Operations & Maintenance Report
Third Quarter 2014

TOC Holdings Co.
Facility No. 01-176
24205 56th Avenue West
Mountlake Terrace WA 98043

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Sign-off Sheet

This document entitled ***Operations and Maintenance Report, Third Quarter 2014***, was prepared by **Stantec Consulting Services Inc. (Stantec)** on behalf of **TOC Holdings Co. (TOC)** for specific application to TOC Facility No. 01-176 in Mountlake Terrace, Washington. Services conducted by Stantec for this project were conducted in accordance with the Environmental Services Contract between **HydroCon Environmental, LLC (HydroCon)** and Stantec. Any reliance on this document by a third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between JBR and HydroCon. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Abbreviations & Acronyms

µg/L	micrograms per liter
AO	Agreed Order
AWS	Air/Water Separator
BTEX	Benzene, Toluene, Ethylbenzene and Total Xylenes
CatOx	Catalytic Oxidizer
City	City of Mountlake Terrace, Washington
DMR	Discharge Monitoring Report
DPE	Dual-Phase Extraction
Ecology	Washington State Department of Ecology
GAC	Granular-Activated Carbon
gallons/day	gallons per day
gallons/minute	gallons per minute
GRPH	Gasoline-Range Petroleum Hydrocarbons
HydroCon	HydroCon Environmental, LLC
IRAWP	Interim Remedial Action Work Plan
lb/day	pounds per day
LNAPL	Light Nonaqueous-Phase Liquid
mg/m^3	milligrams per cubic meter
MPE	Multi-Phase Extraction
MTCA	Model Toxics Control Act
NOC	Notice of Construction
O&M	Operation and Maintenance
OWS	Oil/Water Separator
ppmv	parts per million by volume
PSCAA	Puget Sound Clean Air Agency
ROW	Right-of-Way
SEPA	State Environmental Protection Act
SES	SoundEarth Strategies, Inc.
Stantec	Stantec Consulting Services Inc.
SUP	Special Use Permit
SVE	Soil Vapor Extraction
SWD	State Waste Discharge
TOC	TOC Holdings Co.
VOC	Volatile Organic Compound

Properties

TOC Property	24205 56th Avenue West; Mountlake Terrace WA
TOC/Farmasonis Property	24225 56th Avenue West; Mountlake Terrace WA
Drake Property	24309 56th Avenue West; Mountlake Terrace WA
ROW	56th Avenue West; Mountlake Terrace, WA

Executive Summary

This report documents the **Third Quarter 2014** operation and maintenance (O&M) activities performed by Stantec Consulting Services Inc. (Stantec) on behalf of TOC Holdings Co. (TOC). Field activities associated with interim remedial actions were conducted July through September 2014 at Facility No. 01-176 located in Mountlake Terrace, Washington. Ongoing interim remedial actions are conducted under Agreed Order (AO) No. DE 8661 (entered in October 2011 between Washington Department of Ecology [Ecology] and TOC). The O&M scope of work is defined in the Interim Remedial Action Work Plan (IRAWP) prepared by SoundEarth Strategies, Inc. (SES) in 2011 and included as Exhibit C of the AO.

As specified in the AO and IRAWP, the "TOC Site" encompasses the following properties:

- TOC Property - located at 24205 56th Avenue West;
- TOC/Farmasonis Property - located at 24225 56th Avenue West;
- Drake Property - located at 24309 56th Avenue West; and
- portions of the 56th Avenue West Right-of-Way (ROW).

Three multi-phase extraction (MPE) remediation systems have been installed on the TOC Site for remediation of petroleum hydrocarbon-contaminated groundwater, vapor and free product (where present). The Unit 1 remediation system is located on the TOC Property and is associated with operation of remediation wells installed on the TOC Property. The Unit 2 and Unit 3 remediation systems are located on the TOC/Farmasonis Property and are associated with operation of remediation wells installed on the TOC/Farmasonis and Drake Properties, respectively.

This report includes a description of the MPE systems, permit compliance, performance and optimization efforts. A summary of the MPE system performance and maintenance activities during this Quarter is provided below.

- O&M consisted of routine, scheduled maintenance activities (as described in the O&M Manual), as well as the following activities:
    - routine bag filter replacements;
    - replacement of air compressor regulator gauge at Unit 1;
    - replacement of pressure switch for air compressor at Unit 1;
    - replacement of GAC 1 at Unit 3; and
    - removal of CatOx units at Units 2 and 3.
- A combined total of 61.6 pounds of vapor-phase hydrocarbons was removed during this reporting period, and a cumulative total of approximately 2,893 pounds since startup in October 2012. In addition, a volume of 448,086 gallons of groundwater was extracted, treated and discharged during this period. The total volume of water processed since system startup is approximately 2,185,732 gallons.
- No light nonaqueous-phase liquid (LNAPL) was 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 on the liquid contents.
- System optimization activities during this reporting period focused on balancing the flow of water through the OWS and addressing issues associated with the Granular-Activated Carbon (GAC) canisters. These activities are described in more detail in the following sections.

1.0 INTRODUCTION

This report documents the **Third Quarter 2014** O&M activities and includes a description of the MPE systems, permit compliance, performance and optimization efforts. Field activities associated with interim remedial actions were conducted by Stantec July through September 2014 at Facility No. 01-176 located in Mountlake Terrace, Washington (**Figure 1**). Ongoing interim remedial actions are conducted under AO No. DE 8661 (entered in October 2011 between Ecology and TOC). The O&M scope of work is defined in the IRAWP (SES 2011) included as Exhibit C of the AO.

As specified in the AO and IRAWP, the "TOC Site" encompasses the following properties (**Figure 2**):

- TOC Property - located at 24205 56th Avenue West;
- TOC/Farmasonis Property - located at 24225 56th Avenue West;
- Drake Property - located at 24309 56th Avenue West; and
- portions of the 56th Avenue West Right-of-Way (ROW).

Elements of the scope of work specified in the IRAWP encompass the four properties identified as the "TOC Site" as well as the following three adjacent properties:

- Herman Property – located downgradient of the TOC Site at 24311 56th Avenue West;
- Shin/Choi Property – located downgradient of the TOC Site at 24325 56th Avenue West; and
- portions of the 242nd Street Southwest ROW bordering the north boundary of the TOC Site.

Three MPE remediation systems have been installed on the TOC Site for remediation of petroleum hydrocarbon-contaminated groundwater, vapor and free product (where present). The Unit 1 remediation system is located on the TOC Property and is associated with operation of remediation wells installed on the TOC Property. The Unit 2 and Unit 3 remediation systems are located on the TOC/Farmasonis Property and are associated with operation of remediation wells installed on the TOC/Farmasonis and Drake Properties, respectively.

2.0 SYSTEM DESCRIPTION

The following is a brief description of the remedial system history, current system configurations and a description of system modifications during this Quarter.

2.1 SYSTEM 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 light non-aqueous phase liquid (LNAPL). This system operated between February 1997 and June 2005 and, reportedly effectively remediated shallow zone groundwater at the TOC Site (SES 2013). In 2006, SES confirmed that gasoline contamination in the intermediate water-bearing zone extended downgradient of the TOC Property to the south and west based on groundwater monitoring results.

Site investigations between 1992 and 2013 led to the installation of 107 monitoring and remediation wells in three groundwater zones (shallow, intermediate and deep) on the TOC Site and three adjacent properties (a portion of the 242nd Street Southwest ROW and the downgradient Herman Property and Shin/Choi Property). Of these 107 wells, 20 active wells are installed in the shallow zone, 60 active wells are installed in the intermediate zone, six active wells are installed in the deep zone, 15 active wells have well screens intersecting multiple groundwater zones (either shallow-intermediate or intermediate-deep), and six wells have been decommissioned.

In October 2011, the AO between TOC and Ecology became effective. In accordance with the AO, SES initiated a remedial investigation. Additionally, after SES determined that remediation by the former DPE system in the shallow zone was effective, the DPE was removed and three MPE systems were installed into 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 generally include vapor phase, dissolved phase (i.e., groundwater), and LNAPL or free product.

2.2 CURRENT SYSTEM

Each MPE system consists of a self-contained, aboveground equipment enclosure. The MPE system for the TOC Property (Unit 1) is located within a fenced enclosure on the TOC Property. The MPE systems for the TOC/Farmasonis Property (Unit 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 23 remediation wells serve the three MPE systems: nine wells on the TOC Property, six wells on the TOC/Farmasonis Property, and eight wells at the Drake Property (**Figure 3**), as follows:

- **Unit 1** – MW11, MW15, MW18, MW24, MW27, MW29, MW32, MW90, and MW91;
- **Unit 2** – MW31, MW41, MW57, MW92, MW93, and MW94; and

- **Unit 3** – MW69, MW70, MW95, MW96, MW97, MW98, MW99, and MW101 (MW84 was also originally plumbed as a remediation well but is now only used as a monitoring well. Documentation does not exist in the SES files acquired by Stantec for the reason for this).

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-hole pneumatic pump to extract petroleum-impacted groundwater (dissolved-phase petroleum hydrocarbons) and recoverable LNAPL. In addition, each MPE system is equipped with a soil vapor extraction (SVE) blower. The SVE blowers are intended to extract soil vapors (vapor-phase petroleum hydrocarbons) from the remediation wells and surrounding soil. Process piping is utilized to convey recovered fluids (groundwater and LNAPL) and vapor from the remediation wells to the MPE system enclosures. The piping and instrumentation diagram presented on **Figure 4** illustrates the process flow and major mechanical equipment associated with treatment systems. 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 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 blower(s) creates the vacuum pressure necessary to extract soil vapors from the remediation wells. The extracted soil vapors are processed through an air/water separator (AWS) and a catalytic oxidizer (CatOx), except as recently modified (see Section 2.3). The AWS removes particulate and liquids from the air stream to prevent damage to the SVE blower and ancillary equipment. The vapors are 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.

2.3 SYSTEM MODIFICATIONS

System modifications that were performed during this Quarter are summarized below.

- Drains were installed on the bag filter housing at Unit 1 to better facilitate bag filter change outs.
- Notification was provided to PSCAA on July 14, 2014 regarding shut-down of the CatOx units at Unit 2 and Unit 3, and commencing the 30-day notice for the CatOx removals. On August 29, 2014, the CatOx units at Unit 2 and Unit 3 were shut-down, with SVE emissions being vented directly to the atmosphere through the existing stack. If any future values from the vapor effluent at Unit 2 or Unit 3 exceed 0.5 ppmv for benzene, or 50 ppmv for GRPH, the CatOx units will be reactivated.

3.0 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 3.1 (State Waste Discharge Permit), 3.2 (PSCAA Order of Approval), and 3.3 (Special Use Permit [SUP]).

3.1 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 Outfalls 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 outfall locations where compliance with the maximum daily effluent limits must be attained: the MPE system for the TOC Property (Unit 1) discharges to Outfall 001; the MPE systems for the TOC/Farmasonis Property (Unit 2) and the Drake Property (Unit 3) discharge to Outfall 002. Effluent from each of the three MPE systems is sampled on a monthly basis at points adjacent to each MPE system **(Figure 5)**. Discharges from Units 2 and 3 combine after the effluent sampling points at approximately the location of Outfall 002. The minimum, maximum and average effluent concentrations are reported in the DMR submitted to Ecology.

3.2 PSCAA ORDER OF APPROVAL

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

- All 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. The CatOx shall be reactivated if concentrations of benzene or GRPH exceed 0.5 or 50 ppmv, respectively.

3.3 SPECIAL USE PERMIT

The SUP executed between TOC and the City of Mountlake Terrace (City) addresses interim remedial activities that extend into City ROWs. Specifically, the SUP: (1) 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 (2) retroactively administers the installation, maintenance, sampling, repair and/or decommissioning of monitoring wells that are located within City ROWs.

4.0 SYSTEM PERFORMANCE

According to SES data, prior to system startup in 2012, concentrations of BTEX and/or GRPH in groundwater exceeded their respective Washington State Model Toxics Control Act (MTCA) Method A Cleanup Levels in 17 out of 68 intermediate zone wells (including intermediate zone wells that intersect shallow zone conditions). Thirteen of these wells are connected to one of the three remediation systems.

4.1 TOC PROPERTY

The following is a summary of the **Third Quarter 2014** system O&M at the TOC Property:

- The MPE operation time this Quarter was approximately 92 percent (**Table 1-1**). System down time was attributed to OWS high level conditions, mainly due to bag filter fouling.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 51.2 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was approximately 0.648 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 2,051.9 pounds (**Tables 1-1, 1-2 and 1-3**).
- The volume of groundwater extracted during this reporting period was 101,780 gallons **(Tables 1-1 and 1-3)**. The average flow rate of groundwater recovery was 1,082.8 gallons/day **(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 0.08 to 1.21 pounds per day (lb/day) during this Quarter (**Table 1-2**).
- The effluent concentration of GRPH exiting the CatOx was not detected at concentrations above the laboratory's lower reporting limit of 10 milligrams per cubic meter (mg/m^3; 2.329 ppmv; **Table 1-4**).
- All system operations were in compliance with Ecology's Water Quality Program and PSCAA permits (**Tables 1-4 and 1-5**).

4.2 TOC / FARMASONIS PROPERTY

The following is a summary of the **Third Quarter 2014** system O&M at the TOC/Farmasonis Property:

- The MPE operation time this Quarter was approximately 97 percent (**Table 2-1**). There was negligible system down time during this Quarter, likely attributed to GAC canister fouling OWS high level alarms.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 4.9 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was 0.050 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 707.23 pounds (**Tables 2-1, 2-2 and 2-3**).

- The volume of groundwater extracted during this reporting period was approximately 120,848 gallons (**Tables 2-1 and 2-3**). The average flow rate of groundwater recovery was 1,286 gallons/day (**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.
- The daily vapor mass removal rate ranged from 0.03 to 0.07 lb/day during this Quarter (**Table 2-2**).
- The effluent concentration of GRPH exiting the CatOx, during the July and August events, was not detected at concentrations above the laboratory's lower reporting limit of 10 mg/m3 (2.329 ppmv; **Table 2-4**). In addition the effluent concentration of GRPH exiting the SVE system during the September event, with the CatOx not being operated, was not detected at a concentration above the laboratory's lower reporting limit of 10 mg/m3 (2.329 ppmv; **Table 2-4**).
- All system operations were in compliance with Ecology's Water Quality Program and PSCAA permits (**Tables 2-4 and 2-5**).

4.3 DRAKE PROPERTY

The following is a summary of the **Third Quarter 2014** system O&M at the Drake Property:

- The MPE operation time this Quarter was approximately 91 percent (**Table 3-1**). System down time was attributed to a GAC canister leak, which led to GAC containment high level shut down.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 5.5 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was approximately 0.129 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 149.36 pounds (**Tables 3-1, 3-2 and 3-3**).
- The volume of groundwater extracted during this reporting period was approximately 225,458 gallons (**Tables 3-1 and 3-3**). The average flow rate of groundwater recovery was 2,398 gallons/day (**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 average daily vapor mass removal rate was 0.1 lb/day during this Quarter (**Table 3-2**).
- The effluent concentration of GRPH exiting the CatOx, during the July and August events, was not detected at concentrations above the laboratory's lower reporting limit of 10 mg/m3 (2.329 ppmv; **Table 3-4**). In addition the effluent concentration of GRPH exiting the SVE system during the September event, with the CatOx not being operated, was not detected at a concentration above the laboratory's lower reporting limit of 10 mg/m3 (2.329 ppmv; **Table 3-4**).
- All system operations were in compliance with PSCAA and Ecology's Water Quality Program permits (**Tables 3-4 and 3-5**).

5.0 SYSTEM OPTIMIZATION & FUTURE RECOMMENDATIONS

The following is a summary of the **Third Quarter 2014** system optimization and future recommendations for each 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 hydrocarbon vapors. System optimization activities during this reporting period focused on balancing the flow of water through the OWS. These activities, any system modifications, and observations are summarized below.

- Field personnel continued to optimize the system flows to balance the flow rate of the OWS. System adjustments were made to minimize high level conditions, which triggered the systems to shut down. Generally, the program adjustments stopped the flow of water to the OWS for a brief period of time while the OWS transfer pumps discharged water to the GAC canisters.
- Sand, silt and biological byproducts continued to accumulate within the lead GAC canisters. This buildup of materials restricts the discharge of wastewater from the OWS and eventually causes the systems to shut down. The majority of this loading has been observed at the TOC Property (Unit 1) system. This loading was also observed at the Drake Property system (Unit 2) during previous quarters but has been reduced following installation of a bag filter in 2013. An additional bag filter may need to be installed in Unit 1 in the future. In addition, a biocide pilot test is currently planned during the fourth quarter 2014 to increase more effective performance at Unit 1 by reducing the biological byproduct.
- Benzene and GRPH concentrations continue to remain below thresholds for continued operation of the CatOx units. As specified in the PSCAA Order of Approval, if benzene and GRPH concentrations remain below 0.5 and 50 ppmv, respectively, for a period of three consecutive months, then the CatOx may be turned off (bypassed). Currently, the CatOx units have been removed from operation at Units 2 and 3, and continued vapor sampling will determine if the CatOx at Unit 1 can be bypassed.

6.0 LIMITATIONS

This document, ***Operations & Maintenance Report***, ***Third Quarter 2014,*** was prepared by Stantec Consulting Services Inc. on behalf of TOC Holdings Co. The material presented reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this document, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

7.0 REFERENCES

SES. 2011. *Interim Remedial Action Work Plan (IRAWP), TOC Holdings Co. Facility No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043*. July 28.

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

Tables

Unit 1: TOC Property (24205)

Table 1-1
Unit 1 - TOC Property (24205)
Summary of System Performance
TOC Holdings Facility No. 01-176

Reporting Period		Duration of Reporting Period (days)	System Run Time (days)	System Run Time (%)	Volume of Groundwater Discharged (gallons)	Average Groundwater Recovered Flow Rate (gallons/day)	GRPH Aqueous-Phase Removal (lb)	GRPH Vapor-Phase Removal (lb)
Start Date	End Date							
10/02/12	12/05/12	64	30	46%	35,204.9	550.1	2.522	917.8
12/05/12	03/04/13	89	36	40%	7,655.9	86.0	0.918	42.1
03/04/13	06/05/13	93	29	31%	4,915.8	52.9	0.609	6.0
06/05/13	09/04/13	91	69	76%	83,540.3	918.0	3.121	138.0
09/04/13	12/03/13	90	90	100%	75,825.2	842.5	0.836	698.5
12/03/13	01/31/14	59	26	44%	1,166.2	19.8	0.064	151.7
01/31/14	03/19/14	47	29	63%	29,991.7	638.1	1.235	28.2
03/19/14	06/16/14	89	70	78%	101,082.0	1,135.8	2.984	5.4
06/16/14	09/18/14	94	87	92%	101,780.0	1,082.8	0.648	51.2
Average System Run Time				**65%**				
Totals for Quarter		**94**	**87**	**92%**	**101,780**	**1,082.8**	**0.648**	**51.2**

NOTES:

shaded cells = data for reporting quarter

DEFINITIONS:

% = percent

gallons/day = gallons per day

GRPH = gasoline-range petroleum hydrocarbons

lb = pound(s)

Table 1-2
Unit 1 - TOC Property (24205)
Vapor Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hour Meter	Total Time in Operation	SVE Pre-Filter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Recovery Rate[3] [4]	Cumulative Recovered[5]
Date	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
10/02/12	5.0	0.21	70	146.8	330	380	1,600	21.1	0.00
10/10/12	70.2	2.93	69	149.2	330	419	2,600	27.9	75.91
10/17/12	237.7	9.90	69	149.2	330	410	3,400	40.2	356.74
10/24/12	406.9	16.95	68	144.4	330	385	2,400	38.3	626.56
11/07/12	638.2	26.59	73	140.7	330	384	1,700	26.3	879.75
12/05/12	714.2	29.76	67	148.0	330	344	150	12.0	917.76
01/08/13	1,482.9	61.79	65	153.8	330	342	35	1.3	957.95
01/17/13	1,533.7	63.90	76	153.0	330	350	--	--	--
02/05/13	1,537.6	64.07	64	148.6	330	342	53	0.60	959.32
03/04/13	1,569.4	65.39	27	173.0	330	342	<10	0.42	959.87
04/03/13	1,587.2	66.13	60	157.4	330	342	14	0.14	959.98
05/08/13	1,595.4	66.48	17	175.2	330	341	22	0.27	960.07
06/05/13	2,267.7	94.49	36	166.0	330	340	<10	0.21	965.87
07/02/13	2,789.8	116.24	39	168.0	330	340	26	0.23	970.93
08/06/13	3,227.4	134.48	47	162.1	330	341	31	0.42	978.64
08/09/13	3,302.8	137.62	64	157.1	330	345	--	--	--
09/04/13	3,924.4	163.52	66	152.0	330	351	580	4.31	1,103.91
10/07/13	4,715.2	196.47	66	153.1	330	356	710	8.85	1,395.37
10/14/13	4,888.3	203.68	72	155.4	330	354	--	--	--
10/15/13	4,913.7	204.74	70	154.7	330	355	--	--	--
10/16/13	4,936.9	205.70	66	154.4	330	364	--	--	--
11/06/13	5,434.8	226.45	45	173.7	330	349	240	6.98	1,604.58
11/07/13	5,460.5	227.52	45	168.1	330	346	--	--	--
12/03/13	6,084.2	253.51	74	158.2	330	355	740	7.31	1,802.39
01/13/14	6,710.4	279.60	0	0.0	--	--	--	--	--
01/31/14	6,711.6	279.65	47	174.0	330	342	37	5.80	1,954.04
02/06/14	6,854.2	285.59	47	173.4	330	343	--	--	--
02/07/14	6,877.1	286.55	47	174.9	330	342	110	1.15	1,961.99
3/22/14[6]	7,416.7	309.03	48	174.0 [1]	330	340	<10	0.90	1,982.27
04/18/14	7,919.8	329.99	48	173.1	330	340	<10	0.08	1,983.90
05/19/14	8,420.1	350.84	47	172.8	330	345	<10	0.08	1,985.52
06/16/14	9,088.9	378.70	50	172.2	330	345	<10	0.08	1,987.68
07/09/14	9,571.0	398.79	50	169.8	330	344	<10	0.08	1,989.23
08/12/14	10,287.5	428.65	49	167.4	330	339	19	0.18	1,994.66
09/18/14	11,168.4	465.35	48	170.1	330	341	140	1.21	2,038.92
PSCAA NOC-10384 Restrictions and Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

shaded cells = data for reporting quarter

[1] Air flow rates through 02/07/14 calculated using an averaging flow sensor (Dwyer Model DS). Air flow rates after 02/07/14 calculated from data. Air flow rate from 03/22/14 is assumed value for subsequent calculations.

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

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

[4] Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit. Removal rates based upon this assumption are shown in *italics* .

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

[6] Samples were collected on 3/19/14, while hour readings were from 3/22/14.

DEFINITIONS:

-- = not analyzed, measured, or calculated
< = not detected at concentration above the laboratory reporting limit
° C = degrees Celsius
ave. = average
ft^3 = cubic feet
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
m^3 = cubic meter
max. = maximum
mg = milligrams
min. = minimum
NOC = Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per meter
SVE = soil vapor extraction
Temp. = temperature

Table 1-3
Unit 1 - TOC Property (24205)
Liquid Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
Date	Flow Totalizer	Treated Between Visits	Average Flow Rate	Influent GRPH Concentration	GRPH Removed[1] [2] [3]	Cumulative GRPH Removed[3] [4]
	(gallons)	(gallons)	(gallons/day)	(µg/L)	(lb)	(lb)
10/02/12	636.3	0	0	--	--	--
10/10/12	5,761.0	5,124.7	641	18,000	0.770	0.770
10/17/12	14,898.1	9,137.1	1,305	--	--	--
10/24/12	21,888.4	6,990.3	999	--	--	--
11/07/12	31,361.8	9,473.4	677	6,100	1.303	2.073
12/05/12	35,204.9	3,843.1	137	14,000	0.449	2.522
01/08/13	38,076.5	2,871.6	84	19,000	0.455	2.977
01/17/13	40,712.0	2,635.5	293	--	--	--
02/05/13	41,363.4	651.4	34	8,200	0.225	3.202
03/04/13	42,860.8	1,497.4	55	19,000	0.237	3.439
04/03/13	44,190.2	1,329.4	44	11,000	0.122	3.561
05/08/13	46,979.7	2,789.5	80	20,000	0.466	4.027
06/05/13	47,776.6	796.9	28	3,200	0.021	4.048
07/02/13	63,869.9	16,093.3	596	17,000	2.283	6.331
08/06/13	89,987.5	26,117.6	746	<100	0.011	6.342
08/09/13	95,562.8	5,575.3	1,858	--	--	--
09/04/13	131,316.9	35,754.2	1,375	2,400	0.828	7.169
10/07/13	174,445.2	43,128.3	1,307	1,100	0.396	7.565
10/14/13	184,151.7	9,706.5	1,387	--	--	--
10/15/13	184,982.4	830.7	831	--	--	--
10/16/13	185,955.0	972.6	973	--	--	--
11/06/13	187,065.4	1,110.4	53	3,800	0.400	7.965
11/07/13	188,072.0	1,006.6	1,007	--	--	--
12/03/13	207,142.1	19,070.1	733	240	0.040	8.006
01/13/14	208,153.8	1,011.7	25	--	--	--
01/31/14	208,308.3	154.5	9	6,600	0.064	8.070
02/06/14	214,154.3	5,846.0	974	--	--	--
02/07/14	214,840.5	686.2	686	760	0.041	8.111
03/19/14	238,300	23,459.5	586	6,100	1.194	9.305
04/18/14	273,331	35,031	1,168	4,300	1.257	10.562
05/19/14	303,504	30,173	973	2,700	0.680	11.242
06/16/14	339,382	35,878	1,281	3,500	1.048	12.290
07/09/14	367,276	27,894	1,213	2,500	0.582	12.872
08/12/14	399,903	32,627	960	180	0.049	12.921
09/18/14	441,162	41,259	1,115	<100	0.017	12.938
State Waste Discharge Permit Number ST0007384 Maximum Daily Limits			**7,000**			

NOTES:

shaded cells = data for reporting quarter

[1] Influent samples collected prior to discharging to the City of Mountlake Terrace sanitary sewer.

[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. Removal rates based upon this assumption are shown in *italics* .

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

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

µg-gallon = micrograms - gallon conversion

gallons/day = gallons per day

GRPH = gasoline-range petroleum hydrocarbons

lb = pound(s)

lb-L = pounds - liter conversion

Table 1-4
Unit 1 - TOC Property (24205)
Vapor Stream Analytical Results
TOC Holdings Facility No. 01-176

Sample Date	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					GRPH DRE [5]
	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	%
10/02/12	1,600	2.0	10	5.5	26	<10	<0.1	<0.1	<0.1	<0.3	*99.7*
10/10/12	2,600	2.3	13	8.7	37	<10	<0.1	0.20	<0.1	<0.3	*99.8*
10/17/12	3,400	3.0	9.4	11	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	5.0	<0.1	22	<10	<0.1	<0.1	<0.1	<0.3	*99.1*
10/07/13	710	<0.1	5.7	<0.1	22	<10	<0.1	<0.1	<0.1	<0.3	*99.3*
11/06/13	240	<0.1	1.6	<0.1	6.4	<10	<0.1	<0.1	<0.1	<0.3	*97.9*
12/03/13	740	<0.1	6.3	<0.1	19	<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*
PSCAA NOC-10384 Restrictions and Conditions						**min. 214.7** [5]					**95%** [5] [6]

NOTES:

shaded cells = data for reporting quarter

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

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

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

[4] Analyzed by U.S. Environmental Protection Agency Method 8021B.

[5] DRE shall be at least 95% unless effluent GRPH vapor leaving the catox does not exceed 50 ppmv (214.7 mg/m^3 assuming a molecular weight of 105).

[6] DRE = $(1-[GRPH_{influent}/GRPH_{effluent}]) \times 100$; non-detected influent concentrations assumed to be 50% of the laboratory's reporting limit. DRE % based on this assumption are shown in *italics.*

DEFINITIONS:

-- = not analyzed, measured, or calculated
< = not detected at a concentration exceeding the laboratory reporting limit
% = percent
catox = catalytic oxidizer
DRE = destruction and removal efficiency
GRPH = gasoline-range petroleum hydrocarbons
mg/m^3 = milligrams per cubic meter
min. = minimum
NOC = Notice of Construction
ppmv = part per million volume
PSCAA = Puget Sound Clean Air Agency
SVE = soil vapor extraction

Table 1-5
Unit 1- TOC Property (24205)
Liquid Stream Analytical Results
TOC Holdings Facility No. 01-176

Sample Date	Groundwater Influent - Pre GAC Treatment (µg/L)					Groundwater Influent - Mid GAC Treatment (µg/L)					Groundwater Effluent - Post GAC Treatment (µg/L)							
	GAC-1 Influent Sample[1]					GAC-2 Influent Sample[2]					Effluent Discharge Sample[3]							
	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	Total BTEX	Total Lead[6]	pH[7]
10/10/12	18,000	25	370	280	4,500	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.59
11/07/12	6,100	8.4	99	24	1,200	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.61
12/05/12	14,000	12	250	200	2,700	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	19.4	7.19
01/08/13	19,000	60	400	520	3,600	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.71
02/05/13	8,200	11	83	61	1,200	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.86
03/04/13	19,000	20	200	460	3,900	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.88
04/03/13	11,000	27	83	<40	2,500	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.68
05/08/13	20,000	11	450	<10	3,400	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.06
06/05/13	3,200	4.0	35	<1	350	<100	<1	<1	<1	<3	<100	<1	<1	<1	3.1	<6	3.33	6.8
07/02/13	17,000	9.9	290	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	<1	230	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.41
10/07/13	1,100	1.1	12	<1	86	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.89
11/06/13	3,800	27	150	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	370	<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	<1	1,100	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	8.49
04/18/14	4,300	<1	100	<1	650	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.65
05/19/14	2,700	2.5	62	<1	310	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.90
06/16/14	3,500	2.0	86	<1	520	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.04	6.59
07/09/14	2,500	1.7	35	<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
State Waste Discharge Permit Number ST0007384 Effluent Limits											**1,000**	**5**				**100**	**1,090**	**6 to 10**

NOTES:

shaded cells = data for reporting quarter

[1]Inffluent samples collected prior to first GAC canister.

[2]Inffluent samples collected prior to second GAC canister.

[3]Effluent samples collected prior to sewer discharge.

[4]Analyzed by Method NWTPH-Gx.

[5]Analyzed by EPA Method 8021B.

[6]Analyzed by EPA Method 200.8.

[7]Field measurement

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

BTEX = benzene, toluene, ethylbenzene and xylenes

EPA = U.S. Environmental Protection Agency

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons for gasoline-range organics

Unit 2: TOC/Farmasonis Property (24225)

Table 2-1
Unit 2 - TOC/Farmasonis Property (24225)
Summary of System Performance
TOC Holdings Facility No. 01-176

Reporting Period		Duration of Reporting Period (days)	System Run Time (days)	System Run Time (%)	Volume of Groundwater Discharged (gallons)	Average Groundwater Recovered Flow Rate (gallons/day)	GRPH Aqueous-Phase Removal (lb)	GRPH Vapor-Phase Removal (lb)
Start Date	End Date							
10/03/12	12/05/12	63.0	51.7	82%	12,858	204	0.005	477.4
12/05/12	03/04/13	89	52.5	59%	5,900	66	0.002	9.1
03/04/13	06/05/13	93	67.1	72%	106,670	1,147	0.235	4.9
06/05/13	09/04/13	91	82.2	90%	123,303	1,355	0.051	6.2
09/04/13	12/03/13	90	89.9	100%	89,204	991	0.046	99.6
12/03/13	01/13/14	41	41.1	100%	29,087	709	0.012	54.6
01/13/14	02/07/14	25	18.8	75%	9,854	394	0.004	18.3
02/07/14	06/16/14	129	108.4	84%	187,016	1,450	0.078	31.6
06/16/14	09/18/14	94	91	97%	120,848.0	1,286	0.050	4.9
Average System Run Time				**84%**				
Totals for Quarter		**94**	**90.7**	**97%**	**120,848**	**1,286**	**0.050**	**4.9**

NOTES:

shaded cells = data for reporting quarter

DEFINITIONS:

% = percent

gallons/day = gallons per day

GRPH = gasoline-range petroleum hydrocarbons

lb = pound(s)

O&M = operations and maintenance

Table 2-2
Unit 2 - TOC/Farmasonis Property (24225)
Vapor Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hour Meter	Total Time in Operation	SVE Pre-Filter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Recovery Rate[3] [4]	Cumulative Recovered[5]
Date	(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	0.00
10/10/12	73.7	3.1	86	134.1	330	363	1,300	*10.44*	25.26
10/17/12	242.0	10.1	76	135.8	330	376	1,300	*15.77*	135.86
10/24/12	410.7	17.1	72	137.2	330	355	1,100	*14.73*	239.37
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	*10.91*	392.78
12/05/12	1,257.4	52.4	74	124.3	330	338	15	*3.99*	477.40
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	0.19	483.35
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	*0.15*	486.39
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	*0.07*	486.47
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	*0.07*	488.67
05/08/13	3,454.7	143.9	33	164.5	330	338	<10	*0.07*	489.37
06/05/13	4,127.1	172.0	36	158.9	330	335	<10	*0.07*	491.40
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	*0.07*	493.28
08/06/13	5,403.6	225.2	10	175.5	330	335	<10	*0.08*	495.37
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	*0.08*	497.62
10/07/13	6,890.0	287.1	34	163.9	330	336	41	*0.35*	509.00
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	*1.28*	547.44
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	*1.85*	597.26
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	*1.33*	651.88
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	*0.97*	670.20
03/18/14	--	--	74	--	330	334	26	--	--
04/17/14	10,859.0	452.5	68	146.6	330	336	<10	*0.57*	697.84
05/20/14	11,645.2	485.2	72	146.9	330	338	<10	*0.07*	700.00
06/16/14	12,296.4	512.4	62	152.4	330	338	<10	*0.07*	701.83
07/10/14	12,799.7	533.3	62	150.2	330	338	<10	*0.07*	703.25
08/12/14	13,588.2	566.2	61	149.4	330	338	<10	*0.07*	705.47
09/18/14	14,474.1	603.1	48	158.3	--	--	--	*0.03*	706.74
PSCAA NOC-10384 Restrictions and Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

shaded cells = data for reporting quarter

[1]Air flow rates through 02/07/14 calculated using an averaging flow sensor (Dwyer Model DS).
Air flow rates after 02/07/14 calculated from data.

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

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

[4]Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit.
Removal rates based upon this assumption are shown in *italics* .

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

DEFINITIONS:

-- = not analyzed, measured, or calculated
< = not detected at concentration above the laboratory reporting limit
° C = degrees Celsius
ave. = average
ft^3 = cubic feet
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
m^3 = cubic meter
max. = maximum
mg = milligrams
min. = minimum
NOC = Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per meter
SVE = soil vapor extraction
Temp. = temperature

Table 2-3
Unit 2 - TOC/Farmasonis Property (24225)
Liquid Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
Date	Flow Totalizer	Treated Between Visits	Average Flow Rate	Influent GRPH Concentration	GRPH Removed[1] [2] [3]	Cumulative GRPH Removed[3] [4]
	(gallons)	(gallons)	(gallons/day)	(µg/L)	(lb)	(lb)
10/03/12	397.8	0	0	--	--	--
10/10/12	562.6	164.8	24	<100	0.000	0.000
10/17/12	5,392.6	4,830.0	690	--	--	--
10/24/12	8,170.9	2,778.3	397	--	--	--
10/25/12	8,580.4	409.5	410	--	--	--
11/06/12	10,624.2	2,043.8	170	--	--	--
11/07/12	10,630.5	6.3	6	<100	0.004	0.004
12/05/12	12,858.4	2,227.9	80	<100	0.001	0.005
12/06/12	14,221.5	1,363.1	1,363	--	--	--
01/08/13	18,643.2	4,421.7	134	<100	*0.002*	0.008
01/09/13	18,651.6	8.4	8	--	--	--
01/17/13	18,753.9	102.3	13	--	--	--
02/05/13	18,753.9	0.0	0	<100	*0.000*	0.008
03/12/13	18,758.0	4.1	0	1,100	*0.000*	0.008
03/13/14	18,758.0	0.0	0	--	--	--
04/03/13	24,667.4	5,909.4	-17	740	*0.036*	0.044
05/08/13	90,733.6	66,066.2	1,888	<100	*0.028*	0.072
06/05/13	125,427.8	34,694.2	1,239	590	*0.171*	0.243
06/19/13	131,990.5	6,562.7	469	--	--	--
07/02/13	172,454.5	40,464.0	3,113	<100	*0.020*	0.262
08/06/13	223,496.3	51,041.8	1,458	<100	*0.021*	0.283
08/09/13	226,651.9	3,155.6	1,052	--	--	--
09/04/13	248,730.9	22,079.0	849	<100	*0.011*	0.294
10/07/13	269,136.3	20,405.4	618	<100	*0.018*	0.312
10/14/13	273,636.3	4,500.0	643	--	--	--
10/15/13	275,837.1	2,200.8	2,201	--	--	--
10/16/13	277,480.5	1,643.4	1,643	--	--	--
11/06/13	308,993.4	31,512.9	1,501	<100	*0.017*	0.328
11/07/13	310,249.2	1,255.8	1,256	--	--	--
12/03/13	337,935.2	27,686.0	1,065	<100	*0.012*	0.340
12/04/13	339,243.0	1,307.8	1,308	--	--	--
01/13/14	367,022.0	27,779.0	694	<100	*0.012*	0.353
01/23/14	--	--	--	--	--	--
01/31/14	376,637.4	9,615.4	534	--	--	--
02/07/14	376,875.7	238.4	34	<100	*0.004*	0.357
03/18/14	396,600	19,724.3	506	<100	*0.008*	0.365
04/17/14	424,646	28,046	935	<100	*0.012*	0.377
05/20/14	497,115	72,469	2,196	<100	*0.030*	0.407
06/16/14	563,892	66,777	2,473	<100	*0.028*	0.435
7/10/2014	603616	39,724	1,655	<100	*0.017*	0.451
8/12/2014	652922	49,306	1,494	<100	*0.021*	0.472
9/18/2014	684740	31,818	860	<100	*0.013*	0.485
State Waste Discharge Permit Number ST0007384 Maximum Daily Limits			**7,000**			

NOTES:

shaded cells = data for reporting quarter

[1] Effluent samples collected prior to discharging to the City of Mountlake Terrace sanitary sewer.

[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.
Removal rates based upon this assumption are shown in *italics* .

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

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

µg-gallon = micrograms - gallon conversion

GRPH = gasoline-range petroleum hydrocarbons

gallons/day = gallons per day

lb = pound(s)

lb-L = pounds - liter conversion

Table 2-4
Unit 2 - TOC/Farmasonis Property (24225)
Vapor Stream Analytical Results
TOC Holdings Facility No. 01-176

	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					GRPH
	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	DRE[5]
Sample Date	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	%
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	<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	--
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	0.4	<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	0.15	<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	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
PSCAA NOC-10384 Restrictions and Conditions						**min. 214.7** [5]					**95%** [5] [6]

NOTES:

shaded cells = data for reporting quarter

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

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

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

[4]Analyzed by U.S. Environmental Protection Agency Method 8021B.

[5]DRE shall be at least 95% unless effluent GRPH vapor leaving the catox does not exceed 50 ppmv (214.7 mg/m^3 assuming a molecular weight of 105).

[6]DRE = (1-[$GRPH_{influent}$/$GRPH_{effluent}$]) x 100; non-detected influent concentrations assumed to be 50% of the laboratory's reporting limit.

DRE % based on this assumption are shown in *italics.*

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding the laboratory reporting limit

% = percent

catox = catalytic oxidizer

DRE = destruction and removal efficiency

GRPH = gasoline-range petroleum hydrocarbons

mg/m^3 = milligrams per cubic meter

min. = minimum

NOC = Notice of Construction

ppmv = part per million volume

PSCAA = Puget Sound Clean Air Agency

SVE = soil vapor extraction

Table 2-5
Unit 2 - TOC/Farmasonis Property (24225)
Liquid Stream Analytical Results
TOC Holdings Facility No. 01-176

Sample Date	Groundwater Influent - Pre GAC Treatment (µg/L)					Groundwater Influent - Mid GAC Treatment (µg/L)					Groundwater Effluent - Post GAC Treatment (µg/L)							
	GAC-1 Influent Sample[1]					GAC-2 Influent Sample[2]					Effluent Discharge Sample[3]							
	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	Total BTEX	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	14	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	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
State Waste Discharge Permit Number ST0007384 Effluent Limits											**1,000**	**5**				**100**	**1,090**	**6 to 10**

NOTES:

shaded cells = data for reporting quarter

[1]Inffluent samples collected prior to first GAC canister.

[2]Inffluent samples collected prior to second GAC canister.

[3]Effluent samples collected prior to sewer discharge.

[4]Analyzed by Method NWTPH-Gx.

[5]Analyzed by EPA Method 8021B.

[6]Analyzed by EPA Method 200.8.

[7]Field measurement

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

BTEX = benzene, toluene, ethylbenzene and xylenes

EPA = U.S. Environmental Protection Agency

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons for gasoline-range organics

Unit 3: Drake Property (24309)

Table 3-1
Unit 3 - Drake Property (24309)
Summary of System Performance
TOC Holdings Facility No. 01-176

Reporting Period		Duration of Reporting Period (days)	System Run Time (days)	System Run Time (%)	Volume of Groundwater Discharged (gallons)	Average Groundwater Recovered Flow Rate (gallons/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%	71,160	1,112	0.029	31.5
12/05/12	03/04/13	89	73.3	82%	30,268.8	340	0.258	37.6
03/04/13	06/05/13	93	39.6	43%	74,015.9	796	0.491	2.7
06/05/13	09/04/13	91	58.1	64%	68,178.7	749	0.158	4.6
09/04/13	12/03/13	90	75.8	84%	211,042.8	2,345	0.088	6.3
12/03/13	01/13/14	41	41.0	100%	40,409.7	986	0.017	3.4
01/13/14	03/18/14	64	58.0	91%	132,723.9	2,074	0.055	50.4
03/18/14	06/16/14	90	71.3	79%	206,572.0	2,295	0.086	5.9
06/16/14	09/18/14	94	85.2	91%	225,458.0	2,398	0.129	5.5
Average System Run Time				**78%**				
Totals for Quarter		**94**	**85.2**	**91%**	**225,458**	**2,398**	**0.129**	**5.5**

NOTES:
shaded cells = data for reporting quarter

DEFINITIONS:
% = percent
gallons/day = gallons per day
GRPH = gasoline-range petroleum hydrocarbons
lb = pound(s)

Table 3-2
Unit 3 - Drake Property (24309)
Vapor Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Run Time		SVE Parameters		Catalytic Oxidizer		GRPH Removal		
	SVE Hour Meter	Total Time in Operation	SVE Pre-Filter Vacuum	Air Flow Rate[1]	Catalyst Entrance Temp.	Catalyst Exit Temp.	Influent Concentration[2]	Daily Mass Recovery Rate[3] [4]	Cumulative Recovered[5]
Date	(hours)	(days)	(iow)	(scfm)	(°C)	(°C)	(mg/m^3)	(lb/day)	(lb)
10/02/12	11.2	0.47	70.0	143.8	330	340	13	*0.2*	0.00
10/10/12	75.7	3.15	73.0	140.4	330	338	12	*0.2*	0.43
10/17/12	243.7	10.15	74.0	141.7	330	337	<10	*0.1*	1.18
10/24/12	411.9	17.16	74.0	139.9	330	338	<10	*0.1*	1.63
10/25/12	436.7	18.20	74.0	142.8	330	338	--	--	--
11/06/12	724.8	30.20	77.0	137.6	330	337	--	--	--
11/07/12	750.3	31.3	76	139.1	330	338	<10	*0.1*	2.51
12/05/12	1,417.6	59.1	76	141.9	330	340	160	*1.0*	31.48
01/08/13	2,231.8	93.0	83	137.3	330	337	<10	*1.0*	66.61
02/05/13	2,731.0	113.8	70	144.2	330	337	<10	*0.1*	67.93
03/04/13	3,177.5	132.4	71	144.6	330	338	<10	*0.1*	69.13
04/03/13	3,894.4	162.3	64	152.4	330	338	<10	*0.1*	71.13
05/15/13	4,059.7	169.2	27	173.5	330.0	301.0	<10	*0.1*	71.63
06/05/13	4,126.8	172.0	27	172.9	330.0	338.0	<10	*0.1*	71.85
07/02/13	4,400.3	183.3	17	171.7	330	338	<10	*0.1*	72.73
08/06/13	5,055.3	210.6	10	182.6	330	338	<10	*0.1*	74.91
09/04/13	5,520.0	230.0	13	181.6	330	338	<10	*0.1*	76.49
10/07/13	6,311.3	263.0	13	183.7	330	337	<10	*0.1*	79.20
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	*0.1*	81.69
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	*0.1*	82.76
12/04/13	7,368.7	307.0	25	185.1	330	338	--	--	--
01/13/14	8,323.6	346.8	24	186.6	330	337	<10	*0.1*	86.20
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	8,766.0	365.3	20	188.9	330	340	98	*0.9*	102.22
03/18/14	9,715.1	404.8	24	187.0	330	338	<10	*0.9*	136.63
04/18/14	10,370.2	432.1	27	183.5	330	340	<10	*0.1*	138.91
05/19/14	10,942.5	455.9	22	184.9	330	342	<10	*0.1*	140.88
06/16/14	11,425.1	476.0	26	181.8	330	342	<10	*0.1*	142.54
07/10/14	11,846.3	493.6	24	182.7	330	341	<10	*0.1*	143.98
08/13/14	12,607.6	525.3	26	181.7	330	337	<10	*0.1*	146.57
09/18/14	13,470.3	561.3	17	185.0	--	--	--	*0.0*	148.05
PSCAA NOC-10384 Restrictions and Conditions				**max. 350**	**min. 240**	**max. 620**			

NOTES:

shaded cells = data for reporting quarter

[1] Air flow rates through 02/07/14 calculated using an averaging flow sensor (Dwyer Model DS). Air flow rates after 02/07/14 calculated from data. Air flow rate from 03/18/14 is assumed value for subsequent calculations.

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

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

[4] Nondetectable influent concentrations assumed to be 50% of the laboratory's lower reporting limit. Removal rates based upon this assumption are shown in *italics* .

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

DEFINITIONS:

-- = not analyzed, measured, or calculated
< = not detected at concentration above the laboratory reporting limit
° C = degrees Celsius
ave. = average
ft^3 = cubic feet
GRPH = gasoline-range petroleum hydrocarbons
iow = inches of water
lb = pounds
lb/day = pounds per day
m^3 = cubic meter
max. = maximum
mg = milligrams
min. = minimum
NOC = Notice of Construction
PSCAA = Puget Sound Clean Air Agency
scfm = standard cubic feet per meter
SVE = soil vapor extraction
Temp. = temperature

Table 3-3
Unit 3 - Drake Property (24309)
Liquid Stream - System Performance Monitoring Data
TOC Holdings Facility No. 01-176

Site Visit	Extracted Groundwater			Hydrocarbon Recovery - Aqueous-Phase		
Date	Flow Totalizer (gallons)	Treated Between Visits (gallons)	Average Flow Rate (gallons/day)	Influent GRPH Concentration (µg/L)	GRPH Removed[1] [2] [3] (lb)	Cumulative GRPH Removed[3] [4] (lb)
10/02/12	1,178.0	--	--	--	--	--
10/10/12	5,075.9	3,897.9	487	<100	*0.002*	*0.002*
10/17/12	15,755.8	10,679.9	1,526	--	--	--
10/24/12	27,288.0	11,532.2	1,647	--	--	--
10/25/12	28,809.6	1,521.6	1,522	--	--	--
11/06/12	36,398.8	7,589.2	632	--	--	--
11/07/12	38,565.1	2,166.3	2,166	<100	*0.014*	*0.016*
12/05/12	71,160.2	32,595.1	1,164	<100	*0.014*	*0.029*
01/08/13	71,627.1	466.9	14	<100	*0.000*	*0.029*
02/06/13	84,429.4	12,802.4	441	160	0.017	0.046
03/04/13	101,429.0	16,999.6	654	1,700	0.241	0.288
04/03/13	119,013.8	17,584.8	586	<100	*0.007*	*0.295*
05/08/13	157,058.4	38,044.6	1,087	1,500	*0.476*	*0.771*
06/05/13	175,444.9	18,386.5	657	<100	*0.008*	*0.779*
07/02/13	175,445.7	0.8	0	--	--	--
08/06/13	181,799.7	6,354.0	182	2,500	*0.133*	*0.911*
09/04/13	243,623.6	61,823.9	2,132	<100	*0.026*	*0.937*
10/07/13	333,942.9	90,319.3	2,737	<100	*0.038*	*0.975*
10/14/13	355,115.5	21,172.6	3,025	--	--	--
10/15/13	358,033.9	2,918.4	2,918	--	--	--
11/06/13	420,282.1	62,248.2	2,829	<100	*0.036*	*1.011*
11/07/13	423,365.1	3,083.0	3,083	--	--	--
12/03/13	454,666.4	31,301.3	1,204	<100	*0.014*	*1.025*
12/04/13	458,180.0	3,513.6	3,514	--	--	--
01/13/14	495,076.1	36,896.1	922	<100	*0.017*	*1.042*
01/31/14	506,528.6	11,452.5	636	--	--	--
02/07/14	523,790.1	17,261.5	2,466	<100	*0.012*	*1.054*
03/18/14	627,800	104,010	2,667	<100	*0.043*	*1.097*
04/18/14	722,961	95,161	3,070	<100	*0.040*	*1.137*
05/19/14	791,030	68,069	2,196	<100	*0.028*	*1.166*
06/16/14	834,372	43,342	1,548	<100	*0.018*	*1.184*
07/10/14	887,218	52,846	2,202	130	*0.057*	*1.241*
08/13/14	964,443	77,225	2,271	<100	*0.032*	*1.273*
09/18/14	1,059,830	95,387	2,650	<100	*0.040*	*1.313*
State Waste Discharge Permit Number ST0007384 Maximum Daily Limits			**7,000**			

NOTES:

shaded cells = data for reporting quarter

[1] Effluent samples collected prior to discharging to the City of Mountlake Terrace sanitary sewer.

[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.
Removal rates based upon this assumption are shown in *italics* .

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

DEFINITIONS:

-- = not analyzed, measured, or calculated
< = not detected at concentration exceeding the laboratory reporting limit
µg/L = micrograms per liter
µg-gallon = micrograms - gallon conversion
gallons/day = gallons per day
GRPH = gasoline-range petroleum hydrocarbons
lb = pound(s)
lb-L = pounds - liter conversion

Table 3-4
Unit 3 - Drake Property (24309)
Vapor Stream Analytical Results
TOC Holdings Facility No. 01-176

Sample Date	Analytical Results (mg/m^3)										
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					GRPH DRE [5]
	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	GRPH[3]	Benzene[4]	Toluene[4]	Ethylbenzene[4]	Total Xylenes[4]	
	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	%
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	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
11/06/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
12/03/13	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
01/13/14	<10	<0.1	<0.1	<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	<0.1	<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	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
09/17/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
PSCAA NOC-10384 Restrictions and Conditions						**min. 214.7 [5]**					**95% [5] [6]**

NOTES:

shaded cells = data for reporting quarter

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

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

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

[4]Analyzed by U.S. Environmental Protection Agency Method 8021B.

[5]DRE shall be at least 95% unless effluent GRPH vapor leaving the catox does not exceed 50 ppmv (214.7 mg/m^3 assuming a molecular weight of 105).

[6]DRE = (1-[$GRPH_{influent}$/$GRPH_{effluent}$]) x 100; non-detected influent concentrations assumed to be 50% of the laboratory's reporting limit.

DRE % based on this assumption are shown in *italics* .

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding the laboratory reporting limit

% = percent

catox = catalytic oxidizer

DRE = destruction and removal efficiency

GRPH = gasoline-range petroleum hydrocarbons

mg/m^3 = milligrams per cubic meter

min. = minimum

NOC = Notice of Construction

ppmv = part per million volume

PSCAA = Puget Sound Clean Air Agency

SVE = soil vapor extraction

Table 3-5
Unit 3 - Drake Property (24309)
Liquid Stream Analytical Results
TOC Holdings Facility No. 01-176

Sample Date	Groundwater Influent - Pre GAC Treatment (µg/L)					Groundwater Influent - Mid GAC Treatment (µg/L)					Groundwater Effluent - Post GAC Treatment (µg/L)							
	GAC-1 Influent Sample[1]					GAC-2 Influent Sample[2]					Effluent Discharge Sample[3]							
	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	GRPH[4]	Benzene[5]	Toluene[5]	Ethyl-benzene[5]	Total Xylenes[5]	Total BTEX	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	4.05	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	<1	1.4	24	160	<100	<1	<1	<1	<3	<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	<1	<1	<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	<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	1.9	7.35
01/13/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	--
02/07/14	<100	<1	<1	<1	3.3	<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	<3	<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
State Waste Discharge Permit Number ST0007384 Effluent Limits											**1,000**	**5**				**100**	**1,090**	**6 to 10**

NOTES:

shaded cells = data for reporting quarter

[1]Inffluent samples collected prior to first GAC canister.

[2]Inffluent samples collected prior to second GAC canister.

[3]Effluent samples collected prior to sewer discharge.

[4]Analyzed by Method NWTPH-Gx.

[5]Analyzed by EPA Method 8021B.

[6]Analyzed by EPA Method 200.8.

[7]Field measurement

DEFINITIONS:

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

BTEX = benzene, toluene, ethylbenzene and xylenes

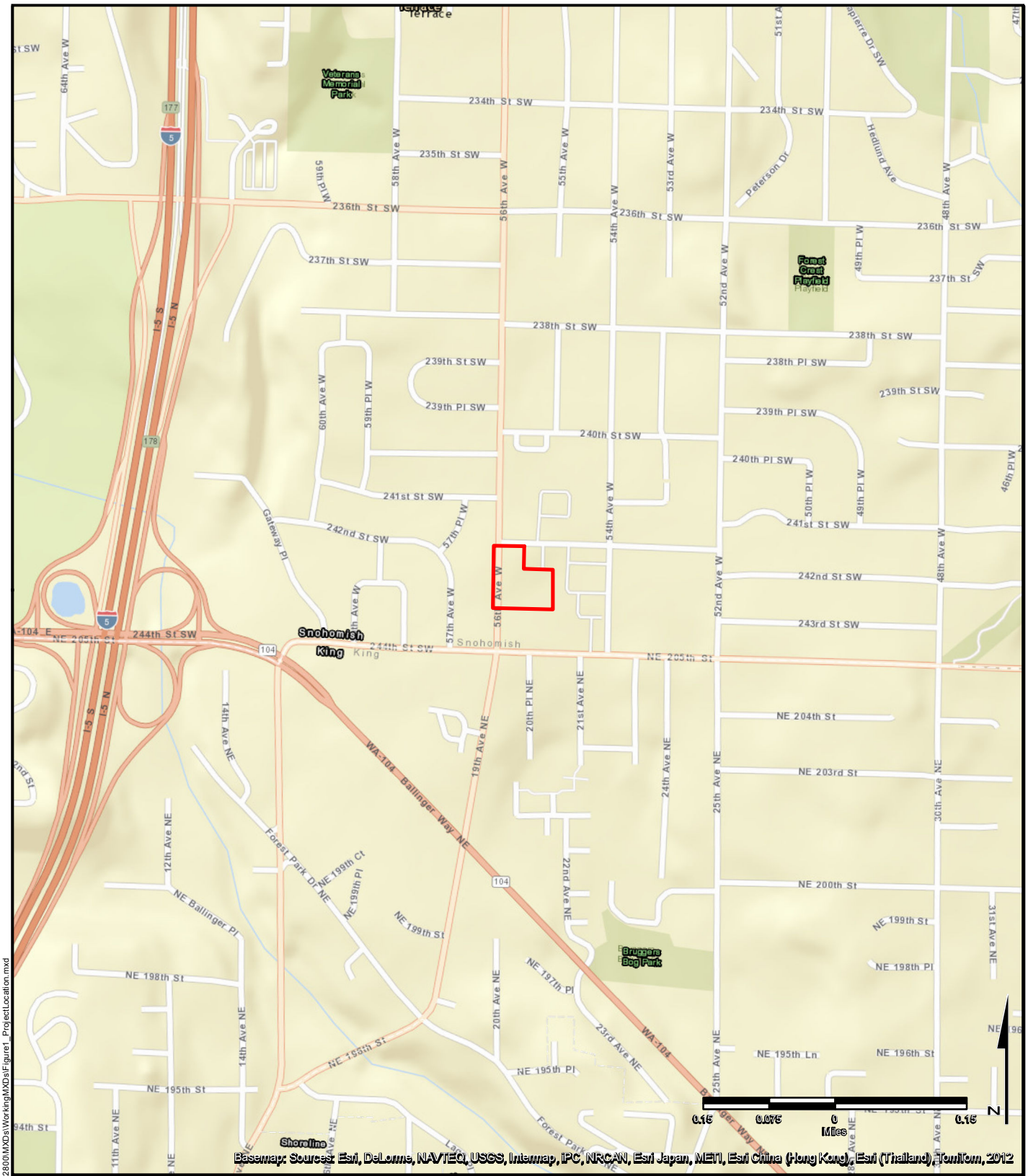
EPA = U.S. Environmental Protection Agency

GAC = granular activated carbon

GRPH = gasoline-range petroleum hydrocarbons

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons for gasoline-range organics

Figures



Basemap: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Legend

Site Boundary

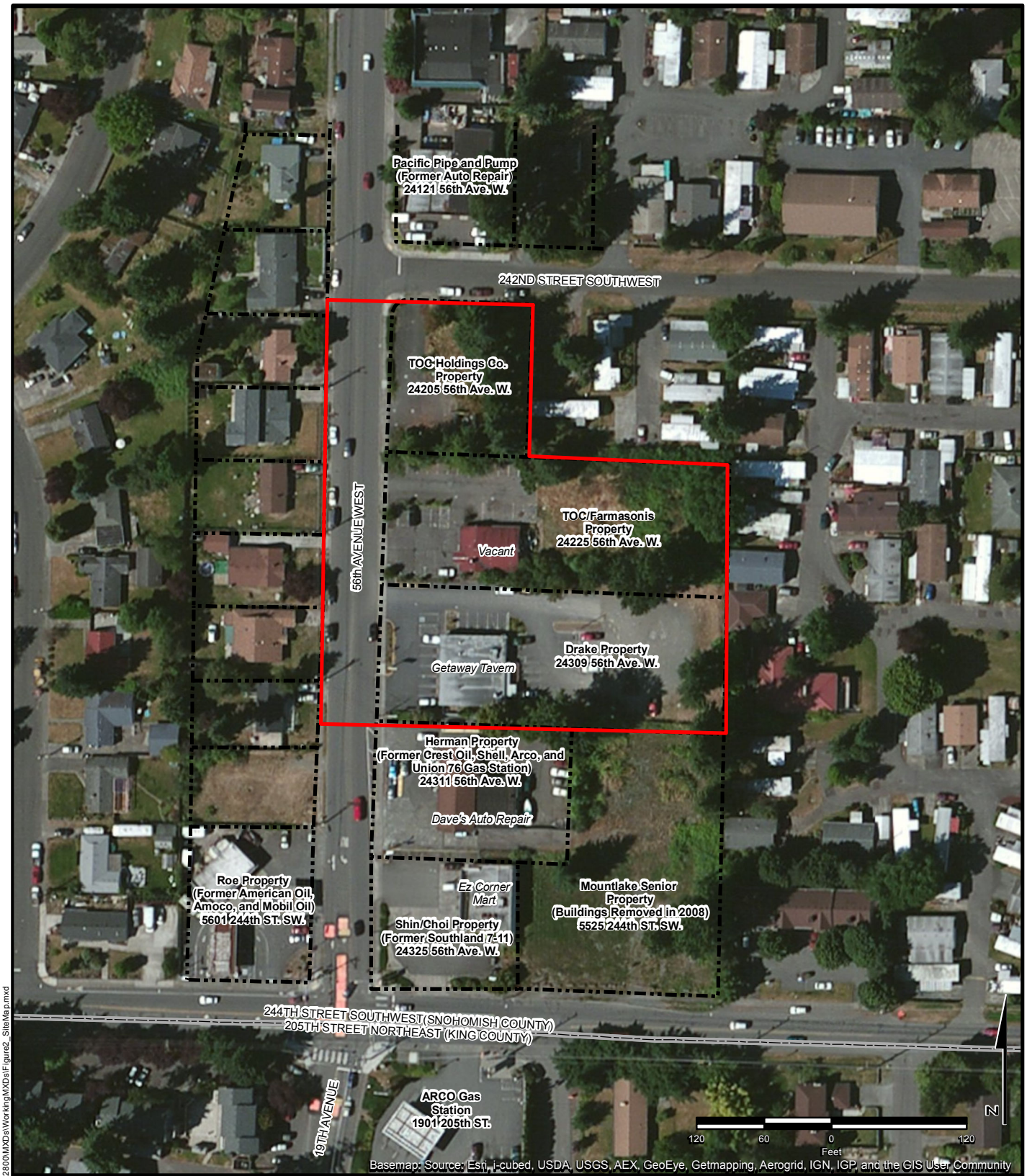
TOC Holdings Co. Facility 01-176
24205 56th Avenue West
Mountlake Terrace, Washington

FIGURE 1: PROJECT LOCATION

Stantec

DRAWN BY	D.H.	DATE DRAWN	1/21/2015
SCALE	1 in = 0.16 miles		
PROJECT	203714085		

X:\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\Figure1_ProjectLocation.mxd



Legend

Site Boundary

PARCELS

TOC Holdings Co. Facility 01-176
24205 56th Avenue West
Mountlake Terrace, Washington

FIGURE 2: SITE MAP

Stantec

DRAWN BY	D.H.	DATE DRAWN	1/21/2015
SCALE	1 in = 120 feet		
PROJECT	203714085		

X:\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\Figure2_SiteMap.mxd

LEGEND

- MW77 — GROUNDWATER REMEDIATION WELL (INTERMEDIATE SCREEN)
- CATCH BASIN
- SURVEY BENCHMARK
- PROPERTY BOUNDARY
- FO — FIBER OPTIC
- GAS — NATURAL GAS
- SI — STORM SEWER INFILTRATION PIPE
- SD — STORM SEWER DRAIN
- SS — SANITARY SEWER
- W — WATER
- OP — OVERHEAD POWER
- E1 — PRIMARY ELECTRICAL
- E2 — SECONDARY ELECTRICAL
- SANITARY SEWER MANHOLE
- OX — CATALYTIC OXIDIZER
- ELECTRICAL JUNCTION BOX
- ELECTRICAL VAULT
- PAD-MOUNTED TRANSFORMER
- C.O. — SANITARY SEWER CLEAN OUT
- UST — UNDERGROUND STORAGE TANK

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'

TEMPORARY BENCHMARKS:

TBM 'A' SET 'X' ON NORTH BONNETT BOLT FOR FIRE HYDRANT.

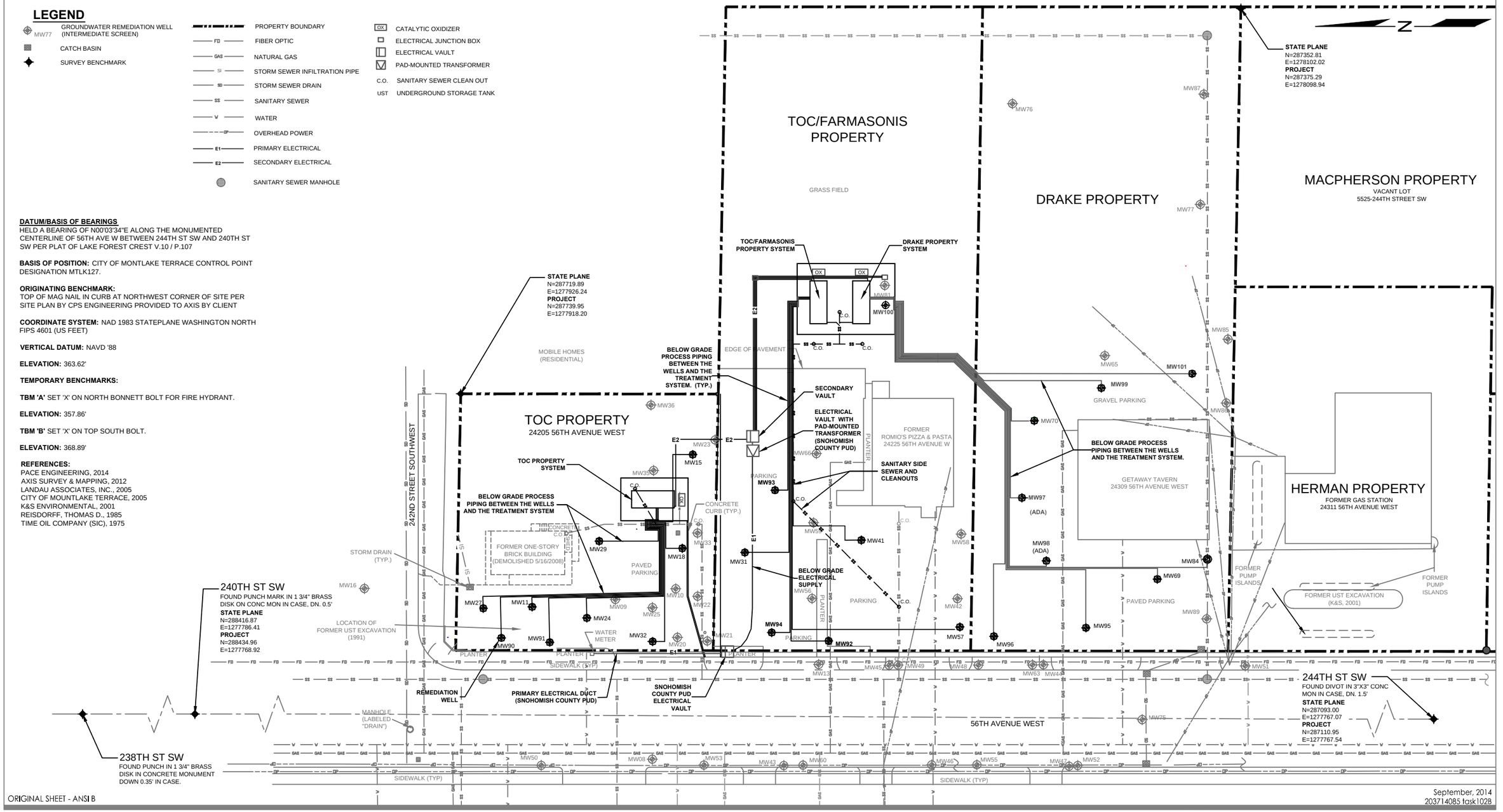
ELEVATION: 357.86'

TBM 'B' SET 'X' ON TOP SOUTH BOLT.

ELEVATION: 368.89'

REFERENCES:

PACE ENGINEERING, 2014
AXIS SURVEY & MAPPING, 2012
LANDAU ASSOCIATES, INC., 2005
CITY OF MOUNTLAKE TERRACE, 2005
K&S ENVIRONMENTAL, 2001
REISDORFF, THOMAS D., 1985
TIME OIL COMPANY (SIC), 1975



ORIGINAL SHEET - ANSI B

September, 2014
203714085 task102B

Z:\WA\TOC_Holdings_Co 203714085\Figure 3 Remediation Systems And Site Details Map.dwg
2014/10/16 10:07 AM By: Pixton, Connie

Stantec

10101 36th Ave. W, Ste. 203
Lynnwood, Washington 98036

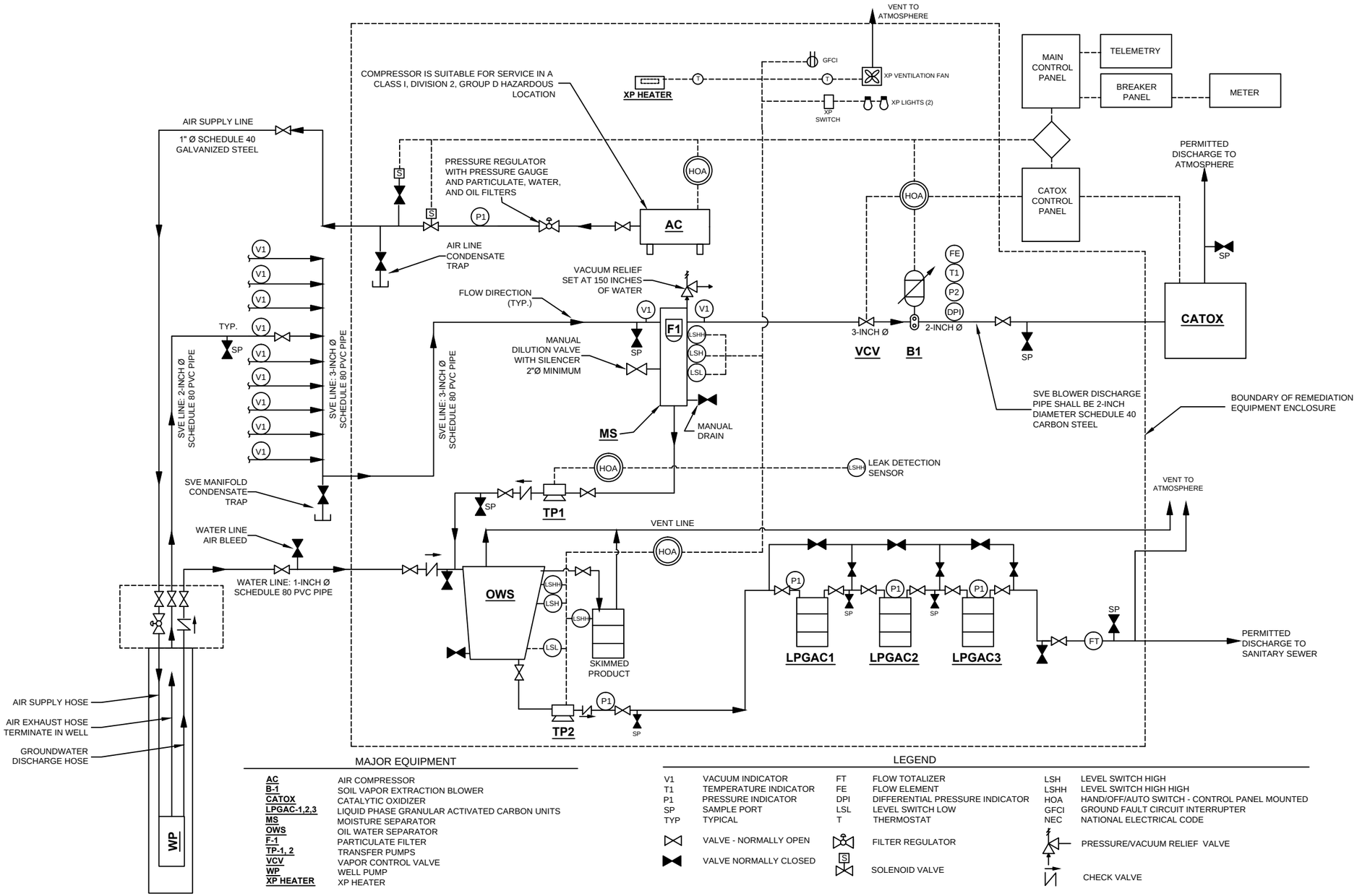
Notes

SOURCE:
SOUNDEARTH STRATEGIES, 2013
(WWW.SOUNDEARTHINC.COM)
Date: 09/30/2013
Drawn By: BLR
Checked By: DHG/TSM
CadFile: 01-176_2012Q4_O&MI_FIG01

Client/Project
TOC HOLDINGS COMPANY
Facility 01-176
Mountlake Terrace, Washington

Figure No.
3

Title
Remediation Systems and Site Details Map



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

September, 2014
203714085 task102B

Z:\WA\TOC_Holdings_Co 203714085\Figure 4 Piping And Instrumentation Diagram.dwg
2014/10/16 10:11 AM By: Pixton, Connie

Stantec
10101 36th Ave. W, Ste. 203
Lynnwood, Washington 98036

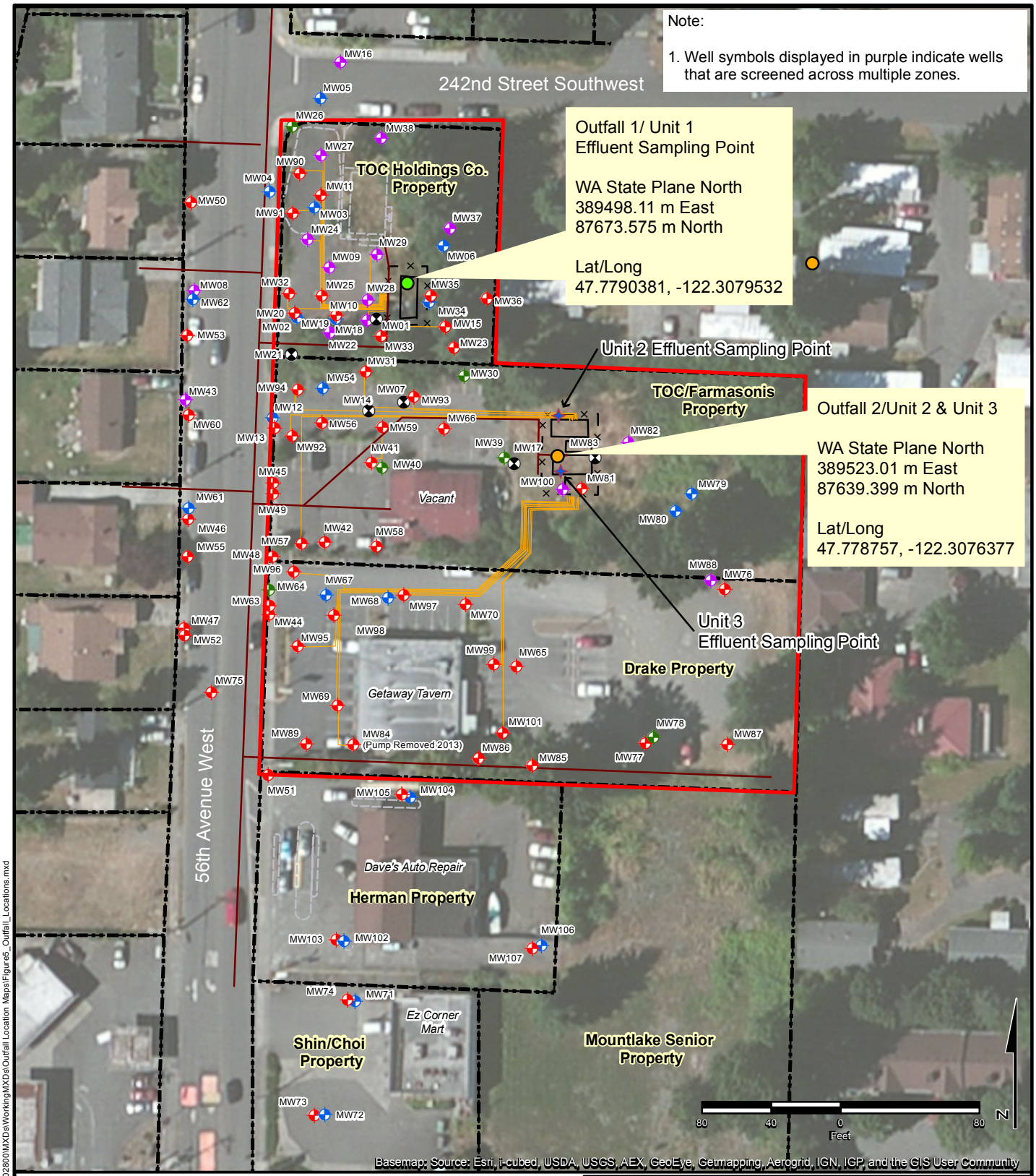
Notes

SOURCE:
SOUNDEARTH STRATEGIES, 2013
(WWW.SOUNDEARTHINC.COM)
Date: 12/03/2012
Drawn By: EAM/BLR
Checked By: MES/TSM
CadFile: 01-176_2013Q3_PID

Client/Project
TOC HOLDINGS COMPANY
Facility 01-176
Mountlake Terrace, Washington

Figure No.
4

Title
Piping and Instrumentation Diagram



Legend

- Site Boundary
- Discharge Permit Outfall Locations
- Corrected Outfall Location
- Effluent Sampling Point
- Abandoned Well
- Deep Well
- Intermediate Well
- Shallow Well
- Mixed Zone Well
- System Piping
- Compound Fence
- Parcels
- Sewer Line
- System Compound

TOC Holdings Co. Facility 01-176
24205 56th Avenue West
Mountlake Terrace, Washington

FIGURE 5: STATE WASTE DISCHARGE PERMIT ST0007384-
OUTFALL SAMPLING LOCATIONS

Stantec

DRAWN BY	D.H.
DATE DRAWN	1/22/2015
SCALE	1 in = 80 feet
PROJECT	203714085

X:\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\Outfall Location Maps\Figure5_Outfall_Locations.mxd

Appendix A

Laboratory Analytical Reports – Vapor

Unit 1: TOC Property (24205)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407160 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407160 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407160 -01	1VINF
407160 -02	1VEFF

Gasoline was detected in the NWTPH-Gx method blank due to carryover from a previous sample. No gasoline range material was detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407160
Date Analyzed: 07/11/14

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)
1VINF 407160-01	<0.1	<0.1	<0.1	<0.3	<10	92
1VEFF 407160-02	<0.1	<0.1	<0.1	<0.3	<10	91
Method Blank 04-1428 MB	<0.1	<0.1	<0.1	<0.3	10 c	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407160

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: 407160-02 (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	77	70-130
Toluene	mg/m^3	5.0	81	70-130
Ethylbenzene	mg/m^3	5.0	85	70-130
Xylenes	mg/m^3	15	83	70-130
Gasoline	mg/m^3	100	109	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.

407160

SAMPLE CHAIN OF CUSTODY ME 7/10/14

Page # 1 of 1

Send Report To Rebekah Brooks
Company STanTec
Address 19101 36th AVE. W. STE 203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC - MLT
PO# 203714085
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
IVINF	01 A-B	7-9-14	1430	Air	2		X	X										
IVEFF	02	7-9-14	1440	Air	2		X	X										

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana HuTchins	STanTec	9-10-14	1000
Received by: Thao Molsness	Thao Molsness	F&BI	7/10/14	12:30
Relinquished by:				
Received by:	Samples received at 27 °C			

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408208 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408208 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408208 -01	1VINF
408208 -02	1VEFF

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408208
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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)
1VINF 408208-01	<0.1	0.12	<0.1	<0.3	19	90
1VEFF 408208-02	<0.1	<0.1	<0.1	<0.3	<10	88
Method Blank 04-1643 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408208

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: 408198-01 (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	75	70-130
Toluene	mg/m^3	5.0	77	70-130
Ethylbenzene	mg/m^3	5.0	76	70-130
Xylenes	mg/m^3	15	80	70-130
Gasoline	mg/m^3	100	106	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.

408208

SAMPLE CHAIN OF CUSTODY ME 8/13/14

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36Th ave W. STE 203
City, State, ZIP Lynnwood, Wa, 98036
Phone # 425-977-4994 Fax # 425-977-4995

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT
PO# 203714085
REMARKS O+M Air UNIT 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
IVINF	01 AB	8-11-14	1430	Air	2		X	X				
[redacted]												
IVEFF	02 AB	8-11-14	1435	Air	2		X	X				

Samples received at 25 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	8-13-14	1400
Received by:	HONG NGUYEN	FBI	V	
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

September 30, 2014

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 September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409471 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
STN0930R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409471 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409471 -01	1VINF
409471 -02	1VEFF

All quality control requirements were acceptable.

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409471
Date Extracted: 09/25/14
Date Analyzed: 09/25/14

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)
1VINF 409471-01	<0.1	0.23	0.54	1.6	140	92
1VEFF 409471-02	<0.1	<0.1	<0.1	<0.3	<10	91
Method Blank 04-1915 MB	<0.1	<0.1	<0.1	<0.3	<10	84

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409471

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: 409469-01 (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	86	70-130
Toluene	mg/m^3	5.0	86	70-130
Ethylbenzene	mg/m^3	5.0	90	70-130
Xylenes	mg/m^3	15	87	70-130
Gasoline	mg/m^3	100	110	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.

409471

SAMPLE CHAIN OF CUSTODY

ME 09/25/14

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

SAMPLERS (signature) Antonella Vadon
PROJECT NAME/NO. TOC-MLT
PO# 20371408J
REMARKS

Page # ____ 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	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW	01 AB	9-25-14	0855	Air	2		X	X										
INEFF	02 AB	9-25-14	0855	Air	2		X	X										
																		Samples received at 22 °C

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Antonella Vadon	Antonella Vadon	Stantec	9-25-14	0900
Received by:	Eric Young	FEB	9/25/14	1030
Relinquished by:				
Received by:				

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

Unit 2: TOC/Farmasonis Property (24225)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407161 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407161 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407161 -01	2VINF
407161 -02	2VEFF

Gasoline was detected in the NWTPH-Gx method blank due to carryover from a previous sample. No gasoline range material was detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407161
Date Extracted: 07/11/14
Date Analyzed: 07/11/14

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)
2VINF 407161-01	<0.1	<0.1	<0.1	<0.3	<10	93
2VEFF 407161-02	<0.1	<0.1	<0.1	<0.3	<10	92
Method Blank 04-1428 MB	<0.1	<0.1	<0.1	<0.3	10 c	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407161

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: 407160-02 (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	77	70-130
Toluene	mg/m^3	5.0	81	70-130
Ethylbenzene	mg/m^3	5.0	85	70-130
Xylenes	mg/m^3	15	83	70-130
Gasoline	mg/m^3	100	109	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.

407161

SAMPLE CHAIN OF CUSTODY

ME 7/10/14

Send Report To Rebekah Brooks
Company STanTec
Address 19101 36th Ave. W. STE203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 203714085
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	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2V INF	01 A-B	7-9-14	1530	Air	2		X	X										
2V EFF	02	7-9-14	1535	Air	2		X	X										

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	9-10-14	1000
Received by: Thao Molsness	Thao Molsness	F&BI	7/10/14	12:30
Relinquished by:				
Received by:				

Samples received at 27 °C

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.

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408209 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408209 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408209 -01	2VINF
408209 -02	2VEFF

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408209
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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)
2VINF 408209-01	<0.1	<0.1	<0.1	<0.3	<10	92
2VEFF 408209-02	<0.1	<0.1	<0.1	<0.3	<10	91
Method Blank 04-1643 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408209

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: 408198-01 (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	75	70-130
Toluene	mg/m^3	5.0	77	70-130
Ethylbenzene	mg/m^3	5.0	76	70-130
Xylenes	mg/m^3	15	80	70-130
Gasoline	mg/m^3	100	106	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.

408209

SAMPLE CHAIN OF CUSTODY

ME 8/13/14

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36th ave STE 203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4944 Fax # 425-977-4944

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC - MLT

PO# 20371408S

REMARKS Otm Air Unit 2

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by

SAMPLE DISPOSAL
- [x] 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												
2VINF	01 AB	8-11-14	1440	Air	2		X	X										
2VEFF	02 AB	8-11-14	1445	Air	2		X	X										
																		Samples received at 25 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	8-13-14	1400
Received by:	HONG NGUYEN	FBI	V	
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

September 30, 2014

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 September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409470 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
STN0930R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409470 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409470 -01	2VEFF

All quality control requirements were acceptable.

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409470
Date Extracted: 09/25/14
Date Analyzed: 09/25/14

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 409470-01	<0.1	<0.1	<0.1	<0.3	<10	78
Method Blank 04-1915 MB	<0.1	<0.1	<0.1	<0.3	<10	84

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409470

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: 409469-01 (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	86	70-130
Toluene	mg/m^3	5.0	86	70-130
Ethylbenzene	mg/m^3	5.0	90	70-130
Xylenes	mg/m^3	15	87	70-130
Gasoline	mg/m^3	100	110	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.

409470

SAMPLE CHAIN OF CUSTODY ME 09/25/14

Send Report To Rebekah Bracks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood

Phone # _____ Fax # _____

SAMPLERS (signature) [signature]

PROJECT NAME/NO. TCC-MLT

PO# 20514057

REMARKS

Page # _____ 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	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
2VEFF	01 AB	9-25-14	0845	Air	2		X	X										
																		Samples received at 22 °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: [signature]	Rebekah Bracks	Stantec	9-25-14	0900
Received by: [signature]	Eric Hoover	FEB	9/25/14	1030
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Unit 3: Drake Property (24309)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407162 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407162 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407162 -01	3VINF
407162 -02	3VEFF

Gasoline was detected in the NWTPH-Gx method blank due to carryover from a previous sample. No gasoline range material was detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407162
Date Extracted: 07/11/14
Date Analyzed: 07/11/14

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)
3VINF 407162-01	<0.1	<0.1	<0.1	<0.3	<10	88
3VEFF 407162-02	<0.1	<0.1	<0.1	<0.3	<10	88
Method Blank 04-1428 MB	<0.1	<0.1	<0.1	<0.3	10 c	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407162

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: 407160-02 (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	77	70-130
Toluene	mg/m^3	5.0	81	70-130
Ethylbenzene	mg/m^3	5.0	85	70-130
Xylenes	mg/m^3	15	83	70-130
Gasoline	mg/m^3	100	109	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.

407162

SAMPLE CHAIN OF CUSTODY

ME 7/10/14

Page # 1 of 1

Send Report To Rebekah Brooks
Company STantec
Address 19101 36Th Ave. W. STE203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4944 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 2037408S
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
3VINF	01 A-B	7-9-14	1605	Air	2		X	X										
3VEFF	02	7-9-14	1610	Air	2		X	X										

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	7-10-14	1000
Received by: Thao Molness	Thao Molness	F&BI	7/10/14	12:30
Relinquished by:				
Received by:				

Samples received at 27 °C

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408210 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408210 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408210 -01	3VINF
408210 -02	3VEFF

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408210
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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)
3VINF 408210-01	<0.1	<0.1	<0.1	<0.3	<10	90
3VEFF 408210-02	<0.1	<0.1	<0.1	<0.3	<10	90
Method Blank 04-1643 MB	<0.1	<0.1	<0.1	<0.3	<10	86

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408210

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: 408198-01 (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	75	70-130
Toluene	mg/m^3	5.0	77	70-130
Ethylbenzene	mg/m^3	5.0	76	70-130
Xylenes	mg/m^3	15	80	70-130
Gasoline	mg/m^3	100	106	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.

408210

SAMPLE CHAIN OF CUSTODY ME 8/13/14

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36th ave, STE 203
City, State, ZIP Lynnwood, Wa, 98036
Phone # 425-977-4944 Fax # 425-977-4944

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 203714085
REMARKS O+M Air UNIT 3

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
3VINF	01 AB	8-1-14	1450	Air	2		X	X										
3V EFF	02 AB	8-1-14	1455	Air	2		X	X										
																		Samples received at 25 °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:	Dana Hutchins	Dana Hutchins	STANTEC	8-13-14	1400
Received by:		HONGNG NGUYEN	FBI	V	
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

September 30, 2014

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 September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409469 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
STN0930R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409469 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409469 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409469
Date Extracted: 09/25/14
Date Analyzed: 09/25/14

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 409469-01	<0.1	<0.1	<0.1	<0.3	<10	89
Method Blank 04-1915 MB	<0.1	<0.1	<0.1	<0.3	<10	84

Date of Report: 09/30/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409469

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: 409469-01 (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	86	70-130
Toluene	mg/m^3	5.0	86	70-130
Ethylbenzene	mg/m^3	5.0	90	70-130
Xylenes	mg/m^3	15	87	70-130
Gasoline	mg/m^3	100	110	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.

409469

SAMPLE CHAIN OF CUSTODY

ME 09/25/14

Page # _____ of _____

Send Report To Rebekah Blacks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood WA 98036

Phone #425-977-4994 Fax # _____

SAMPLERS *(signature)* AVadov

PROJECT NAME/NO. TOC-MLT

PO# 2037/4085

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
3YEF7	01 A B	9-25-14	0850	Air	2		X	X										
																		Samples received at 22 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadov	Antonelo Vador	Stantec	9-25-14	0900
Received by:	Eric Holzer	FedEx	9/25/14	10:20
Relinquished by:				
Received by:				

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

Appendix B

Laboratory Analytical Reports – Water

Unit 1: TOC Property (24205)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407164 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407164 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407164 -01	1WINF
407164 -02	1WEFF
407164 -03	1GAC1
407164 -04	1GAC2
407164 -05	TB-071014-1

All quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407164
Date Extracted: 07/10/14
Date Analyzed: 07/10/14 and 07/11/14

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 407164-01	1.7	35	<1	350	2,500	95
1WEFF 407164-02	<1	<1	<1	<3	<100	91
1GAC1 407164-03	<1	<1	<1	<3	<100	90
1GAC2 407164-04	<1	<1	<1	<3	<100	90
TB-071014-1 407164-05	<1	<1	<1	<3	<100	89
Method Blank 04-1427 MB	<1	<1	<1	<3	<100	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407164

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

Laboratory Code: 407164-02 (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	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	95	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	97	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.

407164

SAMPLE CHAIN OF CUSTODY

ME 07-10-14

V3

Page # 1 of 1

Send Report To Rebekah Brooks
Company STanTec
Address 19101 36th Ave. West STE203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC - MLT

PO# 203714085

REMARKS

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by

SAMPLE DISPOSAL
- [x] 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
IWINF	01A-C	7-9-14	1415	W	3		X	X										
IWEFF	02	7-9-14	1400	W	3		X	X										
IGAC1	03	7-9-14	1410	W	3		X	X										
IGAC2	04	7-9-14	1405	W	3		X	X										
TB-071014-1	05			W	1		X	X										

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	7-10-14	1000
Received by: Dave	DD VO	FBI	11	1245
Relinquished by:				
Received by:		Samples received at 5 °C		

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408205 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408205 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408205 -01	1WINF
408205 -02	1WEFF
408205 -03	1GAC1
408205 -04	1GAC2
408205 -05	TB-081314

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408205
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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 408205-01	<1	1.5	<1	15	180	88
1WEFF 408205-02	<1	<1	<1	<3	<100	93
1GAC1 408205-03	<1	<1	<1	<3	<100	90
1GAC2 408205-04	<1	<1	<1	<3	<100	89
TB-081314 408205-05	<1	<1	<1	<3	<100	89
Method Blank 04-1641 MB	<1	<1	<1	<3	<100	88

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408205

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: 408185-04 (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	86	65-118
Toluene	ug/L (ppb)	50	89	72-122
Ethylbenzene	ug/L (ppb)	50	88	73-126
Xylenes	ug/L (ppb)	150	89	74-118
Gasoline	ug/L (ppb)	1,000	95	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.

408205

SAMPLE CHAIN OF CUSTODY ME 8/13/14 V3

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36TH ave, STE 203
City, State, ZIP Lynnwood, Wa, 98036
Phone # 425-977-4994 Fax # 425-977-4995

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC-MLT

PO# 20371408S

REMARKS Otm water unit 1

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by

SAMPLE DISPOSAL
- [x] 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
IW INF	01 A-C	8-12-14	[redacted]1120	W	3		X	X										
IW EFF	02	8-12-14	[redacted]1125	W	3		X	X										
1GAC1	03	8-12-14	1130	W	3		X	X										
1GAC2	04	8-12-14	1135	W	3		X	X										
TB-081314	05	—	—	W	1		X	X										
																		Received at 4 °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	8-13-14	1400
Received by:	Eric Foua	F-B	8/13/14	1400
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

September 25, 2014

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 September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409355 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
STN0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409355 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409355 -01	1WINF
409355 -02	1WEFF
409355 -03	1GAC1
409355 -04	1GAC2
409355 -05	TB-091914

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409355
Date Extracted: 09/22/14
Date Analyzed: 09/22/14

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 50-150)
1WINF 409355-01	<1	<1	<1	<3	<100	89
1WEFF 409355-02	<1	<1	<1	<3	<100	90
1GAC1 409355-03	<1	<1	<1	<3	<100	88
1GAC2 409355-04	<1	<1	<1	<3	<100	89
TB-091914 409355-05	<1	<1	<1	<3	<100	89
Method Blank 04-1909 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409355

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: 409355-02 (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: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	100	100	50-150	0
Toluene	ug/L (ppb)	50	<1	99	99	50-150	0
Ethylbenzene	ug/L (ppb)	50	<1	96	97	50-150	1
Xylenes	ug/L (ppb)	150	<3	88	89	50-150	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	102	72-119
Toluene	ug/L (ppb)	50	101	71-113
Ethylbenzene	ug/L (ppb)	50	99	72-114
Xylenes	ug/L (ppb)	150	91	72-113
Gasoline	ug/L (ppb)	1,000	87	70-119

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.

409355

SAMPLE CHAIN OF CUSTODY ME 9/19/14 V1

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) AVadon
PROJECT NAME/NO. TOC-MLT
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
1WINF	01A-C	9-17-14	1435	Water	3		X	X										
1WEFF	02A-C		1430		3		X	X										
[redacted] 1GAC1	03A-C		1440		3		X	X										
[redacted] 1GAC2	04A-C		1445		3		X	X										
TB-091914	05	–	–	Water	1		X	X										
																		[redacted] 4

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: AVadon	Antonelo Vadon	Stantec	9-19-14	1500
Received by:	Matt Laughlin	FBI	9/19/14	1500
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Unit 2: TOC/Farmasonis Property (24225)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407165 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407165 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407165 -01	2WINF
407165 -02	2WEFF
407165 -03	2GAC1
407165 -04	2GAC2

All quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407165
Date Extracted: 07/11/14
Date Analyzed: 07/11/14

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 407165-01	<1	<1	<1	<3	<100	90
2WEFF 407165-02	<1	<1	<1	<3	<100	91
2GAC1 407165-03	<1	<1	<1	<3	<100	91
2GAC2 407165-04	<1	<1	<1	<3	<100	92
Method Blank 04-1427 MB	<1	<1	<1	<3	<100	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407165

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: 407164-02 (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	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	95	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	97	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.

407165

SAMPLE CHAIN OF CUSTODY

ME 07-10-14

Page # 1 of 1

Send Report To Rebekah Brooks
Company STanTec
Address 19101 36Th Ave. West STE 203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 203714085
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
2WINF	01A-C	7-9-14	1515	W	3		X	X										
2WEFF	02	7-9-14	1500	W	3		X	X										
2GAC1	03	7-9-14	1505	W	3		X	X										
2GAC2	04	7-9-14	1510	W	3		X	X										

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	7-10-14	1000
Received by: Dana	Dana	F&B	11	1245
Relinquished by:				
Received by:		Samples received at 5 °C		

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408207 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408207 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408207 -01	2WINF
408207 -02	2WEFF
408207 -03	2GAC1
408207 -04	2GAC2

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408207
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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 408207-01	<1	<1	<1	<3	<100	86
2WEFF 408207-02	<1	<1	<1	<3	<100	87
2GAC1 408207-03	<1	<1	<1	<3	<100	88
2GAC2 408207-04	<1	<1	<1	<3	<100	86
Method Blank 04-1641 MB	<1	<1	<1	<3	<100	88

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408207

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: 408185-04 (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	86	65-118
Toluene	ug/L (ppb)	50	89	72-122
Ethylbenzene	ug/L (ppb)	50	88	73-126
Xylenes	ug/L (ppb)	150	89	74-118
Gasoline	ug/L (ppb)	1,000	95	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.

408207

SAMPLE CHAIN OF CUSTODY ME 8/13/14 V3

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36TH ave, STE 203
City, State, ZIP Lynnwood, Wa, 98036
Phone # 425-977-4944 Fax # 425-977-4995

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 20371405
REMARKS OTM water Unit 2

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
2WINF	01 AS	8-12-14	1530	W	3		X	X										
2WEFF	02	8-12-14	1535	W	3		X	X										
2GAC1	03	8-12-14	1540	W	3		X	X										
2GAC2	04	8-12-14	1545	W	3		X	X										
																		Samples received at 4 °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: Dana Hutchins	Dana Hutchins	STANTEC	8-13-14	1400
Received by:	Eric Glover	F&B	8/13/14	1400
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

September 25, 2014

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 September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409357 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
STN0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409357 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409357 -01	2WINF
409357 -02	2WEFF
409357 -03	2GAC1
409357 -04	2GAC2

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409357
Date Extracted: 09/22/14
Date Analyzed: 09/22/14

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 409357-01	<1	<1	<1	<3	<100	95
2WEFF 409357-02	<1	<1	<1	<3	<100	96
2GAC1 409357-03	<1	<1	<1	<3	<100	93
2GAC2 409357-04	<1	<1	<1	<3	<100	94
Method Blank 04-1909 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409357

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: 409355-02 (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: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	100	100	50-150	0
Toluene	ug/L (ppb)	50	<1	99	99	50-150	0
Ethylbenzene	ug/L (ppb)	50	<1	96	97	50-150	1
Xylenes	ug/L (ppb)	150	<3	88	89	50-150	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	102	72-119
Toluene	ug/L (ppb)	50	101	71-113
Ethylbenzene	ug/L (ppb)	50	99	72-114
Xylenes	ug/L (ppb)	150	91	72-113
Gasoline	ug/L (ppb)	1,000	87	70-119

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.

409357

SAMPLE CHAIN OF CUSTODY

ME 9/19/14 V3

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

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

Page # 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	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2WINF	01	9-17-14	1505	Water	3		X	X										
2WEFF	02		1510		3		X	X										
[redacted] 2GAC1	03		1515		3		X	X										
[redacted] 2GAC2	04		1520		3		X	X										
														Samples received at 4 °C				

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Avadon	Antonelo Vadon	Stantec	9-19-14	1500
Received by:	HONG NGUYEN	FBB	9/19/14	
Relinquished by:				
Received by:				

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

Unit 3: Drake Property (24309)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 15, 2014

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 July 10, 2014 from the TOC_01-176, WORFDB8 F&BI 407166 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
STN0715R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 10, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 407166 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
407166 -01	3WINF
407166 -02	3WEFF
407166 -03	3GAC1
407166 -04	3GAC2

All quality control requirements were acceptable.

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407166
Date Extracted: 07/11/14
Date Analyzed: 07/11/14

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 407166-01	<1	<1	<1	3.8	130	85
3WEFF 407166-02	<1	<1	<1	<3	<100	90
3GAC1 407166-03	<1	<1	<1	<3	<100	90
3GAC2 407166-04	<1	<1	<1	<3	<100	91
Method Blank 04-1427 MB	<1	<1	<1	<3	<100	90

Date of Report: 07/15/14
Date Received: 07/10/14
Project: TOC_01-176, WORFDB8 F&BI 407166

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: 407164-02 (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	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	95	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	97	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.

407166

SAMPLE CHAIN OF CUSTODY

ME 07-10-14 V3

Page # 1 of 1

Send Report To Rebekah Brooks
Company STanTec
Address 19101 36th Ave, W. STE 203
City, State, ZIP Lynnwood, WA 98036
Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO.: TOC- MLT

PO#: 203714085

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
3WINF	01A-C	7-9-14	1600	W	3		X	X										
3WEFF	02	7-9-14	1545	W	3		X	X										
3GAC1	03	7-9-14	1555	W	3		X	X										
3GAC2	04	7-9-14	1550	W	3		X	X										

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	9-10-14	1000
Received by:	Dana	Dana	F&BE	11	1245
Relinquished by:					
Received by:					

Samples received at 5 °C

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

August 19, 2014

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 August 13, 2014 from the TOC_01-176, WORFDB8 F&BI 408206 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
STN0819R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 408206 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
408206 -01	3WINF
408206 -02	3WEFF
408206 -03	3GAC2

All quality control requirements were acceptable.

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408206
Date Extracted: 08/14/14
Date Analyzed: 08/14/14

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 408206-01	<1	<1	<1	<3	<100	86
3WEFF 408206-02	<1	<1	<1	<3	<100	87
3GAC2 408206-03	<1	<1	<1	<3	<100	86
Method Blank 04-1641 MB	<1	<1	<1	<3	<100	88

Date of Report: 08/19/14
Date Received: 08/13/14
Project: TOC_01-176, WORFDB8 F&BI 408206

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: 408185-04 (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	86	65-118
Toluene	ug/L (ppb)	50	89	72-122
Ethylbenzene	ug/L (ppb)	50	88	73-126
Xylenes	ug/L (ppb)	150	89	74-118
Gasoline	ug/L (ppb)	1,000	95	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.

408206

SAMPLE CHAIN OF CUSTODY ME 8/13/14 V3

Page # 1 of 1

Send Report To REBEKAH BROOKS
Company STANTEC
Address 19101 36th ave, STE 203
City, State, ZIP Lynnwood, Wa, 98036
Phone # 425-977-4444 Fax # 425-977-4995

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC-MLT
PO# 203714085
REMARKS Otm water unit 3

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
3WINF	01A-C	8-13-14	0900	W	3		X	X									
3WEFF	02	8-13-14	0905	W	3		X	X									
3GAC2	03	8-13-14	1910	W	3		X	X									

ANALYSES REQUESTED

received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	8-13-14	1400
Received by:	Eric Laura	F&B	8/13/14	1400
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

September 25, 2014

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 September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409358 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
STN0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409358 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409358 -01	3WINF
409358 -02	3WEFF
409358 -03	3GAC2

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409358
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

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 409358-01	<1	<1	<1	<3	<100	86
3WEFF 409358-02	<1	<1	<1	<3	<100	88
3GAC2 409358-03	<1	<1	<1	<3	<100	89
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/25/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409358

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: 409358-02 (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	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	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.

409358 ME 9/19/14 V3

SAMPLE CHAIN OF CUSTODY

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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) A Vadon
PROJECT NAME/NO. TOC-MLT
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
						ANALYSES REQUESTED												
3W INF	01A	9-17-14	1535	water	3		X	X										
3W EFF	02		1540		3		X	X										
3 GAC 2	03		1550		3		X	X										
																		Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: A Vadon	Amanda Vadon	Stantec	9-19-14	1500
Received by:	HONG NGUYEN	FBI	V	
Relinquished by:				
Received by:				

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