.8	17,585	586	<100	0.128	0.299
05/08/13	157,058.4	38,045	1,087	1,500	0.246	0.55
06/05/13	175,444.9	18,387	657	<100	0.119	0.66
07/02/13	175,445.7	1	0	NM	--	--
08/06/13	181,799.7	6,354	182	2,500	0.068	0.73
09/04/13	243,623.6	61,824	2,132	<100	0.658	1.39
10/07/13	333,942.9	90,319	2,737	<100	0.038	1.43
10/14/13	355,115.5	21,173	3,025	--	--	--
10/15/13	358,033.9	2,918	2,918	--	--	--
11/06/13	420,282.1	62,248	2,829	<100	0.036	1.46
11/07/13	423,365.1	3,083	3,083	--	--	--
12/03/13	454,666.4	31,301	1,204	<100	0.014	1.48
12/04/13	458,180.0	3,514	3,514	--	--	--
01/13/14	495,076.1	36,896	922	<100	0.017	1.49
01/31/14	506,528.6	11,453	636	--	--	--
02/07/14	523,790.1	17,262	2,466	<100	0.012	1.51
03/18/14	627,800.0	104,010	2,667	<100	0.043	1.55
04/18/14	722,961.0	95,161	3,070	<100	0.040	1.59
05/19/14	791,030.0	68,069	2,196	<100	0.028	1.62
06/16/14	834,372.0	43,342	1,548	<100	0.018	1.64
07/10/14	887,218.0	52,846	2,202	130	0.022	1.66
08/13/14	964,443.0	77,225	2,271	<100	0.032	1.69
09/18/14	1,059,830.0	95,387	2,650	<100	0.040	1.73
10/22/14	1,142,560.0	82,730	2,433	<100	0.035	1.76
11/17/14	1,205,945.0	63,385	2,438	<100	0.026	1.79
12/09/14	1,263,755.0	57,810	2,628	<100	0.024	1.82
01/13/15	1,351,575.0	87,820	2,509	<100	0.037	1.85
02/18/15	1,463,712.0	112,137	3,115	<100	0.047	1.90
03/11/15	1,530,056.0	66,344	3,159	<100	0.028	1.93
04/23/15	1,631,881.0	101,825	2,368	<100	0.042	1.97
05/19/15	1,705,576.0	73,695	2,834	<100	0.031	2.00
06/08/15	1,751,829.0	46,253	2,313	<100	0.019	2.02
State Waste Discharge Permit ST0007384 Limits			**7,000**			

NOTES:
Sample Analysis conducted by Friedman & Bruya, Inc.
[1]Influent samples collected prior to treatment with liquid-phase granular activated carbon.
[2] Mass removal weight (lb) = gallons recovered x concentration (µg/L)
x conversion factor (8.344E-9 lb-L/µg-gallon).
[3]Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit.
[4]Cumulative mass (lb) = mass removal between sampling visits (lb) + previous cumulative total (lb).

DEFINITIONS:
-- = not analyzed, measured, or calculated
< = not detected at the concentration indicated
µg/L = micrograms per liter
GRPH = gasoline-range petroleum hydrocarbons
lb = pound

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Table 3-4
Vapor Stream Analytical Results
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
10/02/12	13	<0.1	0.13	0.12	0.35	<10	<0.1	<0.1	<0.1	<0.3	61.5
10/10/12	12	<0.1	0.10	<0.1	<0.3	<10	<0.1	0.18	<0.1	<0.3	58.3
10/17/12	<10	<0.1	0.17	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
10/24/12	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
11/07/12	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
12/05/12	160	<0.1	<0.1	1.50	0.99	<10	<0.1	<0.1	<0.1	<0.3	96.9
01/08/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	0.12	<0.1	<0.3	--
02/05/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
03/04/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
04/03/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
05/15/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
06/05/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/02/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
08/06/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
09/04/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
10/07/13	<10	<0.1	0.19	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
11/06/13	<10	<0.1	0.52	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
12/03/13	<10	<0.1	0.44	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
01/13/14	<10	<0.1	0.31	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
02/07/14	98	<0.1	<0.1	0.34	0.65	<10	<0.1	<0.1	<0.1	<0.3	94.9
03/18/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	0.2	<0.3	--
04/18/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
05/19/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
06/16/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
07/09/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
08/11/14	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
09/17/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
10/22/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
11/18/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
12/09/14	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--

Hydro Con

Table 3-4
Vapor Stream Analytical Results
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

	Analytical Results (mg/m^3)									
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
Sample Date	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH DRE%[5]
01/13/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
02/18/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
03/11/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
04/23/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
05/19/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
06/08/15	CATOX OFF - SAMPLED AT STACK					<10	<0.1	<0.1	<0.1	<0.3	--
PSCAA NOC-10384 Restrictions and Conditions						**max 214.7[5]**					**95%[5][6]**

NOTES:

Sample analysis conducted by Fremont Analytical in Seattle, Washington.

[1]Influent vapor samples collected from SVE port on the pressure side of the blower

[2]Effluent vapor samples collected from the sample port on the effluent stack

[3]Analyzed by Northwest Total Petroleum Hydrocarbon Method NWTPH-Gx

[4]Analyzed by U.S. EPA Method 8021B.

[5]DRE shall be at least 95% unless the effluent GRPH concentration does not exceed 50 ppmv (or 214.7 mg/m^3 assuming an average molecular weight for GRPH of 105)

DRE is calculated by [GRPH inf-GRPH eff]/[GRPH inf] x 100. For results below detection limit, 50% of the value of the detection limit is used in the calculation.

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

mg/m^3 = milligrams per cubic meter

CATOX = catalytic oxidizer

DRE = destruction removal efficiency

GRPH = gasoline-range petroleum hydrocarbons

NOC = Notice of Construction

ppmv = parts per million by volume

PSCAA = Puget Sound Clean Air Agency

SVE = soil vapor extraction

Hydro Con

Table 3-5
Liquid Stream Analytical Results
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 3WINF)					Sample ID: 3GAC1					Effluent (3WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
10/10/12	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.87
11/07/12	<100	1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.83
12/05/12	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	4.1	7.84
01/08/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.06
02/05/13	160	<1	<1	1.8	5.8	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.02
03/04/13	1,700	2.9	1.4	24	160	--	--	--	--	--	<100	<1	<1	<1	<3	<6	--	7.64
04/03/13	<100	<1	<1	<1	3.7	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.89
05/08/13	1,500	<1	<1	16	120	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.41
06/05/13	<100	2.0	1.8	<1	4.0	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	2.99	7.05
07/02/13	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	<100	<1	<1	<1	<3	<6	--	6.35
08/06/13	2,500	1	2.3	40	260.0	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	8.07
09/04/13	<100	<1	<1	<1	3.6	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.03
10/07/13	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.09
11/06/13	<100	<1	<1	<1	5.7	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.94
12/03/13	<100	<1	<1	<1	5.7	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.90	7.35
01/13/14	<100	<1	<1	<1	<3	<100	<3	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	--
02/07/14	<100	<1	<1	<1	3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.36
03/18/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	8.38
04/18/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.40
05/19/14	<100	<1	<1	<1	5.6	<100	<1	<1	<1		<100	<1	<1	<1	<3	<6	--	7.25
06/16/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.05	5.94
07/09/14	130	<1	<1	<1	3.8	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.67
08/13/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.59
09/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.10
10/22/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	5.97
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.66
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.09	6.89
01/13/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.25
02/18/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.46
03/11/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.36

Table 3-5
Liquid Stream Analytical Results
Unit 3 - Drake Property
TOC Holdings Co. Facility No. 01-176
24309 56th Avenue West
Mountlake Terrace, WA

	Groundwater Influent[1] µg/L					Groundwater Midstream[2] µg/L					Groundwater Effluent[3] to POTW Discharge µg/L							
	Influent Sample (Sample ID: 3WINF)					Sample ID: 3GAC1					Effluent (3WEFF)							
Sample Date	GRPH[4]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	GRPH[1]	Benzene[5]	Toluene[5]	EB[5]	Total Xylenes[5]	Total BTEX[5]	Total Lead[6]	pH[7]
04/23/15	<100	<1	<1	<1	4.3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.80
05/19/15	<100	<1	<1	<1	4.5	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.19
06/08/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	<1	7.0
State Waste Discharge Permit Number ST0007384 Effluent Limits											1,000	5	NS	NS	NS	100	1,090	6 to 10

NOTES:

Sample analysis conducted by Friedman & Bruya, Inc. in Seattle, Washington.

[1]Three GAC vessels are operated in series mode. 3WINF sample is collected prior to first GAC vessel in series

[2]3GAC1 sample is collected downstream of GAC-1 and upstream of GAC-2 vessels in series

[3]Effluent sample collected downstream of third GAC vessel in series, which represents the quality of water discharged to the POTW

[4]Analyzed by Method NWTPH-Gx.

[5]Analyzed by U.S. EPA Method 8021B

[6]Analyzed by U.S. EPA Method 200.8

[7]Analyzed by field instrumentation

-- = not analyzed, measured, or calculated

< = not detected above laboratory's reporting limit

BTEX = benzene, toluene, ethylbenzene, total xylenes

EB = ethylbenzene

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

µg/L = micrograms per liter

NS = no standard

NWTPH = Northwest Total Petroleum Hydrocarbon

POTW = publicly-owned treatment works

APPENDIX A

Remedial Systems Descriptions

APPENDIX A –REMEDIAL SYSTEMS DESCRIPTIONS

The following sections provide remedial systems background, and configurations, respectively.

A.1 BACKGROUND

TOC (formerly Time Oil Co.) operated a retail gasoline station on the TOC Property between 1968 and 1990. One 8,000-gallon and two 6,000-gallon underground storage tanks were removed from the TOC Property in 1991. The TOC Property is currently vacant. In 1996, a dual-phase extraction (DPE) remediation system was installed at the TOC Property to remediate Shallow Zone groundwater impacted by petroleum hydrocarbons and remove LNAPL. The DPE system operated from February 1997 to June 2005 and was later removed following confirmation that the system effectively remediated Shallow Zone groundwater. In 2006, groundwater monitoring results confirmed gasoline-related contamination extending directly downgradient of the TOC Property to the south and west.[6]

Between 1992 and 2013, site investigations were conducted to determine the extent of petroleum contamination which led to the installation of 107 monitoring and remediation wells on the TOC Site and three adjacent properties (a portion of the 242nd Street Southwest ROW and the downgradient Herman and Shin/Choi properties). Six wells have been decommissioned. Two additional wells were installed on the Herman property in July 2015. Currently, there are 103 active monitoring and/or remediation wells installed in three groundwater zones (defined as Shallow, Intermediate and Deep) on the TOC Site and three adjacent properties. Of the 103 active monitoring and remediation wells, 20 are installed in the Shallow Zone, 62 are installed in the Intermediate Zone, 6 are in the Deep Zone, and 15 have well screens intersecting multiple groundwater zones (either shallow-intermediate or intermediate-deep). The three groundwater zones are further discussed in SES 2013 and Stantec 2015a.

In accordance with the AO, SES initiated a remedial investigation (RI) at the TOC Site and determined that remediation by the former DPE system in the Shallow Zone on that property had been effective. The DPE system was removed and three MPE systems were installed in the Intermediate Zone between November 2011 and August 2012. The three MPE systems (Units 1, 2 and 3) began operating in October 2012. MPE is an in situ remedial technology that simultaneously extracts multiple fluid phases from remediation wells. The phases include soil vapor, dissolved (i.e., groundwater), and LNAPL or free product.

A.2 SYSTEM CONFIGURATIONS

Each MPE system is housed in a self-contained, aboveground equipment enclosure surrounded by chain link fence with locked gate. The MPE system for the TOC Property (Unit 1) is located on the TOC Property. The MPE systems for the TOC/Farmasonis Property (Unit

[6] *SES 2013. Draft Remedial Investigation Report, TOC Holdings Co. No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043. November 27.*

2) and Drake Property (Unit 3) are co-located within a single fenced enclosure on the TOC/Farmasonis Property. The three MPE systems are basically identical, with the exception of their orientation, mirror-image layouts, and the number of remediation wells serving each MPE system. A total of 22 remediation wells serve the three MPE systems: eight wells on the TOC Property, six wells on the TOC/Farmasonis Property, and eight wells on the Drake Property (Figure A-1).

Wells MW15 (installed on the TOC Property) and MW84 (installed on the Drake Property) were initially connected to Units 1 and 3 as remediation wells, but currently serve only as monitoring wells. The pump in MW15 was removed by Stantec on December 16, 2014 due to the consistent presence of biological buildup in the well. The pump in MW84 was removed by SES on September 17, 2013. Documentation of the purpose for removing the pump from MW84 is not available in the historical files.

The table below identifies the currently active remediation wells connected to each system and their locations.

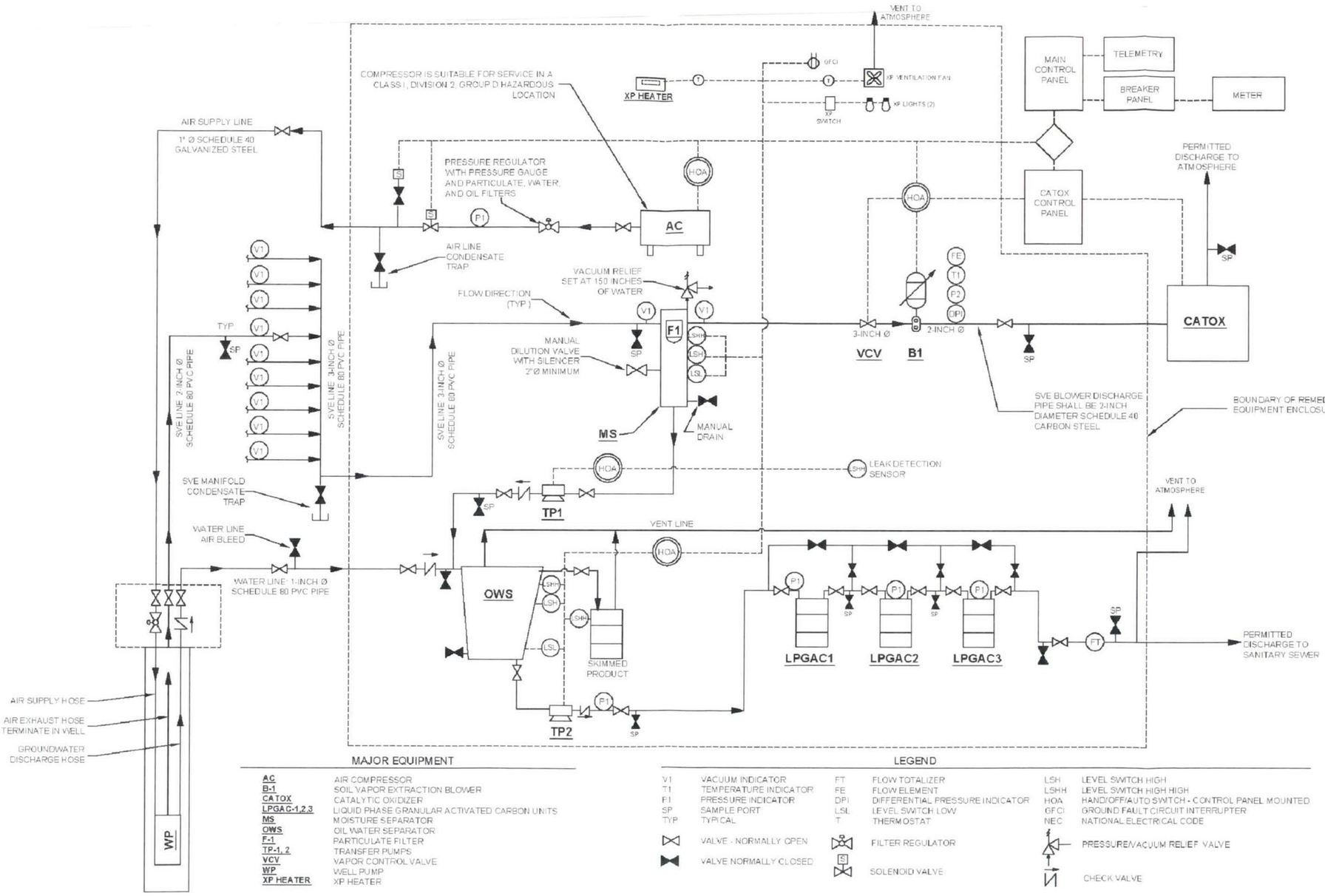
Wells Serving MPE Remediation Systems

System Name	System Location	Remediation Well ID		Well Location
Unit 1	**TOC Property**	• MW11 • MW18 • MW24 • MW27	• MW29 • MW32 • MW90 • MW91	**TOC Property**
Unit 2	**TOC/Farmasonis Property**	• MW31 • MW41 • MW57	• MW92 • MW93 • MW94	**TOC/Farmasonis Property**
Unit 3	**TOC Farmasonis Property**	• MW69 • MW70 • MW95 • MW96	• MW97 • MW98 • MW99 • MW101	**Drake Property**

The individual MPE equipment enclosures were custom fabricated in accordance with the Washington State Department of Labor and Industry requirements for factory-assembled structures. Each of the remediation wells is equipped with a down-well pneumatic pump to extract petroleum- impacted groundwater (dissolved-phase petroleum hydrocarbons) and recoverable LNAPL. In addition, each MPE system is equipped with a SVE blower. The SVE blowers are intended to extract soil vapors (vapor-phase petroleum hydrocarbons) from the remediation wells and surrounding soil. Buried piping is utilized to convey recovered fluids (groundwater and LNAPL) and vapor from the remediation wells to the MPE system enclosures for treatment. The piping and instrumentation diagram presented on Figure A-2 illustrates the typical process flow and major mechanical equipment associated with each MPE system.

Extracted groundwater is conveyed to each MPE system for phase separation, treatment, and permitted discharge to the sanitary sewer in accordance with Ecology State Waste Discharge Permit No. ST0007384. The extracted groundwater is processed through an OWS, which is designed to process up to 10 gallons per minute (gpm). The effluent from the OWS is pumped through three 55-gallon granular activated carbon (GAC) canisters to remove dissolved phase volatile organic compounds (VOCs) prior to being discharged to the sanitary sewer. When present, LNAPL recovered with the OWS is temporarily stored in a 55-gallon product drum prior to disposal or recycling at an offsite facility.

The SVE blowers create the vacuum necessary to extract soil vapors from the remediation wells. The extracted soil vapors are processed through an air/water separator (AWS) and previously through a CATOX. The AWS removes particulate and liquids from the air stream to prevent damage to the SVE blower and ancillary equipment. Previously, the vapors were thermally treated by the CATOX prior to being discharged to the atmosphere, in accordance with the Puget Sound Clean Air Agency (PSCCA) Notice of Construction (NOC) No. 10384.



MAJOR EQUIPMENT

AC	AIR COMPRESSOR
B-1	SOIL VAPOR EXTRACTION BLOWER
CATOX	CATALYTIC OXIDIZER
LPGAC-1,2,3	LIQUID PHASE GRANULAR ACTIVATED CARBON UNITS
MS	MOISTURE SEPARATOR
OWS	OIL WATER SEPARATOR
F-1	PARTICULATE FILTER
TP-1, 2	TRANSFER PUMPS
VCV	VAPOR CONTROL VALVE
WP	WELL PUMP
XP HEATER	XP HEATER

LEGEND

V1	VACUUM INDICATOR	FT	FLOW TOTALIZER	LSH	LEVEL SWITCH HIGH
T1	TEMPERATURE INDICATOR	FE	FLOW ELEMENT	LSHH	LEVEL SWITCH HIGH HIGH
P1	PRESSURE INDICATOR	DPI	DIFFERENTIAL PRESSURE INDICATOR	HOA	HAND/OFF/AUTO SWITCH - CONTROL PANEL MOUNTED
SP	SAMPLE PORT	LSL	LEVEL SWITCH LOW	GFCI	GROUND FAULT CIRCUIT INTERRUPTER
TYP	TYPICAL	T	THERMOSTAT	NEC	NATIONAL ELECTRICAL CODE
	VALVE - NORMALLY OPEN		FILTER REGULATOR		PRESSURE/VACUUM RELIEF VALVE
	VALVE NORMALLY CLOSED	S	SOLENOID VALVE		CHECK VALVE

SOURCE:
SOUND EARTH STRATEGIES, 2013

NOT TO SCALE

HydroCon
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 9-14-15
DWN: JJT
CHK: MS
APPROVED: MS
PRJ. MGR: CH
PROJECT NO: 01-176

FIGURE A-2
PIPING AND INSTRUMENTATION DIAGRAM

TOC HOLDINGS CO. FACILITY NO. 01-176
24205 56TH AVENUE WEST
MOUNTLAKE TERRACE, WA.

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LEGEND

- SOIL BORING (NO WELL INSTALLED)
- GROUNDWATER MONITORING WELL (SHALLOW SCREEN)
- GROUNDWATER MONITORING WELL (UPPER INTERMEDIATE SCREEN)
- GROUNDWATER MONITORING WELL (INTERMEDIATE SCREEN)
- GROUNDWATER MONITORING WELL (DEEP SCREEN)
- DECOMMISSIONED GROUNDWATER MONITORING WELL
- SOIL GAS SAMPLE
- EXCAVATION SOIL SAMPLE
- CURRENT OR FORMER UST
- POWER/LIGHT POST OR SIGN
- EDGE OF EASEMENT
- TOC PROPERTY BOUNDARY
- PARCEL BOUNDARY
- UNDERGROUND ELECTRICAL LINE
- FIBER OPTIC
- NATURAL GAS
- STORM INFILTRATION PIPE
- STORM DRAIN
- SANITARY SEWER
- WATER
- OVERHEAD POWER
- FORMER SITE FEATURE
- TREATMENT SYSTEM PROCESS LINES
- SANITARY SEWER CLEAN OUT
- UNDERGROUND STORAGE TANK
- CATCH BASIN
- SANITARY SEWER MANHOLE
- SURVEY BENCHMARK
- FORMER INFILTRATION PIT (1975)

RAKNES PROPERTY
24121 56TH AVENUE WEST

242ND STREET SOUTHWEST

TOC HOLDING CO. PROPERTY
24205 56TH AVENUE WEST

TOC/FARMASONIS PROPERTY
24225 56TH AVENUE WEST

DRAKE PROPERTY
24309 56TH AVENUE WEST

HERMAN PROPERTY
24311 56TH AVENUE WEST

MOUNTLAKE SENIOR
5525 244TH STREET SOUTHWEST
(CONSTRUCTION PENDING)

SHIN/CHOI PROPERTY
24325 56TH AVENUE WEST

YOUNG MOBILE HOME PARK

ROMIO'S PIZZA & PASTA

GETAWAY TAVERN

EZ CORNER MART
(FORMER GAS STATION)

DAVE'S AUTO SERVICE
(FORMER GAS STATION)

FORMER GAS STATION BUILDING
(DEMOLISHED 2008)

TOC PROPERTY TREATMENT SYSTEM COMPOUND

TOC/FARMASONIS AND DRAKE PROPERTIES TREATMENT SYSTEM COMPOUND

POWER TRANSFORMER

GRASS FIELD

GRAVEL PARKING

ASPHALT-PAVED PARKING

FORMER WOOD SHED

FORMER CONCRETE PAD

FORMER OIL AND DIESEL LOADING RAMP

(HEATING OIL) ABOVEGROUND STORAGE TANK

USTS (REISDORFF, 1985)

UST (REISDORFF 1985)

UST (####)

UST ABANDONED IN PLACE

WASTE OIL UST

FORMER PUMP ISLAND

ABANDONED PUMP ISLAND

FORMER 8,000-GALLON USTs

FORMER 6,000 AND 8,000 GALLON USTS

1991 UST EXCAVATION

2001 UST EXCAVATION (K&S)

1996 UST EXCAVATION

1996 PUMP I EXCAVATION

FORMER PRODUCT LINES

FORMER PUMP ISLAND

PROPERTY BOUNDARY PRIOR TO 1985 (SHORT PLAT 106)

PROPERTY BOUNDARY SINCE 1985 (SHORT PLAT 106)

EDGE OF ASPHALT PAVEMENT

POWER EASEMENT

PRIVATE EASEMENT AND FIRE LANE

SIDEWALK

CONCRETE CURB

PLANTER

DECK

ABANDONED PUMP ISLAND

WATER METER

STORM MANHOLE

56TH AVENUE WEST

STATE PLANE
N=287719.89
E=1277926.24
PROJECT
N=287739.95
E=1277918.20

STATE PLANE
N=287352.81
E=1279102.02
PROJECT
N=287375.29
E=1278098.94

238TH ST SW
FOUND PUNCH IN 1 3/4" BRASS DISK IN CONCRETE MONUMENT DOWN 0.35' IN CASE

240TH ST SW
FOUND PUNCH MARK IN 1 3/4" BRASS DISK ON CONC MON IN CASE, DN. 0.5'
STATE PLANE
N=288416.87
E=1277786.41
PROJECT
N=288434.96
E=1277768.92

244TH ST SW
FOUND DIVOT IN 3"X3" CONC MON IN CASE, DN. 1.5'
STATE PLANE
N=287093.00
E=1277767.07
PROJECT
N=287110.95
E=1277767.54

R E S I D E N T I A L P A R C E L S
24108 THROUGH 24302 56TH AVENUE WEST

DATUM/BASIS OF BEARINGS
HELD A BEARING OF N00°03'34"E ALONG THE MONUMENTED CENTERLINE OF 56TH AVE W BETWEEN 244TH ST SW AND 240TH ST SW PER PLAT OF LAKE FOREST CREST V.10 / P.107

BASIS OF POSITION: CITY OF MONTLAKE TERRACE CONTROL POINT DESIGNATION MTLK127

ORIGINATING BENCHMARK:
TOP OF MAG NAIL IN CURB AT NORTHWEST CORNER OF SITE PER SITE PLAN BY CPS ENGINEERING PROVIDED TO AXIS BY CLIENT

COORDINATE SYSTEM: NAD 1983 STATEPLANE WASHINGTON NORTH FIPS 4601 (US FEET)

VERTICAL DATUM: NAVD '88

ELEVATION: 363.62'

REFERENCES:
AXIS SURVEY & MAPPING, 2013
LANDAU ASSOCIATES, INC., 2005
CITY OF MOUNTLAKE TERRACE, 2005
K&S ENVIRONMENTAL, 2001
REISDORFF, THOMAS D., 1985
SNOHOMISH COUNTY P.U.D. No.1, 2012
TIME OIL COMPANY (SIC), 1975
AERIAL PHOTOGRAPHS, SNOHOMISH COUNTY, 1974

0 50 100
SCALE IN FEET
1" = 50'

Hydro Con
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 9-14-15
DWN: JJT
CHK: MS
APPROVED: MS
PRJ. MGR: CH
PROJECT NO: 01-176

FIGURE A-1
REMEDIATION SYSTEMS AND SITE DETAILS MAP
TOC HOLDINGS CO. FACILITY NO. 01-176
24205 56TH AVENUE WEST
MOUNTLAKE TERRACE, WA.

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APPENDIX B

TOC Facility No. 01-176 Permits

APPENDIX B – TOC FACILITY NO. 01-176 PERMITS

State, regional, and local permit requirements apply to the interim remedial action. Pursuant to the Revised Code of Washington 70.105D.090(1), TOC's interim remedial actions under the AO are exempt from the procedural requirements of any laws requiring or authorizing local government permits or approvals; however, TOC must comply with the substantive requirements of such permits or approvals.

Local requirements for clearing, grading, and erosion control activities were addressed through review under the State Environmental Policy Act (SEPA), which included a public comment period through September 26, 2011. State and regional permit requirements beyond the jurisdiction of the AO are discussed below in Sections B.1 (State Waste Discharge Permit), B.2 [Puget Sound Clean Air Agency (PSCAA) Order of Approval), and B.3 (Special Use Permit [SUP]).

B.1 STATE WASTE DISCHARGE PERMIT

State Waste Discharge Permit ST0007384 (SWD Permit) authorizes and regulates operation of and discharges from the three MPE systems on the TOC Site, effective July 2, 2012 through June 19, 2017.

Ecology's Water Quality Program administers the wastewater discharge permit, wastewater compliance sampling, record-keeping, and submittal schedule. Discharge Monitoring Reports (DMRs) are submitted to Ecology monthly. The DMR is a summary report which presents the monitoring data obtained during the monthly reporting period. A summary of the maximum daily effluent limits established by the permit are summarized below:

- The maximum daily volumes of water to be discharged to Monitoring Points 001 and 002 shall be 7,000 and 14,000 gallons per day (gallons/day), respectively.
- pH shall be between 6 and 10 standard units.
- Benzene concentrations shall not exceed 5 micrograms per liter (µg/L).
- Benzene, toluene, ethylbenzene and total xylene (BTEX) cumulative concentration shall not exceed 100 µg/L.
- Total petroleum hydrocarbons, gasoline range (GRPH) shall not exceed 1,000 µg/L.
- Total lead shall not exceed 1,090 µg/L.

The SWD Permit identifies two monitoring points (001 and 002) where compliance with the maximum daily effluent limits must be attained: the discharge from Unit 1 is monitored at monitoring point 001; the combined discharge from Units 2 and 3 is monitored at point 002. Treated groundwater from both monitoring points discharges to the City of Edmonds, Washington Wastewater Treatment Plant. Effluent from each of the three MPE systems is sampled on a monthly basis at points adjacent to each MPE system (Figure B-1). The minimum, maximum and average effluent concentrations are reported in the monthly DMR submitted to Ecology.

B.2 PSCAA ORDER OF APPROVAL

The PSCAA issued an Order of Approval for NOC 10384 on May 13, 2012, which established the conditions and restrictions for the operation of the CATOX units. The key conditions and restrictions are summarized below:

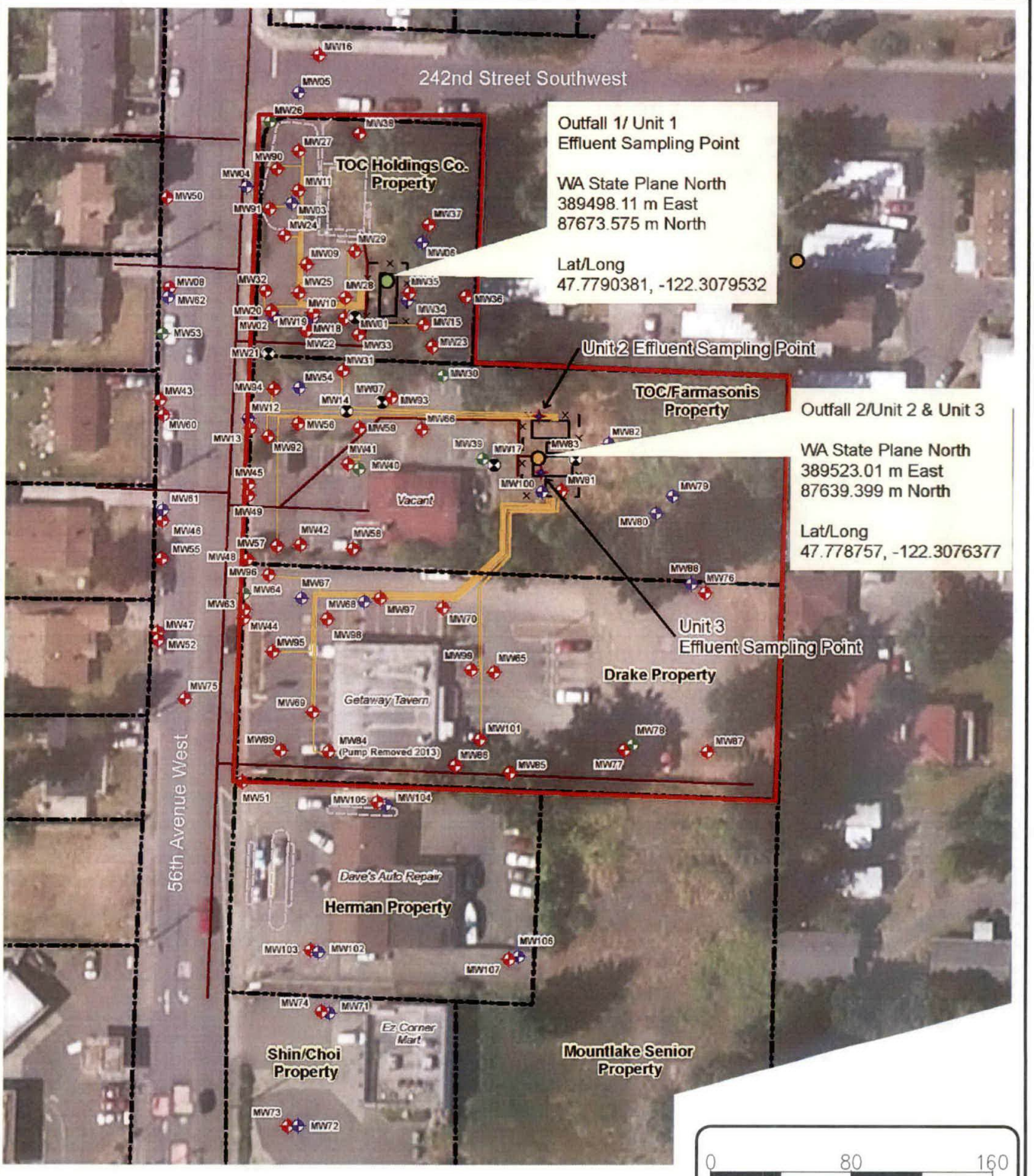
- Emissions from each of the three SVE blowers shall be routed through their associated CATOX.
- The flow through each CATOX shall not exceed 350 standard cubic feet per minute. The flow rate shall be monitored monthly.
- The temperature of the vapor entering the catalytic bed shall be at least 240 degrees Celsius (464 degrees Fahrenheit), and the temperature of the vapor exiting the oxidizer bed shall not exceed 620 degrees Celsius (1148 degrees Fahrenheit).
- The destruction and removal efficiency of the GRPH flowing into and out of the CATOX shall be 95 percent unless the concentration of GRPH in the vapor exiting the CATOX does not exceed 50 parts per million volume (ppmv).
- The CATOX units may be removed and SVE emissions can be vented directly to the atmosphere through a stack provided the benzene and GRPH concentrations remain below 0.5 and 50 ppmv, respectively, for a period of 3 consecutive months. [For this reason, the systems were modified to bypass the CATOX during Fourth Quarter 2014 (Units 2 and 3) and First Quarter 2015 (Unit 1)].
- The CATOX shall be reactivated if concentrations of benzene or GRPH exceed 0.5 or 50 ppmv, respectively. Samples are collected on a monthly basis to monitor the concentrations of benzene and GRPH from the stacks.

B.3 SPECIAL USE PERMIT

The SUP executed between TOC and the City of Mountlake Terrace (City) addresses interim remedial activities that extend into City rights-of-way (ROWs). Specifically, the SUP:

Allows the discharge of treated wastewater to the City sanitary sewer network for conveyance to the City of Edmonds publicly owned treatment works under the State Waste Discharge Permit, and

Retroactively administers the installation, maintenance, sampling, repair and/or decommissioning of monitoring wells that are located within City ROWs.



SOURCE: STANTEC - 2014

N
W
E
S

Hydro Con
510 Allen St. Suite B Kelso, Wa 98626, Ph(360)-703-6086

DATE: 9-14-15
DWN: JJT
CHK: MS
APPROVED: MS
PRJ. MGR: CH
PROJECT NO:
01-176

FIGURE B-1
STATE WASTE DISCHARGE PERMIT ST0007384
OUTFALL SAMPLING LOCATIONS
TOC HOLDINGS CO, FACILITY NO. 01-176
24205 56TH AVENUE WEST
MOUNTLAKE TERRACE, WA.

C:\Users\Josh\Desktop\Autocad Backup\Hydrocon-Autocad\01-176 MLT\2015\pdf figure set\01-176_Figure Set.dwg 2.17.2014

APPENDIX C

Analytical Laboratory Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 1, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 30, 2015 from the TOC_01-176, WORFDB8 F&BI 504564 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0501R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 30, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504564 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504564 -01	1 VEFF

All quality control requirements were acceptable.

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504564
Date Extracted: 04/30/15
Date Analyzed: 04/30/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1 VEFF 504564-01	<0.1	<0.1	<0.1	<0.3	<10	88
Method Blank 05-0866 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504564

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504482-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	80	70-130
Toluene	mg/m^3	5.0	81	70-130
Ethylbenzene	mg/m^3	5.0	86	70-130
Xylenes	mg/m^3	15	87	70-130
Gasoline	mg/m^3	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504564

SAMPLE CHAIN OF CUSTODY

ME 4/30/15

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave Ste 205

City, State, ZIP Lynnwood, WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. TOC MCT

PO#

REMARKS

Page # _____ of _____

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☒ RUSH 2 days

Rush charges authorized by Rebekah Brooks

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
INEFF	01A-B	4/30/15	0850	Vapor	2		X	X										
																		Samples received at 21 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Nathan C Magnussen	Stantec	4/30/15	1230
Received by:		FSP	4/30/15	1230
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 24, 2015 from the TOC_01-176, WORFDB8 F&BI 504456 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0430R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504456 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504456 -01	1WEFF
504456 -02	1GAC2
504456 -03	1GAC1
504456 -04	1WINF
504456 -05	TB-042415-1

All quality control requirements were acceptable.

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504456
Date Extracted: 04/27/15
Date Analyzed: 04/27/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WEFF 504456-01	<1	<1	<1	<3	<100	98
1GAC2 504456-02	<1	<1	<1	<3	<100	99
1GAC1 504456-03	<1	<1	<1	<3	<100	102
1WINF 504456-04	<1	<1	<1	<3	<100	104
TB-042415-1 504456-05	<1	<1	<1	<3	<100	94
Method Blank 05-820 MB	<1	<1	<1	<3	<100	102

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504456

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504456-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	103	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504456

SAMPLE CHAIN OF CUSTODY

MG 04/24/15 1 VI

Send Report To Rebekah Brooks
Company STANTEC
Address 14101 W 36Th Ave Suite 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (*signature*) Dana Hutchins
PROJECT NAME/NO. TOC IMLT
PO#
REMARKS

Page # 1 of

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IWEFF	01 A-C	4-23-15	1200	W	3		X	X										
IGAC2	02	4-23-15	1205	W	3		X	X										
IGAC1	03	4-23-15	1210	W	3		X	X										
IWINF	04	4-23-15	1215	W	3		X	X										
TB-042415-1	05	-	-	W	1		X	X										
																	Samples received at 2 °C	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	4-23-15	1230
Received by: [signature]	Nhan Phan	FEBI	4/24/15	1425
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 1, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 30, 2015 from the TOC_01-176, WORFDB8 F&BI 504565 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0501R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 30, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504565 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504565 -01	2 VEFF

All quality control requirements were acceptable.

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504565
Date Extracted: 04/30/15
Date Analyzed: 04/30/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
2 VEFF 504565-01	<0.1	<0.1	<0.1	<0.3	<10	92
Method Blank 05-0866 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504565

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504482-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m³	<0.1	<0.1	nm
Toluene	mg/m³	<0.1	<0.1	nm
Ethylbenzene	mg/m³	<0.1	<0.1	nm
Xylenes	mg/m³	<0.3	<0.3	nm
Gasoline	mg/m³	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m³	5.0	80	70-130
Toluene	mg/m³	5.0	81	70-130
Ethylbenzene	mg/m³	5.0	86	70-130
Xylenes	mg/m³	15	87	70-130
Gasoline	mg/m³	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504565

SAMPLE CHAIN OF CUSTODY ME 4/30/15

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave Ste 205
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Nathan C. Magnuson
PROJECT NAME/NO. TOC MLT
PO#
REMARKS

Page # ____ of ____

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 2 days
Rush charges authorized by Rebekah Brooks

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2 VEFF	01A-B	4/30/15	0840	Vapor	2		X	X										
												Samples received at 21 °C						

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Nathan C. Magnuson	Nathan C. Magnuson	Stantec	4/30/15	1230
Received by: Eric Young	Eric Young	FRB	4/30/15	1230
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 24, 2015 from the TOC_01-176, WORFDB8 F&BI 504457 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0430R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504457 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504457 -01	2WEFF
504457 -02	2GAC2
504457 -03	2GAC1
504457 -04	2WINF

All quality control requirements were acceptable.

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504457
Date Extracted: 04/27/15
Date Analyzed: 04/27/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
2WEFF 504457-01	<1	<1	<1	<3	<100	103
2GAC2 504457-02	<1	<1	<1	<3	<100	106
2GAC1 504457-03	<1	<1	<1	<3	<100	106
2WINF 504457-04	<1	<1	<1	<3	<100	108
Method Blank 05-820 MB	<1	<1	<1	<3	<100	102

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504457

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504456-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	103	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504457

SAMPLE CHAIN OF CUSTODY ME 04/24/15 VI/1

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 36th Ave Suite 203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC NLT 203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2WEFF	01 A-C	4-23-15	0825	W	3		X	X										
2GAC2	02	4-23-15	0830	W	3		X	X										
2GAC1	03	4-23-15	0835	W	3		X	X										
2WINF	04	4-23-15	0840	W	3		X	X										
																	Samples received at 2 °C	

ANALYSES REQUESTED

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	4-24-15	1005
Received by: Nhan Phan	Nhan Phan	FEBI	4/24/15	1425
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 1, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 30, 2015 from the TOC_01-176, WORFDB8 F&BI 504566 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0501R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 30, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504566 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504566 -01	3 VEFF

All quality control requirements were acceptable.

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504566
Date Extracted: 04/30/15
Date Analyzed: 04/30/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3 VEFF 504566-01	<0.1	<0.1	<0.1	<0.3	<10	85
Method Blank 05-0866 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 05/01/15
Date Received: 04/30/15
Project: TOC_01-176, WORFDB8 F&BI 504566

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504482-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	80	70-130
Toluene	mg/m^3	5.0	81	70-130
Ethylbenzene	mg/m^3	5.0	86	70-130
Xylenes	mg/m^3	15	87	70-130
Gasoline	mg/m^3	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

5045566

SAMPLE CHAIN OF CUSTODY ME 4/30/15

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave Ste 203
City, State, ZIP Lynwood, WA 98036
Phone #425-977-4974 Fax #

SAMPLERS (signature)
PROJECT NAME/NO. TOC MLT
PO#
REMARKS

Page # of

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 2 days
Rush charges authorized by Rebekah Brooks

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
3VEFF	01 1-B	4/30/15	0830	Vapor	2		X	X										

Samples received at 21 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Nathan C. Magnusson	Stantec	4/30/15	1330
Received by:		FB	4/30/15	1330
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 30, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on April 24, 2015 from the TOC_01-176, WORFDB8 F&BI 504458 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0430R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 24, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 504458 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
504458 -01	3WEFF
504458 -02	3GAC2
504458 -03	3GAC1
504458 -04	3WINF

All quality control requirements were acceptable.

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504458
Date Extracted: 04/27/15
Date Analyzed: 04/27/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WEFF 504458-01	<1	<1	<1	<3	<100	106
3GAC2 504458-02	<1	<1	<1	<3	<100	103
3GAC1 504458-03	<1	<1	<1	<3	<100	110
3WINF 504458-04	<1	<1	<1	4.3	<100	105
Method Blank 05-820 MB	<1	<1	<1	<3	<100	102

Date of Report: 04/30/15
Date Received: 04/24/15
Project: TOC_01-176, WORFDB8 F&BI 504458

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 504456-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	93	65-118
Toluene	ug/L (ppb)	50	92	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	103	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

504458

SAMPLE CHAIN OF CUSTODY

MG 04/24/15 VI

Page # 1 of 1

Send Report To Rebekah Brooks
Company STantec
Address 19101 W 36th Ave STE203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT 203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3WEFF	01 AE	4-23-15	1335	w	3		X	X										
3GAC2	02	4-23-15	1340	w	3		X	X										
3GAC1	03	4-23-15	1345	w	3		X	X										
3WINF	04 V	4-23-15	1350	w	3		X	X										
																	Samples received at 2 °C	

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	4-24-15	1000
Received by: [signature]	Khan Phan	FedEx	4/24/15	1425
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505332 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505332 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505332 -01	1VEFF

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505332
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1VEFF 505332-01	<0.1	<0.1	<0.1	<0.3	<10	106
Method Blank 05-1233 MB	<0.1	<0.1	<0.1	<0.3	<10	102

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505332

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505332-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	100	70-130
Toluene	mg/m^3	5.0	101	70-130
Ethylbenzene	mg/m^3	5.0	108	70-130
Xylenes	mg/m^3	15	106	70-130
Gasoline	mg/m^3	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505332

SAMPLE CHAIN OF CUSTODY

ME 05/20/15

Page # 1 of 1

Send Report To Rebekah Brooks
Company StanTec
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # —

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IVEFF	01AB	5-14-15	1015	Air	2		X	X										
																		Samples received at 23 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	5-20-15	0900
Received by:	Eric Clarke	F&B	5/20	1220
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505335 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505335 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505335 -01	1WEFF
505335 -02	1GAC2
505335 -03	1GAC1
505335 -04	1WINF
505335 -05	TB-051915-1

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505335
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WEFF 505335-01	<1	<1	<1	<3	<100	100
1GAC2 505335-02	<1	<1	<1	<3	<100	96
1GAC1 505335-03	<1	<1	<1	<3	<100	105
1WINF 505335-04	<1	<1	<1	<3	<100	103
TB-051915-1 505335-05	<1	<1	<1	<3	<100	92
Method Blank 05-1231 MB2	<1	<1	<1	<3	<100	94

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505335

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505312-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	105	72-122
Ethylbenzene	ug/L (ppb)	50	107	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505335

SAMPLE CHAIN OF CUSTODY ME 5/20/15

V3

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4944 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 203700102
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IWEFF	01A-C	5-19-15	1030	W	3		X	X										
16AC2	02	5-19-15	1035	W	3		X	X										
16AC1	03	5-19-15	1040	W	3		X	X										
IWINF	04	5-19-15	1045	W	3		X	X										
TB-051915-1	05	-	-	W	1		X	X										
																		Samples received at 3 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	5-20-15	0900
Received by:	Eric Hart	F→B	5/21/15	12:5
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
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Seattle, WA 98119-2029
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Arina Podnozova, B.S.
Eric Young, B.S.

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(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505333 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505333 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505333 -01	2VEFF

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505333
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
2VEFF 505333-01	<0.1	<0.1	<0.1	<0.3	<10	104
Method Blank 05-1233 MB	<0.1	<0.1	<0.1	<0.3	<10	102

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505333

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505332-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m³	<0.1	<0.1	nm
Toluene	mg/m³	<0.1	<0.1	nm
Ethylbenzene	mg/m³	<0.1	<0.1	nm
Xylenes	mg/m³	<0.3	<0.3	nm
Gasoline	mg/m³	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m³	5.0	100	70-130
Toluene	mg/m³	5.0	101	70-130
Ethylbenzene	mg/m³	5.0	108	70-130
Xylenes	mg/m³	15	106	70-130
Gasoline	mg/m³	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505333

SAMPLE CHAIN OF CUSTODY

ME 05/20/15

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 20370063
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2VEFF	01 AB	5-19-15	1020	Air	2		X	X										

Samples received at 23 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	5-20-15	0900
Received by:	Eric Lam	TAS	5/20/15	1230
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505336 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505336 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505336 -01	2WEFF
505336 -02	2GAC2
505336 -03	2GAC1
505336 -04	2WINF

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505336
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
2WEFF 505336-01	<1	<1	<1	<3	<100	101
2GAC2 505336-02	<1	<1	<1	<3	<100	105
2GAC1 505336-03	<1	<1	<1	<3	<100	109
2WINF 505336-04	<1	<1	<1	<3	<100	105
Method Blank 05-1234 MB	<1	<1	<1	<3	<100	96

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505336

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505336-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	105	65-118
Toluene	ug/L (ppb)	50	103	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505336

SAMPLE CHAIN OF CUSTODY ME 5/20/15

V3

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 W 36Th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/20370002
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2WEFF	01 A-C	5-19-15	1100	W	3		X	X										
2GACZ	02	5-19-15	1105	W	3		X	X										
2GAC1	03	5-19-15	1110	W	3		X	X										
2WINF	04	5-19-15	1115	W	3		X	X										
																	Samples received at 7 °C	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hotchins	STANTEC	5-20-15	0900
Received by:	Eric Olson	FTB	5/20	1215
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
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fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505334 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505334 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505334 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505334
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3VEFF 505334-01	<0.1	<0.1	<0.1	<0.3	<10	107
Method Blank 05-1233 MB	<0.1	<0.1	<0.1	<0.3	<10	102

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505334

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505332-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m³	<0.1	<0.1	nm
Toluene	mg/m³	<0.1	<0.1	nm
Ethylbenzene	mg/m³	<0.1	<0.1	nm
Xylenes	mg/m³	<0.3	<0.3	nm
Gasoline	mg/m³	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m³	5.0	100	70-130
Toluene	mg/m³	5.0	101	70-130
Ethylbenzene	mg/m³	5.0	108	70-130
Xylenes	mg/m³	15	106	70-130
Gasoline	mg/m³	100	124	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505334

SAMPLE CHAIN OF CUSTODY

ME 05/20/15

Page # 1 of 1

Send Report To Rebekah Brooks
Company STantec
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-[illegible] Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/203700102
PO#
REMARKS

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3VEFF	01 AB	5-19-15	1030	Air	2		X	X										
																		Samples received at 23

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STantec	5-20-15	0900
Received by:	Eric Yam	AEB	5/20/15	1220
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 26, 2015

Rebekah Brooks, Project Manager
Stantec
19101 36th Ave W, Suite 203
Lynnwood, WA 98036

Dear Ms. Brooks:

Included are the results from the testing of material submitted on May 20, 2015 from the TOC_01-176, WORFDB8 F&BI 505337 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0526R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 20, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 505337 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
505337 -01	3WEFF
505337 -02	3GAC2
505337 -03	3GAC1
505337 -04	3WINF

All quality control requirements were acceptable.

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505337
Date Extracted: 05/21/15
Date Analyzed: 05/21/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WEFF 505337-01	<1	<1	<1	<3	<100	107
3GAC2 505337-02	<1	<1	<1	<3	<100	105
3GAC1 505337-03	<1	<1	<1	<3	<100	109
3WINF 505337-04	<1	<1	<1	4.5	<100	104
Method Blank 05-1234 MB	<1	<1	<1	<3	<100	96

Date of Report: 05/26/15
Date Received: 05/20/15
Project: TOC_01-176, WORFDB8 F&BI 505337

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 505336-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	105	65-118
Toluene	ug/L (ppb)	50	103	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

505337

SAMPLE CHAIN OF CUSTODY ME 5/20/15

V3

Page # 1 of 1

Send Report To Rebetiah Brooks
Company STANTEC
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax # -

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 203700162
PO#
REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS						Notes
3WEFF	01 A-C	5-19-15	1050	W	3		X	X									
3GACZ	02	5-19-15	1058	W	3		X	X									
3GAC1	03	5-19-15	1053	W	3		X	X									
3WINF	04	5-19-15	1055	W	3		X	X									
																Samples received at 3 °C	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	5-20-15	0900
Received by:		FB	5/20/15	1215
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
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Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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fbi@isomedia.com
www.friedmanandbruya.com

June 17, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506182 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0617R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506182 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506182 -01	1VEFF

All quality control requirements were acceptable.

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506182
Date Extracted: 06/11/15
Date Analyzed: 06/11/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1VEFF 506182-01	<0.1	<0.1	<0.1	<0.3	<10	106
Method Blank 05-1278 MB	<0.1	<0.1	<0.1	<0.3	<10	109

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506182

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506180-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m³	<0.1	<0.1	nm
Toluene	mg/m³	<0.1	<0.1	nm
Ethylbenzene	mg/m³	<0.1	<0.1	nm
Xylenes	mg/m³	<0.3	<0.3	nm
Gasoline	mg/m³	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m³	5.0	101	70-130
Toluene	mg/m³	5.0	101	70-130
Ethylbenzene	mg/m³	5.0	108	70-130
Xylenes	mg/m³	15	106	70-130
Gasoline	mg/m³	100	119	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506182

SAMPLE CHAIN OF CUSTODY

ME 06-08-15

Send Report To Craig Haltigan & Rebekah Brooks (Stantec)
Company HydroCon
Address 510 Alder Street Suite B
City, State, ZIP Kelso WA 98626
Phone # 360 703-6079 Fax # 360-749-0 703-6086

SAMPLERS (signature)
PROJECT NAME/NO. Tax 01-176
PO#
REMARKS

Page # 1 of 1

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Notes
1VEFF	01	6-8-15	0855	Vapor	2		X	X				

ANALYSES REQUESTED

Samples received at 26 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Hunsberger	HydroCon	6-8-15	1240
Received by:	DOVO	FEDEX	11	12:48
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 12, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506183 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0612R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506183 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506183 -01	1WINF
506183 -02	1GAC1
506183 -03	1GAC2
506183 -04	1WEFF

All quality control requirements were acceptable.

Date of Report: 06/12/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506183
Date Extracted: 06/08/15
Date Analyzed: 06/08/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WINF 506183-01	<1	2.8	<1	28	180	111
1GAC1 506183-02	<1	<1	<1	<3	<100	104
1GAC2 506183-03	<1	<1	<1	<3	<100	110
1WEFF 506183-04	<1	<1	<1	<3	<100	104
Method Blank 05-1274 MB	<1	<1	<1	<3	<100	104

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	1WEFF	Client:	HydroCon
Date Received:	06/08/15	Project:	TOC_01-176, WORFDB8 F&BI 506183
Date Extracted:	06/10/15	Lab ID:	506183-04
Date Analyzed:	06/10/15	Data File:	506183-04.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	5.64

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	HydroCon
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506183
Date Extracted:	06/10/15	Lab ID:	I5-344 mb
Date Analyzed:	06/10/15	Data File:	I5-344 mb.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 06/12/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506183

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506143-14 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	110	65-118
Toluene	ug/L (ppb)	50	108	72-122
Ethylbenzene	ug/L (ppb)	50	110	73-126
Xylenes	ug/L (ppb)	150	105	74-118
Gasoline	ug/L (ppb)	1,000	99	69-134

Date of Report: 06/12/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506183

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506183-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	5.64	106	108	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506183

SAMPLE CHAIN OF CUSTODY

ME 06-08-15

AE2/V2

Page # 1 of 1

Send Report To Craig Hultgren & Rebekah Bailey (Hydrocon)

Company Hydrocon

Address 510 Allen Street Suite B

City, State, ZIP Kelso WA 98626

Phone # 360 703 6079 Fax # 360 703 6086

SAMPLERS (signature)

PROJECT NAME/NO. TOC 01-16

PO#

REMARKS

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Lead						Notes
ANALYSES REQUESTED																		
1WINF	01 A-C	6-8-15	0900	Water	3		X	X										
1GAC1	02 T	"	0905	"	3		X	X										
1GAC2	03 "	"	0910	"	3		X	X										
1WEFF	04 A-C	"	0915	"	4		X	X				X						

Samples received at 5 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A Hansberger	Hydrocon	6-8-15	1240
Received by:	DO VO	FEBE	11	12:40
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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Eric Young, B.S.

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 17, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506181 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0617R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506181 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506181 -01	2VEFF

All quality control requirements were acceptable.

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506181
Date Extracted: 06/11/15
Date Analyzed: 06/11/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
2VEFF 506181-01	<0.1	<0.1	<0.1	<0.3	<10	104
Method Blank 05-1278 MB	<0.1	<0.1	<0.1	<0.3	<10	109

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506181

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506180-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	101	70-130
Toluene	mg/m^3	5.0	101	70-130
Ethylbenzene	mg/m^3	5.0	108	70-130
Xylenes	mg/m^3	15	106	70-130
Gasoline	mg/m^3	100	119	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506181

SAMPLE CHAIN OF CUSTODY

ME 06-08-15

Send Report To Craig Huntington & Rebekah Banks (Stantec)
Company Hydrocon
Address 510 Main St Suite B
City, State, ZIP Kelso WA 98626
Phone # 360 703 6079 Fax # 360-703 6086

SAMPLERS (signature)
PROJECT NAME/NO. TOC 01-176
PO#
REMARKS

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2VEFF	01A-B	6-8-15	0955	Vapor	2		X	X										

Samples received at 26 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Huntington	Hydrocon	6-8-15	1240
Received by:	David	FCBT	11	12:44
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 15, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506185 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0615R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506185 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506185 -01	2WINF
506185 -02	2GAC1
506185 -03	2GAC2
506185 -04	2WEFF
506185 -05	Trip Blank

All quality control requirements were acceptable.

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506185
Date Extracted: 06/09/15
Date Analyzed: 06/09/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
2WINF 506185-01	<1	<1	<1	<3	<100	106
2GAC1 506185-02	<1	<1	<1	<3	<100	108
2GAC2 506185-03	<1	<1	<1	<3	<100	111
2WEFF 506185-04	<1	<1	<1	<3	<100	97
Trip Blank 506185-05	<1	<1	<1	<3	<100	101
Method Blank 05-1276 MB	<1	<1	<1	<3	<100	98

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	2WEFF	Client:	HydroCon
Date Received:	06/08/15	Project:	TOC_01-176, WORFDB8 F&BI 506185
Date Extracted:	06/10/15	Lab ID:	506185-04
Date Analyzed:	06/10/15	Data File:	506185-04.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	HydroCon
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506185
Date Extracted:	06/10/15	Lab ID:	I5-344 mb
Date Analyzed:	06/10/15	Data File:	I5-344 mb.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506185

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506185-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	105	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	103	74-118
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506185

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506183-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	5.64	106	108	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506185

SAMPLE CHAIN OF CUSTODY

ME 06-08-15 AI2/V2

Page # 1 of 1

Send Report To Craig Hultgren & Rebekah Banks (Stantec)

Company Hydrocon

Address 510 Allen St Ste B

City, State, ZIP Kelso WA 98626

Phone # 360-703 6079 Fax # 360-703-6086

SAMPLERS (signature)

PROJECT NAME/NO. PO#

PBL 01176

REMARKS

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Lead						Notes
						ANALYSES REQUESTED												
2W3NF	01AC	6-8-15	1000	water	3		X	X										
2GAC1	02	"	1005	"	3		X	X										
2GAC2	03	"	1010	"	3		X	X										
2WEFF	04AC	"	1015	"	4		X	X				X						
TRIP Blank	05				1		✓	✓										added in lab.
																		✓ per PH 6/8/15 MA
																		Samples received at 5 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A Hultgren	Hydrocon	6-8-15	1240
Received by:	DO VO	FedEx	"	12:40
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 17, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506180 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0617R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506180 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506180 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506180
Date Extracted: 06/11/15
Date Analyzed: 06/11/15

RESULTS FROM THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING MODIFIED METHODS 8021B AND NWTPH-Gx

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3VEFF 506180-01	<0.1	<0.1	<0.1	<0.3	<10	103
Method Blank 05-1278 MB	<0.1	<0.1	<0.1	<0.3	<10	109

Date of Report: 06/17/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506180

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF VAPOR SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING MODIFIED EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506180-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	<0.1	<0.1	nm
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	<0.3	<0.3	nm
Gasoline	mg/m^3	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	101	70-130
Toluene	mg/m^3	5.0	101	70-130
Ethylbenzene	mg/m^3	5.0	108	70-130
Xylenes	mg/m^3	15	106	70-130
Gasoline	mg/m^3	100	119	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506180

SAMPLE CHAIN OF CUSTODY

ME 06-08-15

Send Report To Casey Hultgren & Robert Bruya (starter)
Company Hydrocon
Address 510 Allen St Suite B
City, State, ZIP Kelso WA 98626
Phone # 360-703-6079 Fax # 360-703-6096

SAMPLERS (signature)
PROJECT NAME/NO. TOC 01-176
PO#
REMARKS

Page # 1 of 1

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3V EFF	01 A,B	6-8-15	1035	vapor	2		X	X										

Samples received at 20°C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Hultgren	Hydrocon	6-8-15	1240
Received by:	DO VD	FOBI	6-8-15	12:40
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 15, 2015

Craig Hultgren, Project Manager
HydroCon
510 Allen St, Suite B
Kelso, WA 98626

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on June 8, 2015 from the TOC_01-176, WORFDB8 F&BI 506184 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Rob Honsberger, Rebekah Brooks
HDC0615R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 8, 2015 by Friedman & Bruya, Inc. from the HydroCon TOC_01-176, WORFDB8 F&BI 506184 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	HydroCon
506184 -01	3WINF
506184 -02	3GAC1
506184 -03	3GAC2
506184 -04	3WEFF

All quality control requirements were acceptable.

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506184
Date Extracted: 06/09/15
Date Analyzed: 06/09/15

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WINF 506184-01	<1	<1	<1	<3	<100	111
3GAC1 506184-02	<1	<1	<1	<3	<100	102
3GAC2 506184-03	<1	<1	<1	<3	<100	112
3WEFF 506184-04	<1	<1	<1	<3	<100	108
Method Blank 05-1276 MB	<1	<1	<1	<3	<100	98

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	3WEFF	Client:	HydroCon
Date Received:	06/08/15	Project:	TOC_01-176, WORFDB8 F&BI 506184
Date Extracted:	06/10/15	Lab ID:	506184-04
Date Analyzed:	06/10/15	Data File:	506184-04.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	HydroCon
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 506184
Date Extracted:	06/10/15	Lab ID:	I5-344 mb
Date Analyzed:	06/10/15	Data File:	I5-344 mb.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506184

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 506185-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	106	65-118
Toluene	ug/L (ppb)	50	105	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	103	74-118
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 06/15/15
Date Received: 06/08/15
Project: TOC_01-176, WORFDB8 F&BI 506184

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 506183-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	5.64	106	108	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	98	83-115

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

506184

SAMPLE CHAIN OF CUSTODY

ME 06-08-15 AI2 / V2

Send Report To Craig Holtzclaw & Rebekah Banks (Shaver)
Company Hydrocon
Address 510 Allen Street Suite B
City, State, ZIP Kelso WA 98626
Phone # 360 703-6676 Fax # 360 703-6686

SAMPLERS (signature)
PROJECT NAME/NO. 61-176
PO#
REMARKS

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TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Lead						Notes
3WINF	01	6-8-15	1040	Water	3		X	X										
3GAC1	02		1045		3		X	X										
3GAC2	03		1050		3		X	X										
3WEFF	04		1055		4		X	X				X						

Samples received at 5 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Robert A. Hunsberger	Hydrocon	6-8-15	1240
Received by:	DO VO	FEBI	6-8-15	12:40
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044