Operations & Maintenance Report
First Quarter 2015

TOC Holdings Co.
Facility No. 01-176
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Mountlake Terrace WA 98043

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Sign-off Sheet

This document entitled ***Operations and Maintenance Report, First Quarter 2015***, 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 Stantec 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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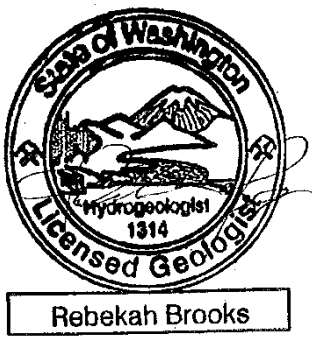

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Stantec

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Acronyms & Abbreviations

µg/L	micrograms per liter
1Q2015	First Quarter 2015
4Q2014	Fourth Quarter 2014
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/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mL	milliliter
MPE	Multi-Phase Extraction
MSDS	Material Safety Data Sheets
MTCA	Model Toxics Control Act
NOC	Notice of Construction
O&M	Operation and Maintenance
OWS	Oil/Water Separator
ppm	parts per million
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
THPS	Tetrakis-Hydroxymethyl Phosphonium Sulfate
TOC	TOC Holdings Co.
VOC	Volatile Organic Compound

1.0 INTRODUCTION

On behalf of TOC Holdings Co. (TOC), this report documents the **First Quarter 2015 (1Q2015)** operation and maintenance (O&M) activities performed by Stantec Consulting Services Inc. (Stantec; as a subconsultant to HydroCon Environmental, LLC [HydroCon]). Field activities associated with interim remedial actions were conducted from January through March 2015 at Facility No. 01-176 located in Mountlake Terrace, Snohomish County, Washington (**Figure 1**).

1.1 SCOPE OF WORK

Ongoing interim remedial actions are conducted under Agreed Order (AO) No. DE 8661, entered in October 2011 between TOC and the Washington State Department of Ecology (Ecology 2011) at TOC's Facility No. 01-176. The O&M scope of work is defined in the *Interim Remedial Action Work Plan* (IRAWP) prepared by the previous consultant overseeing the project, SoundEarth Strategies, Inc. (SES), and is included as Exhibit C of the AO (SES 2011). Per the requirements of the IRAWP, the O&M scope of work includes monthly and quarterly field events.

As specified in the IRAWP, the "TOC Site" encompasses the following four properties located in Mountlake Terrace, Washington (**Figure 2**):

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

Elements of the O&M scope of work defined in the IRAWP encompass the four properties identified as the "TOC Site" as well as the following two adjacent properties:

- **Shin/Choi Property:** 24325 56th Avenue West (downgradient of the TOC Site)
- **242nd Street Southwest ROW:** adjacent to the TOC Property (upgradient of the TOC Site)

Following completion of the IRAWP, monitoring wells were installed on the following property:

- **Herman Property:** 24311 56th Avenue West (downgradient of the TOC Site)

O&M activities are conducted to document the performance of three multi-phase extraction (MPE) remediation systems (described in Section 2.0) located on the TOC Site. The MPE remediation systems were 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.

1.2 1Q2015 O&M ACTIVITIES

This report includes a description of the MPE systems, permit compliance, and performance and optimization efforts. A summary of the MPE system performance and maintenance activities performed by Stantec from January through March 2015 is provided below.

- O&M consisted of routine, scheduled maintenance activities (as described in the O&M Manual), as well as the following activities:
  - routine bag filter replacements;
  - containment level switch replacement in the Granular-Activated Carbon (GAC) containment tray of Unit 1;
  - replacement of GAC drum at Unit 2, due to faulty drum that was installed during the Fourth Quarter 2014 (4Q2014);
  - blower maintenance on all blowers (Units 1, 2, and 3);
  - subsequent blower replacement at Unit 2; and
  - removal of CatOx unit at Unit 1.
- A combined total of 11.9 pounds of vapor-phase hydrocarbons was removed during this reporting period, and a cumulative total of approximately 3,050 pounds has been removed since startup in October 2012.
- A combined total volume of 409,450 gallons of groundwater was extracted, treated and discharged during this period. The total volume of water processed since system startup is approximately 2,871,763 gallons.
- No light nonaqueous-phase liquid (LNAPL) was observed or recovered from the three MPE systems during this quarter. Also, the oil/water separator (OWS) for each system was inspected, and no LNAPL was visible 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 GAC canisters. These activities are described in more detail in the following sections.

2.0 REMEDIATION SYSTEM DESCRIPTION

The following sections provide 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 LNAPL. The DPE system operated from February 1997 to June 2005 and was later removed following confirmation that the system effectively remediated Shallow Zone groundwater (SES 2013). In 2006, groundwater monitoring results collected by SES confirmed gasoline-related contamination extended directly downgradient of the TOC Property to the south and west.

Between 1992 and 2013, site investigations were conducted to determine the extent of petroleum contamination and led to the installation of 107 monitoring and remediation wells on the TOC Site and three adjacent properties (a portion of the 242nd Street Southwest ROW and the downgradient Herman and Shin/Choi properties). Six wells have been decommissioned. Currently, 101 active monitoring and remediation wells are installed in three groundwater zones (defined as Shallow, Intermediate and Deep) on the TOC Site and three adjacent properties. Of the 101 active monitoring and remediation wells, 20 are installed in the Shallow Zone, 60 are installed in the Intermediate Zone, six wells are in the Deep Zone, and 15 wells have well screens intersecting multiple groundwater zones (either shallow-intermediate or intermediate-deep). The three groundwater zones are further discussed in the quarterly and annual groundwater monitoring reports prepared by Stantec.

In accordance with the AO entered between Ecology and TOC in October 2011 (described in Section 1.1), SES initiated a remedial investigation (RI) at the TOC Site and determined that remediation by the former DPE system in the Shallow Zone was effective, the DPE system was removed and three MPE systems were installed in the Intermediate Zone between November 2011 and August 2012. The three MPE systems (Units 1, 2 and 3) began operating in October 2012. MPE is an *in situ* remedial technology that simultaneously extracts multiple fluid phases from remediation wells. The phases generally include vapor phase, dissolved phase (i.e., groundwater), and LNAPL or free product.

2.2 SYSTEM CONFIGURATIONS

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 22 remediation wells serve the three MPE systems: eight wells on the TOC Property, six wells on the TOC/Farmasonis Property, and eight wells on the Drake Property (**Figure 3**).

It should be noted that MW15 (installed on the TOC Property) and MW84 (installed on the Drake Property) were originally plumbed as remediation wells connected to Unit 1 and Unit 3, respectively, but currently serve as monitoring wells. The pump in MW15 was removed by Stantec on December 16, 2014 due to the consistent presence of biological buildup in the well. The pump in MW84 was removed by SES on September 17, 2013. Documentation of the purpose for removing the pump from MW84 does not exist in the SES files acquired by Stantec.

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

Wells Serving MPE Remediation Systems

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

The individual MPE equipment enclosures were custom fabricated in accordance with the Washington State Department of Labor and Industry requirements for factory-assembled structures. Each of the remediation wells is equipped with a down-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 previously through a catalytic oxidizer (CatOx). The systems were recently modified to remove the CatOx, as described in Section 2.3. The AWS removes particulate and liquids from the air stream to prevent damage to the SVE blower and ancillary equipment. Previously, the vapors were thermally treated by the CatOx prior to being discharged to the atmosphere, in accordance with the Puget Sound Clean Air Agency (PSCCA) Notice of Construction (NOC) No. 10384.

2.3 SYSTEM MODIFICATIONS

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

- Installation of bottom-loading extraction pumps at MW57 and MW96 to increase the drawdown at/near these locations where concentrations of gasoline-range petroleum hydrocarbons (GRPH) exceed the Washington State Model Toxic Control Act (MTCA) Method A cleanup levels.
- Installation of a new float switch in OWS in Unit 1. This float switch was placed approximately three inches higher than the previous one, and will assist in OWS high-level alarm shut-downs.
- Notification was provided to PSCAA on February 2, 2015, regarding shut-down of the CatOx unit at Unit 1 and commencing the 30-day notice for the CatOx removal. On February 9, 2015, PSCAA gave approval to remove the CatOx (waiving the 30-day notice), and on February 13, 2015 the CatOx unit at Unit 1 was shut-down, with SVE emissions being vented directly to the atmosphere. If any future values from the vapor effluent at any of the units exceed 0.5 ppmv for benzene, or 50 ppmv for GRPH, the respective CatOx unit(s) will be reactivated. As described in the *Third Quarter 2014 O&M Report* (Stantec 2015a), the CatOx units at Units 2 and 3 were removed on August 29, 2014.
- In order to protect the CatOx units, bypass piping and stacks were installed to prevent flow from entering the CatOx (when they are allowed to be shut-down). Bypass piping and stacks were installed at all three units on February 20 and 23, 2015.
- Installation of components for biocide, including pre-filters (bag filter treatment prior to the OWS). Full implementation of the biocide treatment is anticipated in the Second Quarter 2015 (pending approval by Ecology).

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 monthly 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. As discussed in Section 2.3, the CatOx systems at all three systems have been removed. Samples continue to be collected on a monthly basis to monitor the concentrations of benzene and GRPH from the stacks.

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 MTCA Method A Cleanup levels in 17 of the 73 intermediate zone wells, including wells that intersect shallow-intermediate and intermediate-deep zone conditions. (Note that Stantec has re-evaluated the groundwater zone classifications at each well and some wells have been reclassified. This information is included in the groundwater monitoring reports.) Thirteen of these wells are connected to one of the three remediation systems. Based on groundwater data collected during the December 2014 sampling event, BTEX and/or GRPH concentrations in groundwater have decreased and only exceed the MTCA Method A levels in three (MW48, MW57 and MW73)of the 75 active wells installed in the Intermediate Zone, or wells that intersect shallow-intermediate and intermediate-deep zone conditions. One of these wells (MW57) is connected to a remediation system. These data will be presented in the *First Quarter 2015 Groundwater Monitoring Report* prepared by Stantec.

4.1 TOC PROPERTY (UNIT 1)

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

- The MPE operation time this quarter was approximately 67 percent (**Table 1-1**). System down time was attributed to OWS high level conditions, mainly due to bag filter fouling, as well as containment high level in the GAC containment tray. The containment high level in the GAC containment sump was due to a malfunctioning float switch, which was replaced.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 4.2 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was approximately 0.34 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 2,188.4 pounds (**Tables 1-1, 1-2 and 1-3**).
- The volume of groundwater extracted during this reporting period was 103,289 gallons (**Tables 1-1 and 1-3**). The average flow rate of groundwater recovery was 1,122.7 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 0.02 to 0.16 pounds per day (lb/day) during this Quarter (**Table 1-2**).
- The effluent concentration of GRPH exiting the CatOx during the January 2015 event 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**). The effluent concentration of GRPH exiting the SVE system (with the CatOx not being operated, per the PSCAA permit allowance) during the February 2015 and March 2015 events was not detected at concentrations above the laboratory's lower reporting limit of 10 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 (UNIT 2)

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

- The MPE operation time this quarter was approximately 48 percent (**Table 2-1**). System down time was mostly attributed to blower maintenance, and subsequent blower replacement activities. However, the groundwater extraction and treatment portion of the system at Unit 2 was fully operational during the blower down-time. The MPE operation calculation is based upon blower hours; therefore, correlating to the 48 percent operational time.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 2.1 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was 0.02 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 713.9 pounds (**Tables 2-1, 2-2 and 2-3**).
- The volume of groundwater extracted during this reporting period was approximately 39,860 gallons (**Tables 2-1 and 2-3**). The average flow rate of groundwater recovery was 433.3 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 0.00 to 0.07 lb/day during this quarter (**Table 2-2**).
- The effluent concentration of GRPH exiting the SVE system (with the CatOx not being operated, per the PSCAA permit allowance) was not detected at concentrations above the laboratory's lower reporting limit of 10 mg/m^3 (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 (UNIT 3)

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

- The MPE operation time this quarter was approximately 77 percent (**Table 3-1**). System down time was mostly attributed to blower maintenance.
- The vapor-phase hydrocarbon mass removal associated with the SVE system was approximately 5.6 pounds, and aqueous-phase hydrocarbon removal associated with the GAC treatment process was 0.11 pounds for this reporting period. The cumulative vapor-phase and aqueous-phase hydrocarbon removal to date is approximately 162.5 pounds (**Tables 3-1, 3-2 and 3-3**).
- The volume of groundwater extracted during this reporting period was approximately 266,301 gallons (**Tables 3-1 and 3-3**). The average flow rate of groundwater recovery was 2,894.6 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 SVE system (with the CatOx not being operated) was not detected at concentrations above the laboratory's lower reporting limit of 10 mg/m^3 (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 TOLCIDE/AN-400 INJECTION PILOT TEST RESULTS

As described in the *Fourth Quarter 2014 O&M Report* (Stantec 2015b), a pilot test was completed by Stantec at the Unit 1 MPE remediation system located on the TOC Property on November 5, 2014. The pilot test was conducted to evaluate if concentrations of a biocide (Tolcide PS20A) and sequestering agent (AN-400) were observed in the Unit 1 treatment system effluent water above Ecology discharge thresholds following injection.

5.1 BACKGROUND

The MPE remediation system utilizes carbon filtration to remove petroleum hydrocarbon concentrations from extracted groundwater. Since system startup in 2012, bio-fouling has significantly limited the treatment flow rate at Unit 1. To improve system operation, Stantec recommended that a biocide (Tolcide PS20A) and sequestering agent (AN-400) be chemically injected prior to filtration and granular activated carbon treatment.

The active ingredient of the proposed biocide (Tolcide PS20A) is 20% Tetrakis-Hydroxymethyl Phosphonium Sulfate (THPS), which displays rapid control of a broad spectrum of microorganisms. THPS has a benign environmental toxicity profile and degrades rapidly. AN-400 is a sequestering agent specifically formulated with active ingredients that are environmentally safe, and do not promote bio-fouling.

5.2 PILOT TEST

Stantec conducted the Tolcide/AN-400 pilot test on November 5, 2014, as described in the *Fourth Quarter 2014 O&M Report* (Stantec 2015b).

THPS and AN-400 species were not observed in system effluent water based on comparison of the average background values with the average THPS and AN-400 concentrations collected during injection or post-injection monitoring. Color changes noted in the background samples were consistent with (i.e., at the same concentration as) injection and post-injection readings, indicating that no breakthrough of the THPS or AN-400 species occurred during the pilot test. When compared with the average background concentrations, the average effluent concentration of THPS and AN-400 was 0 ppm. Effluent concentrations were also below Ecology's site-specific discharge thresholds (3.6 ppm for THPS and 3 ppm for AN-400).

Following post-injection monitoring, Stantec discharged approximately 250-gallons of water collected during pilot testing to the Unit 1 discharge location. Treated water was discharged based on Ecology's allowable discharge thresholds.

5.3 INJECTION IMPLEMENTATION

Based on the pilot test results, and upon approval from Ecology, Stantec intends to implement injections of Tolcide and AN-400 at Unit 1 (as long as the remediation system is operating), beginning in the Second Quarter of 2015. Stantec coordinated with Ecology's Water Quality Division to establish appropriate discharge thresholds for THPS and AN-400 and for modification of the SWD Permit to include these limits. Ecology approved modification of the permit to include discharge limits of 10 milligrams per liter (mg/L) for THPS and 3.2 mg/L for AN-400. The modified permit was issued by Ecology on May 11, 2015.

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

Per the requirements in the SWD Permit, the concentrations of THPS and AN-400 will be monitored using titration field test kits on a quarterly basis from the effluent sample ports of the first carbon drum and third carbon drum. More frequent monitoring will be conducted if required by Ecology. In the event breakthrough is observed above discharge thresholds, Stantec will replace the spent carbon drum with new granular activated carbon.

6.0 SYSTEM OPTIMIZATION & FUTURE RECOMMENDATIONS

The following is a summary of the **First Quarter 2015** 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 dissolved phase hydrocarbons and 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. These activities will need to be continued, as well as determining the cause of a turbulent flow into Unit 3 OWS.

- 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 3) during previous quarters but has been reduced following installation of a bag filter in 2013. As presented in Section 5.0, a biocide pilot test was conducted during 4Q2014 to increase more effective performance at Unit 1 by reducing the biological byproduct. Full implementation of the biocide treatment at Unit 1 is anticipated to occur in the Second Quarter of 2015.

- 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 all three units (Unit 1, Unit 2, and Unit 3); with the CatOx at Unit 1 being removed from operation in the First Quarter of 2015.

- Concentrations of groundwater samples collected quarterly (at the required sampling locations identified in the IRAWP) from intermediate zone wells installed on the TOC/Farmasonis Property (MW31, MW56, MW58, MW59 and MW66) and the Drake Property (MW65, MW69, MW70, MW77, MW84, MW85, MW86, MW89) have consistently been below MTCA Method A cleanup levels for at least five consecutive quarters (from 1Q2014 through 1Q2015), with the exception of MW69 and MW86. Stantec recommends discontinuing pumping at remediation wells in areas where groundwater concentrations consistently meet MTCA cleanup levels and combining the remaining remediation wells on the Drake Property with the TOC/Farmasonis Property. The existing aboveground piping (for supply air, water, and SVE) from Unit 3 would be connected to Unit 2. Then, all none-functioning extraction wells for both Units 2 (MW41 and MW92, and potentially MW93 and MW94) and Unit 3 (MW70, MW97, MW98, MW99 and MW101) would be shut down at the wellhead, and the unneeded pumps would be removed. At this point, Unit 3 could be shut down completely for increased remediation system efficiency and performance. Following shutdown of Unit 3, Unit 2 would be retrofitted for continuous operation of the groundwater extraction pumps. Additional changes to improve performance, such as shutting down SVE to select wells, could also occur at this time.

7.0 LIMITATIONS

This document entitled, ***Operations & Maintenance Report***, ***First Quarter 2015,*** was prepared by Stantec Consulting Services Inc. (as a subconsultant to HydroCon Environmental, LLC) 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.

8.0 REFERENCES

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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%	35,205	550.1	2.52	917.8
12/05/12	03/04/13	89	36	40%	7,655.9	86.0	0.92	42.1
03/04/13	06/05/13	93	29	31%	4,915.8	52.9	0.61	6.0
06/05/13	09/04/13	91	69	76%	83,540	918.0	3.12	138.0
09/04/13	12/03/13	90	90	100%	75,825	842.5	0.84	698.5
12/03/13	01/31/14	59	26	44%	1,166.2	19.8	0.06	151.7
01/31/14	03/19/14	47	29	63%	29,992	638.1	1.24	28.2
03/19/14	06/16/14	89	70	78%	101,082	1,135.8	2.98	5.4
06/16/14	09/18/14	94	87	92%	101,780	1,082.8	0.65	51.2
09/18/14	12/09/14	82	69	84%	53,355	650.7	0.02	132.0
12/09/14	03/11/15	92	62	67%	103,289	1,122.7	0.34	4.2
Average System Run Time				**67%**				
Totals for Quarter		**92**	**62**	**67%**	**103,289**	**1,122.7**	**0.34**	**4.2**

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 [4]	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
10/22/14	11,881.3	495.05	48	166.5	330	342	220	2.72	2,119.82
11/17/14	12,301.8	512.58	52	175.0	330	341	63	2.17	2,157.88
12/09/14	12,817.3	534.05	52	171.5	330	340	15	0.61	2,170.93
01/13/15	13,215.2	550.63	54	174.4	330	340	<10	0.16	2,173.50
02/18/15	13,815.2	575.63	57	40.9	--	--	--	0.05	2,174.71
03/11/15	14,305.9	596.08	59	51.2	--	--	--	0.02	2,175.14
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
10/22/14	464,280	23,118	680	<100	0.010	12.947
11/17/14	478,016	13,736	528	<100	0.006	12.953
12/09/14	494,517	16,501	750	<100	0.007	12.960
01/13/15	516,310	21,793	623	1,500	0.273	13.233
02/18/15	559,454	43,144	1,198	150	0.054	13.287
03/11/15	597,806	38,352	1,826	<100	0.016	13.303
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*
10/22/14	220	<0.1	3.0	<0.1	3.3	<10	<0.1	<0.1	<0.1	<0.3	*97.7*
11/18/14	63	<0.1	0.57	<0.1	0.72	<10	<0.1	<0.1	<0.1	<0.3	*92.1*
12/09/14	15	<0.1	0.29	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	*66.7*
01/13/15	<10	<0.1	<0.1	<0.1	<0.3	<10	<0.1	<0.1	<0.1	<0.3	--
02/28/15	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
03/11/15	--	--	--	--	--	<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 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
10/22/14	<100	<1	1.4	<1	4.0	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.19
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.56
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	13.3	7.29
01/13/15	1,500	<1	35	<1	270	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.37
02/18/15	150	<1	3.3	<1	25	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.25
03/11/15	<100	<1	<1	<1	8.5	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.15
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	52	82%	12,858.4	204	0.01	477.4
12/05/12	03/04/13	89	52	59%	5,899.6	66	0.00	9.1
03/04/13	06/05/13	93	67	72%	106,670	1,147	0.23	4.9
06/05/13	09/04/13	91	82	90%	123,303	1,355	0.05	6.2
09/04/13	12/03/13	90	90	100%	89,204.3	991	0.05	99.6
12/03/13	01/13/14	41	41	100%	29,086.8	709	0.01	54.6
01/13/14	02/07/14	25	19	75%	9,853.8	394	0.00	18.3
02/07/14	06/16/14	129	108	84%	187,016	1,450	0.08	31.6
06/16/14	09/18/14	94	91	97%	120,848	1,286	0.05	6.2
09/18/14	12/09/14	82	54	66%	19,301	235.4	0.01	3.3
12/09/14	03/11/15	92	44	48%	39,860	433.3	0.02	2.1
Average System Run Time				**79%**				
Totals for Quarter		**92**	**43.8**	**48%**	**39,860**	**433.3**	**0.02**	**2.1**

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	--	--	--	*0.07*	708.02
10/22/14	14,721.8	613.4	45	72.7	--	--	--	*0.05*	708.55
11/17/14	15,242.7	635.1	47	166.6	--	--	--	*0.05*	709.72
12/09/14	15,767.5	657.0	49	156.5	--	--	--	*0.07*	711.31
01/13/15	16,495.6	687.3	56	155.8	--	--	--	*0.07*	713.44
02/18/15	16,818.0	700.8	--	--	--	--	--	*0.00*	713.44
03/11/15	16,818.0	700.8	--	--	--	--	--	*0.00*	713.44
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 (8.99×10^{-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
10/22/2014	687370	2,630	77	<100	*0.001*	0.486
11/17/2014	695157	7,787	300	<100	*0.003*	0.489
12/9/2014	704041	8,884	404	<100	*0.004*	0.493
1/13/2015	725601	21,560	616	<100	*0.009*	0.502
2/18/2015	736017	10,416	289	<100	*0.004*	0.506
3/11/2015	743901	7,884	375	<100	*0.003*	0.510
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	--
10/22/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
11/18/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
12/09/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
01/13/15	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
02/18/15	--	--	--	--	--	--	--	--	--	--	--
03/11/15	--	--	--	--	--	--	--	--	--	--	--
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
10/22/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	5.92
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.83
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	<1	7.29
01/13/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.45
02/18/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.07
03/11/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.26
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%	71,160.2	1,111.9	0.03	31.5
12/05/12	03/04/13	89	73.3	82%	30,268.8	340.1	0.26	37.6
03/04/13	06/05/13	93	39.6	43%	74,015.9	795.9	0.49	2.7
06/05/13	09/04/13	91	58.1	64%	68,178.7	749.2	0.16	4.6
09/04/13	12/03/13	90	75.8	84%	211,043	2,344.9	0.09	6.3
12/03/13	01/13/14	41	41.0	100%	40,409.7	985.6	0.02	3.4
01/13/14	03/18/14	64	58.0	91%	132,724	2,073.8	0.06	50.4
03/18/14	06/16/14	90	71.3	79%	206,572	2,295.2	0.09	5.9
06/16/14	09/18/14	94	85.2	91%	225,458	2,398.5	0.13	7.0
09/18/14	12/09/14	82	70.8	86%	203,925	2,486.9	0.09	5.9
12/09/14	03/11/15	92	70.6	77%	266,301	2,894.6	0.11	5.6
Average System Run Time				**79%**				
Totals for Quarter		**92**	**70.6**	**77%**	**266,301**	**2,894.6**	**0.11**	**5.6**

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	--	--	--	*0.1*	149.54
10/22/14	14,047.2	585.3	18	185.2	--	--	--	*0.1*	151.54
11/17/14	14,646.6	610.3	19	189.1	--	--	--	*0.1*	153.64
12/09/14	15,168.6	632.0	19	185.6	--	--	--	*0.1*	155.47
01/13/15	15,889.0	662.0	8	187.9	--	--	--	*0.1*	157.99
02/18/15	16,369.4	682.1	64	160.7	--	--	--	*0.1*	159.56
03/11/15	16,862.8	702.6	69	157.1	--	--	--	*0.1*	161.03
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		
	Flow Totalizer	Treated Between Visits	Average Flow Rate	Influent GRPH Concentration	GRPH Removed[1] [2] [3]	Cumulative GRPH Removed[3] [4]
Date	(gallons)	(gallons)	(gallons/day)	(µg/L)	(lb)	(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*
10/22/14	1,142,560	82,730	2,433	<100	*0.035*	*1.347*
11/17/14	1,205,945	63,385	2,438	<100	*0.026*	*1.374*
12/09/14	1,263,755	57,810	2,628	<100	*0.024*	*1.398*
01/13/15	1,351,575	87,820	2,509	<100	*0.037*	*1.435*
02/18/15	1,463,712	112,137	3,115	<100	*0.047*	*1.481*
03/11/15	1,530,056	66,344	3,159	<100	*0.028*	*1.509*
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)										GRPH DRE [5]
	Influent Vapor Samples[1]					Effluent Vapor Samples[2]					
	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	--
10/22/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
11/18/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
12/09/14	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
01/13/15	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
02/18/15	--	--	--	--	--	<10	<0.1	<0.1	<0.1	<0.3	--
03/11/15	--	--	--	--	--	<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 = $(1-[GRPH_{influent}/GRPH_{effluent}]) \times 100$; 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 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
10/22/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	5.97
11/17/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.66
12/09/14	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	1.09	6.89
01/13/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	6.25
02/18/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.46
03/11/15	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<100	<1	<1	<1	<3	<6	--	7.36
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

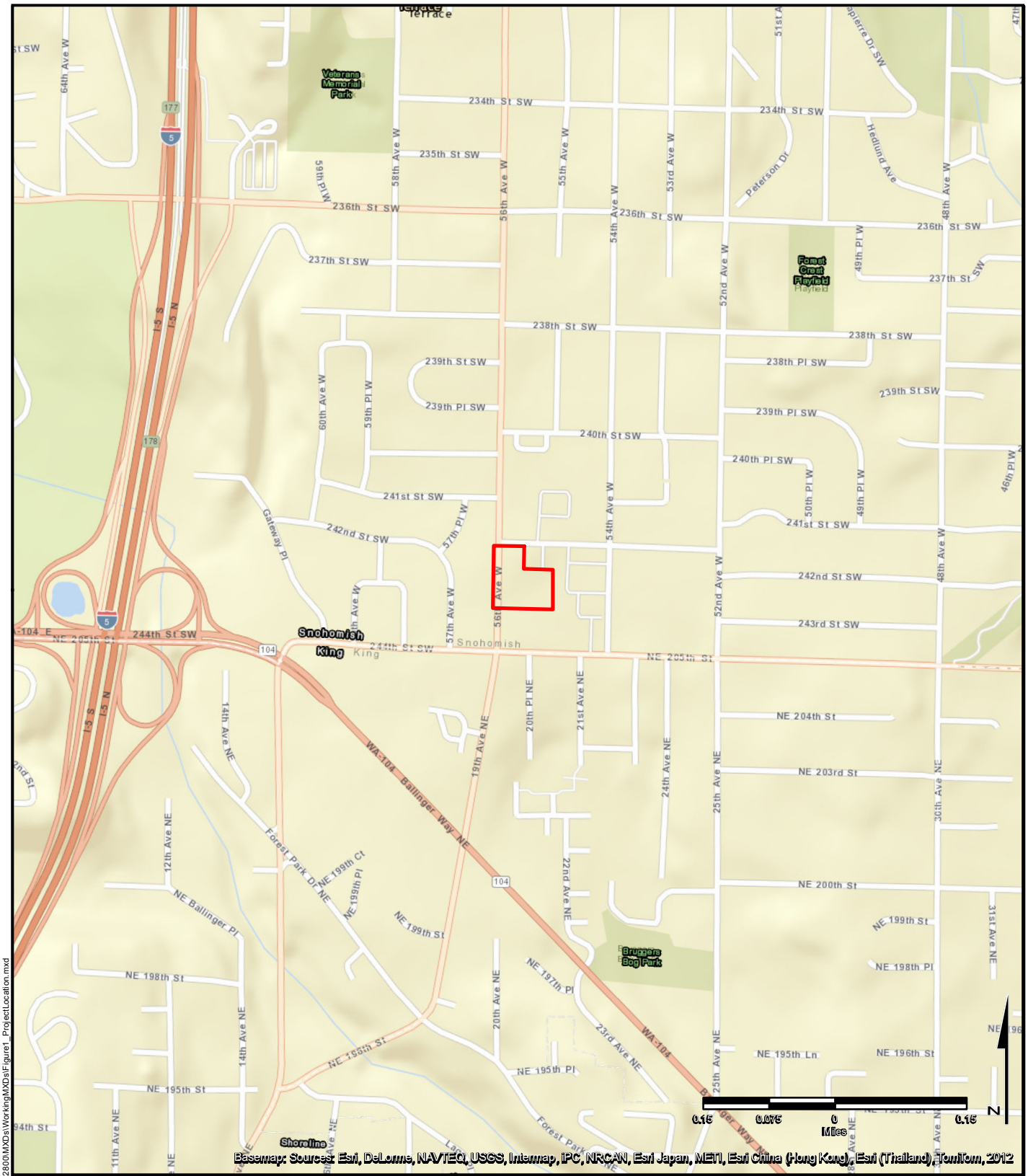
EPA = U.S. Environmental Protection Agency

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

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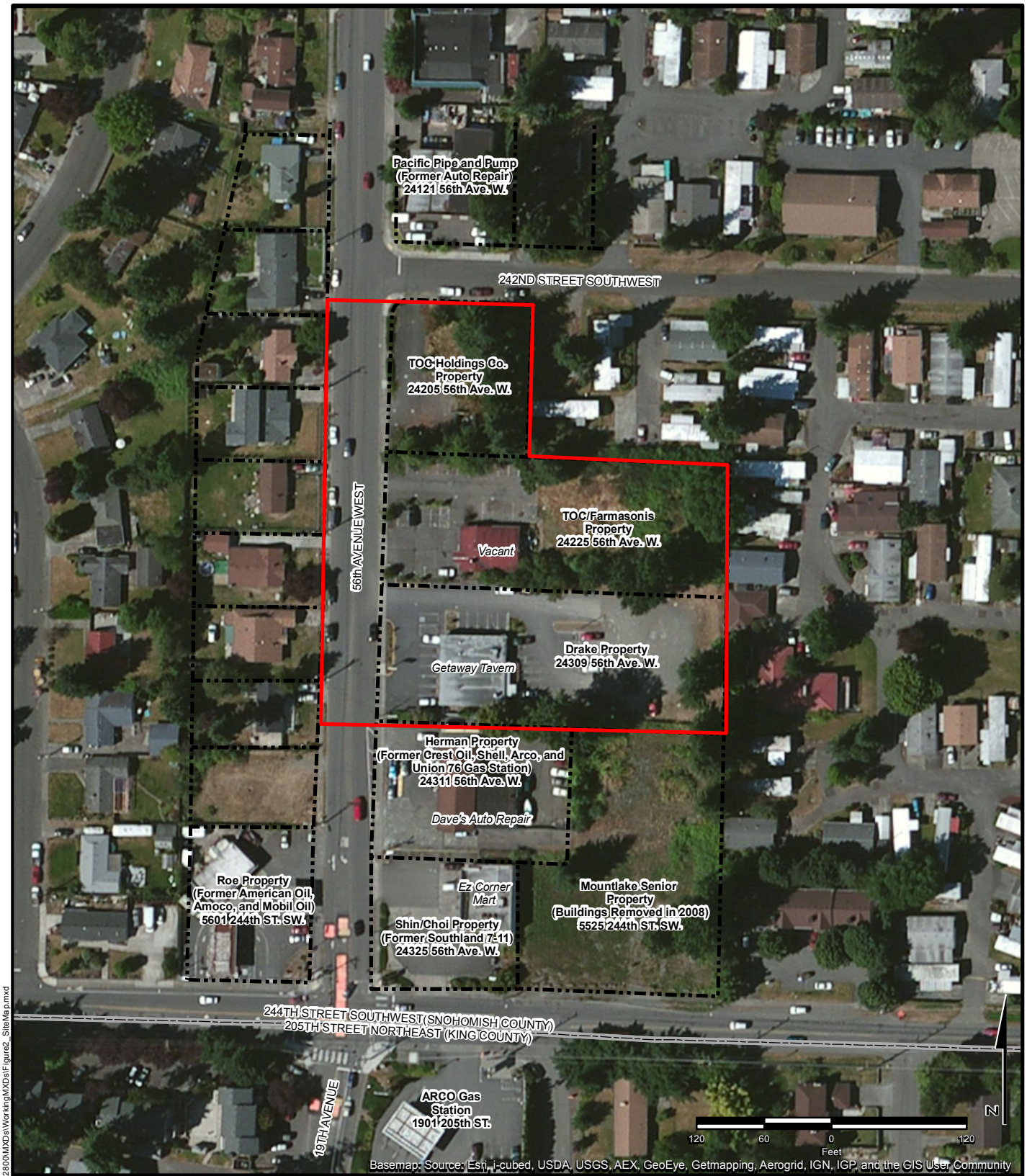

Legend

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

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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.

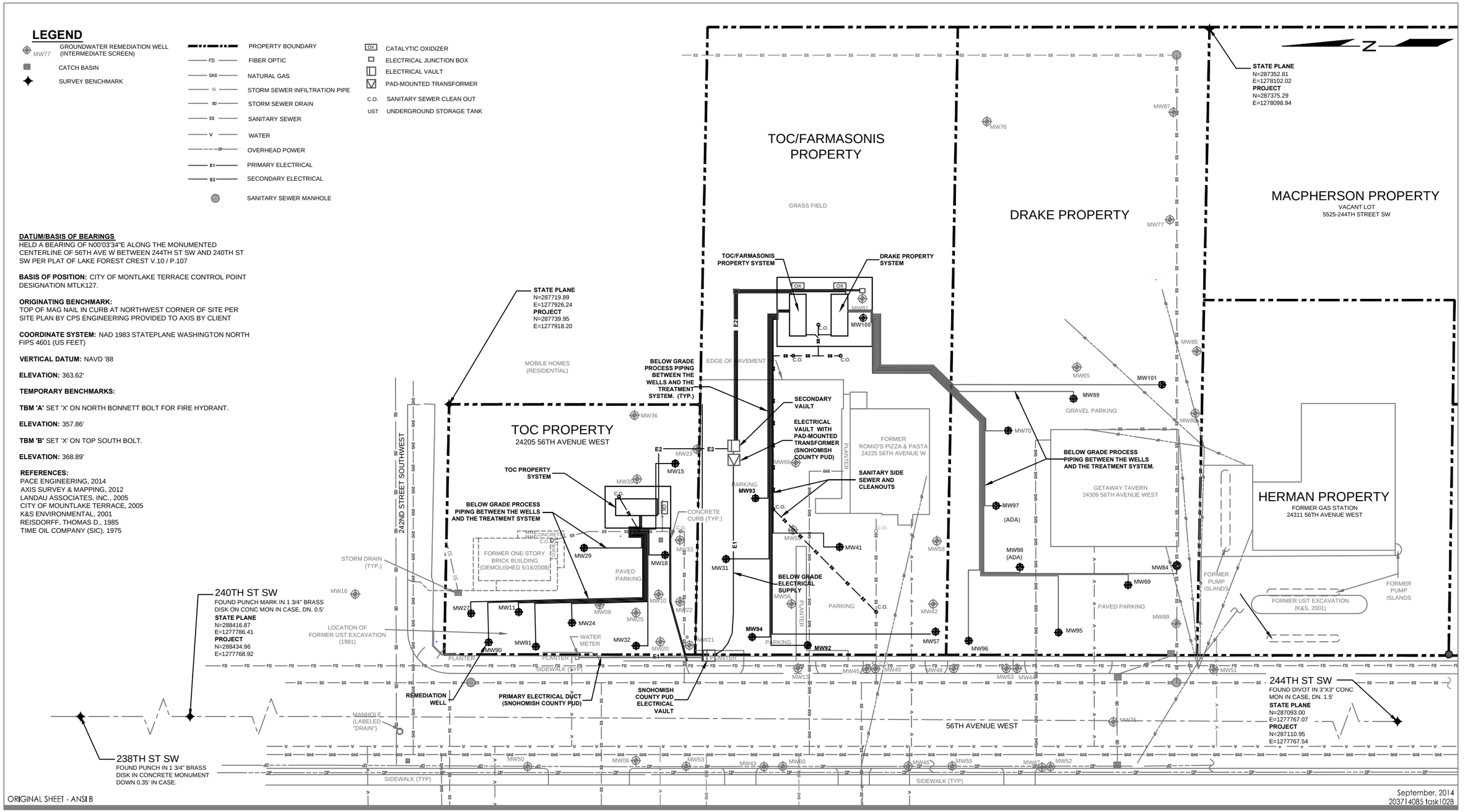
ELEVATION: 357.86'

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

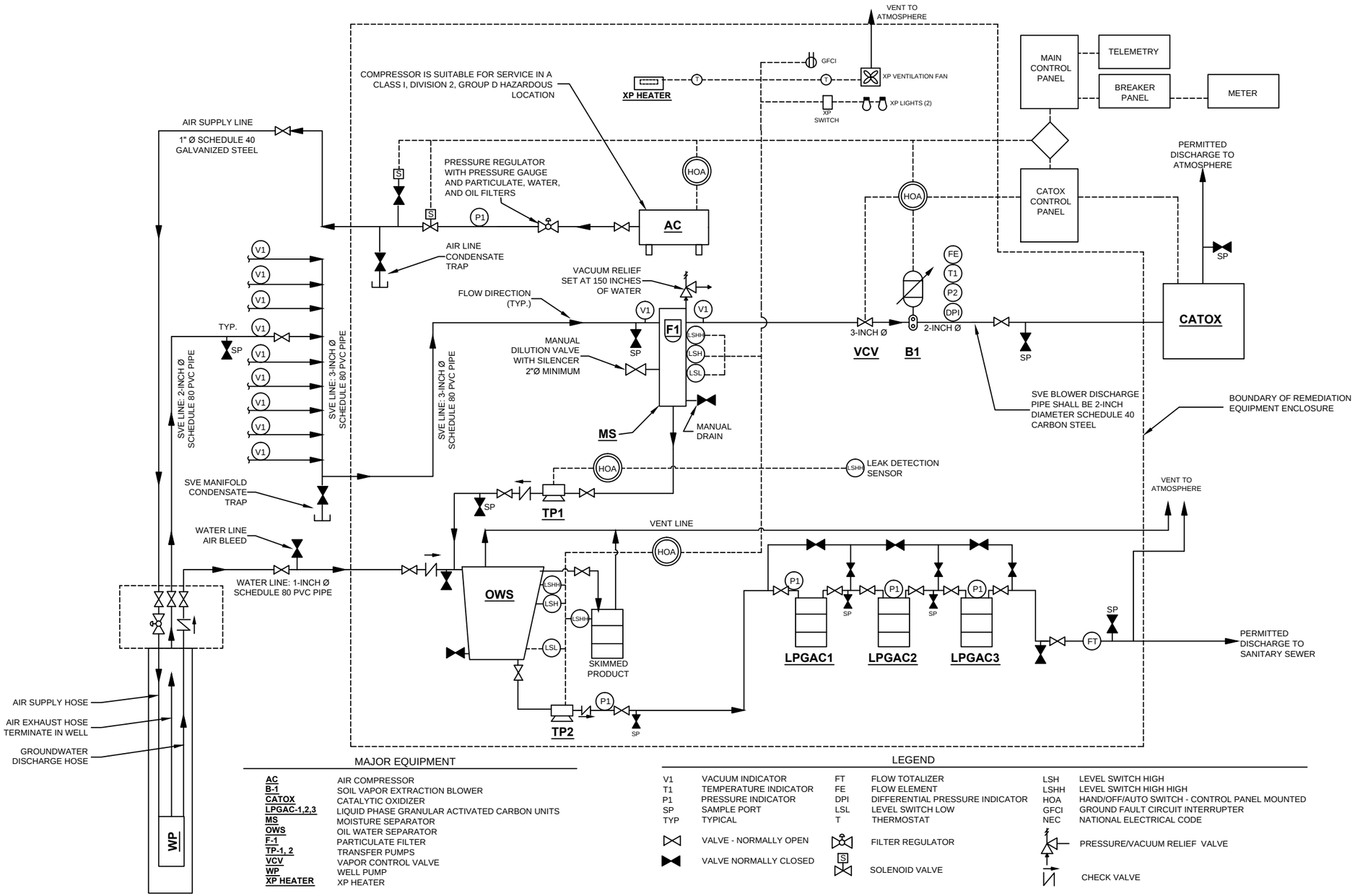
Notes

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

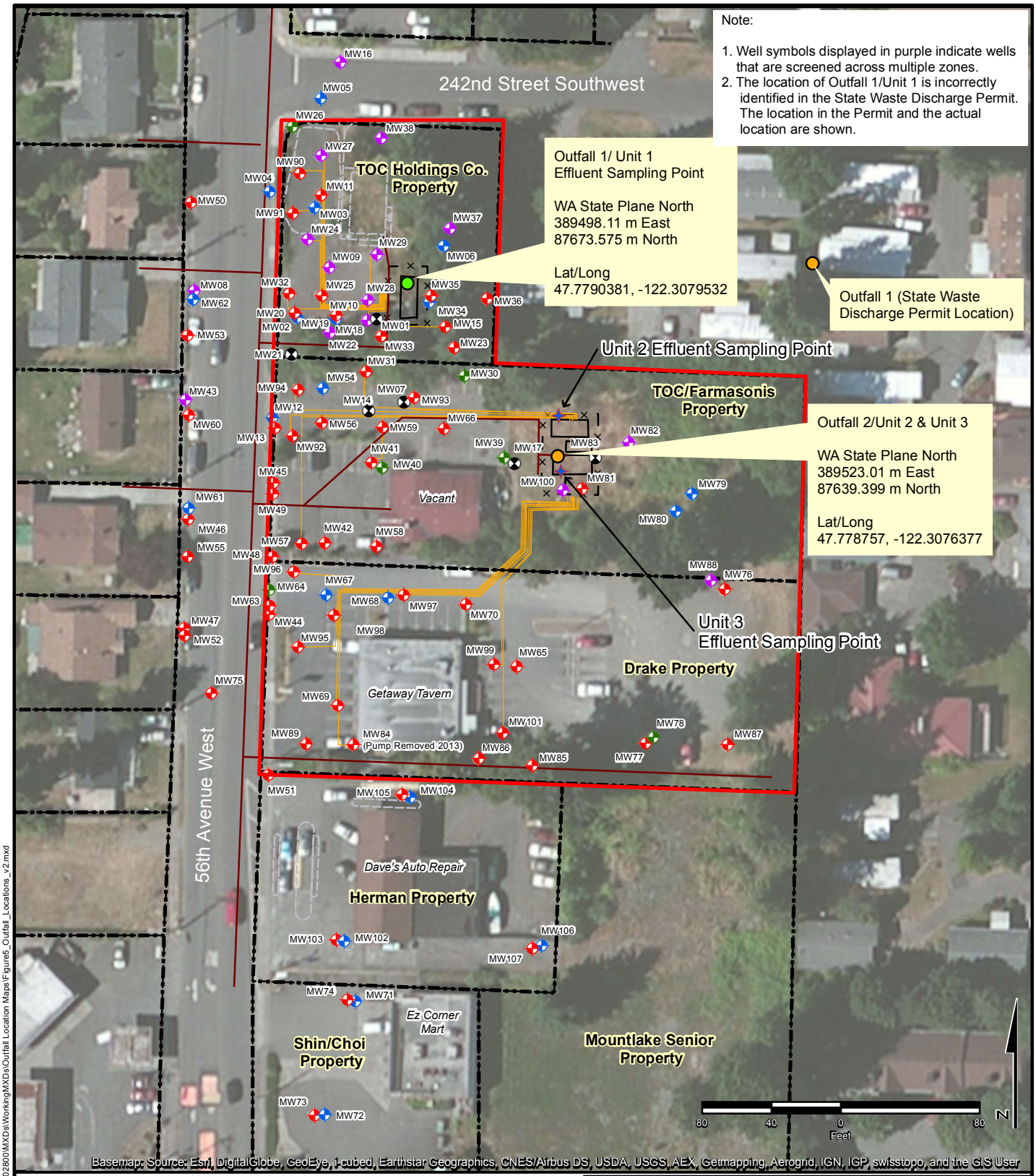
Notes

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	3/12/2015
SCALE	1 in = 80 feet		
PROJECT	203714085		

X:\WA\Clients\Time_OII\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\Outfall Location Maps\Figure5_Outfall_Locations_v2.mxd

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Appendix A

Laboratory Analytical Reports – Vapor

Unit 1: TOC Property Wells (24205)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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January 19, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501151 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
STN0119R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501151 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501151 -01	1VINF
501151 -02	1VEFF

All quality control requirements were acceptable.

Date of Report: 01/19/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501151
Date Extracted: 01/15/15
Date Analyzed: 01/15/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1VINF 501151-01	<0.1	<0.1	<0.1	<0.3	<10	99
1VEFF 501151-02	<0.1	<0.1	<0.1	<0.3	<10	101
Method Blank 05-0081 MB	<0.1	<0.1	<0.1	<0.3	<10	104

Date of Report: 01/19/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501151

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: 501151-02 (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	82	70-130
Toluene	mg/m^3	5.0	85	70-130
Ethylbenzene	mg/m^3	5.0	91	70-130
Xylenes	mg/m^3	15	91	70-130
Gasoline	mg/m^3	100	118	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.

501151

SAMPLE CHAIN OF CUSTODY ME 01-13-15

Page # 1 of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IVINF	01 AB	1-13-15	1125	Air	2		X	X										
IVEFF	02 AB	1-13-15	1130	Air	2		X	X										
													Samples received at 14 °C					

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	1-13-15	1400
Received by: Nhan Phan	Nhan Phan	FCBT	1-13-15	1430
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

February 26, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on February 19, 2015 from the TOC_01-176, WORFDB8 F&BI 502302 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
STN0226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 502302 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
502302 -01	1VEFF

All quality control requirements were acceptable.

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502302
Date Extracted: 02/20/15
Date Analyzed: 02/20/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1VEFF 502302-01	<0.1	<0.1	<0.1	<0.3	<10	89
Method Blank 05-0330 MB	<0.1	<0.1	<0.1	<0.3	<10	89

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502302

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: 502302-01 (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	84	70-130
Toluene	mg/m^3	5.0	93	70-130
Ethylbenzene	mg/m^3	5.0	102	70-130
Xylenes	mg/m^3	15	97	70-130
Gasoline	mg/m^3	100	119	70-130

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

502302

SAMPLE CHAIN OF CUSTODY

ME 02-19-15

Page # 1 of 1

Send Report To Rebekah Brooks
Company STANTEC
Address 19101 36th Ave Suite 203
City, State, ZIP Lynnwood Wa, 98036
Phone # 425-977-4444 Fax #

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IVEFF	01 AB	2-19-15	1000	Air	2		X	X										
																	Samples receiv	at 19 °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	2-19-15	1400
Received by:	Khan Phan	FEBT	2-19-15	1406
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

March 18, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on March 12, 2015 from the TOC_01-176, WORFDB8 F&BI 503230 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
STN0318R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 503230 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
503230 -01	1VEFF

All quality control requirements were acceptable.

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503230
Date Extracted: 03/13/15
Date Analyzed: 03/13/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
1VEFF 503230-01	<0.1	<0.1	<0.1	<0.3	<10	97
Method Blank 05-0509 MB	<0.1	<0.1	<0.1	<0.3	<10	96

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503230

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: 503166-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	0.11	0.13	12
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	0.36 a	0.48 a	28 a
Gasoline	mg/m^3	17	16	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	87	70-130
Toluene	mg/m^3	5.0	90	70-130
Ethylbenzene	mg/m^3	5.0	96	70-130
Xylenes	mg/m^3	15	95	70-130
Gasoline	mg/m^3	100	120	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.

503230

SAMPLE CHAIN OF CUSTODY

ME 03-12-15

Page # 1 of 1

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave. #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-477-4994 Fax #

SAMPLERS (signature) Avaolon

PROJECT NAME/NO. TOC MLT / 2037D0102

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
1VEFF	9/AB	03-11-15	1000	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: Avaolon	Antonelo Vaolon	Stantec	3-12-15	1500
Received by: Nhan Phan	Nhan Phan	FEBT	3-12-15	1500
Relinquished by:				
Received by:		Samples received at 23 °C		

FORMS\COC\COC.DOC

Unit 2: TOC/Farmasonis Property Wells (24225)

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

January 16, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501152 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
STN0116R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501152 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501152 -01	2VEFF

All quality control requirements were acceptable.

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501152
Date Extracted: 01/15/15
Date Analyzed: 01/15/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
2VEFF 501152-01	<0.1	<0.1	<0.1	<0.3	<10	98
Method Blank 05-0081 MB	<0.1	<0.1	<0.1	<0.3	<10	104

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501152

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: 501151-02 (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	82	70-130
Toluene	mg/m^3	5.0	85	70-130
Ethylbenzene	mg/m^3	5.0	91	70-130
Xylenes	mg/m^3	15	91	70-130
Gasoline	mg/m^3	100	118	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.

501152

SAMPLE CHAIN OF CUSTODY

ME 01-13-15

Page # 1 of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
2VEFF	01 AB	1-13-15	1015	Air	2		X	X										
												Samples received at					16 °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	1-13-15	1400
Received by:	Nhan Phan	F&BE	1-13-15	1430
Relinquished by:				
Received by:				

Unit 3: Drake Property Wells (24309)

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

January 19, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501153 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
STN0119R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501153 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501153 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 01/19/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501153
Date Extracted: 01/15/15
Date Analyzed: 01/15/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3VEFF 501153-01	<0.1	<0.1	<0.1	<0.3	<10	105
Method Blank 05-0081 MB	<0.1	<0.1	<0.1	<0.3	<10	104

Date of Report: 01/19/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501153

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: 501151-02 (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	82	70-130
Toluene	mg/m^3	5.0	85	70-130
Ethylbenzene	mg/m^3	5.0	91	70-130
Xylenes	mg/m^3	15	91	70-130
Gasoline	mg/m^3	100	118	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.

501153

SAMPLE CHAIN OF CUSTODY

ME 01-13-15

Page # 1 of 1

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

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC/MLT 20370102

PO#

REMARKS

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3V EFF	01 AB	1-13-15	1000	Air	2		X	X										
												Samples received at					16 °C	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	StanTec	1-13-15	1400
Received by: [signature]	Nhan Phan	FCBT	1-13-15	1430
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

February 26, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on February 19, 2015 from the TOC_01-176, WORFDB8 F&BI 502303 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
STN0226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 502303 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
502303 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502303
Date Extracted: 02/20/15
Date Analyzed: 02/20/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3VEFF 502303-01	<0.1	<0.1	<0.1	<0.3	<10	89
Method Blank 05-0330 MB	<0.1	<0.1	<0.1	<0.3	<10	89

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502303

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: 502302-01 (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	84	70-130
Toluene	mg/m^3	5.0	93	70-130
Ethylbenzene	mg/m^3	5.0	102	70-130
Xylenes	mg/m^3	15	97	70-130
Gasoline	mg/m^3	100	119	70-130

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

502303

SAMPLE CHAIN OF CUSTODY ME 02-19-15

Page # 1 of 1

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

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. tac MLT / 2037.0002
PO#
REMARKS

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3VEFF	01 AB	2-18-15	1015	Air	2		X	X										
																		Samples received at 19 °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	2-19-15	1400
Received by:	Nhan Phan	FEBI	2-19-15	1406
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

March 18, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on March 12, 2015 from the TOC_01-176, WORFDB8 F&BI 503231 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
STN0318R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 503231 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
503231 -01	3VEFF

All quality control requirements were acceptable.

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503231
Date Extracted: 03/13/15
Date Analyzed: 03/13/15

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

Results Reported as mg/m^3

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
3VEFF 503231-01	<0.1	<0.1	<0.1	<0.3	<10	95
Method Blank 05-0509 MB	<0.1	<0.1	<0.1	<0.3	<10	96

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503231

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: 503166-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	mg/m^3	<0.1	<0.1	nm
Toluene	mg/m^3	0.11	0.13	12
Ethylbenzene	mg/m^3	<0.1	<0.1	nm
Xylenes	mg/m^3	0.36 a	0.48 a	28 a
Gasoline	mg/m^3	17	16	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/m^3	5.0	87	70-130
Toluene	mg/m^3	5.0	90	70-130
Ethylbenzene	mg/m^3	5.0	96	70-130
Xylenes	mg/m^3	15	95	70-130
Gasoline	mg/m^3	100	120	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.

503231

SAMPLE CHAIN OF CUSTODY ME 03-12-15

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W36th
City, State, ZIP Lynnwood WA 98036
Phone # 425-477-4944 Fax #

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3VEFF	01A-B	3-11-15	1030	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	3-12-15	1500
Received by:	Nhan Phan	FEBI	3-12-15	1520
Relinquished by:				
Received by:		Samples received at 23°C		

FORMS\COC\COC.DOC

Appendix B

Laboratory Analytical Reports – Water

Unit 1: TOC Property Wells (24205)

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

January 15, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501148 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
STN0115R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501148 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501148 -01	1WEFF
501148 -02	1WINF
501148 -03	1GAC1
501148 -04	1GAC2

All quality control requirements were acceptable.

Date of Report: 01/15/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501148
Date Extracted: 01/14/15
Date Analyzed: 01/14/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WEFF 501148-01	<1	<1	<1	<3	<100	104
1WINF 501148-02	<1	35	<1	270	1,500	113
1GAC1 501148-03	<1	<1	<1	<3	<100	105
1GAC2 501148-04	<1	<1	<1	<3	<100	107
Method Blank 05-0079 MB	<1	<1	<1	<3	<100	105

Date of Report: 01/15/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501148

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: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	91	94	65-118	3
Toluene	ug/L (ppb)	50	93	97	72-122	4
Ethylbenzene	ug/L (ppb)	50	94	99	73-126	5
Xylenes	ug/L (ppb)	150	93	98	74-118	5
Gasoline	ug/L (ppb)	1,000	98	99	69-134	1

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.

501148

SAMPLE CHAIN OF CUSTODY ME 01-13-15 V5

Page # 1 of 1

Send Report To Rebekah Brooks
Company Stantec
Address 1910 W 36th Ave. #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IWEFF	01 AC	1-13-15	1130	W	3		X	X										
IWINF	02		1125	W	3		X	X										
IGAC1	03		1120	W	3		X	X										
IGAC2	04		1115	W	3		X	X										
																		Samples received at 4 °C

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	1-13-15	1400
Received by: Nhan Phan	Nhan Phan	FEBI	1-13-15	1430
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

February 26, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on February 19, 2015 from the TOC_01-176, WORFDB8 F&BI 502304 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
STN0226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 502304 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
502304 -01	1WEFF
502304 -02	1GAC2
502304 -03	1GAC1
502304 -04	1WINF
502304 -05	TB-021915-1
502304 -06	TB-021915-2

All quality control requirements were acceptable.

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502304
Date Extracted: 02/20/15
Date Analyzed: 02/20/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WEFF 502304-01	<1	<1	<1	<3	<100	112
1GAC2 502304-02	<1	<1	<1	<3	<100	103
1GAC1 502304-03	<1	<1	<1	<3	<100	105
1WINF 502304-04	<1	3.3	<1	25	150	105
TB-021915-1 502304-05	<1	<1	<1	<3	<100	97
TB-021915-2 502304-06	<1	<1	<1	<3	<100	98
Method Blank 05-331 MB	<1	<1	<1	<3	<100	106

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502304

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: 502306-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	90	65-118
Toluene	ug/L (ppb)	50	96	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	100	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.

502304

SAMPLE CHAIN OF CUSTODY

ME 02/19/15

V2

Page # 1 of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
IWEFF	01 A+C	2-18-15	1130	W	3		X	X										
IGAC2	02	2-18-15	1135	W	3		X	X										
IGAC1	03	2-18-15	1140	W	3		X	X										
IWINF	04	2-18-15	1145	W	3		X	X										
TB-021915-1	05	-	-	W	1		X	X										
TB-021915-2	06	-	-	W	1		X	X										
																		Samples received at 3

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	2-19-15	1400
Received by:	Khan Phan	FEBT	2-19-15	1406
Relinquished by:				
Received by:				

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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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

March 18, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on March 12, 2015 from the TOC_01-176, WORFDB8 F&BI 503221 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
STN0318R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 503221 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
503221 -01	1WEFF
503221 -02	1GAC2
503221 -03	1GAC1
503221 -04	1WINF
503221 -05	TB-031215-1

All quality control requirements were acceptable.

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503221
Date Extracted: 03/13/15
Date Analyzed: 03/13/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
1WEFF 503221-01	<1	<1	<1	<3	<100	91
1GAC2 503221-02	<1	<1	<1	<3	<100	97
1GAC1 503221-03	<1	<1	<1	<3	<100	94
1WINF 503221-04	<1	<1	<1	8.5	<100	96
TB-031215-1 503221-05	<1	<1	<1	<3	<100	96
Method Blank 05-512 MB	<1	<1	<1	<3	<100	96

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503221

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: 503220-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	98	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	94	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.

503221

SAMPLE CHAIN OF CUSTODY ME 03-12-15

Page # 1 of 1

V2

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-499-4994 Fax #

SAMPLERS (signature) AVadon

PROJECT NAME/NO. TOC MLT / 203700102

PO#

REMARKS

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
1WEFF	01 A-C	03/12/15	1020	water	3		X	X										
~~1GAC1~~ 1GAC2	02	↓	1025	↓	3		X	X										
~~1GAC2~~ 1GAC1	03	↓	1035	↓	3		X	X										
1WINF	04	↓	1035	↓	3		X	X										
TB-031215-1	05	-	-	W	1		X	X										
																		Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadon	Antonela Vadon	Stantec	3-12-15	1530
Received by:	Nhan Phan	FedEx	3-12-15	1530
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 Wells (24225)

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

January 16, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501149 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
STN0116R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501149 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501149 -01	2WEFF
501149 -02	2WINF
501149 -03	2GAC1
501149 -04	2GAC2

All quality control requirements were acceptable.

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501149
Date Extracted: 01/14/15
Date Analyzed: 01/14/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
2WEFF 501149-01	<1	<1	<1	<3	<100	87
2WINF 501149-02	<1	<1	<1	<3	<100	89
2GAC1 501149-03	<1	<1	<1	<3	<100	94
2GAC2 501149-04	<1	<1	<1	<3	<100	93
Method Blank 05-0079 MB	<1	<1	<1	<3	<100	105

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501149

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: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	91	94	65-118	3
Toluene	ug/L (ppb)	50	93	97	72-122	4
Ethylbenzene	ug/L (ppb)	50	94	99	73-126	5
Xylenes	ug/L (ppb)	150	93	98	74-118	5
Gasoline	ug/L (ppb)	1,000	98	99	69-134	1

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.

501149

SAMPLE CHAIN OF CUSTODY ME 01-13-15 VS

Page # 1 of 1

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

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 203700102
PO#
REMARKS 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
2WEFF	01 A-C	1-13-15	1050	W	3		X	X										
2WINF	02		1105	W	3		X	X										
2GAC1	03		1100	W	3		X	X										
2GAC2	04		1055	W	3		X	X										
												Samples received at ____ °C						

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	1-13-15	1400
Received by: Nhan Pham	Nhan Pham	FCBI	1-13-15	1430
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

February 26, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on February 19, 2015 from the TOC_01-176, WORFDB8 F&BI 502305 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
STN0226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 502305 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
502305 -01	2WEFF
502305 -02	2GAC2
502305 -03	2GAC1
502305 -04	2WINF

All quality control requirements were acceptable.

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502305
Date Extracted: 02/19/15
Date Analyzed: 02/19/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
2WEFF 502305-01	<1	<1	<1	<3	<100	100
2GAC2 502305-02	<1	<1	<1	<3	<100	105
2GAC1 502305-03	<1	<1	<1	<3	<100	107
2WINF 502305-04	<1	<1	<1	<3	<100	99
Method Blank 05-328 MB	<1	<1	<1	<3	<100	107

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502305

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: 502284-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	90	65-118
Toluene	ug/L (ppb)	50	96	72-122
Ethylbenzene	ug/L (ppb)	50	108	73-126
Xylenes	ug/L (ppb)	150	102	74-118
Gasoline	ug/L (ppb)	1,000	100	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.

502305

SAMPLE CHAIN OF CUSTODY ME 02/19/15 V2

Page # 1 of 1

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

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT/20370102
PO#
REMARKS

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
2WEFF	01	2-18-15	1045	W	3		X	X										
2GAC2	02	2-18-15	1055	W	3		X	X										
2GAC1	03	2-18-15	1050	W	3		X	X										
2WINF	04	2-18-15	1100	W	3		X	X										
																	Samples received at 3 °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	2-19-15	1400
Received by:		Khan Pham	FCBE	2-19-15	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

March 18, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on March 12, 2015 from the TOC_01-176, WORFDB8 F&BI 503222 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
STN0318R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 503222 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
503222 -01	2WEFF
503222 -02	2GAC2
503222 -03	2GAC1
503222 -04	2WINF

All quality control requirements were acceptable.

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503222
Date Extracted: 03/13/15
Date Analyzed: 03/13/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
2WEFF 503222-01	<1	<1	<1	<3	<100	96
2GAC2 503222-02	<1	<1	<1	<3	<100	100
2GAC1 503222-03	<1	<1	<1	<3	<100	94
2WINF 503222-04	<1	<1	<1	<3	<100	99
Method Blank 05-512 MB	<1	<1	<1	<3	<100	96

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503222

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: 503220-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	98	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	94	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.

503222

SAMPLE CHAIN OF CUSTODY ME 03-12-15

V2

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave

City, State, ZIP Lynnwood WA 98036

Phone # 425-477-4994 Fax #

SAMPLERS (signature) A Vadon

PROJECT NAME/NO. TOC MLT / 203700102

PO#

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
						ANALYSES REQUESTED												
2WEFF	01 A-C	3-11-15	1100	Water	3		X	X										
2GAC2	02		1105		3		X	X										
2GAC1	03		1110		3		X	X										
2WINF	04		1115		3		X	X										
																		Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: A Vadon	Antonela Vadon	Stantec	3-12-15	1520
Received by:	Nhan Phan	FedEx	3-12-15	1500
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 Wells (24309)

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

January 16, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on January 13, 2015 from the TOC_01-176, WORFDB8 F&BI 501150 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
STN0116R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 13, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 501150 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
501150 -01	3WEFF
501150 -02	3WINF
501150 -03	3GAC1
501150 -04	TB-011315

All quality control requirements were acceptable.

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501150
Date Extracted: 01/14/15
Date Analyzed: 01/14/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WEFF 501150-01	<1	<1	<1	<3	<100	104
3WINF 501150-02	<1	<1	<1	<3	<100	99
3GAC1 501150-03	<1	<1	<1	<3	<100	98
TB-011315 501150-04	<1	<1	<1	<3	<100	97
Method Blank 05-0079 MB	<1	<1	<1	<3	<100	105

Date of Report: 01/16/15
Date Received: 01/13/15
Project: TOC_01-176, WORFDB8 F&BI 501150

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: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	91	94	65-118	3
Toluene	ug/L (ppb)	50	93	97	72-122	4
Ethylbenzene	ug/L (ppb)	50	94	99	73-126	5
Xylenes	ug/L (ppb)	150	93	98	74-118	5
Gasoline	ug/L (ppb)	1,000	98	99	69-134	1

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.

501150

SAMPLE CHAIN OF CUSTODY

ME 01-13-15 V5

Page # 1 of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
3WEFF	01 A-C	1-13-15	1050	W	3		X	X										
3WINF	02		1030	W	3		X	X										
3GAC1	03		1040	W	3		X	X										
TB-011315	04	-	-	W	1		X	X										
												Samples received at						°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	1-13-15	1400
Received by:	Nhan Phan	FedEx	1-13-15	1430
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

February 26, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on February 19, 2015 from the TOC_01-176, WORFDB8 F&BI 502306 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
STN0226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 19, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 502306 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
502306 -01	3WEFF
502306 -02	3GAC1
502306 -03	3WINF

All quality control requirements were acceptable.

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502306
Date Extracted: 02/20/15
Date Analyzed: 02/20/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WEFF 502306-01	<1	<1	<1	<3	<100	105
3GAC1 502306-02	<1	<1	<1	<3	<100	110
3WINF 502306-03	<1	<1	<1	<3	<100	102
Method Blank 05-331 MB	<1	<1	<1	<3	<100	106

Date of Report: 02/26/15
Date Received: 02/19/15
Project: TOC_01-176, WORFDB8 F&BI 502306

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: 502306-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	90	65-118
Toluene	ug/L (ppb)	50	96	72-122
Ethylbenzene	ug/L (ppb)	50	106	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	100	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.

522306

SAMPLE CHAIN OF CUSTODY

ME 02/19/15

V2

Page # 1 of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS								Notes
						ANALYSES REQUESTED													
3W EFF	01	2-18-15	1110	W	3		X	X											
3GAC1	02	2-18-15	1120	W	3		X	X											
3WINF	03	2-18-15	1125	W	3		X	X											
													Samples received at 3 °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	2-19-15	1400
Received by: Nhan Phan	Nhan Phan	FEBI	2-19-15	1403
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

March 18, 2015

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on March 12, 2015 from the TOC_01-176, WORFDB8 F&BI 503223 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
STN0318R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on March 12, 2015 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 503223 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
503223 -01	3WEFF
503223 -02	3GAC1
503223 -03	3WINF

All quality control requirements were acceptable.

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503223
Date Extracted: 03/13/15
Date Analyzed: 03/13/15

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
3WEFF 503223-01	<1	<1	<1	<3	<100	96
3GAC1 503223-02	<1	<1	<1	<3	<100	98
3WINF 503223-03	<1	<1	<1	<3	<100	96
Method Blank 05-512 MB	<1	<1	<1	<3	<100	96

Date of Report: 03/18/15
Date Received: 03/12/15
Project: TOC_01-176, WORFDB8 F&BI 503223

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: 503220-01 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	98	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	94	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.

503223

SAMPLE CHAIN OF CUSTODY ME 03-12-15

V2

Send Report To Rebekah Brooks
Company STanTec
Address 19101 W 36th Ave #203
City, State, ZIP Lynnwood WA 98036
Phone # 425 477-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MET / 203.7001.02
PO#
REMARKS

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
						ANALYSES REQUESTED												
3WEFF	01 A-C	3-11-15	1120	GW	3		X	X										
3GAC1	02	3-11-15	1125	GW	3		X	X										
3WINF	03	3-11-15	1130	GW	3		X	X										
																	Samples received at 2 °C	

Friedman & Bruya, Inc.
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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STanTec	3-12-15	1500
Received by:	Nhan Phan	FEBI	3-12-15	1500
Relinquished by:				
Received by:				

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