Groundwater Monitoring Report, Second, Third & Fourth Quarters 2014

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February 10, 2016

Sign-Off Sheet

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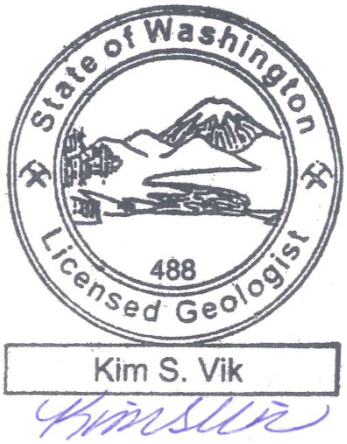

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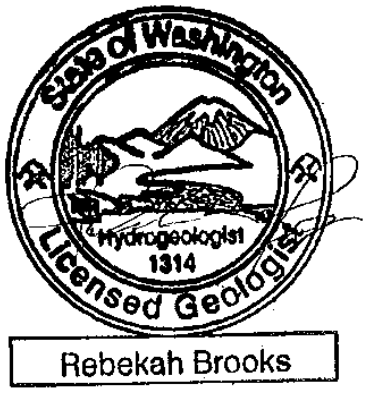

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Acronyms & Abbreviations

µg/L	micrograms per liter
2Q2014	Second Quarter 2014
3Q2014	Third Quarter 2014
4Q2014	Fourth Quarter 2014
AO	Agreed Order
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CSM	conceptual site model
DPE	dual-phase extraction
DRPH	diesel-range petroleum hydrocarbons
DTP	depth-to-product
DTW	depth-to-water
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GRPH	gasoline-range petroleum hydrocarbons
HydroCon	HydroCon Environmental, LLC
ID	identifier
IRAWP	Interim Remedial Action Work Plan
LNAPL	light non-aqueous phase liquid
MDL	method detection limit
mL/min	milliliters per minute
MPE	multi-phase extraction
MRL	method reporting limit
MTBE	methyl tert-butyl ether
MTCA	Model Toxics Control Act
MW	monitoring well
NWTPH-Gx	Northwest Total Petroleum Hydrocarbon - Gasoline Range Organics
ORPH	oil-range petroleum hydrocarbons
PACE	PACE Engineers, Inc.
PAH	petroleum aromatic hydrocarbons
QA/QC	quality assurance/quality control
RI	remedial Investigation
ROW	right-of-way
RW	remediation well
SES	SoundEarth Strategies, Inc.
Stantec	Stantec Consulting Services Inc.
SVE	soil vapor extraction
TOC	TOC Holdings Co.
UST	underground storage tank

List of Properties – TOC Site

TOC Property	24205 56th Avenue West, Mountlake Terrace, WA
TOC/Farmasonis Property	24225 56th Avenue West, Mountlake Terrace, WA
Drake Property	24309 56th Avenue West, Mountlake Terrace, WA
56th Avenue West ROW	Right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

List of Properties – Adjacent to TOC Site

242nd Street Southwest ROW	Right-of-way adjacent to TOC Property
Herman Property	24311 56th Avenue West, Mountlake Terrace, WA
Shin/Choi Property	24325 56th Avenue West, Mountlake Terrace, WA

1.0 INTRODUCTION

This report presents the results of the Second, Third and Fourth Quarter 2014 (2Q2014, 3Q2014 and 4Q2014) groundwater monitoring events for the interim remedial action at the TOC Holdings Co. (TOC) Facility No. 01-176 located in Mountlake Terrace, Snohomish County, Washington (**Figure 1**). Field activities and data evaluation were performed by Stantec Consulting Services Inc. (Stantec), as a subconsultant to HydroCon Environmental, LLC (HydroCon), on behalf of TOC.

Ongoing groundwater monitoring is conducted under Agreed Order (AO) No. DE 8661, entered in October 2011 between TOC and the Washington State Department of Ecology (Ecology 2011). The groundwater monitoring scope of work is defined in the *Interim Remedial Action Work Plan* (IRAWP; SES 2011) included as Exhibit C of the AO. Per the requirements of the IRAWP, the groundwater monitoring scope of work includes one annual field event and three quarterly field events (described in **Section 6.0**). Groundwater monitoring is conducted to monitor and evaluate the performance and efficacy of three multi-phase extraction (MPE) remediation systems (described in **Section 5.0**) and their effect on groundwater quality.

This report presents a description of groundwater monitoring activities performed by Stantec and an evaluation of the field data and analytical results. The dates of the 2014 quarterly groundwater monitoring events are provided in the table below.

Dates of 2014 Quarterly Groundwater Monitoring Events

Quarter	Field Event Dates
2Q2014	June 10 to 20, 2014
3Q2014	September 17 to 25, 2014
4Q2014	December 9 to 16, 2014

A description of the site, adjacent properties and site background is provided in **Section 2.0.** The geologic and hydrologic frameworks are described in **Sections 3.0 4.0**, respectively. A summary of the remediation system status is provided in **Section 5.0**. The scope of work for the groundwater monitoring events is described in **Section 6.0**. Field methodologies for collecting depth-to-water/depth-to-product (DTW/DTP) level measurements and groundwater samples in accordance with the IRAWP (SES 2011) or using approved modifications are described in **Section 7.0**. Groundwater monitoring results for the 2Q2014, 3Q2014 and 4Q2014 events are described in **Section 8.0** and a summary of the results and a list of conclusions for the quarterly events are provided in **Section 9.0**. Future groundwater monitoring tasks are described in **Section 10.0**.

2.0 SITE DESCRIPTION & BACKGROUND

2.1 Description of TOC Site

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

- **TOC Property:** 24205 56th Avenue West. The vacant TOC Property consists of vegetated land with the exception of an asphalt area and graveled and fenced area housing a MPE remediation system (described in **Section 5.0**).
- **TOC/Farmasonis Property:** 24225 56th Avenue West. The TOC/Farmasonis Property consists of one commercial building (operating as a restaurant at the time of the field event and currently vacant), an asphalt parking area, vegetated land, and a graveled and fenced area housing two MPE remediation systems (described in **Section 5.0**).
- **Drake Property:** 24309 56th Avenue West. The Drake Property consists of one commercial building (currently occupied by Getaway Tavern) and asphalt and gravel parking areas.
- **56th Avenue West Right-of-Way (ROW):** The portion of the 56th Avenue ROW included in the TOC Site is adjacent to the TOC, TOC/Farmasonis and Drake properties.

The TOC Site is bordered by 242nd Street Southwest and commercial properties to the north; by residential properties to the east and west; and by the Herman Property and then vacant Mountlake Senior Property to the south. The Snohomish County boundary is defined by 244th Street and the King County boundary is defined by 205th Street. Descriptions of each property included within the TOC Site boundary are provided below.

2.2 Description of Adjacent Properties

In addition to the TOC Site, the scope of work for the quarterly events (described in **Section 6.0**) also includes the following adjacent properties:

- **242nd Street Southwest ROW:** The portion of the ROW included in the scope of the work is adjacent to the northern boundary of the TOC Site.
- **Herman Property:** 24311 56th Avenue West. The Herman Property consists of one commercial building (occupied by Dave's Auto Service), an asphalt parking area and vegetated land.
- **Shin/Choi Property:** The Shin/Choi Property consists of one building (occupied by the EZ Corner Mart) and an asphalt parking area.

2.3 Site Background

TOC operated a retail gasoline station on the TOC Property between 1968 and 1990. The facility included three underground storage tanks (USTs), six fuel dispensers and associated product delivery lines. One 8,000-gallon and two 6,000-gallon USTs and ancillary equipment were removed from the TOC Property in 1991 and petroleum constituents in the form of gasoline-range petroleum hydrocarbons (GRPH), benzene, and total xylenes were observed in soil and groundwater in excess of the applicable Model Toxics Control Act (MTCA) Method A cleanup levels (Ecology 2007). Between 1992 and 2013, site investigations were conducted to determine the extent of petroleum contamination and 107 monitoring and remediation wells (six of which have been decommissioned) were installed in three groundwater zones (defined as Shallow, Intermediate, and Deep and further described in **Section 4.0**).

In 1996, a dual-phase extraction (DPE) remediation system was installed at the TOC Property at six remediation wells (MW01, MW02, MW03, MW09, MW10, and MW11) to remediate groundwater impacted by petroleum hydrocarbons and remove light non-aqueous phase liquid (LNAPL) in the

Shallow Zone. 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 in the Intermediate Zone extended directly downgradient of the TOC Property to the south (TOC/Farmasonis and Drake properties) and west (56th Avenue ROW).

In accordance with the AO (Ecology 2011), a remedial investigation (RI) was initiated at the TOC Site and three MPE remediation systems were installed between November 2011 and August 2012 to remediate residual petroleum-contaminated groundwater, soil vapor and LNAPL (if present) in the Intermediate Zone beneath the TOC Site. As shown on **Figure 3**, the MPE remediation systems are located within fenced enclosures on the TOC Property and TOC/Farmasonis Property and are served by remediation wells installed on the TOC, TOC/Farmasonis and Drake properties.

Available information regarding historical operations on the TOC/Farmasonis and Drake properties do not indicate the presence of USTs. Historical operations on the downgradient Herman and Shin/Choi properties indicate three USTs were removed from the Shin/Choi Property in 1991 and two USTs were removed from the Herman Property in 2001; however five additional USTs may still exist on the Herman Property. Available information on historical or current USTs and associated equipment located on downgradient properties is shown on **Figure 3.**

At the time of the 2014 quarterly field events, 101 active monitoring and remediation wells were located on seven properties (the four properties included within the TOC Site boundary [described in **Section 2.1**] plus the adjacent 242nd Street ROW, Herman and Shin/Choi properties described in **Section 2.2**).

3.0 GEOLOGIC FRAMEWORK

The TOC Site is situated on the glacial upland plateau between Seattle and Everett, Washington, known as the Intercity Plateau (SES 2013). Regional geology consists of Pleistocene-age glacial till locally overlain by pockets of glacial recessional outwash sand.

The recessional outwash sand, which ranges in thickness from approximately 25 to 300 feet, is generally loose to medium dense sand and gravel with little or no fines, and may include ice contact deposits and ablation till. The glacial till, which represents the ground moraine of the Vashon glaciations, ranges from a few feet to over 50 feet thick and consists of dense to very dense gravelly, sandy silt to silty sand with variable amounts of clay, cobbles, and boulders. Groundwater is perched above and within the glacial till layer. Bedrock underlying the area consists of Tertiary sediment rocks (sandstone, shale, or conglomerate) over 900 feet deep beneath the TOC Site; therefore, bedrock is not relevant for the TOC Site characterization.

Based on the results of previous investigations conducted between 1991 and 2013, subsurface soil beneath the TOC Site consists primarily of local anthropogenic fill overlying Vashon-age glacial deposits. As reported in the *Draft RI Report* (SES 2013), subsurface soil is interpreted to consist of the following geologic units, from youngest to oldest: artificial (anthropogenic) fill, Vashon recessional outwash deposits, Vashon glacial till and Vashon outwash deposits.

4.0 HYDROGEOLOGIC FRAMEWORK

Three separate groundwater zones were identified at the TOC Site in the *Draft RI Report* (SES 2013). The zones were defined by SoundEarth Strategies, Inc. (SES) based on lithology, well screen intervals and groundwater level measurements. Stantec evaluated the data as part of updates and revisions to the Conceptual Site Model (CSM), based on comments provided by Ecology to SES on the *Draft RI Report* (Ecology 2014). Stantec will incorporate the results of the revised CSM into the final RI report for submittal to Ecology.

Stantec agrees that three groundwater zones can be identified at the TOC Site; however, these zones do not appear to be separate, but are interconnected, as evidenced by the geology, groundwater elevations and contaminant distribution data. Also, the groundwater zones do not appear to be separated by distinct confining units defined by lower permeability lithology. Stantec's conceptualization of the hydrogeology is currently based on geologic field interpretations (e.g., boring logs) provided by SES and other consultants that previously managed the project, but will be supplemented by future investigations and development of the revised CSM. Based on evaluation of the available data by Stantec, the following sections describe the three groundwater zones, as well as locations where well screen intervals intersect multiple groundwater zones.

4.1 Shallow Water-Bearing Zone (Shallow Zone)

The Shallow Zone is a perched zone in the artificial fill or upper portion of the glacial till, at depths between approximately 5 to 20 feet below ground surface (bgs) throughout the TOC Site, depending on seasonal fluctuations of the water table. The saturation in these horizons can be seasonally discontinuous, as evidenced by some monitoring wells that are seasonally dry (e.g., MW04 during the December 2012 event), while other Shallow Zone wells monitored during the same season contain water. The primary source of recharge to the Shallow Zone is infiltration of natural precipitation through emplaced fill and native soil in unpaved areas. Other potential sources of recharge to the Shallow Zone reportedly included a former topographically closed depression, where surface runoff previously ponded, and a former stormwater infiltration pit (identified on **Figure 3**), both of which were located in the southeast portion of the TOC Property. According to a 1975 TOC blueprint (Time Oil Co. 1975), the stormwater infiltration pit is located in proximity to MW18 and MW33; measures 10 feet square by 4 feet deep; and was backfilled with coarse gravel. Surface runoff intercepted by a catch basin located near the southeast corner of the paved asphalt area formerly discharged into the stormwater infiltration pit via a 6-inch-diameter drain pipe, which has been capped.

4.2 Intermediate Water-Bearing Zone (Intermediate Zone)

The Intermediate Zone is an unconfined groundwater zone that is observed at depths between approximately 20 and 60 feet bgs. As described in the *Draft RI Report* (SES 2013), the Intermediate Zone consists of glacial till deposits between approximately 20 and 40 feet bgs and discontinuous sand and/or gravel-rich glacial deposits within the lower portion of the glacial till between approximately 40 and 60 feet bgs. As discussed further in **Section 8.2.2**, groundwater elevations in the Intermediate Zone of the TOC Property appear to be mounded such that the upper boundary of the Intermediate Zone appears closer to the base of the Shallow Zone in the vicinity of the UST excavation fill area and former stormwater infiltration pit (identified on **Figure 3**). Explanations for the observed groundwater mounding are likely related to artificial recharge within the backfill of the former UST cavity, depression, and the infiltration pit; the presence of low permeability deposits near the downgradient edge of the property; and/or from localized influence of the vacuum for the remediation system located on the TOC Property (identified on **Figure 3** and described in **Sections 2.3** and **5.0**). The low permeability deposits in the upper portion of the Intermediate Zone impede the vertical percolation of water into the Deep Zone (see **Section 4.3**) and decrease the horizontal flux of the groundwater in the immediate vicinity. The

prevalence of low permeability deposits correlates with the location of steeper horizontal hydraulic gradients in this area (see **Section 8.2**). In downgradient areas where the Intermediate Zone consists primarily of higher permeability units (i.e., sands and gravels), the thickness of unsaturated materials and the distance between the Shallow and Intermediate Zones increase. The higher permeability deposits contribute to a flattening of the horizontal hydraulic gradient. The Intermediate Zone appears to receive recharge from natural precipitation via the Shallow Zone. A comparison of groundwater elevations and analytical data confirm that the Intermediate Zone is considered to be the current primary contaminant transport pathway at the TOC Site.

4.3 Deep Water-Bearing Zone (Deep Zone)

The Deep Zone consists of glacial sand and gravel located at depths greater than 60 feet bgs, based on deep well screen intervals. Within the vicinity of the artificial recharge area on the TOC Property, the groundwater elevation data indicate that downward vertical gradients appear to exist between all three zones. In downgradient areas, the groundwater elevation data suggest that vertical gradients shift from downward (between the Shallow and Intermediate Zones) to neutral or slightly upward (between the Intermediate and Deep Zones). Based on these observations and the presence of fully saturated well screens, these groundwater level conditions could be a reflection of a higher permeability zone at the base of a single groundwater unit that includes both the Intermediate and Deep Zones or could represent semi-confined conditions in a separate, but interconnected groundwater zone; however, the presence of a low permeability confining unit between the two zones is not obvious in the available data. The presence of upward vertical gradients between the Deep and Intermediate Zones appear to be effective in inhibiting downward migration of contamination in downgradient areas and effectively bounding the extent of vertical contamination.

4.4 Well Screen Intervals Intersecting Multiple Water-Bearing Zones

Based on evaluation of available data by Stantec, 16 wells (15 of which are active and one of which was decommissioned) appear to have screen intervals that intersect multiple groundwater zones (either Shallow and Intermediate Zones or Intermediate and Deep Zones) and may not represent the individual hydrogeological conditions of either zone. Because Shallow Zone contamination in the area where these wells are located has been remediated, the potential for cross-contamination between groundwater zones does not currently exist. For discussion purposes, monitoring and remediation wells are placed into five categories based on groundwater zones and well screen intervals intersecting these zones. The five categories are defined as: 1) Shallow Zone Wells; 2) Intermediate Zone Wells; 3) Deep Zone Wells; 4) Shallow-Intermediate Zone Intersect Wells; and 5) Intermediate-Deep Zone Intersect Well.

5.0 REMEDIATION SYSTEM STATUS

In accordance with the AO (Ecology 2011), three MPE remediation systems were installed between November 2011 and August 2012 to remediate residual petroleum-contaminated groundwater, soil vapor and LNAPL (if present) in the Intermediate Zone beneath TOC Site. As shown on **Figure 3**, the MPE remediation systems are located within fenced enclosures on the TOC Property and TOC/Farmasonis Property and are served by remediation wells installed on the TOC, TOC/Farmasonis and Drake properties.

At the time of 2Q2014 and 3Q2014 quarterly field events, 23 remediation wells were operating for the MPE remediation systems. The pump in remediation well MW15 (located on the TOC Property) was removed on December 16, 2014. Therefore, 22 remediation wells were operating at the time of the 4Q2014 event. The table below identifies the remediation wells connected to each system and their location. As noted next to the well identifier (ID), remediation wells are either 2 or 4 inches in diameter. Operation of all three MPE remediation systems is ongoing.

MPE Remediation System Wells

System Name	System Location	Remediation Well ID	Location of Remediation Wells
Unit 1	TOC Property	• MW11 (4" RW) • MW15 (4" RW)* • MW18 (4" RW) • MW24 (4" RW) • MW27 (2" RW) • MW29 (2" RW) • MW32 (4" RW) • MW90 (4" RW) • MW91 (4" RW)	TOC Property
Unit 2	TOC/Farmasonis Property	• MW31 (2" RW) • MW41 (2" RW) • MW57 (4" RW) • MW92 (4" RW) • MW93 (4" RW) • MW94 (4" RW)	TOC/Farmasonis Property
Unit 3	TOC/Farmasonis Property	• MW69 (2" RW) • MW70 (2" RW) • MW95 (4" RW) • MW96 (4" RW) • MW97 (4" RW) • MW98 (4" RW) • MW99 (4" RW) • MW101 (4" RW)	Drake Property

**Pump was removed on December 16, 2014 (during 4Q2014 field event).*

Additional information describing the performance of the MPE remediation systems was provided in the *Remedial Systems Operation and Maintenance (O&M) Report* prepared quarterly and submitted to Ecology (Stantec 2014a; Stantec 2015a and Stantec 2015b) submitted to Ecology.

6.0 GROUNDWATER MONITORING SCOPE OF WORK

The original scope of work defined in the IRAWP (SES 2011) includes the four properties located within the boundary of the TOC Site (described in **Section 2.1**) as well as a portion of the 242nd Street Southwest ROW (directly north of the TOC Site; described in **Section 2.2**). At the time the IRAWP was prepared, four monitoring wells had been decommissioned and 85 active monitoring and remediation wells were located on the TOC Site and adjacent properties. After the IRAWP was prepared, two additional monitoring wells were decommissioned (for a total of six decommissioned wells) and 18 additional wells were installed at the locations identified in the table below (for a total of 101 active monitoring and remediation wells). The 18 additional wells installed are referred to as the "post-IRAWP wells" and were incorporated into future groundwater monitoring events.

Post-IRAWP Monitoring & Remediation Wells

Property Name	Well ID [1]	
	Installed Wells	Decommissioned Wells
TOC	• MW90 (4" RW) • MW91 (4" RW)	• MW21
TOC/Farmasonis	• MW92 (4" RW) • MW94 (4" RW) • MW93 (4" RW) • MW100	• MW83
Drake	• MW95 (4" RW) • MW97 (4" RW) • MW99 (4" RW) • MW96 (4" RW) • MW98 (4" RW) • MW101 (4" RW)	*None*
Herman	• MW102 • MW104 • MW106 • MW103 • MW105 • MW107	*None*

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter.

The IRAWP states the four active monitoring wells installed on the Shin/Choi Property (directly south of the Herman Property and two properties south of the TOC Site) are excluded from the scope work for the annual and quarterly groundwater monitoring events. However, for the purpose of obtaining additional information regarding contaminant distribution, Stantec added these wells to the scope for the groundwater monitoring events. Additional details describing the scope of work for the annual and quarterly events are provided in the following sections.

6.1 Annual Event Scope of Work

The original scope of work defined in the IRAWP (SES 2011) for the annual event includes

1) measuring depth-to-groundwater/depth-to-product (DTW/DTP) levels for all active wells; and
2) collecting groundwater samples from 81 active monitoring and remediation wells located on five properties (TOC, TOC/Farmasonis, Drake, 56th Avenue ROW, and 242nd Street ROW).

The original scope of work did not include monitoring of the four wells located on the Shin/Choi Property (directly south of the Herman Property and two properties south of the TOC Site). In addition to collecting DTW/DTP level measurements and groundwater samples from the wells identified in the IRAWP, the groundwater monitoring scope of work for the annual event was revised by Stantec to also include the 18 post-IRAWP wells (described in **Section 6.0**) as well as the four wells located on the Shin/Choi Property. Six of the 107 wells installed on the TOC Site and adjacent properties have been decommissioned to date. Therefore, 101 active wells are included in the groundwater monitoring scope of work for the annual event. Groundwater samples are only collected from wells that do not contain product. Since product is typically observed at MW71 and MW72 (located on the Shin/Choi Property), and MW102 (located on the Herman Property), samples are not collected from these locations. The annual event takes place during the first quarter of each year.

6.2 Quarterly Event Scope of Work

The original scope of work defined in the IRAWP (SES 2011) for the quarterly events includes:

1) collecting DTW/DTP level measurements for all active wells (excluding wells located on the Shin/Choi Property and MW75 located in the 56th Avenue ROW); and
2) collecting groundwater samples from 30 active monitoring and remediation wells installed on the TOC Site.

In addition to collecting DTW/DTP level measurements and groundwater samples from the active wells identified in the IRAWP, the groundwater monitoring scope of work for the quarterly events was revised by Stantec to also include:

1) measuring DTW/DTP levels from the 18 post-IRAWP wells (described in **Section 6.0**) as well as the four wells located on the Shin/Choi Property; and

2) sampling the four wells located on the Shin/Choi Property and select post-IRAWP wells.

Similar to the annual event, groundwater samples are only collected from wells that do not contain product; therefore, wells MW71 and MW72 (located on the Shin/Choi Property), and MW102 (located on the Herman Property) are typically not sampled. Quarterly events take place during the second, third and fourth quarters of each year.

The table below identifies the 30 active monitoring and remediation wells scheduled for quarterly sampling (per the requirements of the IRAWP [SES 2011]). All of the wells scheduled for quarterly sampling are located in the Intermediate Zone with the exception of MW09 and MW27, which are Shallow-Intermediate Zone Intersect Wells.

Well Locations Sampled Quarterly (per IRAWP)

Sample Location/ Well ID [1]	Property	Sample Location/ Well ID [1]	Property	Sample Location/ Well ID [1]	Property
MW09	TOC	**MW49**	56th Ave ROW	**MW63**	56th Ave ROW
MW10	TOC	**MW50**	56th Ave ROW	**MW65**	Drake
MW15 (4" RW)	TOC	**MW51**	56th Ave ROW	**MW66**	TOC/Farmasonis
MW20	TOC	**MW52**	56th Ave ROW	**MW69 (2" RW)**	Drake
MW27 (2" RW)	TOC	**MW53**	56th Ave ROW	**MW70 (2" RW)**	Drake
MW31 (2" RW)	TOC/Farmasonis	**MW55**	56th Ave ROW	**MW77**	Drake
MW32 (4" RW)	TOC	**MW56**	TOC/Farmasonis	**MW84**	Drake
MW33	TOC	**MW58**	TOC/Farmasonis	**MW85**	Drake
MW45	56th Ave ROW	**MW59**	TOC/Farmasonis	**MW86**	Drake
MW48	56th Ave ROW	**MW60**	56th Ave ROW	**MW89**	Drake

[1] Remediation wells are identified as "RW" and are either 2 or 4 inches in diameter.

For the purpose of obtaining additional information regarding contaminant distribution and at the request of TOC, select sampling locations identified in the tables below were added to the scope of work for the 2014 quarterly events.

Additional Shallow Zone Wells Sampled by Quarter

2Q2014		3Q2014		4Q2014	
Well ID	**Property**	**Well ID**	**Property**	**Well ID**	**Property**
MW54	TOC/Farmasonis	**MW54**	TOC/Farmasonis	**MW02**	TOC
MW67	Drake	**MW67**	Drake	**MW12**	56th Ave ROW
MW68	Drake	**MW68**	Drake	**MW19**	TOC
MW71*	Shin/Choi	**MW71***	Shin/Choi	**MW54**	TOC/Farmasonis
MW72*	Shin/Choi	**MW72***	Shin/Choi	**MW67**	Drake
MW102*	Herman	**MW102***	Herman	**MW68**	Drake
MW104	Herman	**MW104**	Herman	**MW71***	Shin/Choi
MW106	Herman	**MW106**	Herman	**MW72***	Shin/Choi
				MW102*	Herman
				MW104	Herman
				MW106	Herman

**Denotes locations of LNAPL samples collected during 2Q2014. Due to the consistent presence of product in these wells, samples were not collected at these locations during subsequent (3Q2014 and 4Q2014) field events.*

Additional Intermediate Zone Wells Sampled by Quarter

2Q2014		3Q2014		4Q2014	
Well ID	**Property**	**Well ID**	**Property**	**Well ID[1]**	**Property**
MW73	Shin/Choi	**MW73**	Shin/Choi	**MW57 (4" RW)**	TOC/Farmasonis
MW74	Shin/Choi	**MW74**	Shin/Choi	**MW73**	Shin/Choi
MW103	Herman	**MW103**	Herman	**MW74**	Shin/Choi
MW105	Herman	**MW105**	Herman	**MW96 (4" RW)**	Drake
MW107	Herman	**MW107**	Herman	**MW103**	Herman
				MW105	Herman
				MW107	Herman

[1] Remediation wells are identified as "RW" and are either 2 or 4 inches in diameter.

7.0 GROUNDWATER MONITORING FIELD METHODOLOGY

Field procedures used to conduct the groundwater monitoring event are provided in the following sections.

7.1 DTW/DTP Level Measurements

During each field event, Stantec measured DTW/DTP levels while the remediation systems were turned off and while they were operating. Measurements were collected while the remediation systems were turned off to obtain information on baseline (i.e., non-pumping) groundwater flow patterns, and while the remediation systems were operating to evaluate the influence of the remediation system pumping on groundwater flow. System-on measurements were collected at the beginning of the field event and system-off measurements were collected at the end of the field event. Prior to collecting system-off measurements, the remediation systems were turned off and groundwater levels were allowed to recharge for at least two days. The DTW/DTP levels were measured after removing the monitoring well caps and allowing groundwater levels to equilibrate with atmospheric pressure. The DTW/DTP levels were measured relative to the top of the well casings to an accuracy of 0.01 feet using an electronic water level meter. Where LNAPL was previously observed or expected to occur, an oil/water interface probe was used to check for the presence of LNAPL and measure the DTW/DTP level. When more than one water level meter was selected for a field event, Stantec collected a baseline measurement using each instrument at one well location to check for consistency between the instruments. Any differences between measurements were then used to calibrate the instruments and correct the groundwater elevations, if necessary.

DTW/DTP level measurements were collected from active monitoring and remediation wells located on the TOC Site, and adjacent properties (242nd Avenue ROW and the Herman and Shin/Choi properties). Measurements are not collected from 2-inch remediation wells (MW27, MW29, MW31, MW41, MW69 and MW70) because the diameter of water probe is too large to fit past the pump tubing. MW75 is only gauged during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

The DTW/DTP measurements were used to calculate groundwater elevations based on a monitoring well survey performed by PACE Engineers, Inc. (PACE) in April and May 2014. The groundwater elevations were then contoured to identify groundwater flow direction and hydraulic gradients.

DTW/DTP level measurements and resulting groundwater elevations for the 2014 quarterly events are discussed in **Sections 8.1 through 8.3** and presented on **Table 1-1** for system-off conditions and **Table 1-2** for system-on conditions.

7.2 Groundwater and LNAPL Sample Collection

During the quarterly groundwater monitoring events, 30 active wells are scheduled for groundwater sampling (per the IRAWP). As described in **Section 6.2**, Stantec collected groundwater samples from additional Shallow and Intermediate Zone well locations for the purpose of obtaining additional information regarding contaminant distribution. Product samples were collected from three additional Shallow Zone Wells on the Herman and Shin/Choi property during the 2Q2014 event.

Field sampling methods and procedures used to collected groundwater and LNAPL samples are described in the following sections. Groundwater quality results are discussed in **Section 8.4** and presented on **Tables 2-1 through 4-1**. Hydrocarbon fingerprinting results are discussed in **Section 8.5**.

7.2.1 Groundwater Sampling Methods & Procedures

Groundwater sampling methods used for the quarterly events are summarized below. Methods used to collect individual samples are identified on the attached groundwater quality results tables.

- **Pneumatic Pump:** For remediation wells connected to a MPE remediation system, Stantec collected groundwater samples using a dedicated downhole pneumatic pump. The pneumatic pump delivers a pulse of groundwater to the wellhead whenever the groundwater table rises above the pump intake. One set of field parameters was collected from the remediation wells sampled with a pneumatic pump. Groundwater samples were collected from the pneumatic pump directly into laboratory-prepared sample containers using disposable polyethylene tubing.
- **Peristaltic Pump:** This sampling method was selected for monitoring wells installed in the Shallow and/or Shallow-Intermediate Intersect Zone with DTW levels less than 31 feet bgs (due to the inability of the pump to lift the water for sampling from greater depths). Purging and sampling with a peristaltic pump was performed using disposable polyethylene tubing at approximate flow rates of 0.1 liters per minute or less.
- **Submersible Pump:** This sampling method was selected for monitoring wells installed in the Intermediate, Deep, and/or Intermediate-Deep Intersect Zones with DTW levels greater than 31 feet bgs (in which case a peristaltic pump could not be used for sampling). Submersible pumps were used in wells that had insufficient groundwater recharge rates and/or insufficient water column heights. Purging and sampling with a submersible pump was performed using disposable polyethylene tubing at flow rates ranging from 0.1 to 0.5 liters per minute. If the water table was above the top of the screen and, hence, the well screen was saturated, the intake tubing or the submersible pump was placed approximately in the middle of the screen. If however the groundwater table was below the top of the screen and, hence, the well screen was not fully-saturated, the intake tubing or submersible pump was placed near the middle of the water column.
- **Bailer:** The disposable polyethylene bailer sampling method was the last selected method and was only used under the following circumstances:
    - Historical analytical results indicated that elevated turbidity associated with bailing would not be likely to result in detectable concentrations of petroleum hydrocarbons in groundwater samples.
    - Historical water columns are less than five feet and recharge makes sampling with a submersible pump problematic.

  Well purging and groundwater sampling with disposable bailers required the removal of at least three well volumes from each monitoring well prior to sampling. Upon removal of at least three well volumes of groundwater, samples were collected from the bailer directly into laboratory-prepared sample containers. If fewer than three well volumes were purged when attempting to collect groundwater samples, the wells were allowed to recharge for several hours (or overnight) before samples were collected.

Samples collected with a peristaltic pump, submersible pump or bailer were collected in accordance with low-flow protocols (EPA 2010). When purging and sampling in accordance with low-flow protocols, Stantec monitored groundwater field parameters using a YSI Inc. water quality field meter equipped with a flow-through cell (except when sampling groundwater using a bailer). Field parameters, including temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation-reduction potential were monitored and recorded.

Following purging and stabilization of the field parameters, groundwater samples were collected from the pump outlet tubing located upstream of the flow-through cell and placed directly into laboratory-prepared sample containers. Purge water generated during this sampling event was placed in

appropriately labeled 55-gallon steel drums and temporarily stored on the TOC Property for transfer to the remediation systems for treatment and permitted discharge to the sanitary sewer.

Each set of sample containers was labeled with a unique sample identification number, placed on ice and stored inside of a cooler, and transported to Friedman & Bruya, Inc. (Friedman & Bruya) under standard chain-of-custody protocols for laboratory analysis.

7.2.2 LNAPL Sampling Methods & Procedures

At the request of TOC, LNAPL samples were collected from three locations (MW71, MW72 and MW102) during the 2Q2014 field event. Samples of the LNAPL layer were collected using peristaltic pumps in accordance with the methods and procedures described in the previous section.

7.3 Laboratory Analyses

Groundwater samples were analyzed by Friedman & Bruya, Inc. The data were validated by Stantec and, in some cases, qualifiers were assigned. Results are reported between the method detection limits (MDLs) and the method reporting limits (MRLs) for all data packages. Results are typically reported as "not detected" when below the MRLs. In cases where the MRLs were not below MTCA Method A cleanup levels for groundwater, the results are reported between the MDL and MRL and are considered estimates that are used for informational purposes only. The types of analyses typically performed for samples collected during the 2014 quarterly field events are identified in the table below.

Laboratory Analyses for Groundwater Samples

Analysis Type	Analysis Method	Sample Location / Well ID
Gasoline-Range Petroleum Hydrocarbons (GRPH)	NWTPH-Gx	*Analyses performed for all groundwater samples collected (as shown on Tables 2-1, 3-1 and 4-1).*
Oil-Range Petroleum Hydrocarbons (ORPH)	NWTPH-Dx	*Analyses performed for groundwater samples collected from select locations (as shown on Tables 2-1, 3-1 and 4-1).*
Diesel-Range Petroleum Hydrocarbons (DRPH)	NWTPH-Dx	
Benzene, Toluene, Ethylbenzene, & Total Xylenes (BTEX)	EPA Method 8021B or EPA Method 8260C	*Analyses performed for all groundwater samples collected (as shown on Tables 2-1, 3-1 and 4-1).*
Methyl Tertiary-Butyl Ether (MTBE)	EPA Method 8260C	*Analyses performed for groundwater samples collected from select locations (as shown on Tables 2-2 and 3-2).*
1,2-Dicholoroethane/ Ethylene Dichloride (EDC)	EPA Method 8260C	
1,2-Dibromoethane/ Ethylene Dibromide (EDB)	EPA Method 8011M	
Polycyclic Aromatic Hydrocarbons (PAH)	EPA Method 8270SIM	
Lead (total & dissolved)	EPA Method 200.8	

Laboratory Analyses for LNAPL Samples

Analysis Type	Analysis Type	Sample Location / Well ID
Hydrocarbon Fingerprinting	Gas Chromatograph/ Flame Ionization Detector EPA Method 8260C or EPA 200.8	• MW71 (Shin/Choi Property) • MW72 (Shin/Choi Property) • MW102 (Herman Property)

7.4 QA/QC Sampling Methods & Data Quality Review

The scope of work for quarterly groundwater monitoring events includes collection and laboratory analyses of groundwater samples for QA/QC purposes. QA/QC samples are collected to review the accuracy and precision of field sampling procedures and data supplied by the laboratory. A summary of the QA/QC samples collected each quarter is provided below.

7.4.1 Field Blanks

Field blanks include equipment/rinsate blanks and water blanks. Equipment/rinsate blanks consist of clean water (i.e. deionized water) that is poured through non-dedicated sampling equipment (submersible pumps) following decontamination; these samples are used to assess the thoroughness of the equipment decontamination process. Water blanks consist of the clean water used to decontaminate the non-dedicated sampling equipment poured directly into sample containers. The sample IDs for the field blanks collected during each quarterly event are listed in the table below. Analytical results are provided in the laboratory reports included as **Appendices A, B and C**.

Field Blanks Collected During Quarterly Events

Sample Type	Sample ID		
	2Q2014	**3Q2014**	**4Q2014**
Water Blanks	▪ WB-061314 ▪ WB-061914	▪ WB-092114	▪ WB-121314 ▪ WB-121514
Equipment/Rinsate Blanks	▪ EB-061314 ▪ EB-061414 ▪ EB-061914 ▪ EB-062014	▪ EB-092114	▪ EB-121314 ▪ EB-121514 ▪ EB-121614 ▪ EB-121714

7.4.2 Blind Field Duplicate Samples

Blind field duplicate samples were collected from the locations identified in the tables provided in this section. Duplicate samples are typically collected from two or more wells located on the TOC Site and from one well located on the Herman Property. These samples were collected by the same method used to collect the primary sample. Analytical results are provided in the laboratory reports (included as **Appendices A, B and C**) and presented on **Tables 2-1 through 4-1**.

Second Quarter 2014

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW09	TOC	Peristaltic Pump	MW09	MLT-01
MW20	TOC	Submersible Pump	MW20	MLT-02
MW86	Drake	Submersible Pump	MW86	MLT-03

Third Quarter 2014

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW20	TOC	Bailer	MW20	MLT-01
MW86	Drake	Submersible Pump	MW86	MLT-03
MW104	Herman	Peristaltic Pump	MW104	MLT-02

Fourth Quarter 2014

Sample Location/Well ID	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW09	TOC	Submersible Pump	MW09-SUB	MLT-1
MW86	Drake	Submersible Pump	MW86	MLT-02
MW104	Herman	Peristaltic Pump	MW104	MLT-03

7.4.3 Method Duplicate Samples

In order to evaluate the effects of sampling methods on data quality, groundwater samples were collected from MW09 during 2Q2014 using the three sampling methods. Method duplicate samples were historically collected by the previous consultant managing the project (SoundEarth Strategies [SES]). Following transition of groundwater monitoring activities from SES to Stantec, method duplicate samples were collected from this location for the purpose of further evaluating sampling methods historically used by SES. Based on field observations and data collected, Stantec determined the sampling methods identified in the table below (described in **Section 7.2.1**) were the most applicable based on the well type and the groundwater depth.

Selected Sampling Methods

Sampling Method	Description of Well Type and Groundwater Depth
Pneumatic Pump	Remediation Wells connected to a MPE remediation system.
Peristaltic Pump	Shallow Zone and/or Shallow-Intermediate Zone Intersect monitoring wells with DTW levels less than 31 feet bgs.
Submersible Pump	Intermediate Zone, Deep Zone, and/or Intermediate-Deep Zone Intersect monitoring wells with DTW levels greater than 31 feet bgs (in which case a peristaltic pump could not be used for sampling)
Bailer	Monitoring wells with DTW levels greater than 31 feet bgs and water columns less than five feet (in which case neither peristaltic nor submersible pumps could be used for sampling).

Since the sampling methods have been established by Stantec, continuation of method duplicate samples was determined to be not necessary for subsequent events. Analytical results are provided in the 2Q2014 laboratory reports (included as **Appendix A**) and presented on **Table 4-1**.

Sampling Method	Sample ID
Peristaltic Pump	MW09
Submersible Pump	MW09(Bailer)
Bailer	MW09(Submersible)

8.0 GROUNDWATER MONITORING RESULTS

Groundwater monitoring results for the 2014 quarterly groundwater monitoring events are organized by monitoring well categories based on groundwater zone and well screen intervals intersecting groundwater zones (see discussion in **Section 4.0**). The five monitoring well categories include:

1. Shallow Zone Wells,
2. Intermediate Zone Wells,
3. Deep Zone Wells,
4. Shallow-Intermediate Zone Intersect Wells, and
5. Intermediate-Deep Zone Intersect Wells.

8.1 DTW/DTP Level Measurements

A summary of information collected during each DTW/DTP level measurement event is provided in the tables below. DTW/DTP level measurements collected and resulting groundwater elevations at individual well locations are presented on **Table 1-1** for system-off conditions and **Table 1-2** for system-on conditions. Groundwater elevation results are discussed in **Section 8.2** and shown on groundwater elevation contour maps **(Figures 4 through 12)**.

A summary of DTW level measurement data and a list of wells where measurable LNAPL was observed for each quarterly event are provided in the tables below. LNAPL measurements are presented in **Section 8.3**.

System-Off DTW/DTP Level Measurement Events

	2Q2014	3Q2014	4Q2014
Measurement Date	June 18, 2014	September 24, 2014	December 16, 2014
Total Dry Wells [1]	8	32	22
Total Inaccessible Wells [2]	0	4 (MW15, MW18, MW98, MW101)	1 (MW102)
Shallowest DTW Level Measurement	10.67 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)	14.46 feet bgs (MW12, 56th Avenue ROW, Shallow Zone Well)	10.40 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)
Deepest DTW Level Measurement	45.95 feet bgs (MW16, 242nd Street ROW, Intermediate-Deep Zone Intersect Well)	47.41 feet bgs (MW26, TOC Property, Deep Zone Well)	48.38 feet bgs (MW26, TOC Property, Deep Zone Well)
Shallow Zone Wells with Measurable LNAPL	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)*

**MW102 was inaccessible during the 4Q2014 measurement event but is included in the table because LNAPL is typically observed at this location.*

[1] Wells did not have sufficient groundwater volume to measure DTW/DTP levels either because the well was dry (monitoring well) or the top of the pump was encountered before groundwater (remediation wells).

[2] Only includes wells that were inaccessible due to a vehicle blocking the wellhead or other reason described on Table 1-1.

System-On DTW/DTP Level Measurement Events

	2Q2014	3Q2014	4Q2014
Measurement Date	June 11, 2014	September 19, 2014	December 12, 2014
Total Dry Wells (1)	9	28	18
Total Inaccessible Wells (2)	1 (MW84)	0	1 (MW66)
Shallowest DTW Level Measurement	10.30 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)	14.34 feet bgs (MW12, 56th Avenue ROW, Shallow Zone Well)	11.11 feet bgs (MW34, TOC Property, Shallow Zone Well)
Deepest DTW Level Measurement	47.73 feet bgs (MW96, Drake Property, Intermediate Zone Well)	47.75 feet bgs (MW96, Drake Property, Intermediate Zone Well)	48.62 feet bgs (MW26, TOC Property, Deep Zone Well)

Note: Wells installed on the Herman and Shin/Choi Properties and in the ROW adjacent to these properties were not measured during the system-on event for 3Q2014 and 4Q2014 because they are located beyond of the remediation system's area of influence. Therefore, these wells are not included in the total of "dry" or "inaccessible" wells provided in the table.

(1) Wells did not have sufficient groundwater volume to measure DTW/DTP levels either because the well was dry (monitoring well) or the top of the pump was encountered before groundwater (remediation wells).

(2) Only includes wells that were inaccessible due to a vehicle blocking the wellhead or other reason described on Table 1-2.

As described in **Section 7.1**, DTW/DTP levels are not measured in 2-inch remediation wells (MW27, MW29, MW31, MW41, MW69, and MW70) because the diameter of the water probe is too large to fit past the pump tubing. In addition, DTP/DTW levels are only measured in MW75 during the annual (first quarter) event. DTW/DTP levels in several other wells were not measured during each quarterly field event for one of the following reasons:

1) Monitoring Wells: insufficient groundwater or the well was inaccessible (indicated as "dry" on the groundwater elevation contour maps provided as **Figures 4 through 12**).

2) Remediation Wells: the top of the remediation pump was encountered prior to groundwater and access past the pump was not possible (indicated as "dry" on the contour maps) or the diameter of the water probe was too large to fit past pump tubing in 2-inch remediation wells (indicated as "NM" on the contour maps).

3) Wellhead was inaccessible during the field event (inaccessible locations are shown in the tables above indicated as "NM" on contour maps).

4) The well was not included in the scope of work for the measurement event (indicated as "NM" on the contour maps).

8.2 Groundwater Elevations

Groundwater elevations were determined for each quarterly event when the remediation systems were operating and when they were not operating in order to evaluate groundwater flow patterns during baseline and active remediation conditions. A discussion of the observations is provided below for each groundwater zone and each quarterly event.

8.2.1 Shallow Zone

Consistent with groundwater elevation data collected during previous events, groundwater flow in the Shallow Zone during the 2014 quarterly events appears to be predominantly to the south-southeast, as shown on **Figures 4, 5, and 6**. A relatively consistent horizontal hydraulic gradient ranging from approximately 0.02 to 0.06 feet/feet is present across the southern portion of the TOC Site (i.e., TOC/Farmasonis and Drake Properties); however, in the northern area of the TOC Site (in the southern

portion of the TOC Property), steepening of the gradient to about 0.1 feet/feet occurs. As discussed in **Section 4.1**, this steepening could be related to increased infiltration in this area through emplaced fill from the UST excavation or from the former topographically closed depression, where surface runoff previously ponded, and the former stormwater infiltration pit.

8.2.2 Intermediate Zone

Similar to the Shallow Zone, groundwater flow in the Intermediate Zone during baseline (system-off/non-pumping) conditions appears to be generally to the south-southeast based on previous groundwater elevations and those measured during the 2014 field events, as shown on **Figures 7a, 8a, and 9a**. Horizontal hydraulic gradients ranging from approximately 0.01 to 1.25 feet/feet occur across the TOC Site.

The groundwater elevations shown on **Figures 7b, 8b, and 9b**, were based on measurements collected when the remediation systems were operating. As discussed in **Section 4.2,** steepening in the slope of the horizontal gradient is apparent in the vicinity of the TOC Property's southern boundary and is thought to be related to mounding of groundwater in the area of the TOC Property. This mounding could reflect the combined influences of the following: artificial recharge associated with emplaced fill in the former UST area and the stormwater infiltration pit and depression; and/or the apparent presence of low permeability material restricting groundwater flow in that area. Also, localized mounding effects appear to be present in the direct vicinity of at least three remediation wells (MW32, MW91, MW95 and/or MW96 [as shown on **Figures 7b, 8b, and 9b**]) during each of the quarterly events. The mounding effect is likely associated with vacuum effects from the SVE components of the remediation systems during operation. As groundwater moves downgradient and encounters higher permeability layers (e.g., gravels and sands), the horizontal hydraulic gradient flattens significantly. The areas of depressed groundwater elevations on the TOC/Farmasonis Property and 56th Avenue ROW are likely influenced by operation of the remediation systems (Units 2 and 3, respectively).

8.2.3 Deep Zone

Groundwater flow in the Deep Zone appears to be generally to the southeast. The horizontal hydraulic gradient has a relatively flat range from approximately 0.001 to 0.008 feet/feet during the three 2014 quarterly events (likely because the wells are screened in high permeability material). Groundwater elevations for the monitoring wells located in the Deep Zone are shown on **Figures 10, 11 and 12**.

8.2.4 Well Screens Intersecting Multiple Zones

As previously mentioned, the well screens in 16 monitoring and remediation wells appear to intersect conditions of multiple groundwater zones. Since the groundwater level elevations for these wells do not correlate with a single groundwater zone, they appear anomalous when included with groundwater elevations representing a single groundwater zone, and therefore, were not used for groundwater elevation contouring. Data for these wells are shown on the Intermediate Zone contours maps identified in **Section 8.2.2**. The groundwater elevation data collected from the wells intersecting two groundwater zones are described below.

8.2.4.1 Shallow-Intermediate Zone Intersect Wells

Fifteen monitoring and remediation wells appear to have screened intervals that intersect both Shallow and Intermediate Zone conditions (MW08, MW09, MW18, MW22, MW24, MW27, MW28, MW29, MW37, MW38, MW43, MW82, MW83, MW88 and MW100). Groundwater elevations for these wells are typically lower than Shallow Zone wells but higher than Intermediate Zone wells due to influence of groundwater conditions from both the Shallow and Intermediate Zones.

8.2.4.2 Intermediate-Deep Zone Intersect Wells

One monitoring well (MW16) appears to have a screened interval that intersects both Intermediate and Deep Zone conditions. The well has been dry during many sampling events but, when measured, the groundwater elevations are typically lower than other Intermediate Zone wells due to influence from the Deep Zone.

8.3 LNAPL Measurements

Measurable LNAPL was observed and sampled in three Shallow Zone monitoring wells during the 2014 quarterly field events. The table below provides LNAPL thickness at these locations during system-off measurement events.

LNAPL Thickness in Shallow Zone Wells during 2014 Quarterly Events

Location/Well ID	Property	LNAPL Thickness (feet)		
		2Q2014	3Q2014	4Q2014
MW71	Shin/Choi	0.46	1.23	1.19
MW72	Shin/Choi	0.43	0.44	0.15
MW102	Herman	0.96	0.19	Wellhead Inaccessible

8.4 Groundwater Quality Results

Analytical results for the quarterly field events are provided in **Tables 2-1 through 4-1**. The types of laboratory analyses performed by Friedman & Bruya for the groundwater samples collected are identified on the table in **Section 7.3,** and analytical reports for each of the quarterly events are provided as **Appendices A, B and C**. As shown on the attached tables, the analytical results indicate several constituents were consistently detected in groundwater samples at concentrations above the MRLs (i.e., detected concentrations) and above MTCA Method A cleanup levels.

A summary of the analytical results that exceed the MTCA Method A cleanup levels for each well network are presented in the following sections. A summary of the results for each 2014 quarterly event is provided in **Sections 9.1 through 9.3**, followed by a list of Conclusions in **Section 9.4**.

8.4.1 Shallow Zone

The Shallow Zone well network includes 20 active monitoring wells and one decommissioned well. The scope of work defined in the IRAWP does not require quarterly groundwater sampling of any of the wells in this zone. As previously discussed, Stantec collected samples from select Shallow Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are provided in **Section 6.2**.

The tables provided in this section identify concentrations of groundwater samples exceeding MTCA Method A cleanup levels during each of the 2014 quarterly events. **Tables 2-1 and 2-2** summarize the analytical results for the groundwater samples collected from Shallow Zone wells. Concentration distribution maps for GRPH and benzene in the Shallow Zone are provided as **Figures 13 and 14** for the 2Q2014 event, **Figures 15 and 16** for the 3Q2014 event, and **Figures 17 and 18** for the 4Q2014 event.

2Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	800 when benzene is present	MW71	Shin/Choi	LNAPL
		MW72	Shin/Choi	LNAPL
		MW102	Herman	LNAPL
		MW104	Herman	2,400
DRPH	500	MW104	Herman	1,700 (JL)
Benzene	5	MW71	Shin/Choi	LNAPL
		MW72	Shin/Choi	LNAPL
		MW102	Herman	LNAPL
Fluorene	0.1	MW106	Herman	0.27

3Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	800 when benzene is present	MW71 [(1)]	Shin/Choi	LNAPL
		MW72 [(1)]	Shin/Choi	LNAPL
		MW102 [(1)]	Herman	LNAPL
		MW104*	Herman	47,000
DRPH	500	MW104*	Herman	8,300
Benzene	5	MW71	Shin/Choi	LNAPL
		MW72	Shin/Choi	LNAPL
		MW102	Herman	LNAPL
		MW104*	Herman	35
Toluene	1,000	MW104*	Herman	6,700
Ethyl-Benzene	700	MW104*	Herman	2,000
Total Xylenes	1,000	MW104*	Herman	7,300
EDB	0.01	MW104*	Herman	0.13
Acenaphthene	0.1	MW104*	Herman	0.21
Fluorene	0.1	MW104*	Herman	0.12
		MW106	Herman	0.27
Napthalene	160	MW104*	Herman	360
Phenanthrene	0.1	MW104*	Herman	0.12

4Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Shallow Zone Wells)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	800 when benzene is present	MW71 [(1)]	Shin/Choi	LNAPL
		MW72 [(1)]	Shin/Choi	LNAPL
		MW102 [(2)]	Herman	LNAPL
		MW104*	Herman	54,000
ORPH	500	MW104*	Herman	740
DRPH	500	MW104*	Herman	11,000
Benzene	5	MW71	Shin/Choi	LNAPL
		MW72	Shin/Choi	LNAPL
		MW102	Herman	LNAPL
		MW104*	Herman	71
Toluene	1,000	MW104*	Herman	6,300
Ethyl-Benzene	700	MW104*	Herman	1,700
Total Xylenes	1,000	MW104*	Herman	7,400

Table Notes:

**Indicates duplicate sample was collected from this location. Analytical results represent maximum concentration of the two samples collected.*

(1) Samples were not collected from well location due to presence of LNAPL. Since product was observed during DTW/DTP measurements, exceedance of MTCA cleanup levels is expected.

(2) MW102 was inaccessible during 4Q2014 but product is typically observed at this location.

(JL) = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned by the laboratory based on their QC protocol.

8.4.2 Intermediate Zone

At the time of the 2014 quarterly events, the Intermediate Zone well network included 60 active wells (19 of which were being used as remediation wells during the 2Q2014 and 3Q2014 events) and four decommissioned wells. As indicated in **Section 5.0**, the pump was removed from remediation well MW15 during the 4Q2014 event, reducing the number of active remediation wells to 18. The scope of work defined in the IRAWP requires quarterly groundwater sampling of 28 of the 60 active wells in this zone. As previously discussed, in addition to sampling the required wells, Stantec also sampled several other select Intermediate Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are provided in **Section 6.2**.

The tables below identify concentrations of groundwater samples exceeding MTCA Method A cleanup levels during each of the 2014 quarterly events. **Tables 3-1 and 3-2** summarize the analytical results for the groundwater samples collected from Intermediate Zone wells. Concentration distribution maps for GRPH and benzene in the Intermediate Zone are provided as **Figures 19 and 20** for the 2Q2014 event, **Figures 21 and 22** for the 3Q2014 event, and **Figures 23 and 24** for the 4Q2014 event.

2Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW32 MW48 MW73 MW74 MW84	TOC TOC/Farmasonis Shin/Choi Shin/Choi Drake	2,100 10,000 87,000 66,000 960
DRPH	**500**	MW73 MW74	Shin/Choi Shin/Choi	5,900 (JL) 4,200 (JL)
Benzene	**5**	MW20* MW73 MW74	TOC Shin/Choi Shin/Choi	12 (J)* 2,100 1,800
Toluene	**1000**	MW73 MW74	Shin/Choi Shin/Choi	4,100 7,600
Ethylbenzene	**700**	MW73	Shin/Choi	840
Total Xylenes	**1,000**	MW73 MW74	Shin/Choi Shin/Choi	9,700 2,700
MTBE	**20**	MW73 MW74 MW103	Shin/Choi Shin/Choi Herman	200 (U)** 610 170
EDC	**5**	MW73 MW74	Shin/Choi Shin/Choi	200 (U)** 200 (U)**
EDB	**0.01**	MW73 MW74	Shin/Choi Shin/Choi	1.8 1.7
Naphthalene	**160**	MW73	Shin/Choi	290
PAHs (excluding Naphthalene)	**0.1**	MW73 MW74	Shin/Choi Shin/Choi	5 (U)** 5 (U)**

3Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW73 MW74 MW86*	56th Ave ROW Shin/Choi Shin/Choi Drake	8,500 81,000 7,100 1,000
DRPH	**500**	MW73 MW74	Shin/Choi Shin/Choi	4,600 3,000
Benzene	**5**	MW73 MW74 MW107	Shin/Choi Shin/Choi Herman	15,000 1,700 5.3 (J)
Toluene	**1000**	MW73	Shin/Choi	3,600
Ethylbenzene	**700**	MW73	Shin/Choi	1,900
Total Xylenes	**1,000**	MW73	Shin/Choi	9,200
MTBE	**20**	MW74	Shin/Choi	580
EDB	**0.01**	MW73	Shin/Choi	0.41
Dissolved Lead	**15**	MW32	TOC	50.8
Total Lead	**15**	MW32	TOC	62.2
Naphthalene	**160**	MW73	Shin/Choi	330

4Q2014 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW57 MW73	56th Ave ROW TOC/Farmasonis Shin/Choi	7,700 4,700 69,000
DRPH	**500**	MW73	Shin/Choi	4,300
Benzene	**5**	MW48 MW73	56th Ave ROW Shin/Choi	67 13,000
Ethylbenzene	**700**	MW73	Shin/Choi	1,600
Total Xylenes	**1,000**	MW73	Shin/Choi	7,900
MTBE	**20**	MW73	Shin/Choi	90

**Indicates duplicate sample was collected from this location. Analytical results represent maximum concentration of the two samples collected.*

***Indicates the constituent was not detected at or above the MRL; however, the MRL was elevated due to sample dilution and exceeded the MTCA cleanup level.*

(J) = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

(JL) = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned by the laboratory based on their quality control protocol.

(U) = Indicates the compound was undetected at the reported concentration.

8.4.3 Deep Zone

The Deep Zone well network includes six active monitoring wells. The scope of work defined in the IRAWP does not require quarterly groundwater sampling of any of the active wells installed in this zone.

8.4.4 Well Screens Intersecting Multiple Zones

As described in **Section 4.4**, 15 active wells (four of which serve as remediation wells) and one decommissioned well appear to have wells screens that intersect conditions of multiple groundwater zones. The groundwater quality results for monitoring wells in these zones are discussed in the following sections.

8.4.4.1 Shallow-Intermediate Zone Intersect Wells

The Shallow-Intermediate Zone intersect well network includes 14 active wells (four of which serve as remediation wells) and one decommissioned well. The scope of work defined in the IRAWP requires quarterly groundwater sampling of two (MW09 and MW27) of the 14 active wells in this zone. As shown on **Table 4-1**, the analytical results of the samples collected did not exceed MTCA Method A cleanup levels for 2Q2014, 3Q2014 or 4Q2014. Since MTBE, EDC, EDB, lead and PAHs were not analyzed for these samples, a groundwater quality results table for common fuel additives is not provided for this zone.

8.4.4.2 Intermediate-Deep Zone Intersect Wells

The scope of work defined in the IRAWP does not require quarterly groundwater monitoring for the one monitoring well (MW16 located within the 242nd Street ROW) that intersects Intermediate and Deep Zone conditions. Groundwater sampling for MW16 is performed during the annual (first quarter) event.

8.5 LNAPL/Hydrocarbon Fingerprinting Results

During the 2Q2014 event, Stantec collected product samples from the following locations:

- MW71 – near northern boundary of Shin/Choi Property (adjacent to the Herman Property line);
- MW72 – within historic excavation area on the southern portion of the Shin/Choi Property; and
- MW102 – downgradient of the historic excavation area on the Herman Property (adjacent to the Shin/Choi Property line).

The samples were submitted to Friedman & Bruya for hydrocarbon fingerprinting analysis.

The results of the product fingerprinting for the samples collected from MW71 and MW72 were unusable for the intended purpose. The samples submitted had separated into two phases of water and product and the lab analyzed the water portion instead of the product portion. Because the results do not represent the product, they were considered unusable for a hydrocarbon fingerprinting evaluation.

The sample collected from MW102 was analyzed as a product sample, but the lab did not complete reanalysis of certain analytes that were out of the calibration range of the instrument (and are typically diluted and reanalyzed). As a result, many of the concentrations were designated as estimated values. The lab did provide a narrative based on their review of the chromatograms for this sample. The lab reported that the chromatograms for the product sample collected from MW102 showed the presence of C3-benzenes, toluene, ethylbenzene, xylenes and methylnaphthalenes, which are compounds characteristic of the constituents commonly found in gasoline. According to the lab, the relative abundance of the volatile and semi-volatile constituents present in the sample indicates that substantial degradation has not occurred to the fuel. The laboratory report for the product sample from MW102 is provided as **Appendix D**.

The product results from MW102 (located on the Herman Property) were compared to the results of a composite product sample collected by SES on November 30, 2005 (SES sample PPW113005) from MW15, MW18 and MW20 (located on the TOC Property). The results of the 2005 and 2014 product samples were compared to determine if the product found on the TOC and Herman properties appear

to be from the same source. Friedman & Bruya reported that the chromatogram for the composite product sample collected from the TOC Property in 2005 contained low levels or the absence of toluene, ethylbenzene and xylenes, which indicates that the gasoline present has undergone extensive degradation. The lab report for the 2005 composite product sample collected by SES is provided as **Appendix E**.

Based on comparison of the laboratory fingerprinting results between the 2005 and 2014 events, it appears the historical product at the TOC Property and the current product at the Herman property are from different sources.

8.6 QA/QC & Data Quality Results

As described in **Section 6.0**, the scope of work for the quarterly groundwater monitoring events included collection and laboratory analyses of groundwater samples for QA/QC purposes. Stantec performed a QA/QC (data validation) review of the analytical results, which included a review of accuracy and precision of data supplied by the laboratory per EPA guidelines. The data validation resulted in assignment of qualifiers to several sample results. Analytical results for field duplicates and method duplicates and data validation qualifiers are provided on the attached groundwater quality results tables. Analytical results for all other QA/QC samples, including water blanks and equipment/rinsate blanks are provided in the laboratory reports provided as **Appendices A, B and C**.

9.0 SUMMARY OF RESULTS & CONCLUSIONS

A summary of the results and a list of conclusions for each of the 2014 quarterly groundwater monitoring events are provided in **Sections 9.1 and 9.2**, respectively.

9.1 Summary of 2Q2014 Results

9.1.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 10.67 feet bgs for MW61 (a Shallow Zone well located within the 56th Avenue ROW) to 45.95 feet bgs for MW16 (an Intermediate-Deep Zone Intersect well located within the 242nd Street ROW).
- Measurable LNAPL was observed in three Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property and MW102 located on the Herman Property).

9.1.2 Groundwater Quality & LNAPL/Hydrocarbon Fingerprinting Results

- **Shallow Zone – Groundwater Samples:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 2Q2014 are described below.
    - As shown on **Figure 13**, concentrations of GRPH exceeding MTCA cleanup levels were observed near the northern boundary of the Herman Property at MW104. Since LNAPL was present at MW102 on the Herman Property and MW71 and MW72 on the Shin/Choi Property, a GRPH plume area was added to include these three locations.
    - Since the product sample collected from MW71, MW72 and MW102 contained benzene, the plume area shown on **Figure 14** includes these three wells.
    - In addition, DRPH was observed in MW104 (Herman Property) and PAHs (acenaphthene, fluorene, naphthalene, and phenanthrene) were observed in MW106 (Herman Property) at concentrations exceeding MTCA cleanup levels.
- **Shallow Zone – Product Samples:** LNAPL samples were collected from three Shallow Zone monitoring wells (MW71, MW72, and MW102) for hydrocarbon fingerprinting. Due to issues with the laboratory analyses, the results of product samples collected from MW71 and MW72 were determined to be unusable (see **Section 8.4.5**). However, the product fingerprinting narrative from the laboratory indicated that the relative abundance of the volatile and semivolatile constituents present in the sample indicates that substantial fuel degradation had not occurred.
- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells described below.
    - As shown on **Figure 19,** concentrations of GRPH exceeding MTCA cleanup levels were focused in the following areas:
        - the west side of the TOC Property near MW32 (adjacent to the 56th Avenue ROW Property Line);
        - the east side of the 56th Avenue ROW near MW48 (located on the sidewalk adjacent to the property line shared by the TOC/Farmasonis and Drake Properties);
        - the southwest area of the Shin/Choi Property near MW73 and close to the northern property line near MW74 (adjacent to the Herman Property); and
        - just north of the southern border of the Drake Property near MW84.

- As shown on **Figure 20**, concentrations of benzene exceeding MTCA cleanup levels were focused in the following areas:
  - the southwest area of the TOC Property near MW20 (adjacent to the 56th Avenue ROW Property line); and
  - the southwest area of the Shin/Choi Property near MW73 (in the vicinity of the historic excavation area) and close to the northern property line near MW74 (adjacent to the Herman Property).
- Concentrations of DRPH, toluene, ethylbenzene, total xylenes, MTBE, EDB, and naphthalene exceeded MTCA cleanup levels in at least one of the groundwater samples collected from the two Intermediate Zone wells located on the Shin/Choi Property (MW73 and MW74). Other PAH constituents were not detected at or above the MRL; however, the MRL was elevated due to sample dilution and exceeded the MTCA cleanup level. These constituents were not detected at concentrations exceeding MTCA cleanup levels in the groundwater samples collected from the TOC Site.
- The concentration of MTBE exceeded the MTCA cleanup level in the groundwater sample collected from MW103 on the Herman Property. MTBE was not detected at concentrations exceeding MTCA cleanup levels in the groundwater samples collected from the TOC Site.

- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** Concentrations of groundwater samples collected from Shallow-Intermediate Zone Intersect wells during 2Q2014 did not exceed MTCA cleanup levels.
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.2 Summary of 3Q2014 Results

9.2.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 14.46 feet bgs for MW12 (a Shallow Zone well located within the 56th Avenue ROW) to 47.41 feet bgs for MW26 (a Deep Zone well located on the TOC Property).
- Measurable LNAPL was observed in three Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property and MW102 located on the Herman Property).

9.2.2 Groundwater Quality Results

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 3Q2014 are described below.
  - As shown on **Figures 15 and 16**, concentrations of GRPH and benzene exceeding MTCA cleanup levels were focused near the northern boundary of the Herman Property in MW104. Since LNAPL was observed in MW102 on the Herman Property and MW71 and MW72 on the Shin/Choi Property, GRPH and benzene plume areas were added to include these locations.
  - Concentrations of DRPH, toluene, ethylbenzene, total xylenes, and EDB exceeded MTCA cleanup levels in the groundwater sample collected from MW104 on the Herman Property.

- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells described below.
    - As shown on **Figure 21,** concentrations of GRPH exceeding MTCA cleanup levels were focused in the following areas:
        - the east side of the 56th Avenue ROW near MW48 (located on the sidewalk adjacent to the property line shared by the TOC/Farmasonis and Drake Properties);
        - just north of the southern border of the Drake Property near MW86; and
        - the southwest area of the Shin/Choi Property near MW73 (in the vicinity of the historic excavation area) and close to the northern property line near MW74 (adjacent to the Herman Property).
    - As shown on **Figure 22**, concentrations of benzene exceeding MTCA cleanup levels were focused in the following areas:
        - the southwest area of the Shin/Choi Property near MW73 (in the vicinity of the historic excavation area) and close to the northern property line near MW74 (adjacent to the Herman Property).
        - the southeast area of the Herman Property near MW107 (adjacent to the Shin/Choi and Mountlake Senior property lines).
    - Concentrations of DRPH, toluene, ethylbenzene, total xylenes, MTBE, EDB, and napthalene exceeded MTCA cleanup levels in groundwater samples collected from one or both of the wells located on the Shin/Choi Property (MW73 and MW74). These constituents were not observed at concentrations exceeding MTCA cleanup levels in groundwater samples collected from the TOC Site.
    - Concentrations of dissolved and total lead exceeded MTCA cleanup levels in the groundwater sample collected from MW32 on the TOC Property.
- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** Due to insufficient groundwater sample volume, MW09 and MW27 could not be sampled as scheduled for this quarterly event.
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.3 Summary of 4Q2014 Results

9.3.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 10.40 feet bgs for MW61 (located within the 56th Avenue ROW in the Shallow Zone) to 48.38 feet bgs for MW26 (located on the TOC Property in the Deep Zone).
- Measurable LNAPL was observed in two Shallow Zone monitoring wells (MW71 and MW72 located on the Shin/Choi Property). Measurable LNAPL is typically observed in MW102 (located on the Herman Property); however, the well was noted as "dry" during the 4Q2014 event.

9.3.2 Groundwater Quality Results

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 4Q2014 are described below.
    - As shown on **Figures 17 and 18,** GRPH and benzene concentrations exceeded MTCA cleanup levels in groundwater samples collected from MW104 (located near the northern boundary of the Herman Property). Since, LNAPL is typically observed in MW102 on the Herman Property and was present in MW71 and MW72 on the Shin/Choi Property during the 4Q2014 event, GRPH and benzene plume areas were added to include these locations.
    - Concentrations of DRPH, ORPH, toluene, ethylbenzene, and total xylenes exceeded the MTCA cleanup levels in groundwater samples collected from MW104 on the Herman Property.
- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells described below.
    - As shown on **Figure 23,** concentrations of GRPH exceeding MTCA cleanup levels were focused in the following areas:
        - the east side of the 56th Avenue ROW near MW48 (located on the sidewalk adjacent to the property line shared by the TOC/Farmasonis and Drake Properties);
        - the southeast corner of the TOC/Farmasonis Property near MW57 (adjacent to the 56th Avenue ROW); and
        - the southwest area of the Shin Choi Property near MW73 (in the vicinity of the historic excavation area). (Note: MW74 [located near the northern property line and adjacent to the Herman Property] could not be sampled during 4Q2014 due to insufficient groundwater sample volume. Since GRPH was observed at concentrations exceeding the MTCA Method A cleanup level at MW74 during previous quarterly events, the plume area was extended to include this location.)
    - As shown on **Figure 24**, concentrations of benzene exceeding MTCA cleanup levels were focused near MW73 located on the Shin Choi Property. (Note: As described above, MW74 could not be sampled during 4Q2014 due to insufficient groundwater sample volume. Since benzene was observed at concentrations exceeding the MTCA Method A cleanup level at MW74 during previous quarterly events, the plume area was extended to include this location.) Benzene was not observed at concentrations exceeding MTCA cleanup levels in the groundwater samples collected from the TOC Site.
    - Concentrations of DRPH, ethylbenzene, total xylenes, and MTBE exceeded the MTCA cleanup levels within groundwater at well MW73 on the Shin/Choi Property. These constituents were not observed at concentrations exceeding MTCA cleanup levels in the groundwater samples collected from the TOC Site.
- **Deep Zone:** Groundwater samples were not collected from wells located in the Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).
- **Shallow-Intermediate Zone Intersect Wells:** Concentrations of constituents analyzed did not exceed MTCA Method A cleanup levels in groundwater samples collected from Shallow-Intermediate Zone Intersect wells during this quarterly event.
- **Intermediate-Deep Zone Intersect Wells:** Groundwater samples were not collected from the well located in the Intermediate-Deep Zone during this quarterly event (per the scope of work defined in the IRAWP).

9.4 Conclusions

A list of conclusions based on the results from the 2014 quarterly events is provided below:

- The overall direction of groundwater flow through the Shallow, Intermediate, and Deep Zones is toward the south-southeast.
- Shallow Zone groundwater impacts from petroleum hydrocarbons are not currently observed at the TOC Site. Impacts to Shallow Zone groundwater exceeding MTCA Method A cleanup levels were limited to the Herman and Shin/Choi Properties during the reporting period.
- LNAPL has been consistently observed in Shallow Zone wells on the Shin/Choi Property and typically in the southernmost Shallow Zone well on the Herman Property (adjacent to the Shin/Choi Property line), Based on historical information (presented in the 2014 and 2015 *Annual Groundwater Monitoring Reports* [Stantec 2014b and 2015c]), the results of the hydrocarbon fingerprinting analyses (described in **Section 8.4.5**), and the lack of current and historical measurable LNAPL in the Shallow Zone wells on the Drake Property (located directly upgradient of the wells containing LNAPL), the source of the free product in MW71, MW72 and MW102 appears to be different than that of the TOC Property and may originate from USTs historically or currently located on the Herman and Shin/Choi Properties.
- Intermediate Zone groundwater impacts from petroleum hydrocarbons on the TOC Site are isolated near the southwest corners of the TOC and TOC/Farmasonis Property boundaries and just north of the Drake and Herman Property boundary. Additional impacts from petroleum hydrocarbons in the Intermediate Zone are observed near the southern portion of the Herman Property and the Shin/Choi Property. Based on the current and historical concentration distribution patterns and comparison of contaminant concentrations on the TOC Site with those in the southernmost plume area (located on the Herman and Shin/Choi Properties), the Intermediate Zone impacts on the TOC Site appear to be separate from those on the Herman and Shin/Choi Properties.
- Impacts to groundwater from petroleum hydrocarbons were not observed in Shallow-Intermediate Zone Intersect wells sampled during the 2014 quarterly events. Since impacts to groundwater are no longer observed in Deep Zone and Intermediate-Deep Zone wells, quarterly groundwater sampling is not required. Groundwater samples are only collected from these zones during the annual (first quarter) event (per the scope of work defined in the IRAWP).
- The current vertical and lateral distributions of petroleum hydrocarbons in the three groundwater zones support the working hypothesis that contamination originating from the former USTs on the TOC Property has been mostly remediated with limited petroleum-impacted groundwater remaining within the Intermediate Zone on the TOC, TOC/Farmasonis and Drake Properties.

10.0 FUTURE GROUNDWATER TASKS

The dates of the 2015 groundwater monitoring events are provided in the table below.

Dates of 2015 Groundwater Monitoring Events

Quarter	Field Event Dates
1Q2015 (Annual Event)	March 10 to 20, 2015
2Q2015	June 9 to 19, 2015
3Q2015	September 22 to 28, 2015
4Q2015	December 9 to 15, 2015

The 2015 Annual Groundwater Monitoring Report was submitted to Ecology on July 31, 2015 (Stantec 2015c). A single report documenting the 2Q2015, 3Q2015, and 4Q2015 groundwater monitoring results will be provided to Ecology during the first quarter 2016. The 2016 annual (first quarter) event will be conducted in March 2016. The *2016 Annual Groundwater Monitoring Report* will be submitted to Ecology by June 30, 2016.

11.0 REFERENCES

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Tables

1-1 Depth-to-Groundwater Level & Product Thickness Measurements (System Off)

1-2 Depth-to-Groundwater Level & Product Thickness Measurements (System On)

2-1 Groundwater Quality Results for Select Constituents, Shallow Zone Wells

2-2 Groundwater Quality Results for Common Fuel Additives, Shallow Zone Wells

3-1 Groundwater Quality Results for Select Constituents, Intermediate Zone Wells

3-2 Groundwater Quality Results for Common Fuel Additives, Intermediate Zone Wells

4-1 Groundwater Quality Results for Select Constituents, Shallow-Intermediate Intersect Wells

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	06/18/2014	11:01	358.71	11.80	346.91	--	
MW02	TOC	09/24/2014	14:32	358.71	15.39	343.32	--	
MW02	TOC	12/16/2014	10:34	358.71	12.67	346.04	--	
MW03	TOC	06/18/2014	11:18	361.85	13.09	348.76	--	
MW03	TOC	09/24/2014	14:55	361.85	DRY	DRY	DRY	
MW03	TOC	12/16/2014	10:40	361.85	14.37	347.48	--	
MW04	56th Ave ROW	06/18/2014	11:32	361.96	11.62	350.34	--	
MW04	56th Ave ROW	09/24/2014	11:53	361.96	DRY	DRY	DRY	
MW04	56th Ave ROW	12/16/2014	10:41	361.96	DRY	DRY	DRY	
MW05	242nd St ROW	06/18/2014	11:27	363.70	11.42	352.28	--	
MW05	242nd St ROW	09/24/2014	11:49	363.70	DRY	DRY	DRY	
MW05	242nd St ROW	12/16/2014	10:44	363.70	DRY	DRY	DRY	
MW06	TOC	06/18/2014	10:46	358.98	13.17	345.81	--	
MW06	TOC	09/24/2014	12:00	358.98	DRY	DRY	DRY	
MW06	TOC	12/16/2014	10:20	358.98	DRY	DRY	DRY	
MW07	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	06/18/2014	11:36	360.34	21.51	338.83	--	
MW08	56th Ave ROW	09/24/2014	10:59	360.34	DRY	DRY	DRY	
MW08	56th Ave ROW	12/16/2014	12:23	360.34	23.34	337.00	--	
MW09	TOC	06/18/2014	11:06	360.32	26.25	334.07	Sheen	
MW09	TOC	09/24/2014	14:39	360.32	38.09	322.23	--	
MW09	TOC	12/16/2014	10:37	360.32	29.58	330.74	--	
MW10	TOC	06/18/2014	10:58	357.91	33.55	324.36	--	
MW10	TOC	09/24/2014	14:24	357.91	DRY	DRY	DRY	
MW10	TOC	12/16/2014	10:32	357.91	36.39	321.52	--	
MW11 (4" RW)	TOC	06/18/2014	11:22	362.34	24.25	338.09	--	
MW11 (4" RW)	TOC	09/24/2014	15:00	362.34	28.04	334.30	--	
MW11 (4" RW)	TOC	12/16/2014	9:22	362.34	25.70	336.64	--	
MW12	56th Ave ROW	06/18/2014	9:37	357.65	10.77	346.88	--	
MW12	56th Ave ROW	09/24/2014	13:20	357.65	14.46	343.19	--	
MW12	56th Ave ROW	12/16/2014	11:26	357.65	12.30	345.35	--	
MW13	56th Ave ROW	06/18/2014	9:36	357.34	40.59	316.75	--	
MW13	56th Ave ROW	09/24/2014	13:22	357.34	DRY	DRY	DRY	
MW13	56th Ave ROW	12/16/2014	11:25	357.34	DRY	DRY	DRY	
MW14	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15 (4" RW)	TOC	06/11/2014	12:20	357.56	35.49	322.07	--	Measurement not collected on 06/18/2014 due to abundant biological buildup on top of water. Data represents measurement taken at time of sample collection. Measurement may be anomalous due to abundant bio and/or mud build up in the well.
MW15 (4" RW)	TOC	09/24/2014	14:20	357.56	NM	NM	NM	Well full of mud and could not be measured on 06/18/2014 or at time of sample collection.
MW15	TOC	12/16/2014	9:28	357.56	40.80	316.76	--	Removed pump from well on 12/16/2014.
MW16	242nd St ROW	06/18/2014	11:29	365.18	45.95	319.23	--	
MW16	242nd St ROW	09/24/2014	11:48	365.18	DRY	DRY	DRY	
MW16	242nd St ROW	12/16/2014	10:46	365.18	DRY	DRY	DRY	
MW17	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	06/18/2014	10:51	357.91	DRY	DRY	DRY	
MW18 (4" RW)	TOC	09/24/2014	14:23	357.91	NM	NM	NM	unable to measure (vault full of water)
MW18 (4" RW)	TOC	12/16/2014	9:08	357.91	DRY	DRY	DRY	
MW19	TOC	06/18/2014	10:54	358.86	13.82	345.04	--	
MW19	TOC	09/24/2014	11:56	358.86	DRY	DRY	DRY	Poor seal on well cap.
MW19	TOC	12/16/2014	10:30	358.86	14.53	344.33	--	
MW20	TOC	06/18/2014	11:01	359.93	35.29	324.64	--	
MW20	TOC	09/24/2014	11:54	359.93	38.48	321.45	--	
MW20	TOC	12/16/2014	10:35	359.93	37.91	322.02	--	
MW21	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	06/18/2014	11:00	358.52	29.08	329.44	--	
MW22	TOC	09/24/2014	14:27	358.52	DRY	DRY	DRY	
MW22	TOC	12/16/2014	10:31	358.52	28.95	329.57	--	
MW23	TOC	06/18/2014	10:33	357.08	39.03	318.05	--	
MW23	TOC	09/24/2014	12:04	357.08	DRY	DRY	DRY	
MW23	TOC	12/16/2014	10:14	357.08	DRY	DRY	DRY	
MW24 (4" RW)	TOC	06/18/2014	11:09	361.97	24.46	337.51	Sheen	Biological buildup on top of water.
MW24 (4" RW)	TOC	09/24/2014	12:47	361.97	DRY	DRY	DRY	
MW24 (4" RW)	TOC	12/16/2014	9:14	361.97	32.81	329.16	--	
MW25	TOC	06/18/2014	11:04	358.70	31.66	327.04	--	
MW25	TOC	09/24/2014	14:37	358.70	37.23	321.47	--	
MW25	TOC	12/16/2014	10:37	358.70	35.54	323.16	--	
MW26	TOC	06/18/2014	11:30	363.81	45.64	318.17	--	
MW26	TOC	09/24/2014	11:50	363.81	47.41	316.40	--	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW26	TOC	12/16/2014	10:43	363.81	48.38	315.43	--	
MW27 (2" RW)	TOC	06/18/2014	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW27 (2" RW)	TOC	09/24/2014	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW27 (2" RW)	TOC	12/16/2014	9:21	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW28	TOC	06/18/2014	10:49	358.41	28.17	330.24	--	
MW28	TOC	09/24/2014	11:57	358.41	DRY	DRY	DRY	
MW28	TOC	12/16/2014	10:29	358.41	29.03	329.38	--	
MW29 (2" RW)	TOC	06/18/2014	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW29 (2" RW)	TOC	09/24/2014	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW29 (2" RW)	TOC	12/16/2014	9:10	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW30	TOC/Farmasonis	06/18/2014	NM	356.46	39.28	317.18	--	
MW30	TOC/Farmasonis	09/24/2014	12:04	356.46	41.68	314.78	--	
MW30	TOC/Farmasonis	12/16/2014	11:10	356.46	41.61	314.85	--	
MW31 (2" RW)	TOC/Farmasonis	06/18/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW31 (2" RW)	TOC/Farmasonis	09/24/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW31 (2" RW)	TOC/Farmasonis	12/16/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW32 (4" RW)	TOC	06/18/2014	11:02	359.95	23.14	336.81	--	Biological buildup on top of water.
MW32 (4" RW)	TOC	09/24/2014	12:34	359.95	26.84	333.11	--	
MW32 (4" RW)	TOC	12/16/2014	9:17	359.95	24.78	335.17	--	
MW33	TOC	06/18/2014	10:56	358.24	DRY	DRY	DRY	
MW33	TOC	09/24/2014	11:56	358.24	DRY	DRY	DRY	
MW33	TOC	12/16/2014	10:24	358.24	DRY	DRY	DRY	
MW34	TOC	06/18/2014	10:42	357.88	12.64	345.24	--	
MW34	TOC	09/24/2014	12:04	357.88	DRY	DRY	DRY	
MW34	TOC	12/16/2014	10:18	357.88	11.21	346.67	--	
MW35	TOC	06/18/2014	10:43	358.46	39.39	319.07	--	
MW35	TOC	09/24/2014	12:03	358.46	DRY	DRY	DRY	
MW35	TOC	12/16/2014	10:19	358.46	DRY	DRY	DRY	
MW36	TOC	06/18/2014	10:45	357.98	41.67	316.31	--	
MW36	TOC	09/24/2014	12:01	357.98	DRY	DRY	DRY	
MW36	TOC	12/16/2014	NM	357.98	42.40	315.58	--	
MW37	TOC	06/18/2014	10:47	358.90	21.15	337.75	--	
MW37	TOC	09/24/2014	11:58	358.90	31.55	327.35	--	
MW37	TOC	12/16/2014	10:21	358.90	22.79	336.11	--	
MW38	TOC	06/18/2014	11:26	364.42	19.80	344.62	--	
MW38	TOC	09/24/2014	11:50	364.42	25.29	339.13	--	
MW38	TOC	12/16/2014	10:47	364.42	21.67	342.75	--	
MW39	TOC/Farmasonis	06/18/2014	10:00	355.88	39.32	316.56	--	
MW39	TOC/Farmasonis	09/24/2014	12:09	355.88	41.74	314.14	--	
MW39	TOC/Farmasonis	12/16/2014	11:08	355.88	41.53	314.35	--	
MW40	TOC/Farmasonis	06/18/2014	9:46	356.32	39.30	317.02	--	
MW40	TOC/Farmasonis	09/24/2014	13:36	356.32	41.70	314.62	--	
MW40	TOC/Farmasonis	12/16/2014	11:18	356.32	41.65	314.67	--	
MW41 (2" RW)	TOC/Farmasonis	06/18/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW41 (2" RW)	TOC/Farmasonis	09/24/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW41 (2" RW)	TOC/Farmasonis	12/16/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW42	TOC/Farmasonis	06/18/2014	9:16	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	09/24/2014	13:34	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	12/16/2014	11:20	356.43	DRY	DRY	DRY	
MW43	56th Ave ROW	06/18/2014	11:41	358.84	35.81	323.03	--	
MW43	56th Ave ROW	09/24/2014	10:55	358.84	DRY	DRY	DRY	
MW43	56th Ave ROW	12/16/2014	12:27	358.84	34.90	323.94	--	
MW44	56th Ave ROW	06/18/2014	8:39	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	09/24/2014	9:51	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	12/16/2014	11:44	354.93	DRY	DRY	DRY	
MW45	56th Ave ROW	06/18/2014	9:24	356.49	DRY	DRY	DRY	
MW45	56th Ave ROW	09/24/2014	12:23	356.49	DRY	DRY	DRY	
MW45	56th Ave ROW	12/16/2014	11:24	356.49	DRY	DRY	DRY	
MW46	56th Ave ROW	06/18/2014	11:45	357.00	40.97	316.03	--	
MW46	56th Ave ROW	09/24/2014	10:50	357.00	DRY	DRY	DRY	
MW46	56th Ave ROW	12/16/2014	12:32	357.00	DRY	DRY	DRY	
MW47	56th Ave ROW	06/18/2014	11:48	355.47	40.86	314.61	--	
MW47	56th Ave ROW	09/24/2014	10:46	355.47	DRY	DRY	DRY	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW47	56th Ave ROW	12/16/2014	12:35	355.47	DRY	DRY	DRY	
MW48	56th Ave ROW	06/18/2014	8:34	355.41	39.99	315.42	--	
MW48	56th Ave ROW	09/24/2014	9:47	355.41	42.79	312.62	--	
MW48	56th Ave ROW	12/16/2014	11:38	355.41	43.25	312.16	--	
MW49	56th Ave ROW	06/18/2014	9:25	356.44	40.84	315.60	--	
MW49	56th Ave ROW	09/24/2014	13:32	356.44	43.22	313.22	--	
MW49	56th Ave ROW	12/16/2014	NM	356.44	43.78	312.66	--	
MW50	56th Ave ROW	06/18/2014	11:34	361.99	35.61	326.38	--	Historical data indicates well is typically dry. Measurement may be anomalous.
MW50	56th Ave ROW	09/24/2014	11:00	361.99	DRY	DRY	DRY	
MW50	56th Ave ROW	12/16/2014	12:21	361.99	DRY	DRY	DRY	
MW51	56th Ave ROW	06/18/2014	8:15	352.66	39.44	313.22	--	
MW51	56th Ave ROW	09/24/2014	10:06	352.66	41.56	311.10	--	
MW51	56th Ave ROW	12/16/2014	12:38	352.66	41.79	310.87	--	
MW52	56th Ave ROW	06/18/2014	11:49	355.61	41.04	314.57	--	
MW52	56th Ave ROW	09/24/2014	10:44	355.61	43.60	312.01	--	
MW52	56th Ave ROW	12/16/2014	12:36	355.61	DRY	DRY	DRY	
MW53	56th Ave ROW	06/18/2014	11:40	359.85	41.75	318.10	--	
MW53	56th Ave ROW	09/24/2014	10:56	359.85	43.95	315.90	--	
MW53	56th Ave ROW	12/16/2014	12:25	359.85	44.24	315.61	--	
MW54	TOC/Farmasonis	06/18/2014	9:43	357.93	11.65	346.28	--	
MW54	TOC/Farmasonis	09/24/2014	13:18	357.93	15.21	342.72	--	
MW54	TOC/Farmasonis	12/16/2014	11:17	357.93	13.25	344.68	--	
MW55	56th Ave ROW	06/18/2014	11:46	356.50	40.79	315.71	--	
MW55	56th Ave ROW	09/24/2014	10:48	356.50	43.78	312.72	--	
MW55	56th Ave ROW	12/16/2014	12:34	356.50	44.29	312.21	--	
MW56	TOC/Farmasonis	06/18/2014	9:44	357.49	42.18	315.31	--	
MW56	TOC/Farmasonis	09/24/2014	13:17	357.49	44.30	313.19	--	
MW56	TOC/Farmasonis	12/16/2014	11:16	357.49	44.55	312.94	--	
MW57 (4" RW)	TOC/Farmasonis	06/18/2014	9:18	356.42	41.20	315.22	--	
MW57 (4" RW)	TOC/Farmasonis	09/24/2014	15:35	356.42	DRY	DRY	DRY	
MW57 (4" RW)	TOC/Farmasonis	12/16/2014	9:44	356.42	DRY	DRY	DRY	
MW58	TOC/Farmasonis	06/18/2014	9:14	355.40	40.55	314.85	--	
MW58	TOC/Farmasonis	09/24/2014	13:35	355.40	43.35	312.05	--	
MW58	TOC/Farmasonis	12/16/2014	11:20	355.40	43.68	311.72	--	
MW59	TOC/Farmasonis	06/18/2014	9:49	356.51	41.17	315.34	--	
MW59	TOC/Farmasonis	09/24/2014	13:16	356.51	43.35	313.16	--	
MW59	TOC/Farmasonis	12/16/2014	11:15	356.51	43.64	312.87	--	
MW60	56th Ave ROW	06/18/2014	11:42	358.58	41.61	316.97	--	
MW60	56th Ave ROW	09/24/2014	10:53	358.58	43.76	314.82	--	
MW60	56th Ave ROW	12/16/2014	12:29	358.58	44.23	314.35	--	
MW61	56th Ave ROW	06/18/2014	11:44	357.17	10.67	346.50	--	
MW61	56th Ave ROW	09/24/2014	10:51	357.17	14.78	342.39	--	
MW61	56th Ave ROW	12/16/2014	12:31	357.17	10.40	346.77	--	
MW62	56th Ave ROW	06/18/2014	11:38	360.50	12.00	348.50	--	
MW62	56th Ave ROW	09/24/2014	10:58	360.50	DRY	DRY	DRY	
MW62	56th Ave ROW	12/16/2014	12:23	360.50	11.96	348.54	--	
MW63	56th Ave ROW	06/18/2014	8:37	355.11	40.71	314.40	--	
MW63	56th Ave ROW	09/24/2014	9:50	355.11	43.08	312.03	--	
MW63	56th Ave ROW	12/16/2014	11:39	355.11	43.32	311.79	--	
MW64	56th Ave ROW	06/18/2014	8:36	355.18	38.76	316.42	--	
MW64	56th Ave ROW	09/24/2014	9:49	355.18	41.16	314.02	--	
MW64	56th Ave ROW	12/16/2014	11:39	355.18	41.12	314.06	--	
MW65	Drake	06/18/2014	8:48	353.08	39.38	313.70	Sheen	
MW65	Drake	09/24/2014	9:29	353.08	41.89	311.19	--	
MW65	Drake	12/16/2014	11:52	353.08	42.00	311.08	--	
MW66	TOC/Farmasonis	06/18/2014	9:54	355.75	40.25	315.50	--	
MW66	TOC/Farmasonis	09/20/2014	14:04	355.75	42.50	313.25	--	Wellhead inaccessible during measurement event 09/24/2014 (under surface water). Data represents measurement taken at time of sample collection.
MW66	TOC/Farmasonis	12/16/2014	11:11	355.75	42.83	312.92	--	
MW67	Drake	06/18/2014	8:30	355.73	12.51	343.22	--	
MW67	Drake	09/24/2014	9:42	355.73	16.89	338.84	--	
MW67	Drake	12/16/2014	11:45	355.73	14.96	340.77	--	
MW68	Drake	06/18/2014	8:40	355.11	12.19	342.92	--	
MW68	Drake	09/24/2014	9:39	355.11	16.51	338.60	--	
MW68	Drake	12/16/2014	11:49	355.11	14.51	340.60	--	
MW69 (2" RW)	Drake	06/18/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW69 (2" RW)	Drake	09/24/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW69 (2" RW)	Drake	12/16/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW70 (2" RW)	Drake	06/18/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	09/24/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	12/16/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW71	Shin/Choi	06/18/2014	8:00	347.92	12.22	336.07	0.46	
MW71	Shin/Choi	09/24/2014	10:19	347.92	16.10	332.80	1.23	
MW71	Shin/Choi	12/16/2014	13:01	347.92	15.27	333.60	1.19	
MW72	Shin/Choi	06/18/2014	8:05	347.38	14.69	333.03	0.43	
MW72	Shin/Choi	09/24/2014	10:23	347.38	17.88	329.85	0.44	
MW72	Shin/Choi	12/16/2014	12:58	347.38	17.37	330.13	0.15	
MW73	Shin/Choi	06/18/2014	8:07	347.33	37.26	310.07	--	
MW73	Shin/Choi	09/24/2014	10:26	347.33	39.11	308.22	--	
MW73	Shin/Choi	12/16/2014	12:55	347.33	39.61	307.72	--	
MW74	Shin/Choi	06/18/2014	8:02	347.94	36.59	311.35	--	
MW74	Shin/Choi	09/24/2014	10:16	347.94	38.92	309.02	--	
MW74	Shin/Choi	12/16/2014	12:53	347.94	DRY	DRY	DRY	
MW75	56th Ave ROW	NA	NA	354.78	NA	NA	NA	Well is only measured during annual (first quarter) event and is subject to Traffic Control Plan (WSDOT 2014).
MW76	Drake	06/18/2014	9:09	351.69	37.37	314.32	--	
MW76	Drake	09/24/2014	9:23	351.69	40.30	311.39	--	
MW76	Drake	12/16/2014	12:05	351.69	40.16	311.53	--	
MW77	Drake	06/18/2014	8:58	349.95	36.69	313.26	--	
MW77	Drake	09/24/2014	9:14	349.95	39.18	310.77	--	screwdriver in well
MW77	Drake	12/16/2014	11:59	349.95	39.19	310.76	--	
MW78	Drake	06/18/2014	9:00	349.90	35.15	314.75	--	
MW78	Drake	09/24/2014	9:16	349.90	37.60	312.30	--	
MW78	Drake	12/16/2014	12:01	349.90	37.12	312.78	--	
MW79	TOC/Farmasonis	06/18/2014	10:10	353.98	13.78	340.20	--	
MW79	TOC/Farmasonis	09/24/2014	12:17	353.98	DRY	DRY	DRY	
MW79	TOC/Farmasonis	12/16/2014	11:04	353.98	14.70	339.28	--	
MW80	TOC/Farmasonis	06/18/2014	10:08	353.83	14.13	339.70	--	
MW80	TOC/Farmasonis	09/24/2014	12:16	353.83	19.20	334.63	--	
MW80	TOC/Farmasonis	12/16/2014	11:05	353.83	16.40	337.43	--	
MW81	TOC/Farmasonis	06/18/2014	10:04	355.60	40.46	315.14	--	
MW81	TOC/Farmasonis	09/24/2014	12:13	355.60	42.89	312.71	--	
MW81	TOC/Farmasonis	12/16/2014	11:29	355.60	43.02	312.58	--	
MW82	TOC/Farmasonis	06/18/2014	10:06	355.59	28.44	327.15	--	
MW82	TOC/Farmasonis	09/24/2014	12:16	355.59	DRY	DRY	DRY	
MW82	TOC/Farmasonis	12/16/2014	11:03	355.59	27.43	328.16	--	
MW83	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	06/18/2014	8:20	353.75	40.07	313.68	--	
MW84	Drake	09/23/2014	9:00	353.75	42.47	311.28	--	Wellhead inaccessible during measurement event 09/24/2014 (car parked on top). Data represents measurement taken at time of sample collection.
MW84	Drake	12/16/2014	9:52	353.75	42.90	310.85	--	
MW85	Drake	06/18/2014	8:55	351.28	37.81	313.47	--	
MW85	Drake	09/24/2014	9:06	351.28	40.30	310.98	--	
MW85	Drake	12/16/2014	11:57	351.28	40.51	310.77	--	
MW86	Drake	06/18/2014	8:53	352.72	39.18	313.54	--	
MW86	Drake	09/24/2014	8:50	352.72	41.70	311.02	--	
MW86	Drake	12/16/2014	11:54	352.72	42.00	310.72	--	
MW87	Drake	06/18/2014	9:06	349.72	36.68	313.04	--	
MW87	Drake	09/24/2014	9:20	349.72	39.19	310.53	--	
MW87	Drake	12/16/2014	12:02	349.72	38.92	310.80	--	
MW88	Drake	06/18/2014	9:11	351.63	15.99	335.64	--	
MW88	Drake	09/24/2014	9:26	351.63	21.25	330.38	--	
MW88	Drake	12/16/2014	12:06	351.63	22.30	329.33	--	
MW89	Drake	06/18/2014	8:17	353.86	39.98	313.88	--	
MW89	Drake	09/24/2014	9:56	353.86	42.58	311.28	--	
MW89	Drake	12/16/2014	11:47	353.86	42.93	310.93	--	
MW90 (4" RW)	TOC	06/18/2014	11:24	362.87	24.95	337.92	--	
MW90 (4" RW)	TOC	09/24/2014	14:58	362.87	30.17	332.70	--	
MW90 (4" RW)	TOC	12/16/2014	9:25	362.87	26.80	336.07	--	
MW91 (4" RW)	TOC	06/18/2014	11:20	362.67	25.20	337.47	--	
MW91 (4" RW)	TOC	09/24/2014	12:51	362.67	28.63	334.04	--	
MW91 (4" RW)	TOC	12/16/2014	9:19	362.67	26.70	335.97	--	
MW92 (4" RW)	TOC/Farmasonis	06/18/2014	9:33	357.91	42.08	315.83	--	
MW92 (4" RW)	TOC/Farmasonis	09/24/2014	15:32	357.91	44.69	313.22	--	
MW92 (4" RW)	TOC/Farmasonis	12/16/2014	9:41	357.91	44.91	313.00	--	
MW93 (4" RW)	TOC/Farmasonis	06/18/2014	9:51	355.97	40.31	315.66	--	
MW93 (4" RW)	TOC/Farmasonis	09/24/2014	15:27	355.97	DRY	DRY	DRY	
MW93 (4" RW)	TOC/Farmasonis	12/16/2014	9:35	355.97	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	06/18/2014	9:14	357.94	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	09/24/2014	15:30	357.94	DRY	DRY	DRY	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW94 (4" RW)	TOC/Farmasonis	12/16/2014	9:38	357.94	DRY	DRY	DRY	
MW95 (4" RW)	Drake	06/18/2014	8:22	354.67	40.34	314.33	--	
MW95 (4" RW)	Drake	09/24/2014	9:52	354.67	42.84	311.83	--	
MW95 (4" RW)	Drake	12/16/2014	9:49	354.67	43.08	311.59	--	
MW96 (4" RW)	Drake	06/18/2014	8:32	356.00	41.17	314.83	--	
MW96 (4" RW)	Drake	09/24/2014	9:43	356.00	43.60	312.40	--	
MW96 (4" RW)	Drake	12/16/2014	9:46	356.00	43.92	312.08	--	
MW97 (4" RW)	Drake	06/18/2014	8:41	354.29	39.98	314.31	--	
MW97 (4" RW)	Drake	09/24/2014	9:35	354.29	42.49	311.80	--	
MW97 (4" RW)	Drake	12/16/2014	9:57	354.29	42.74	311.55	--	
MW98 (4" RW)	Drake	06/18/2014	8:28	354.75	DRY	DRY	DRY	
MW98 (4" RW)	Drake	09/24/2014	NM	354.75	NM	NM	NM	wellhead inaccessible (car parked on top)
MW98 (4" RW)	Drake	12/16/2014	9:54	354.75	43.27	311.48	--	
MW99 (4" RW)	Drake	06/18/2014	8:44	353.58	DRY	DRY	DRY	
MW99 (4" RW)	Drake	09/24/2014	9:33	353.58	DRY	DRY	DRY	
MW99 (4" RW)	Drake	12/16/2014	10:00	353.58	DRY	DRY	DRY	
MW100	TOC/Farmasonis	06/18/2014	10:02	355.75	16.51	339.24	--	
MW100	TOC/Farmasonis	09/24/2014	12:12	355.75	20.49	335.26	--	
MW100	TOC/Farmasonis	12/16/2014	11:30	355.75	17.90	337.85	--	
MW101 (4" RW)	Drake	06/18/2014	8:50	352.05	38.54	313.51	Sheen	
MW101 (4" RW)	Drake	09/24/2014	NM	352.05	NM	NM	NM	wellhead inaccessible (car parked on top)
MW101 (4" RW)	Drake	12/16/2014	10:03	352.05	41.13	310.92	--	
MW102	Herman	06/19/2014	9:30	352.39	14.90	337.49	0.96	Wellhead inaccessible during measurement event on 06/18/2014 (car parked on top). Data represents measurement taken at time of sample collection.
MW102	Herman	09/24/2014	10:32	352.39	16.84	335.70	0.19	
MW102	Herman	12/16/2014	NM	352.39	NM	NM	NM	wellhead inaccessible (car parked on top)
MW103	Herman	06/18/2014	14:15	352.21	39.92	312.29	--	
MW103	Herman	09/24/2014	10:30	352.21	33.32	318.89	--	Based on groundwater elevations for nearby wells, the groundwater elevation for MW103 may be anomalous and was not used for contouring.
MW103	Herman	12/16/2014	12:47	352.21	43.82	308.39	--	Based on groundwater elevations for nearby wells, the groundwater elevation for MW103 may be anomalous and was not used for contouring.
MW104	Herman	06/18/2014	7:53	353.00	11.18	341.82	Sheen	
MW104	Herman	09/24/2014	10:08	353.00	16.18	336.82	--	
MW104	Herman	12/16/2014	12:44	353.00	13.94	339.06	--	
MW105	Herman	06/18/2014	7:55	353.05	39.76	313.29	--	
MW105	Herman	09/24/2014	10:10	353.05	DRY	DRY	DRY	
MW105	Herman	12/16/2014	12:43	353.05	DRY	DRY	DRY	
MW106	Herman	06/18/2014	13:50	349.24	13.25	335.99	--	
MW106	Herman	09/24/2014	10:13	349.24	18.19	331.05	--	
MW106	Herman	12/16/2014	12:50	349.24	12.07	337.17	--	
MW107	Herman	06/18/2014	15:10	349.56	37.47	312.09	--	
MW107	Herman	09/24/2014	10:11	349.56	39.75	309.81	--	
MW107	Herman	12/16/2014	12:49	349.56	39.75	309.81	--	

Notes:
(a) Remediation wells (identified as "RW") are 2 or 4 inches in diameter and are connected to a multi-phase extraction system.
Measurements are not collected from 2" RWs because the diameter of the water probe is too large to fit past pump tubing.
(b) Reference elevation is the north side of the top of the well casing (except for MW25 where the reference elevation is the high point on the PVC casing and for MW99 where the reference elevation is the top of the well cap). Elevations are measured in feet above mean sea level (North American Vertical Datum of 1988 [NAVD 88]).
PACE Engineers, Inc. performed well location and elevation surveys for all active wells in April and May 2014.
(c) DTW/DTP was measured from surveyed reference elevation [see note (b)].
(d) Where product (LNAPL) thickness was measured, groundwater elevation was adjusted to account for the presence of LNAPL using the method from "Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells" (Lenhard & Parker 1990). Product thickness is calculated using DTP level measured concurrently with DTW level.
(e) Groundwater elevation represents "system off" data (i.e., natural site conditions).

Definitions:
-- = No measurable product or odor observed.
DRY = Unable to measure DTW due to insufficient groundwater (in monitoring well) or groundwater level was below the top of pump (in remediation well).
Trace = Observed <0.01 feet of LNAPL.
Sheen = Iridescence on surface of groundwater that is indicative of LNAPL.

Acronyms:
DTP = depth-to-product
DTW = depth-to-groundwater
LNAPL = liquid non-aqueous phase liquid
NA = not available
NM = not measured
RW = remediation well

List of Properties:
TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
242nd St ROW = portion of right-of-way adjacent to TOC Property

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	06/11/2014	12:51	358.71	11.52	347.19	--	
MW02	TOC	09/19/2014	10:00	358.71	15.57	343.14	--	
MW02	TOC	12/12/2014	10:37	358.71	13.26	345.45	--	
MW03	TOC	06/11/2014	13:15	361.85	13.04	348.81	--	
MW03	TOC	09/19/2014	9:46	361.85	DRY	DRY	DRY	
MW03	TOC	12/12/2014	10:43	361.85	17.40	344.45	--	
MW04	56th Ave ROW	06/11/2014	13:33	361.96	11.37	350.59	--	
MW04	56th Ave ROW	09/19/2014	9:49	361.96	17.95	344.01	--	
MW04	56th Ave ROW	12/12/2014	10:45	361.96	DRY	DRY	DRY	
MW05	242nd St ROW	06/11/2014	13:30	363.70	11.16	352.54	--	
MW05	242nd St ROW	09/19/2014	9:32	363.70	DRY	DRY	DRY	
MW05	242nd St ROW	12/12/2014	10:52	363.70	DRY	DRY	DRY	
MW06	TOC	06/11/2014	12:28	358.98	12.77	346.21	--	
MW06	TOC	09/19/2014	10:15	358.98	14.72	344.26	--	
MW06	TOC	12/12/2014	10:27	358.98	DRY	DRY	DRY	
MW07	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	06/11/2014	13:35	360.34	25.20	335.14	--	
MW08	56th Ave ROW	09/19/2014	11:40	360.34	DRY	DRY	DRY	
MW08	56th Ave ROW	12/12/2014	13:26	360.34	27.25	333.09	--	
MW09	TOC	06/11/2014	12:59	360.32	28.69	331.63	Sheen	
MW09	TOC	09/19/2014	9:53	360.32	38.45	321.87	--	
MW09	TOC	12/12/2014	10:41	360.32	33.71	326.61	--	
MW10	TOC	06/11/2014	12:45	357.91	34.27	323.64	--	
MW10	TOC	09/19/2014	10:02	357.91	DRY	DRY	DRY	
MW10	TOC	12/12/2014	10:34	357.91	37.92	319.99	--	
MW11 (4" RW)	TOC	06/11/2014	13:18	362.34	29.99	332.35	--	
MW11 (4" RW)	TOC	09/19/2014	9:44	362.34	33.00	329.34	--	
MW11 (4" RW)	TOC	12/12/2014	NM	362.34	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW12	56th Ave ROW	06/11/2014	11:01	357.65	10.50	347.15	--	
MW12	56th Ave ROW	09/19/2014	11:11	357.65	14.34	343.31	--	
MW12	56th Ave ROW	12/12/2014	13:09	357.65	12.73	344.92	--	
MW13	56th Ave ROW	06/11/2014	11:00	357.34	41.10	316.24	--	
MW13	56th Ave ROW	09/19/2014	11:12	357.34	DRY	DRY	DRY	
MW13	56th Ave ROW	12/12/2014	13:08	357.34	DRY	DRY	DRY	
MW14	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15 (4" RW)	TOC	06/11/2014	12:20	357.56	35.49	322.07	--	
MW15 (4" RW)	TOC	09/19/2014	10:22	357.56	33.00	324.56	--	
MW15	TOC	12/12/2014	11:15	357.56	40.20	317.36	--	Removed pump from well on 12/16/2014.
MW16	242nd St ROW	06/11/2014	13:29	365.18	DRY	DRY	DRY	
MW16	242nd St ROW	09/19/2014	9:33	365.18	DRY	DRY	DRY	
MW16	242nd St ROW	12/12/2014	10:52	365.18	DRY	DRY	DRY	
MW17	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	06/11/2014	12:39	357.91	DRY	DRY	DRY	
MW18 (4" RW)	TOC	09/19/2014	10:07	357.91	DRY	DRY	DRY	
MW18 (4" RW)	TOC	12/12/2014	11:11	357.91	DRY	DRY	DRY	
MW19	TOC	06/11/2014	12:43	358.86	13.61	345.25	--	
MW19	TOC	09/19/2014	10:03	358.86	DRY	DRY	DRY	
MW19	TOC	12/12/2014	10:33	358.86	14.97	343.89	--	
MW20	TOC	06/11/2014	12:49	359.93	36.47	323.46	--	
MW20	TOC	09/19/2014	9:59	359.93	38.50	321.43	--	
MW20	TOC	12/12/2014	10:38	359.93	38.96	320.97	--	
MW21	TOC	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	06/11/2014	12:47	358.52	30.23	328.29	--	
MW22	TOC	09/19/2014	10:06	358.52	DRY	DRY	DRY	
MW22	TOC	12/12/2014	10:36	358.52	30.24	328.28	--	
MW23	TOC	06/11/2014	12:18	357.08	38.30	318.78	--	
MW23	TOC	09/19/2014	10:25	357.08	DRY	DRY	DRY	
MW23	TOC	12/12/2014	10:15	357.08	DRY	DRY	DRY	
MW24 (4" RW)	TOC	06/11/2014	13:09	361.97	33.00	328.97	--	
MW24 (4" RW)	TOC	09/19/2014	9:51	361.97	23.20	338.77	--	
MW24 (4" RW)	TOC	12/12/2014	NM	361.97	33.37	328.60	--	
MW25	TOC	06/11/2014	13:58	358.70	33.99	324.71	--	
MW25	TOC	09/19/2014	9:54	358.70	DRY	DRY	DRY	
MW25	TOC	12/12/2014	11:10	358.70	36.90	321.80	--	
MW26	TOC	06/11/2014	13:32	363.81	45.89	317.92	--	
MW26	TOC	09/19/2014	9:40	363.81	47.02	316.79	--	
MW26	TOC	12/12/2014	10:48	363.81	48.62	315.19	--	
MW27 (2" RW)	TOC	06/11/2014	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW27 (2" RW)	TOC	09/19/2014	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW27 (2" RW)	TOC	12/12/2014	NM	362.51	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW28	TOC	06/11/2014	12:37	358.41	28.80	329.61	--	
MW28	TOC	09/19/2014	10:11	358.41	DRY	DRY	DRY	
MW28	TOC	12/12/2014	11:24	358.41	29.16	329.25	--	

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW29 (2" RW)	TOC	06/11/2014	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW29 (2" RW)	TOC	09/19/2014	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW29 (2" RW)	TOC	12/12/2014	NM	358.93	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW30	TOC/Farmasonis	06/11/2014	11:15	356.46	39.70	316.76	--	
MW30	TOC/Farmasonis	09/19/2014	10:47	356.46	42.02	314.44	--	
MW30	TOC/Farmasonis	12/12/2014	10:18	356.46	42.18	314.28	--	
MW31 (2" RW)	TOC/Farmasonis	06/11/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW31 (2" RW)	TOC/Farmasonis	09/19/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW31 (2" RW)	TOC/Farmasonis	12/12/2014	NM	357.08	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW32 (4" RW)	TOC	06/11/2014	12:53	359.95	28.93	331.02	--	
MW32 (4" RW)	TOC	09/19/2014	9:56	359.95	28.95	331.00	--	
MW32 (4" RW)	TOC	12/12/2014	11:05	359.95	28.93	331.02	--	
MW33	TOC	06/11/2014	12:35	358.24	DRY	DRY	DRY	
MW33	TOC	09/19/2014	9:45	358.24	DRY	DRY	DRY	
MW33	TOC	12/12/2014	10:29	358.24	DRY	DRY	DRY	
MW34	TOC	06/11/2014	12:23	357.88	12.27	345.61	--	
MW34	TOC	09/19/2014	10:18	357.88	DRY	DRY	DRY	
MW34	TOC	12/12/2014	10:25	357.88	11.11	346.77	--	
MW35	TOC	06/11/2014	12:25	358.46	DRY	DRY	DRY	
MW35	TOC	09/19/2014	10:17	358.46	DRY	DRY	DRY	
MW35	TOC	12/12/2014	10:26	358.46	DRY	DRY	DRY	
MW36	TOC	06/11/2014	12:31	357.98	41.36	316.62	--	
MW36	TOC	09/19/2014	10:21	357.98	DRY	DRY	DRY	
MW36	TOC	12/12/2014	10:21	357.98	42.81	315.17	--	
MW37	TOC	06/11/2014	12:30	358.90	21.61	337.29	--	
MW37	TOC	09/19/2014	10:13	358.90	34.17	324.73	--	
MW37	TOC	12/12/2014	10:28	358.90	26.00	332.90	--	
MW38	TOC	06/11/2014	13:27	364.42	20.89	343.53	--	
MW38	TOC	09/19/2014	9:38	364.42	26.37	338.05	--	
MW38	TOC	12/12/2014	10:50	364.42	24.25	340.17	--	
MW39	TOC/Farmasonis	06/11/2014	11:18	355.88	39.70	316.18	--	
MW39	TOC/Farmasonis	09/19/2014	10:52	355.88	42.05	313.83	--	
MW39	TOC/Farmasonis	12/12/2014	10:12	355.88	42.05	313.83	--	
MW40	TOC/Farmasonis	06/11/2014	10:46	356.32	39.71	316.61	--	
MW40	TOC/Farmasonis	09/19/2014	11:06	356.32	42.06	314.26	--	
MW40	TOC/Farmasonis	12/12/2014	12:59	356.32	42.28	314.04	--	
MW41 (2" RW)	TOC/Farmasonis	06/11/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW41 (2" RW)	TOC/Farmasonis	09/19/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW41 (2" RW)	TOC/Farmasonis	12/12/2014	NM	356.14	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW42	TOC/Farmasonis	06/11/2014	10:40	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	09/19/2014	11:20	356.43	DRY	DRY	DRY	
MW42	TOC/Farmasonis	12/12/2014	NM	356.43	DRY	DRY	DRY	
MW43	56th Ave ROW	06/11/2014	13:41	358.84	35.22	323.62	--	
MW43	56th Ave ROW	09/19/2014	11:45	358.84	DRY	DRY	DRY	
MW43	56th Ave ROW	12/12/2014	13:29	358.84	35.10	323.74	--	
MW44	56th Ave ROW	06/11/2014	9:51	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	09/19/2014	12:15	354.93	DRY	DRY	DRY	
MW44	56th Ave ROW	12/12/2014	NM	354.93	DRY	DRY	DRY	
MW45	56th Ave ROW	06/11/2014	10:56	356.49	38.55	317.94	--	
MW45	56th Ave ROW	09/19/2014	9:45	356.49	DRY	DRY	DRY	
MW45	56th Ave ROW	12/12/2014	13:06	356.49	DRY	DRY	DRY	
MW46	56th Ave ROW	06/11/2014	13:48	357.00	43.27	313.73	--	Well cap was off.
MW46	56th Ave ROW	09/19/2014	11:51	357.00	DRY	DRY	DRY	
MW46	56th Ave ROW	12/12/2014	13:34	357.00	DRY	DRY	DRY	
MW47	56th Ave ROW	06/11/2014	13:52	355.47	40.62	314.85	--	
MW47	56th Ave ROW	09/19/2014	11:57	355.47	DRY	DRY	DRY	
MW47	56th Ave ROW	12/12/2014	13:38	355.47	DRY	DRY	DRY	
MW48	56th Ave ROW	06/11/2014	9:56	355.41	40.38	315.03	--	
MW48	56th Ave ROW	09/19/2014	11:28	355.41	42.10	313.31	--	
MW48	56th Ave ROW	12/12/2014	12:22	355.41	43.29	312.12	--	
MW49	56th Ave ROW	06/11/2014	10:59	356.44	42.21	314.23	--	
MW49	56th Ave ROW	09/19/2014	11:14	356.44	43.85	312.59	--	
MW49	56th Ave ROW	12/12/2014	13:05	356.44	44.27	312.17	--	
MW50	56th Ave ROW	06/11/2014	13:34	361.99	35.87	326.12	--	
MW50	56th Ave ROW	09/19/2014	11:37	361.99	DRY	DRY	DRY	
MW50	56th Ave ROW	12/12/2014	13:23	361.99	DRY	DRY	DRY	
MW51	56th Ave ROW	06/11/2014	9:23	352.66	40.24	312.42	--	
MW51	56th Ave ROW	09/19/2014	NM	352.66	NM	NM	NM	
MW51	56th Ave ROW	12/12/2014	12:14	352.66	42.19	310.47	--	
MW52	56th Ave ROW	06/11/2014	13:55	355.61	41.13	314.48	--	

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW52	56th Ave ROW	09/19/2014	11:58	355.61	42.80	312.81	--	
MW52	56th Ave ROW	12/12/2014	13:39	355.61	DRY	DRY	DRY	
MW53	56th Ave ROW	06/11/2014	13:39	359.85	42.09	317.76	--	
MW53	56th Ave ROW	09/19/2014	11:43	359.85	44.32	315.53	--	
MW53	56th Ave ROW	12/12/2014	13:28	359.85	44.80	315.05	--	
MW54	TOC/Farmasonis	06/11/2014	11:07	357.93	11.38	346.55	--	
MW54	TOC/Farmasonis	09/19/2014	9:00	357.93	15.15	342.78	--	
MW54	TOC/Farmasonis	12/12/2014	12:57	357.93	13.69	344.24	--	
MW55	56th Ave ROW	06/11/2014	13:49	356.50	40.87	315.63	--	
MW55	56th Ave ROW	09/19/2014	11:54	356.50	43.24	313.26	--	
MW55	56th Ave ROW	12/12/2014	13:36	356.50	44.47	312.03	--	
MW56	TOC/Farmasonis	06/11/2014	10:50	357.49	44.37	313.12	--	
MW56	TOC/Farmasonis	09/19/2014	10:42	357.49	44.24	313.25	--	
MW56	TOC/Farmasonis	12/12/2014	12:56	357.49	44.46	313.03	--	
MW57 (4" RW)	TOC/Farmasonis	06/11/2014	10:35	356.42	43.42	313.00	--	
MW57 (4" RW)	TOC/Farmasonis	09/19/2014	11:18	356.42	43.48	312.94	--	
MW57 (4" RW)	TOC/Farmasonis	12/12/2014	11:54	356.42	43.55	312.87	--	
MW58	TOC/Farmasonis	06/11/2014	10:41	355.40	42.04	313.36	--	
MW58	TOC/Farmasonis	09/19/2014	11:22	355.40	43.88	311.52	--	
MW58	TOC/Farmasonis	12/12/2014	13:00	355.40	44.90	310.50	--	
MW59	TOC/Farmasonis	06/11/2014	10:49	356.51	43.19	313.32	--	
MW59	TOC/Farmasonis	09/19/2014	11:04	356.51	44.49	312.02	--	
MW59	TOC/Farmasonis	12/12/2014	12:55	356.51	43.71	312.80	--	
MW60	56th Ave ROW	06/11/2014	13:43	358.58	43.21	315.37	--	
MW60	56th Ave ROW	09/19/2014	11:47	358.58	44.17	314.41	--	
MW60	56th Ave ROW	12/12/2014	13:31	358.58	44.95	313.63	--	
MW61	56th Ave ROW	06/11/2014	13:45	357.17	10.30	346.87	--	
MW61	56th Ave ROW	09/19/2014	11:50	357.17	14.65	342.52	--	
MW61	56th Ave ROW	12/12/2014	13:33	357.17	11.18	345.99	--	
MW62	56th Ave ROW	06/11/2014	13:37	360.50	11.69	348.81	--	
MW62	56th Ave ROW	09/19/2014	11:42	360.50	DRY	DRY	DRY	
MW62	56th Ave ROW	12/12/2014	13:24	360.50	11.55	348.95	--	
MW63	56th Ave ROW	06/11/2014	9:52	355.11	41.56	313.55	--	
MW63	56th Ave ROW	09/19/2014	12:14	355.11	44.25	310.86	--	
MW63	56th Ave ROW	12/12/2014	12:18	355.11	43.50	311.61	--	
MW64	56th Ave ROW	06/11/2014	9:53	355.18	39.11	316.07	--	
MW64	56th Ave ROW	09/19/2014	12:12	355.18	40.96	314.22	--	
MW64	56th Ave ROW	12/12/2014	12:20	355.18	41.33	313.85	--	
MW65	Drake	06/11/2014	10:08	353.08	40.60	312.48	--	
MW65	Drake	09/19/2014	12:41	353.08	41.95	311.13	--	
MW65	Drake	12/12/2014	12:29	353.08	42.47	310.61	--	
MW66	TOC/Farmasonis	06/11/2014	11:13	355.75	42.16	313.59	--	
MW66	TOC/Farmasonis	09/19/2014	10:50	355.75	41.80	313.95	--	
MW66	TOC/Farmasonis	12/12/2014	NM	355.75	NM	NM	NM	wellhead inaccessible (under surface water)
MW67	Drake	06/11/2014	9:45	355.73	12.24	343.49	--	
MW67	Drake	09/19/2014	12:32	355.73	16.70	339.03	--	
MW67	Drake	12/12/2014	12:24	355.73	15.38	340.35	--	
MW68	Drake	06/11/2014	9:59	355.11	11.86	343.25	--	
MW68	Drake	09/19/2014	12:29	355.11	16.32	338.79	--	
MW68	Drake	12/12/2014	12:26	355.11	15.01	340.10	--	
MW69 (2" RW)	Drake	06/11/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW69 (2" RW)	Drake	09/19/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW69 (2" RW)	Drake	12/12/2014	NM	353.76	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	06/11/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	09/19/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW70 (2" RW)	Drake	12/12/2014	NM	354.17	NM	NM	NM	Diameter of water probe is too large to fit past 2" remediation pump tubing.
MW71	Shin/Choi	06/11/2014	8:53	347.92	12.05	336.31	0.55	
MW71	Shin/Choi	09/19/2014	NM	347.92	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW71	Shin/Choi	12/12/2014	NM	347.92	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW72	Shin/Choi	06/11/2014	8:49	347.38	14.55	333.25	0.52	
MW72	Shin/Choi	09/19/2014	NM	347.38	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW72	Shin/Choi	12/12/2014	NM	347.38	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW73	Shin/Choi	06/11/2014	8:47	347.33	37.58	309.75	--	
MW73	Shin/Choi	09/19/2014	NM	347.33	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW73	Shin/Choi	12/12/2014	NM	347.33	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW74	Shin/Choi	06/11/2014	8:55	347.94	36.42	311.52	--	

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW74	Shin/Choi	09/19/2014	NM	347.94	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW74	Shin/Choi	12/12/2014	NM	347.94	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW75	56th Ave ROW	NA	NM	354.78	NA	NA	NA	Well is only measured during annual (first quarter) event and is subject to Traffic Control Plan (WSDOT 2014).
MW76	Drake	06/11/2014	10:29	351.69	38.50	313.19	--	
MW76	Drake	09/19/2014	12:58	351.69	39.88	311.81	--	
MW76	Drake	12/12/2014	12:42	351.69	40.35	311.34	--	
MW77	Drake	06/11/2014	10:21	349.95	37.84	312.11	--	
MW77	Drake	09/19/2014	12:51	349.95	39.15	310.80	--	
MW77	Drake	12/12/2014	12:36	349.95	39.45	310.50	--	
MW78	Drake	06/11/2014	10:24	349.90	35.72	314.18	--	
MW78	Drake	09/19/2014	12:53	349.90	37.62	312.28	--	
MW78	Drake	12/12/2014	12:37	349.90	37.58	312.32	--	
MW79	TOC/Farmasonis	06/11/2014	11:32	353.98	13.30	340.68	--	
MW79	TOC/Farmasonis	09/19/2014	10:59	353.98	DRY	DRY	DRY	
MW79	TOC/Farmasonis	12/12/2014	10:03	353.98	15.57	338.41	--	
MW80	TOC/Farmasonis	06/11/2014	11:30	353.83	14.00	339.83	--	
MW80	TOC/Farmasonis	09/19/2014	11:00	353.83	18.39	335.44	--	
MW80	TOC/Farmasonis	12/12/2014	13:15	353.83	17.77	336.06	--	
MW81	TOC/Farmasonis	06/11/2014	11:22	355.60	40.54	315.06	--	
MW81	TOC/Farmasonis	09/19/2014	10:56	355.60	42.17	313.43	--	
MW81	TOC/Farmasonis	12/12/2014	9:45	355.60	42.87	312.73	--	
MW82	TOC/Farmasonis	06/11/2014	11:27	355.59	DRY	DRY	DRY	
MW82	TOC/Farmasonis	09/19/2014	10:58	355.59	DRY	DRY	DRY	
MW82	TOC/Farmasonis	12/12/2014	10:04	355.59	28.67	326.92	--	
MW83	TOC/Farmasonis	NA	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	06/11/2014	9:30	353.75	NM	NM	NM	wellhead inaccessible (car parked on top)
MW84	Drake	09/19/2014	12:23	353.75	42.99	310.76	--	
MW84	Drake	12/12/2014	11:41	353.75	43.39	310.36	--	
MW85	Drake	06/11/2014	10:19	351.28	38.49	312.79	--	
MW85	Drake	09/19/2014	12:49	351.28	39.79	311.49	--	
MW85	Drake	12/12/2014	12:34	351.28	40.50	310.78	--	
MW86	Drake	06/11/2014	10:18	352.72	39.28	313.44	--	
MW86	Drake	09/19/2014	12:46	352.72	41.33	311.39	--	
MW86	Drake	12/12/2014	12:33	352.72	42.18	310.54	--	
MW87	Drake	06/11/2014	10:25	349.72	37.66	312.06	--	
MW87	Drake	09/19/2014	12:54	349.72	39.75	309.97	--	
MW87	Drake	12/12/2014	12:39	349.72	39.56	310.16	--	
MW88	Drake	06/11/2014	10:30	351.63	15.82	335.81	--	
MW88	Drake	09/19/2014	13:00	351.63	20.97	330.66	--	
MW88	Drake	12/12/2014	12:43	351.63	23.47	328.16	--	
MW89	Drake	06/11/2014	9:31	353.86	41.18	312.68	--	
MW89	Drake	09/19/2014	12:21	353.86	43.24	310.62	--	
MW89	Drake	12/12/2014	12:12	353.86	43.66	310.20	--	
MW90 (4" RW)	TOC	06/11/2014	13:24	362.87	34.03	328.84	--	
MW90 (4" RW)	TOC	09/19/2014	9:42	362.87	34.98	327.89	--	
MW90 (4" RW)	TOC	12/12/2014	10:57	362.87	34.98	327.89	--	
MW91 (4" RW)	TOC	06/11/2014	13:12	362.67	28.20	334.47	--	
MW91 (4" RW)	TOC	09/19/2014	9:47	362.67	32.59	330.08	--	
MW91 (4" RW)	TOC	12/12/2014	10:59	362.67	32.10	330.57	--	
MW92 (4" RW)	TOC/Farmasonis	06/11/2014	10:52	357.91	44.65	313.26	--	
MW92 (4" RW)	TOC/Farmasonis	09/19/2014	11:08	357.91	44.86	313.05	--	
MW92 (4" RW)	TOC/Farmasonis	12/12/2014	11:58	357.91	44.92	312.99	--	
MW93 (4" RW)	TOC/Farmasonis	06/11/2014	11:09	355.97	41.68	314.29	--	
MW93 (4" RW)	TOC/Farmasonis	09/19/2014	10:44	355.97	41.86	314.11	--	
MW93 (4" RW)	TOC/Farmasonis	12/12/2014	12:04	355.97	41.92	314.05	--	
MW94 (4" RW)	TOC/Farmasonis	06/11/2014	11:05	357.94	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	09/19/2014	10:39	357.94	DRY	DRY	DRY	
MW94 (4" RW)	TOC/Farmasonis	12/12/2014	NM	357.94	DRY	DRY	DRY	
MW95 (4" RW)	Drake	06/11/2014	9:35	354.67	42.39	312.28	--	
MW95 (4" RW)	Drake	09/19/2014	12:18	354.67	44.89	309.78	--	
MW95 (4" RW)	Drake	12/12/2014	11:39	354.67	43.89	310.78	--	
MW96 (4" RW)	Drake	06/11/2014	9:48	356.00	47.73	308.27	--	
MW96 (4" RW)	Drake	09/19/2014	12:10	356.00	47.75	308.25	--	
MW96 (4" RW)	Drake	12/12/2014	11:33	356.00	47.71	308.29	--	
MW97 (4" RW)	Drake	06/11/2014	10:01	354.29	41.28	313.01	--	
MW97 (4" RW)	Drake	09/19/2014	12:34	354.29	42.66	311.63	--	
MW97 (4" RW)	Drake	12/12/2014	11:44	354.29	43.40	310.89	--	
MW98 (4" RW)	Drake	06/11/2014	9:41	354.75	41.39	313.36	--	
MW98 (4" RW)	Drake	09/19/2014	12:26	354.75	43.06	311.69	--	
MW98 (4" RW)	Drake	12/12/2014	11:36	354.75	43.77	310.98	--	
MW99 (4" RW)	Drake	06/11/2014	10:06	353.58	DRY	DRY	DRY	
MW99 (4" RW)	Drake	09/19/2014	12:37	353.58	DRY	DRY	DRY	

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Measurement Date	Measurement Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW99 (4" RW)	Drake	12/12/2014	NM	353.58	DRY	DRY	DRY	
MW100	TOC/Farmasonis	06/11/2014	11:20	355.75	16.64	339.11	--	
MW100	TOC/Farmasonis	09/19/2014	10:55	355.75	20.29	335.46	--	
MW100	TOC/Farmasonis	12/12/2014	9:50	355.75	18.93	336.82	--	
MW101 (4" RW)	Drake	06/11/2014	10:13	352.05	38.93	313.12	Sheen	
MW101 (4" RW)	Drake	09/19/2014	12:44	352.05	40.93	311.12	--	
MW101 (4" RW)	Drake	12/12/2014	11:50	352.05	41.38	310.67	--	
MW102	Herman	06/11/2014	9:05	352.39	14.80	338.46	1.09	
MW102	Herman	09/19/2014	NM	352.39	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW102	Herman	12/12/2014	NM	352.39	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW103	Herman	06/11/2014	9:07	352.21	41.38	310.83	--	
MW103	Herman	09/19/2014	NM	352.21	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW103	Herman	12/12/2014	NM	352.21	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW104	Herman	06/11/2014	9:17	353.00	10.95	342.05	--	
MW104	Herman	09/19/2014	NM	353.00	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW104	Herman	12/12/2014	NM	353.00	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW105	Herman	06/11/2014	9:19	353.05	39.78	313.27	--	
MW105	Herman	09/19/2014	NM	353.05	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW105	Herman	12/12/2014	NM	353.05	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW106	Herman	06/11/2014	9:13	349.24	12.38	336.86	--	
MW106	Herman	09/19/2014	NM	349.24	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW106	Herman	12/12/2014	NM	349.24	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW107	Herman	06/11/2014	9:10	349.56	38.73	310.83	--	
MW107	Herman	09/19/2014	NM	349.56	NM	NM	NM	Not included in the scope of work for the system on measurement event.
MW107	Herman	12/12/2014	NM	349.56	NM	NM	NM	Not included in the scope of work for the system on measurement event.

Notes:

(a) Remediation wells (identified as "RW") are 2 or 4 inches in diameter and are connected to a multi-phase extraction system. Measurements are not collected from 2" RWs because the diameter of the water probe is too large to fit past pump tubing.

(b) Reference elevation is the north side of the top of the well casing (except for MW25 where the reference elevation is the high point on the PVC casing and for MW99 where the reference elevation is the top of the well cap). Elevations are measured in feet above mean sea level (North American Vertical Datum of 1988 [NAVD 88]). PACE Engineers, Inc. performed well location and elevation surveys for all active wells in April and May 2014.

(c) DTW/DTP was measured from surveyed reference elevation [see note (b)].

(d) Where product (LNAPL) thickness was measured, groundwater elevation was adjusted to account for the presence of LNAPL using the method from "Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells" (Lenhard & Parker 1990). Product thickness is calculated using DTP level measured concurrently with DTW level.

(e) Groundwater elevation represents "system on" data (i.e., pumping conditions).

Definitions:

-- = No measurable product or odor observed.
DRY = Unable to measure DTW due to insufficient groundwater (in monitoring well) or groundwater level was below the top of pump (in remediation well).
Trace = Observed <0.01 feet of LNAPL.
Sheen = Iridescence on surface of groundwater that is indicative of LNAPL.

Acronyms:

DTP = depth-to-product
DTW = depth-to-groundwater
LNAPL = liquid non-aqueous phase liquid
NA = not available
NM = not measured
RW = remediation well

List of Properties:

TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
242nd St ROW = portion of right-of-way adjacent to TOC Property

TABLE 2-1
Groundwater Quality Results for Select Constituents
Shallow Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[1]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)[2]					**1,000/800[3]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[4]**	**NE[4]**
MW02	TOC	12/10/2014	MW02	Peristaltic Pump	100U	NA	NA	1U[a]	1U[a]	1U[a]	3U	NA	NA
MW12	56th Ave ROW	12/10/2014	MW12	Peristaltic Pump	100U	NA	NA	1U[a]	1U[a]	1U[a]	3U	NA	NA
MW19	TOC	12/11/2014	MW19	Peristaltic Pump	100U	NA	NA	1U[a]	1U[a]	1U[a]	3U	NA	NA
MW54	TOC/Farmasonis	6/12/2014	MW54	Peristaltic Pump	100U	50U	250U	1U	1U	1U	3U	NA	NA
MW54	TOC/Farmasonis	9/18/2014	MW54	Peristaltic Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW54	TOC/Farmasonis	12/11/2014	MW54	Bailer	100U	NA	NA	0.35U	1U	1U	2U[b]	2U	1U
MW67	Drake	6/17/2014	MW67	Peristaltic Pump	100U	50U	250U	1U	1U	1U	3U	NA	NA
MW67	Drake	9/20/2014	MW67	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW67	Drake	12/11/2014	MW67	Peristaltic Pump	100U	NA	NA	0.35U	1U	1U	2U[b]	2U	1U
MW68	Drake	6/17/2014	MW68	Peristaltic Pump	100U	50U	250U	1U	1U	1U	3U	NA	NA
MW68	Drake	9/20/2014	MW68	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW68	Drake	12/17/2014	MW68	Peristaltic Pump	100U	NA	NA	0.35U	1U	1U	2U[b]	2U	1U
MW71	Shin/Choi	6/13/2014	MW71-P**	Peristaltic Pump	LNAPL								
MW71	Shin/Choi	09/24/2014	not sampled	not sampled	LNAPL								
MW71	Shin/Choi	12/16/2014	not sampled	not sampled	LNAPL								
MW72	Shin/Choi	6/13/2014	MW72-P**	Peristaltic Pump	LNAPL								
MW72	Shin/Choi	09/24/2014	not sampled	not sampled	LNAPL								
MW72	Shin/Choi	12/16/2014	not sampled	not sampled	LNAPL								
MW102	Herman	6/19/2014	MW102-P**	Peristaltic Pump	LNAPL								
MW102	Herman	09/24/2014	not sampled	not sampled	LNAPL								
MW102	Herman	12/16/2014	not sampled	not sampled	LNAPL (Well was inaccessible but product is typically observed.)								
MW104	Herman	6/17/2014	MW104	Peristaltic Pump	2,400	1,700JL	260JL	1U	10	57	210	NA	NA
MW104	Herman	9/23/2014	MW104	Peristaltic Pump	45,000	370	7,500	35[a]	6,700[a]	2,000[a]	7,300[b]	5,200	2,100
MW104	Herman	9/23/2014	MLT-02*	Peristaltic Pump	47,000	400	8,300	32[a]	6,000[a]	1,700[a]	6,400[b]	4,600	1,800
MW104	Herman	12/17/2014	MW-104	Peristaltic Pump	52,000	740	11,000	71	6,300	1,700	7,400[b]	5,200	2,200
MW104	Herman	12/17/2014	MLT-03*	Peristaltic Pump	54,000	730	10,000	69	6,300	1,700	7,400[b]	5,200	2,200
MW106	Herman	6/18/2014	MW106	Peristaltic Pump	100U	320JL	250U	1U	1U	1U	3U	NA	NA
MW106	Herman	9/21/2014	MW106	Peristaltic Pump	100U	250U	400	1U	1U	1U	3U	NA	NA
MW106	Herman	12/15/2014	MW106	Peristaltic Pump	100U	250U	130	0.35U	1U	2.2	2U[b]	2U	1U

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

(1) If samples were analyzed by two methods, the maximum concentration of the two results is reported.

(2) MTCA Method A Cleanup Levels, Table 720-1 of Washington Administrative Code (WAC) 173-340-900, revised October 12, 2007.

(3) Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

(4) Cleanup levels for individual xylenes have not been established.

(a) Represents the maximum concentration for the two analytical methods.

(b) Calculated concentration based on the sum of the detected concentrations for m,p-xylene and o-xylene.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

** = Indicates product sample was collected.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

LNAPL = Indicates well was not sampled due to presence of product (LNAPL).

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

LABORATORY NOTES:

U = Indicates the compound was undetected at the method reporting limit.

JL = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned by the laboratory based on their quality control protocol.

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Herman = 24311 56th Avenue West, Mountlake Terrace WA

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

ACRONYMS:

µg/L = micrograms per liter

LNAPL = light non-aqueous phase liquid

MTCA = Model Toxics Control Act

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics

TABLE 2-2
Groundwater Quality Results for Common Fuel Additives
Shallow Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[2]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)[1]					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW02	TOC	12/10/2014	MW02	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW12	56th Ave ROW	12/10/2014	MW12	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW19	TOC	12/11/2014	MW19	Peristaltic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW54	TOC/Farmasonis	6/12/2014	MW54	Peristaltic Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW54	TOC/Farmasonis	9/18/2014	MW54	Peristaltic Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW54	TOC/Farmasonis	12/11/2014	MW54	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW67	Drake	6/17/2014	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW67	Drake	9/20/2014	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW67	Drake	12/11/2014	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	6/17/2014	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW68	Drake	9/20/2014	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	12/17/2014	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW71	Shin/Choi	6/13/2014	MW71-P**	Peristaltic Pump	**LNAPL**																					
MW71	Shin/Choi	09/24/2014	not sampled	not sampled	**LNAPL**																					
MW71	Shin/Choi	12/16/2014	not sampled	not sampled	**LNAPL**																					
MW72	Shin/Choi	6/13/2014	MW72-P**	Peristaltic Pump	**LNAPL**																					
MW72	Shin/Choi	09/24/2014	not sampled	not sampled	**LNAPL**																					
MW72	Shin/Choi	12/16/2014	not sampled	not sampled	**LNAPL**																					
MW102	Herman	6/19/2014	MW102-P**	Peristaltic Pump	**LNAPL**																					
MW102	Herman	09/24/2014	not sampled	not sampled	**LNAPL**																					
MW102	Herman	12/16/2014	not sampled	not sampled	**LNAPL (Well was inaccessible but product is typically observed.)**																					
MW104	Herman	6/17/2014	MW104	Peristaltic Pump	1U	1U	0.01U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	**22**	1U	1U
MW104	Herman	9/23/2014	MW104	Peristaltic Pump	10U	10U	**0.13**	1U	1U	**0.2**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.11**	0.1U	**340**	**0.11**	0.1U
MW104	Herman	9/23/2014	MLT-02*	Peristaltic Pump	10U	10U	**0.13**	1U	1U	**0.21**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.12**	0.1U	**360**	**0.12**	0.1U
MW104	Herman	12/17/2014	MW-104	Peristaltic Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW104	Herman	12/17/2014	MLT-03*	Peristaltic Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW106	Herman	6/18/2014	MW106	Peristaltic Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.27**	0.1U	0.1U	0.1U	0.1U
MW106	Herman	9/21/2014	MW106	Peristaltic Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.22**	0.1U	0.1U	0.1U	0.1U
MW106	Herman	12/15/2014	MW106	Peristaltic Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2-2
Groundwater Quality Results for Common Fuel Additives
Shallow Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels.
Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.
Red denotes sample concentration exceeds MTCA Method A Cleanup Levels for groundwater.
Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.
Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.
(1) MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of Washington Administrative Code (WAC) 173-340-900, revised October 12, 2007.
(2) With the exception of Napthalene, preliminary screening results for carcinogenic polycyclic aromatic hydrocarbons (PAHs) are compared to the MTCA Method A Cleanup Level provided for benzo(a)pyrene on Table 720-1 of WAC 173-340-900. Per MTCA, this value represents the total concentration that all carcinogenic PAHs must meet using the toxicity equivalency methodology of WAC 173-340-708(8).
* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.
** = Indicates product sample was collected.
Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.
LNAPL = Indicates well was not sampled due to presence of product (LNAPL).
NA = Indicates the compound was not analyzed.

LABORATORY NOTES:

U = Indicates the compound was undetected at the method reporting limit.

ACRONYMS:

µg/L = micrograms per liter
LNAPL = light non-aqueous phase liquid
MTCA = Model Toxics Control Act

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA
TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA
Drake = 24309 56th Avenue West, Mountlake Terrace WA
56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties
Herman = 24311 56th Avenue West, Mountlake Terrace WA
Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

TABLE 3-1
Groundwater Quality Results for Select Constituents
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)									
					Total Petroleum Hydrocarbons			Volatile Organic Compounds						
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]						
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)[3]					1,000/800[4]	500	500	5	1,000	700	1,000	NE[5]	NE[5]
MW10	TOC	6/16/2014	MW10	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW10	TOC	9/20/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW10	TOC	12/11/2014	MW10	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW15 (4" RW)	TOC	6/11/2014	MW15	Pneumatic Pump	270	NA	NA	1U	1U	2.2	7.3	NA	NA
MW15 (4" RW)	TOC	9/18/2014	MW15	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW15	TOC	12/15/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW20	TOC	6/13/2014	MW20	Submersible Pump	110	250U	170J	12J	5.8J	1.8	5.8	NA	NA
MW20	TOC	6/13/2014	MLT-02*	Submersible Pump	110	250U	230J	12J	6.0J	1.8	6.3	NA	NA
MW20	TOC	9/22/2014	MW20	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW20	TOC	9/22/2014	MLT-01*	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW20	TOC	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	6/11/2014	MW31	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW31 (2" RW)	TOC/Farmasonis	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW32 (4" RW)	TOC	6/10/2014	MW32	Pneumatic Pump	2,100	NA	NA	2.6	30	32	180	NA	NA
MW32 (4" RW)	TOC	9/18/2014	MW32	Pneumatic Pump	450	NA	NA	2.9	4.7	15	26	NA	NA
MW32 (4" RW)	TOC	12/11/2014	MW32	Pneumatic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW33	TOC	6/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	6/13/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW48	56th Ave ROW	6/12/2014	MW48	Bailer	10,000	NA	NA	1U	11	37	610	NA	NA
MW48	56th Ave ROW	9/18/2014	MW48	Bailer	8,500	NA	NA	5U	12	5U	100	NA	NA
MW48	56th Ave ROW	12/11/2014	MW48	Bailer	7,700	NA	NA	67	21	20U	440	NA	NA
MW49	56th Ave ROW	6/14/2014	MW49	Submersible Pump	100U	NA	NA	1.5	1.6	1U	3U	NA	NA
MW49	56th Ave ROW	9/22/2014	MW49	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW49	56th Ave ROW	12/15/2014	MW49	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW50	56th Ave ROW	6/13/2014	MW50	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW50	56th Ave ROW	9/19/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW50	56th Ave ROW	12/12/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW51	56th Ave ROW	6/17/2014	MW51	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW51	56th Ave ROW	9/20/2014	MW51	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW51	56th Ave ROW	12/12/2014	MW51	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW52	56th Ave ROW	6/13/2014	MW52	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW52	56th Ave ROW	9/20/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW52	56th Ave ROW	12/12/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW53	56th Ave ROW	6/19/2014	MW53	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW53	56th Ave ROW	9/24/2014	MW53	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW53	56th Ave ROW	12/15/2014	MW53	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW55	56th Ave ROW	6/19/2014	MW55	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW55	56th Ave ROW	9/24/2014	MW55	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW55	56th Ave ROW	12/16/2014	MW55	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	6/14/2014	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	9/22/2014	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW56	TOC/Farmasonis	12/13/2014	MW56	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW57 (4" RW)	TOC/Farmasonis	12/11/2014	MW57	Pneumatic Pump	4,700	NA	NA	2.2	2.8	62	416[a]	400	16
MW58	TOC/Farmasonis	6/14/2014	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW58	TOC/Farmasonis	9/22/2014	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW58	TOC/Farmasonis	12/16/2014	MW58	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	6/14/2014	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	9/22/2014	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW59	TOC/Farmasonis	12/13/2014	MW59	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW60	56th Ave ROW	6/19/2014	MW60	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW60	56th Ave ROW	9/25/2014	MW60	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW60	56th Ave ROW	12/16/2014	MW60	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	6/19/2014	MW63	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	9/23/2014	MW63	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW63	56th Ave ROW	12/17/2014	MW63	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	6/17/2014	MW65	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	9/23/2014	MW65	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW65	Drake	12/17/2014	MW65	Bailer	100U	NA	NA	0.35U	1U	1U	2U[a]	2U	1U
MW66	TOC/Farmasonis	6/11/2014	MW66	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW66	TOC/Farmasonis	9/20/2014	MW66	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW66	TOC/Farmasonis	12/15/2014	MW66	Bailer	100U	250U	190	0.35U	1U	1U	2U[a]	2U	1U
MW69 (2" RW)	Drake	6/19/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

TABLE 3-1
Groundwater Quality Results for Select Constituents
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)[3]					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW69 (2" RW)	Drake	9/23/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW69 (2" RW)	Drake	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW70 (2" RW)	Drake	6/20/2014	MW70	Pneumatic Pump	100U	300U	**85JL**	1U	1U	1U	3U	NA	NA
MW70 (2" RW)	Drake	9/19/2014	MW70	Pneumatic Pump	100U	250U	**110**	1U	1U	1U	3U	NA	NA
MW70 (2" RW)	Drake	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW73	Shin/Choi	6/13/2014	MW73	Submersible Pump	**87,000**	300U	**5,900JL**	**2,100**	**4,100**	**840**	**9,700[a]**	**6,400**	**3,300**
MW73	Shin/Choi	9/21/2014	MW73	Submersible Pump	**81,000**	250U	**4,600**	**15,000**	**3,600**	**1,900**	**9,200**	NA	NA
MW73	Shin/Choi	12/15/2014	MW73	Bailer	**69,000**	250U	**4,300**	**13,000**	**920**	**1,600**	**7,900[a]**	**5,400**	**2,500**
MW74	Shin/Choi	6/13/2014	MW74	Submersible Pump	**66,000**	250U	**4,200JL**	**1,800**	**7,600**	**690**	**2,700[a]**	**2,100**	**600**
MW74	Shin/Choi	9/22/2014	MW74	Bailer	**7,100**	**390**	**3,000**	**1,700**	**310**	**67**	**290**	NA	NA
MW74	Shin/Choi	12/15/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW77	Drake	6/17/2014	MW77	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW77	Drake	9/23/2014	MW77	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW77	Drake	12/17/2014	MW77	Bailer	100U	NA	NA	0.35U	1U	1U	2U[a]	2U	1U
MW84	Drake	6/20/2014	MW84	Submersible Pump	**960**	NA	NA	1U	1U	**5.9**	**17**	NA	NA
MW84	Drake	9/23/2014	MW84	Submersible Pump	**780**	NA	NA	1U	1U	**4.9**	**15**	NA	NA
MW84	Drake	12/17/2014	MW84	Submersible Pump	**620**	NA	NA	0.35U	1U	**2.3**	**8.7[a]**	**8.7**	1U
MW85	Drake	6/20/2014	MW85	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW85	Drake	9/24/2014	MW85	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW85	Drake	12/15/2014	MW85	Submersible Pump	100U	NA	NA	0.35U	1U	1U	2U[a]	2U	1U
MW86	Drake	6/20/2014	MW86	Submersible Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW86	Drake	6/20/2014	MLT-03*	Submersible Pump	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW86	Drake	9/24/2014	MW86	Submersible Pump	**1,000**	250U	**180J**	**1.8**	**1.9**	**1.2**	3U	NA	NA
MW86	Drake	9/24/2014	MLT-03*	Submersible Pump	**930**	250U	**140J**	**1.8**	**1.9**	**1.2**	**3.1**	NA	NA
MW86	Drake	12/15/2014	MW86	Submersible Pump	100U	250U	50U	0.35U	1U	1U	2U[a]	2U	1U
MW86	Drake	12/15/2014	MLT-02*	Submersible Pump	100U	250U	50U	0.35U	1U	1U	2U[a]	2U	1U
MW89	Drake	6/20/2014	MW89	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW89	Drake	9/23/2014	MW89	Submersible Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW89	Drake	12/17/2014	MW89	Submersible Pump	100U	NA	NA	0.35U	1U	1U	2U[a]	2U	1U
MW96 (4" RW)	Drake	12/11/2014	MW96	Pneumatic Pump	100U	NA	NA	0.35U	1U	1U	**3[a]**	**3.0**	1U
MW103	Herman	6/18/2014	MW103	Bailer	100U	250U	**120JL**	**3.0**	**1.3**	1U	3U	NA	NA
MW103	Herman	9/21/2014	MW103	Bailer	100U	300U	**170**	1U	1U	1U	3U	NA	NA
MW103	Herman	12/13/2014	MW103	Bailer	100U	250U	50U	**1.3**	1U	1U	2U[a]	2U	1U
MW105	Herman	6/18/2014	MW105	Bailer	100U	250U	50U	1U	1U	1U	3U	NA	NA
MW105	Herman	9/22/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW105	Herman	12/16/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW107	Herman	6/19/2014	MW107	Submersible Pump	100U	250U	**59JL**	1U	1U	1U	3U	NA	NA
MW107	Herman	9/21/2014	MW107	Submersible Pump	100U	250U	**66**	**5.3J**	**2.1**	1U	**4**	NA	NA
MW107	Herman	12/15/2014	MW107	Submersible Pump	100U	250U	50U	0.35U	1U	1U	2U[a]	2U	1U

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] If samples were analyzed by two methods, the maximum concentration of the two results is reported.

[3] MTCA Method A Cleanup Levels, Table 720-1 of Washington Administrative Code (WAC) 173-340-900, revised October 12, 2007.

[4] Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

[5] Cleanup levels for individual xylenes have not been established.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Herman = 24311 56th Avenue West, Mountlake Terrace WA

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

LABORATORY NOTES:

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

JL = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned by the laboratory based on their quality control protocol.

U = Indicates the compound was undetected at the reported concentration.

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[3]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L) [2]					20	5	0.01	15	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	160	0.1	0.1
MW10	TOC	6/16/2014	MW10	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW10	TOC	9/20/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW10	TOC	12/11/2014	MW10	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW15	TOC	12/15/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW15 (4" RW)	TOC	6/11/2014	MW15	Pneumatic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW15 (4" RW)	TOC	9/18/2014	MW15	Pneumatic Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW20	TOC	6/13/2014	MW20	Submersible Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW20	TOC	6/13/2014	MLT-02*	Submersible Pump	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW20	TOC	9/22/2014	MW20	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW20	TOC	9/22/2014	MLT-01*	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW20	TOC	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	6/11/2014	MW31	Pneumatic Pump	NA	NA	NA	**9.67**	**11.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW31 (2" RW)	TOC/Farmasonis	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW31 (2" RW)	TOC/Farmasonis	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW32 (4" RW)	TOC	6/10/2014	MW32	Pneumatic Pump	NA	NA	NA	**2.97**	**4.03**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW32 (4" RW)	TOC	9/18/2014	MW32	Pneumatic Pump	NA	NA	NA	**50.8**	**62.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW32 (4" RW)	TOC	12/11/2014	MW32	Pneumatic Pump	NA	NA	NA	NA	**14.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW33	TOC	6/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW33	TOC	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	6/13/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW45	56th Ave ROW	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW48	56th Ave ROW	6/12/2014	MW48	Bailer	NA	NA	NA	**2.46**	**3.91**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	9/18/2014	MW48	Bailer	NA	NA	NA	**3.13**	**10.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	12/11/2014	MW48	Bailer	NA	NA	NA	**8.14**	**10.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	6/14/2014	MW49	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	9/22/2014	MW49	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	12/15/2014	MW49	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW50	56th Ave ROW	6/13/2014	MW50	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW50	56th Ave ROW	9/19/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW50	56th Ave ROW	12/12/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW51	56th Ave ROW	6/17/2014	MW51	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW51	56th Ave ROW	9/20/2014	MW51	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW51	56th Ave ROW	12/12/2014	MW51	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[3]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)[2]					20	5	0.01	15	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	160	0.1	0.1
MW52	56th Ave ROW	6/13/2014	MW52	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW52	56th Ave ROW	9/20/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW52	56th Ave ROW	12/12/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW53	56th Ave ROW	6/19/2014	MW53	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW53	56th Ave ROW	9/24/2014	MW53	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW53	56th Ave ROW	12/15/2014	MW53	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	6/19/2014	MW55	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	9/24/2014	MW55	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW55	56th Ave ROW	12/16/2014	MW55	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	6/14/2014	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	9/22/2014	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW56	TOC/Farmasonis	12/13/2014	MW56	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW57 (4" RW)	TOC/Farmasonis	12/11/2014	MW57	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW58	TOC/Farmasonis	6/14/2014	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW58	TOC/Farmasonis	9/22/2014	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW58	TOC/Farmasonis	12/16/2014	MW58	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	6/14/2014	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	9/22/2014	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW59	TOC/Farmasonis	12/13/2014	MW59	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	6/19/2014	MW60	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	9/25/2014	MW60	Bailer	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW60	56th Ave ROW	12/16/2014	MW60	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	6/19/2014	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	9/23/2014	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW63	56th Ave ROW	12/17/2014	MW63	Submersible Pump	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	6/17/2014	MW65	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	9/23/2014	MW65	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW65	Drake	12/17/2014	MW65	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW66	TOC/Farmasonis	6/11/2014	MW66	Bailer	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW66	TOC/Farmasonis	9/20/2014	MW66	Bailer	1U	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW66	TOC/Farmasonis	12/15/2014	MW66	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW69 (2" RW)	Drake	6/19/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW69 (2" RW)	Drake	9/23/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW69 (2" RW)	Drake	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW70 (2" RW)	Drake	6/20/2014	MW70	Pneumatic Pump	1U	1U	0.01U	1U	**2.48**	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[3]															
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM															
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)[2]					20	5	0.01	15	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	160	0.1	0.1
MW70 (2" RW)	Drake	9/19/2014	MW70	Pneumatic Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW70 (2" RW)	Drake	12/11/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW73	Shin/Choi	6/13/2014	MW73	Submersible Pump	*200U*	*200U*	1.8	1U	4.30	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	290	*5U*	*5U*
MW73	Shin/Choi	9/21/2014	MW73	Submersible Pump	1U	1U	0.41	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	330	0.1U	0.1U
MW73	Shin/Choi	12/15/2014	MW73	Bailer	90	NA	NA	1U	2.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW74	Shin/Choi	6/13/2014	MW74	Submersible Pump	610	*200U*	1.7	5.88	7.39	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	*5U*	62	*5U*	*5U*
MW74	Shin/Choi	9/22/2014	MW74	Bailer	580	NA	NA	NA	NA	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.24	0.1U	0.1U
MW74	Shin/Choi	12/15/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW77	Drake	6/17/2014	MW77	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	9/23/2014	MW77	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	12/17/2014	MW77	Bailer	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW84	Drake	9/23/2014	MW84	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW84	Drake	12/17/2014	MW84	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW84	Drake	6/20/2014	MW84	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW85	Drake	6/20/2014	MW85	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW85	Drake	9/24/2014	MW85	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW85	Drake	12/15/2014	MW85	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW86	Drake	6/20/2014	MW86	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	6/20/2014	MLT-03*	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	9/24/2014	MW86	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	9/24/2014	MLT-03*	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW86	Drake	12/15/2014	MW86	Submersible Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW86	Drake	12/15/2014	MLT-02*	Submersible Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW89	Drake	6/20/2014	MW89	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW89	Drake	9/23/2014	MW89	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW89	Drake	12/17/2014	MW89	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW96 (4" RW)	Drake	12/11/2014	MW96	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW103	Herman	6/18/2014	MW103	Bailer	170	1U	0.01U	3.84	4.69	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW103	Herman	9/21/2014	MW103	Bailer	10	1U	0.01U	1U	2.64	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW103	Herman	12/13/2014	MW103	Bailer	9.1	NA	NA	1U	2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW105	Herman	6/18/2014	MW105	Bailer	1U	1U	0.01U	1U	1.21	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW105	Herman	9/22/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW105	Herman	12/16/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[3]																
					Method SW8260C		Method 8011M	Method 200.8		EPA Method 8270D SIM																
					Methyl t-butyl ether (MTBE)	1,2-Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Dissolved Lead	Total Lead	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MTCA Method A Cleanup Level (µg/L)[2]					**20**	**5**	**0.01**	**15**	**15**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**160**	**0.1**	**0.1**
MW107	Herman	6/19/2014	MW107	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
MW107	Herman	9/21/2014	MW107	Submersible Pump	1U	1U	0.01U	1U	1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	**0.17J**	0.1U	0.1U
MW107	Herman	12/15/2014	MW107	Submersible Pump	1U	NA	NA	1U	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Italic denotes the constituent was not detected at or above the method reporting limit (MRL); however, the MRL was elevated due to sample dilution and exceeds the MTCA cleanup level.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] MTCA Method A Cleanup Levels, Table 720-1 of Washington Administrative Code (WAC) 173-340-900, revised October 12, 2007.

[3] With the exception of Napthalene, preliminary screening results for carcinogenic polycyclic aromatic hydrocarbons (PAHs) are compared to the MTCA Method A Cleanup Level provided for benzo(a)pyrene on Table 720-1 of WAC 173-340-900. Per MTCA, this value represents the total concentration that all carcinogenic PAHs must meet using the toxicity equivalency methodology of WAC 173-340-708(8).

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

LABORATORY NOTES:

U = Indicates the compound was undetected at the reported concentration.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

TOC/Farmasonis = 24225 56th Avenue West, Mountlake Terrace WA

Drake = 24309 56th Avenue West, Mountlake Terrace WA

56th Ave ROW = right-of-way adjacent to TOC, TOC/Farmasonis & Drake properties

Herman = 24311 56th Avenue West, Mountlake Terrace WA

Shin/Choi = 24325 56th Avenue West, Mountlake Terrace WA

TABLE 4-1
Groundwater Quality Results for Select Constituents
Shallow-Intermediate Zone Intersect Wells
Second, Third and Fourth Quarters 2014
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	Sample Date	Sample Identifier	Sample Method	Analytical Results (µg/L)								
					Total Petroleum Hydrocarbons			Volatile Organic Compounds					
					Method NWTPH-Gx	Method NWTPH-Dx		Method SW8021B / SW8260C[2]					
					Gasoline-Range (GRPH)	Motor Oil-Range (ORPH)	Diesel-Range (DRPH)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)[3]					**1,000/800[4]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[5]**	**NE[5]**
MW09	TOC	6/13/2014	MW09	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	6/13/2014	MLT-01*	Peristaltic Pump	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	6/13/2014	MW09(Bailer)**	Bailer	100U	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	6/13/2014	MW09(Submersible)**	Submersible Pump	100U	NA	NA	**3.4J**	**2.9J**	1U	**4.6**	NA	NA
MW09	TOC	9/22/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW09	TOC	12/13/2014	MW09-SUB	Submersible Pump	**210**	NA	NA	1U	1U	1U	3U	NA	NA
MW09	TOC	12/13/2014	MLT-1*	Submersible Pump	**160**	NA	NA	1U	1U	1U	3U	NA	NA
MW27 (2" RW)	TOC	6/19/2014	MW27	Pneumatic Pump	**390**	NA	NA	1U	**1.6**	**7.1**	**44**	NA	NA
MW27 (2" RW)	TOC	9/18/2014	not sampled	not sampled	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW27 (2" RW)	TOC	12/11/2014	MW27	Pneumatic Pump	100U	NA	NA	1U	1U	1U	**4.2**	NA	NA

NOTES & DEFINITIONS:

Well screens intersect Shallow and Intermediate Zone conditions.

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels.

Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.

Red denotes sample concentration exceeds MTCA Method A Cleanup Levels for groundwater.

Black denotes sample concentration was detected but does not exceed MTCA Method A Cleanup Levels for groundwater.

Gray denotes sample concentration was undetected at the method reporting limit, the constituent was not analyzed, or the well was dry.

[1] Remediation wells (identified as "RW") are either 2 or 4 inches in diameter and are connected to a multi-phase extraction system.

[2] If samples were analyzed by two methods, the maximum concentration of the two results is reported.

[3] MTCA Method A Cleanup Levels, Table 720-1 of Washington Administrative Code (WAC) 173-340-900, revised October 12, 2007.

[4] Cleanup level is 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

[5] Cleanup levels for individual xylenes have not been established.

* = Indicates blind field duplicate sample was collected for quality assurance/quality control purposes.

** = Indicates non-blind field duplicate sample collected for quality assurance/quality control purposes.

Dry = Indicates well could not be sampled due to insufficient groundwater sample volume.

NA = Indicates the compound was not analyzed.

NE = Indicates MTCA Method A Cleanup Level has not been established.

LABORATORY NOTES:

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. Qualifier was assigned based on data validation protocol.

U = Indicates the compound was undetected at the reported concentration.

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

NWTPH-Dx = Northwest Total Petroleum Hydrocarbon - diesel-range organics

NWTPH-Gx = Northwest Total Petroleum Hydrocarbon - gasoline-range organics

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

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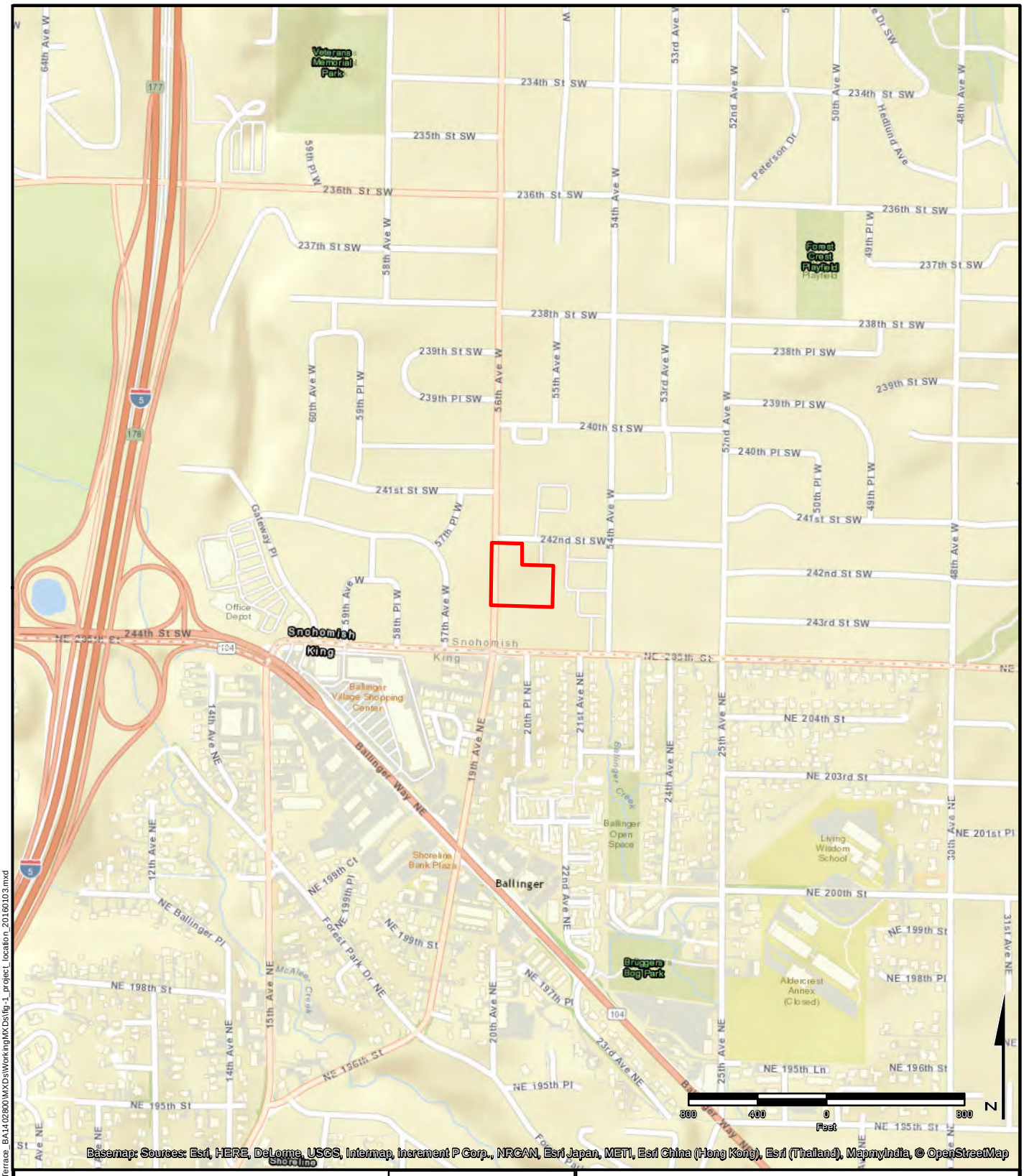
24 Benzene Concentrations in Groundwater, Intermediate Zone, Fourth Quarter 2014



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	2/11/2016
SCALE	1 in = 800 feet		
PROJECT	203700102		

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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	2/10/2016
SCALE	1 in = 120 feet		
PROJECT	203700102		

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Notes:

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

Utilities

- Water Line
- Stormwater Line
- Sewer Line
- Gas Line
- Fiber Optic Line

242nd Street Southwest

56th Avenue West

MW16 MW05 MW26 MW38 MW27 MW90 MW04 MW11 MW50 MW91 MW03 MW24 MW37 MW29 MW06 MW09 MW08 MW32 MW25 MW28 MW35 MW36 MW62 MW20 MW10 MW01 MW34 MW53 MW19 MW02 MW18 MW15 MW22 MW33 MW23 MW21 MW31 MW30 MW94 MW54 MW43 MW07 MW93 MW14 MW60 MW12 MW56 MW59 MW66 MW82 MW13 MW92 MW39 MW17 MW83 MW41 MW40 MW100 MW45 MW79 MW61 MW49 MW81 MW46 MW80 MW57 MW42 MW58 MW55 MW48 MW96 MW88 MW76 MW64 MW67 MW63 MW68 MW97 MW70 MW44 MW98 MW47 MW52 MW95 MW99 MW65 MW75 MW69 MW101 MW78 MW87 MW89 MW84 MW86 MW85 MW77 MW51 MW109 MW104 MW105 MW108 MW103 MW102 MW106 MW107 MW74 MW71 MW73 MW72

Tanks Removed 1991

TOC Holdings Co. Property

Unit 1 Remediation System

Stormwater Infiltration Pit (1975)

Unit 2 Remediation System

Utility Shed

TOC/Farmasonis Property

Unit 3 Remediation System

Vacant

Drake Property

Getaway Tavern

Tanks Removed 2001

Unconfirmed UST Locations (Status Unknown)

Unconfirmed UST Location (Status Unknown, Identified in 2001)

Dave's Auto Repair

Herman Property

Ez Corner Mart

Shin/Choi Property

Mountlake Senior Property

Tanks Removed 1996

Feet
50 25 0 50

N

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Site Boundary
- Historic Pump Islands (Removed)
- Parcels
- Remediation System Piping
- Compound Fence
- Estimated Historic Excavation
- Historic UST Location
- Remediation System
- Abandoned Well
- Deep Well
- Intermediate Well
- Shallow Well
- Mix Zone Well
- Stormwater Infiltration Pit

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

FIGURE 3: LOCATIONS OF WELLS AND REMEDIATION SYSTEMS

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 ft
PROJECT	203700102

Path: U:\Pre_MEDAD\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\Figure3_SiteMap With Well Locations(11x17).mxd

Notes:

1. Dry = Insufficient groundwater in monitoring well.
   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. LNAPL was observed in wells MW71, MW72 and MW102.

5. The groundwater elevation for MW102 was measured on 6/19/2014 at time of sample collection.

242nd Street Southwest

56th Avenue West

MW05 352.28
MW04 350.34
MW03 348.76
MW06 345.81
MW62 348.50
MW02 346.91
MW19 345.04
MW34 345.24
MW54 346.28
MW12 346.88
MW61 346.50
MW67 343.22
MW68 342.92
MW79 340.20
MW80 339.70
MW104 341.82
MW102 337.49
MW106 335.99
MW71 336.07
MW72 333.03

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

352 351 350 349 348 347 346 345 344 343 342 341 340 339 338 337 336 335 334

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW72 343.04 — Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 4: GROUNDWATER ELEVATION CONTOURS, SHALLOW ZONE, JUNE 16, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Notes:

1. Dry = Insufficient groundwater in monitoring well.
   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. LNAPL was observed in wells MW71, MW72 and MW102.

242nd Street Southwest

56th Avenue West

MW05 Dry

MW04 Dry

MW03 Dry

TOC Holdings Co. Property

MW06 Dry

MW62 Dry

MW34 Dry

MW02 343.32

MW19 Dry

MW54 342.72

MW12 343.19

TOC/Farmasonis Property

MW61 342.39

MW79 Dry

MW80 334.63

MW67 338.84

MW68 338.60

Drake Property

MW104 336.82

Herman Property

MW102 335.7

MW106 331.05

MW71 332.80

Shin/Choi Property

Mountlake Senior Property

MW72 329.85

344 343 342 341 340 339 338 337 336 335 334 333 332 331 330

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW72 343.04 — Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

Washington

Project Location

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

FIGURE 5: GROUNDWATER ELEVATION CONTOURS, SHALLOW ZONE, SEPTEMBER 24, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Notes:

1. Dry = Insufficient groundwater in monitoring well.
   NM = Not Measured
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. LNAPL was observed in wells MW71 and MW72.
5. LNAPL is typically observed in MW102 but the well was inaccessible during the 4Q2014 event and, therefore, could not be measured.

242nd Street Southwest

56th Avenue West

MW05 Dry

MW04 Dry

MW03 347.48

TOC Holdings Co. Property

MW06 Dry

MW62 348.54

MW02 346.04

MW19 344.33

MW34 346.67

MW54 344.68

MW12 345.35

TOC/Farmasonis Property

MW61 346.77

MW79 339.28

MW80 337.43

MW67 340.77

MW68 340.60

Drake Property

MW104 339.06

Herman Property

MW102 NM

MW106 337.17

MW71 333.60

Shin/Choi Property

Mountlake Senior Property

MW72 330.13

348 347 346 345 344 343 342 341 340 339 338 337 336 335 334 333 332 331 330

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Legend

- Parcels
- MW72 343.04 — Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 6: GROUNDWATER ELEVATION CONTOURS, SHALLOW ZONE, DECEMBER 16, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet
PROJECT	203700102

Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. Groundwater elevation for MW15 is based on DTW measurement obtained at the time of sample collection and may be anomalous due to abundant bio and/or mud build up in the well. Therefore, data were not used for groudwater contouring.

8. Historical data indicates MW50 is typically dry. Therefore, the data collected may be anomalous and were not used for contouring.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 319.23
MW38 344.62
MW27 NM
MW90 337.92
MW11 338.09
MW50 326.38
MW91 337.47
MW37 337.75
MW24 337.51
MW29 NM
MW09 334.07
MW08 338.83
MW32 336.81
MW25 327.04
MW28 330.24
MW35 319.07
MW36 316.31
MW20 324.64
MW10 324.36
MW18 Dry
MW15 322.07
MW53 318.10
MW22 329.44
MW33 Dry
MW23 318.05
MW31 NM
MW94 Dry
MW93 315.66
MW43 323.03
MW60 316.97
MW13 316.75
MW56 315.31
MW59 315.34
MW66 315.50
MW92 315.83
MW82 327.15
MW41 NM
MW45 Dry
MW49 315.60
MW100 339.24
MW81 315.14
MW46 316.03
MW57 315.22
MW42 Dry
MW58 314.85
MW55 315.71
MW48 315.42
MW96 314.83
MW88 335.64
MW76 314.32
MW97 314.31
MW70 NM
MW63 314.40
MW44 Dry
MW98 Dry
MW47 314.61
MW52 314.57
MW95 314.33
MW99 Dry
MW65 313.70
MW75 NM
MW69 NM
MW101 313.51
MW89 313.88
MW84 313.68
MW77 313.26
MW87 313.04
MW86 313.54
MW85 313.47
MW51 313.22
MW105 313.29
MW103 312.29
MW107 312.09
MW74 311.35
MW73 310.07

335 330 325 320 315 310

N

50 25 0 50 Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 7a: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, JUNE 18, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. MW32, MW91 and MW96 show a false groundwater mound likely due to vaccum effects from the SVE remediation system.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 Dry
MW38 343.53
MW27 NM
MW90 328.84
MW11 332.35
MW50 326.12
MW91 334.47
MW24 328.97
MW37 337.29
MW29 NM
MW09 331.63
MW08 335.14
MW32 331.02
MW25 324.71
MW28 329.61
MW35 Dry
MW36 316.62
MW20 323.46
MW10 323.64
MW18 Dry
MW15 322.07
MW53 317.76
MW22 328.29
MW33 Dry
MW23 318.78
MW31 NM
MW94 Dry
MW93 314.29
MW43 323.62
MW60 315.37
MW56 313.12
MW59 313.32
MW66 313.59
MW13 316.24
MW92 313.26
MW82 Dry
MW41 NM
MW45 Dry
MW49 314.23
MW100 339.11
MW81 315.06
MW46 313.73
MW57 313.00
MW42 Dry
MW58 313.36
MW55 315.63
MW48 315.03
MW96 308.27
MW88 335.81
MW76 313.19
MW97 313.01
MW70 NM
MW63 313.55
MW44 Dry
MW98 313.36
MW47 314.85
MW52 314.48
MW95 312.28
MW99 Dry
MW65 312.48
MW75 NM
MW69 Dry
MW101 313.12
MW89 312.68
MW84 NM
MW77 312.11
MW87 312.06
MW86 313.44
MW85 312.79
MW51 312.42
MW105 313.27
MW103 310.83
MW107 310.83
MW74 311.52
MW73 309.75

330 325 320 315 310

N

50 25 0 50 Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 7b: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, JUNE 11, 2014 (SYSTEM ON)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. MW66 and MW84 were inaccessible during the DTW measurement event. Groundwater elevations reflect measurement data obtained at the time of sample collection and were not used for contouring.

8. Based on groundwater elevations for nearby wells, the groundwater elevation for MW103 may be anomalous and was not used for contouring.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 Dry
MW38 339.13
MW27 NM
MW90 332.70
MW11 334.30
MW50 Dry
MW91 334.04
MW37 327.35
MW24 Dry
MW29
MW09 NM
322.23
MW08 Dry
MW32 333.11
MW25 321.47
MW28 Dry
MW35 Dry
MW36 Dry
MW20 321.45
MW10 Dry
MW18 NM
MW15 NM
MW53 315.90
MW22 Dry
MW33 Dry
MW23 Dry
MW31 NM
MW94 Dry
MW93 Dry
MW43 Dry
MW60 314.82
MW13 Dry
MW56 313.19
MW59 313.16
MW66 313.25
MW92 313.22
MW82 Dry
MW41 NM
MW45 Dry
MW49 313.22
MW100 335.26
MW81 312.71
MW46 Dry
MW57 Dry
MW42 Dry
MW58 312.05
MW55 312.72
MW48 312.62
MW96 312.40
MW88 330.38
MW76 311.39
MW97 311.80
MW70 NM
MW63 312.03
MW44 Dry
MW98 NM
MW47 Dry
MW52 312.01
MW95 311.83
MW99 Dry
MW65 311.19
MW75 NM
MW69 NM
MW101 NM
MW89 311.28
MW84 311.28
MW77 310.77
MW87 310.53
MW86 311.02
MW85 310.98
MW51 311.10
MW105 Dry
MW103 318.89
MW107 309.81
MW74 309.02
MW73 308.22

330 325 320 315 310

50 25 0 50 Feet

N

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington

Project Location

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

FIGURE 8a: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, SEPTEMBER 24, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. MW32, MW91, MW95 and MW96 show a false groundwater mound likely due to vacuum effects from the SVE remediation system.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 Dry
MW38 338.05
MW27 NM
MW90 327.89
MW11 329.34
MW50 Dry
MW91 330.08
MW37 324.73
MW24 338.77
MW29 NM
MW09 321.87
MW08 Dry
MW32 331.00
MW25 Dry
MW28 Dry
MW35 Dry
MW36 Dry
MW20 321.43
MW10 Dry
MW18 Dry
MW15 324.56
MW53 315.53
MW22 Dry
MW33 Dry
MW23 Dry
MW31 NM
MW43 Dry
MW94 Dry
MW93 314.11
MW60 314.41
MW56 313.25
MW59 312.02
MW66 313.95
MW13 Dry
MW92 313.05
MW82 Dry
MW41 NM
MW45 Dry
MW49 312.59
MW100 335.46
MW81 313.43
MW46 Dry
MW57 312.94
MW42 Dry
MW58 311.52
MW55 313.26
MW48 313.31
MW96 308.25
MW88 330.66
MW76 311.81
MW97 311.63
MW70 NM
MW63 310.86
MW44 Dry
MW98 311.69
MW47 Dry
MW52 312.81
MW95 309.78
MW99 Dry
MW65 311.13
MW75 NM
MW69 NM
MW101 311.12
MW89 310.62
MW84 310.76
MW77 310.80
MW87 309.97
MW86 311.39
MW85 311.49
MW51 NM
MW105 NM
MW103 NM
MW107 NM
MW74 NM
MW73 NM

330 325 320 315 310

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

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

FIGURE 8b: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, SEPTEMBER 19, 2014 (SYSTEM ON)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MED\AD\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA\1402800\MXDs\Working\MXDs\3Q14 GW Report\Figure8b_3Q14_GWE_IZ_Map.mxd

Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. Based on groundwater elevation for nearby wells, the groundwater elevation for MW103 may be anomalous and was not used for contouring.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 Dry
MW38 342.75
MW27 NM
MW90 336.07
MW11 336.64
MW50 Dry
MW91 335.97
MW24 329.16
MW37 336.11
MW29 NM
MW09 330.74
MW08 337.00
MW32 335.17
MW25 323.16
MW28 329.38
MW35 Dry
MW36 315.58
MW20 322.02
MW10 321.52
MW18 Dry
MW15 316.76
MW53 315.61
MW22 329.57
MW33 Dry
MW23 Dry
MW31 NM
MW94 Dry
MW93 Dry
MW43 323.94
MW60 314.35
MW13 Dry
MW56 312.94
MW59 312.87
MW66 312.92
MW92 313.00
MW82 328.16
MW41 NM
MW45 Dry
MW49 312.66
MW100 337.85
MW81 312.58
MW46 Dry
MW57 Dry
MW42 Dry
MW58 311.72
MW55 312.21
MW48 312.16
MW96 312.08
MW88 329.33
MW76 311.53
MW97 311.55
MW70 NM
MW63 311.79
MW44 Dry
MW98 311.48
MW47 Dry
MW52 Dry
MW95 311.59
MW99 Dry
MW65 311.08
MW75 NM
MW69 NM
MW101 310.92
MW89 310.93
MW84 310.85
MW77 310.76
MW87 310.80
MW86 310.72
MW85 310.77
MW51 310.87
MW105 Dry
MW103 308.39
MW107 309.81
MW74 Dry
MW73 307.72

335 330 325 320 315 310

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

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

FIGURE 9a: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, DECEMBER 16, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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Note:

1. Dry = Insufficient groundwater volume in monitoring well or the top of pump was encountered prior to the groundwater level in remediation wells.

   NM = Not Measured

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. Wells symbols displayed in purple indicate well screens intersect two groundwater zones. These wells were not used for contouring. Groundwater elevations at these locations are displayed in red.

5. MW27, MW29, MW31, MW41, MW69 and MW70 are 2-inch remediation wells. Depth-to-groundwater (DTW) levels cannot be measured in these wells because the diameter of water probe is too large to fit past the pump tubing.

6. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan.

7. MW32, MW91 and MW96 show a false groundwater mound likely due to vaccum effects from the SVE remediation system.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 Dry
MW38 340.17
MW27 NM
MW90 327.89
MW11 NM
MW50 Dry
MW91 330.57
MW24 328.60
MW37 332.90
MW29 NM
MW09 326.61
MW08 333.09
MW32 331.02
MW25 321.80
MW28 329.25
MW35 Dry
MW36 315.17
MW20 320.97
MW10 319.99
MW18 Dry
MW15 317.36
MW53 315.05
MW22 328.28
MW33 Dry
MW23 Dry
MW31 NM
MW94 Dry
MW93 314.05
MW43 323.74
MW60 313.63
MW56 313.03
MW59 312.80
MW66 NM
MW13 Dry
MW92 312.99
MW82 326.92
MW41 NM
MW45 Dry
MW49 312.17
MW100 336.82
MW81 312.73
MW46 Dry
MW57 312.87
MW42 Dry
MW58 310.50
MW55 312.03
MW48 312.12
MW96 308.29
MW88 328.16
MW76 311.34
MW97 310.89
MW70 NM
MW63 311.61
MW44 Dry
MW98 310.98
MW47 Dry
MW52 Dry
MW95 310.78
MW99 Dry
MW65 310.61
MW75 NM
MW69 NM
MW101 310.67
MW89 310.20
MW84 310.36
MW77 310.50
MW87 310.16
MW86 310.54
MW85 310.78
MW51 310.47
MW105 NM
MW103 NM
MW107 NM
MW74 NM
MW73 NM

330 325 320 315 310

N

50 25 0 50 Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping,

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 343.04 — Groundwater Elevation (ft, MSL) (NM = Not Measured)
- Estimated Groundwater Flow Direction
- 343 — Estimated Groundwater Elevation Contour (ft, MSL)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

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

FIGURE 9b: GROUNDWATER ELEVATION CONTOURS, INTERMEDIATE ZONE, DECEMBER 12, 2014 (SYSTEM ON)

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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Notes:

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

242nd Street Southwest

56th Avenue West

MW26
318.17

318

318

TOC Holdings Co.
Property

MW30
317.18

317

MW39
316.56

MW40
317.02

TOC/Farmasonis
Property

317

316

MW64
316.42

Drake Property

316

315

315

MW78
314.75

Herman Property

Shin/Choi
Property

Mountlake Senior
Property

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured) — 343.04
- Estimated Groundwater Flow Direction
- Estimated Groundwater Elevation Contour (ft, MSL) — 315
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- Estimated Historic Excavation

Washington

Project Location

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

FIGURE 10: GROUNDWATER ELEVATION CONTOURS, DEEP ZONE, JUNE 18, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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Notes:

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

242nd Street Southwest

56th Avenue West

MW26
316.40

316

316

TOC Holdings Co.
Property

315

MW30
314.78

315

MW40
314.62

MW39
314.14

TOC/Farmasonis
Property

314

314

MW64
314.02

313

Drake Property

313

312

MW78
312.30

312

Herman Property

Shin/Choi
Property

Mountlake Senior
Property

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured) — 343.04
- Estimated Groundwater Flow Direction
- Estimated Groundwater Elevation Contour (ft, MSL) — 315
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- Estimated Historic Excavation

Washington

Project Location

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

FIGURE 11: GROUNDWATER ELEVATION CONTOURS, DEEP ZONE, SEPTEMBER 24, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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Notes:

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

242nd Street Southwest

MW26
315.43

TOC Holdings Co.
Property

315

315

56th Avenue West

MW30
314.85

MW40
314.67

MW39
314.35

TOC/Farmasonis
Property

314

314

MW64
314.06

313

Drake Property

313

MW78
312.78

Herman Property

Shin/Choi
Property

Mountlake Senior
Property

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- Groundwater Sample Location Identifier and Groundwater Elevation (ft, MSL) (NM = Not Measured) — 343.04
- Estimated Groundwater Flow Direction
- Estimated Groundwater Elevation Contour (ft, MSL) — 315'
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- Estimated Historic Excavation

Washington

Project Location

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

FIGURE 12: GROUNDWATER ELEVATION CONTOURS, DEEP ZONE, DECEMBER 16, 2014 (SYSTEM OFF)

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/11/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Product (LNAPL) sample was collected from well.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest consentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since product (LNAPL) samples collected from MW71, MW72, and MW102 during 2Q2014 contained GRPH, a plume was drawn around these locations

242nd Street Southwest
56th Avenue West
MW05 NS
MW04 NS
MW03 NS
TOC Holdings Co. Property
MW06 NS
MW62 NS
MW02 NS
MW19 NS
MW34 NS
MW54 ND
MW12 NS
TOC/Farmasonis Property
MW61 NS
MW79 NS
MW80 NS
MW67 ND
MW68 ND
Drake Property
MW104 2400
Herman Property
MW102 LNAPL
MW106 ND
MW71 LNAPL
Shin/Choi Property
Mountlake Senior Property
MW72 LNAPL
N
50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW72 800 — Groundwater Sample Location Identifier and GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 13: GRPH CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, JUNE 2014

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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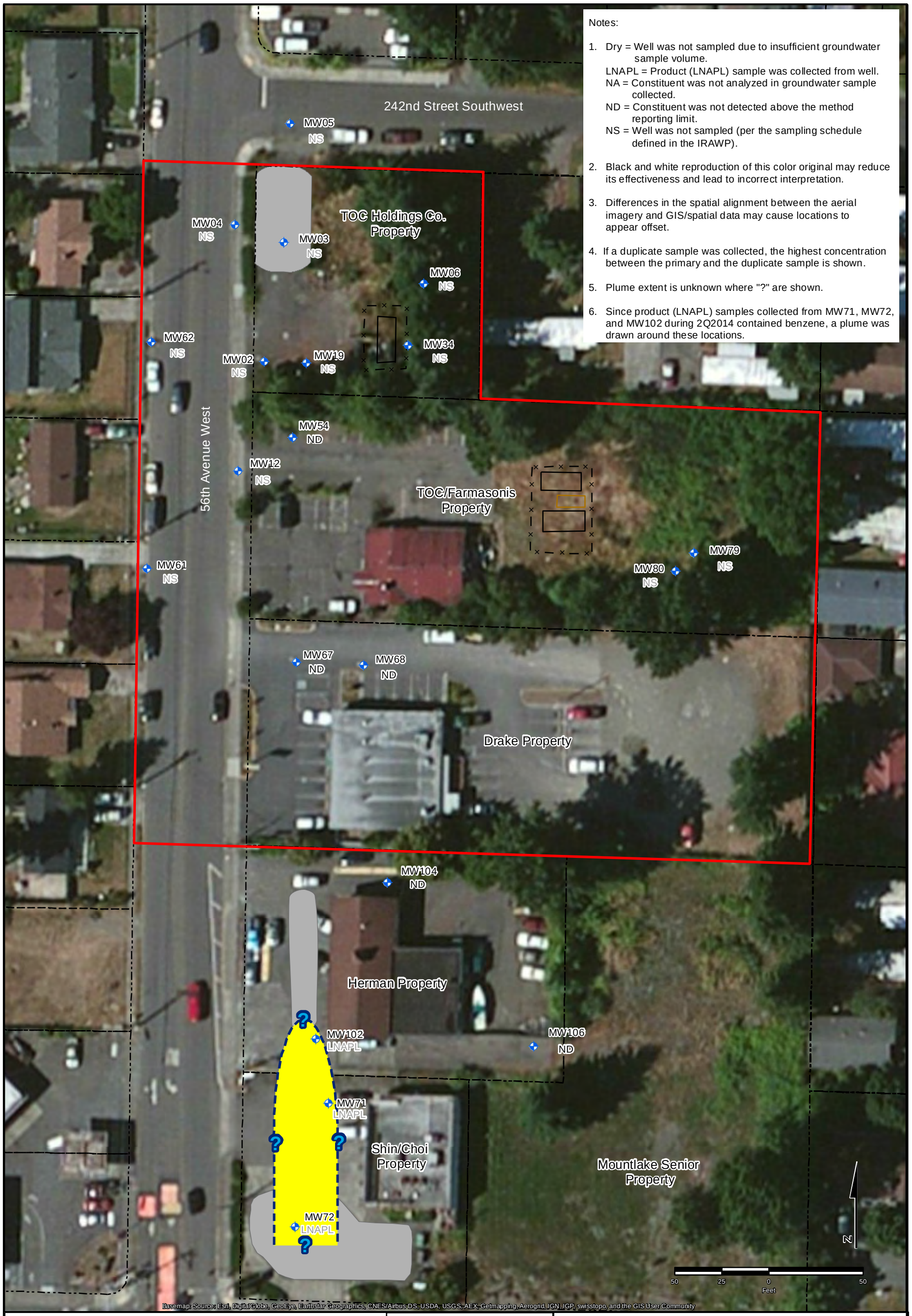

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Product (LNAPL) sample was collected from well.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since product (LNAPL) samples collected from MW71, MW72, and MW102 during 2Q2014 contained benzene, a plume was drawn around these locations.

Legend

- Parcels
- MW72 / 5 — Groundwater Sample Location Identifier and Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when benzene is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

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

FIGURE 14: BENZENE CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, JUNE 2014

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

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Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Well was not sampled due to presence of product (LNAPL).
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since product (LNAPL) samples collected from MW71, MW72, and MW102 during 2Q2014 contained GRPH and measurable product was observed in these wells during 3Q2014, a plume was drawn around these locations.

242nd Street Southwest
56th Avenue West
MW05 NS
MW04 NS
MW03 NS
TOC Holdings Co. Property
MW06 NS
MW62 NS
MW02 NS
MW19 NS
MW34 NS
MW54 ND
MW12 NS
TOC/Farmasonis Property
MW79 NS
MW80 NS
MW61 NS
MW67 ND
MW68 ND
Drake Property
MW104 47000
Herman Property
MW102 LNAPL
MW106 ND
MW71 LNAPL
Shin/Choi Property
Mountlake Senior Property
MW72 LNAPL
N
50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW72 800 — Groundwater Sample Location Identifier and GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 15: GRPH CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, SEPTEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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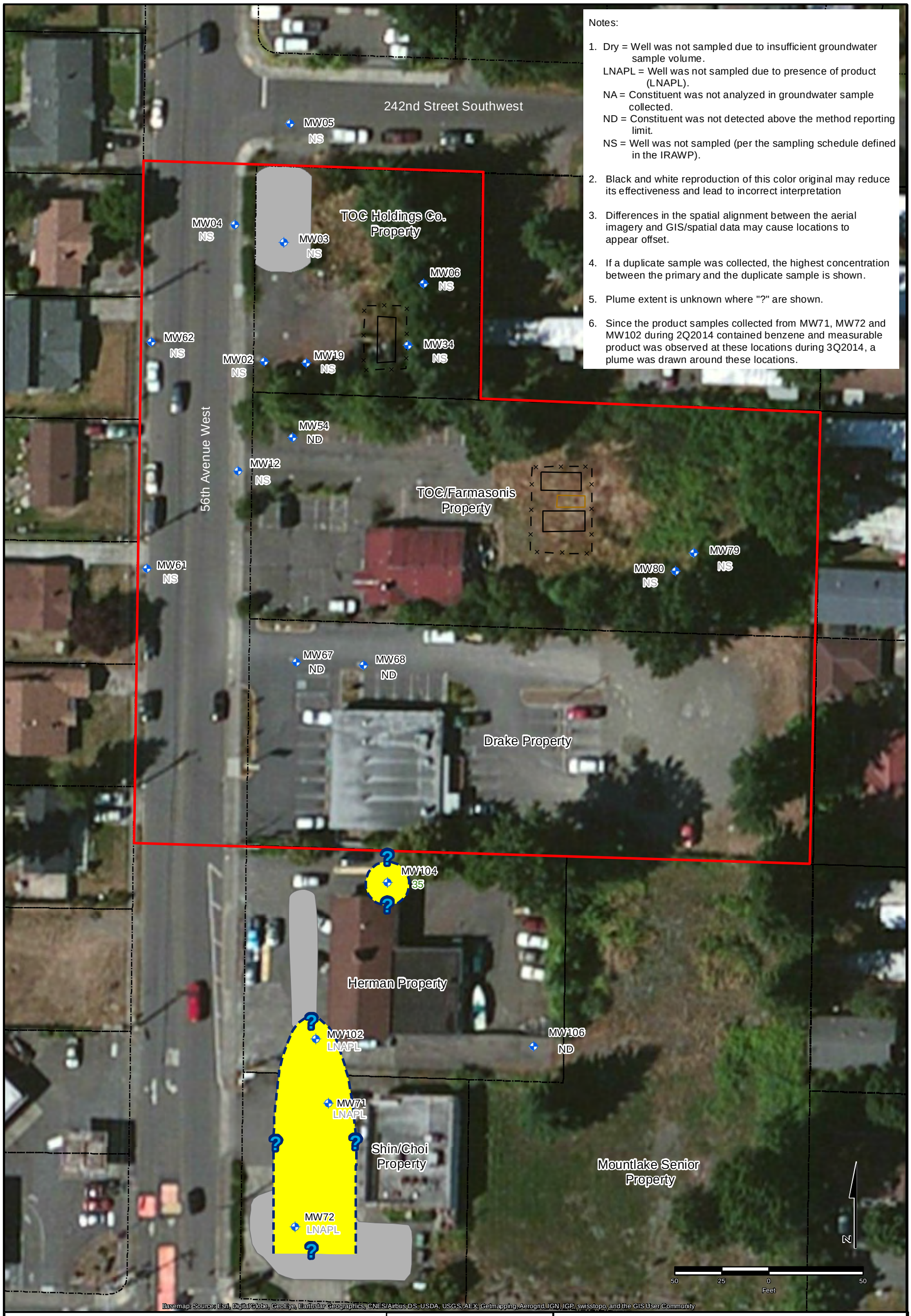
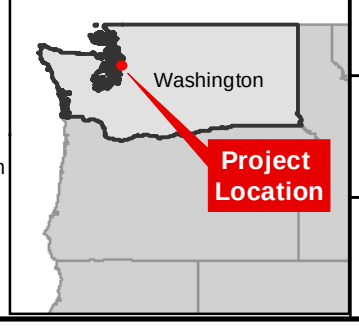


Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Well was not sampled due to presence of product (LNAPL).
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since the product samples collected from MW71, MW72 and MW102 during 2Q2014 contained benzene and measurable product was observed at these locations during 3Q2014, a plume was drawn around these locations.

Legend

- Parcels
- MW72 / 5 — Groundwater Sample Location Identifier and Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when benzene is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation



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

FIGURE 16: BENZENE CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, SEPTEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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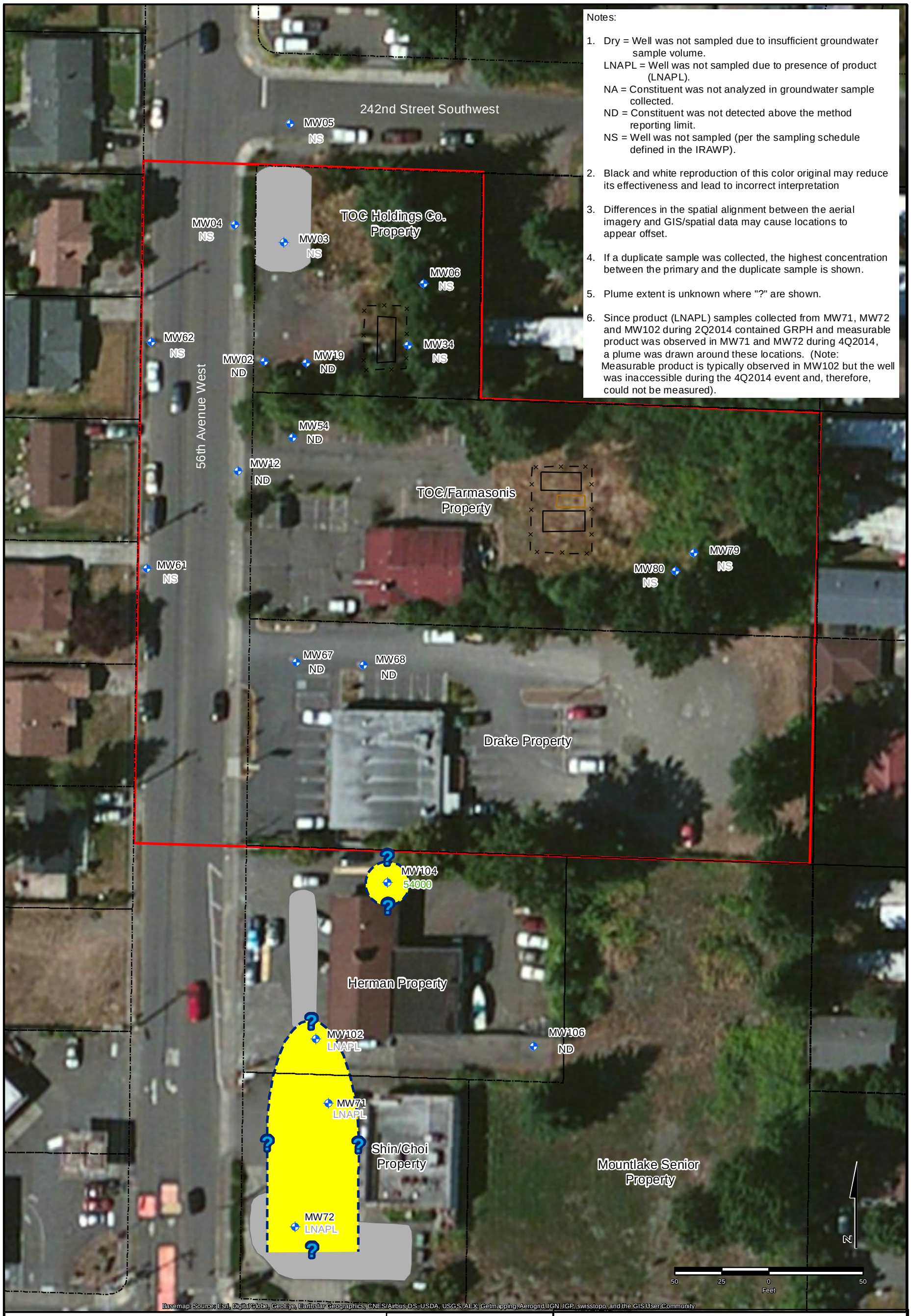
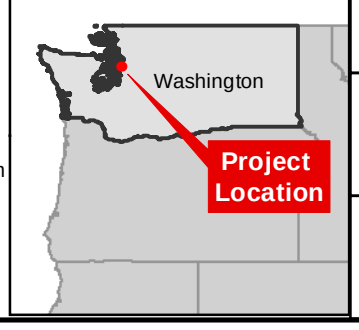


Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Well was not sampled due to presence of product (LNAPL).
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since product (LNAPL) samples collected from MW71, MW72 and MW102 during 2Q2014 contained GRPH and measurable product was observed in MW71 and MW72 during 4Q2014, a plume was drawn around these locations. (Note: Measurable product is typically observed in MW102 but the well was inaccessible during the 4Q2014 event and, therefore, could not be measured).

Legend

- Parcels
- MW72 / 800 — Groundwater Sample Location Identifier and GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation



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

FIGURE 17: GRPH CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, DECEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

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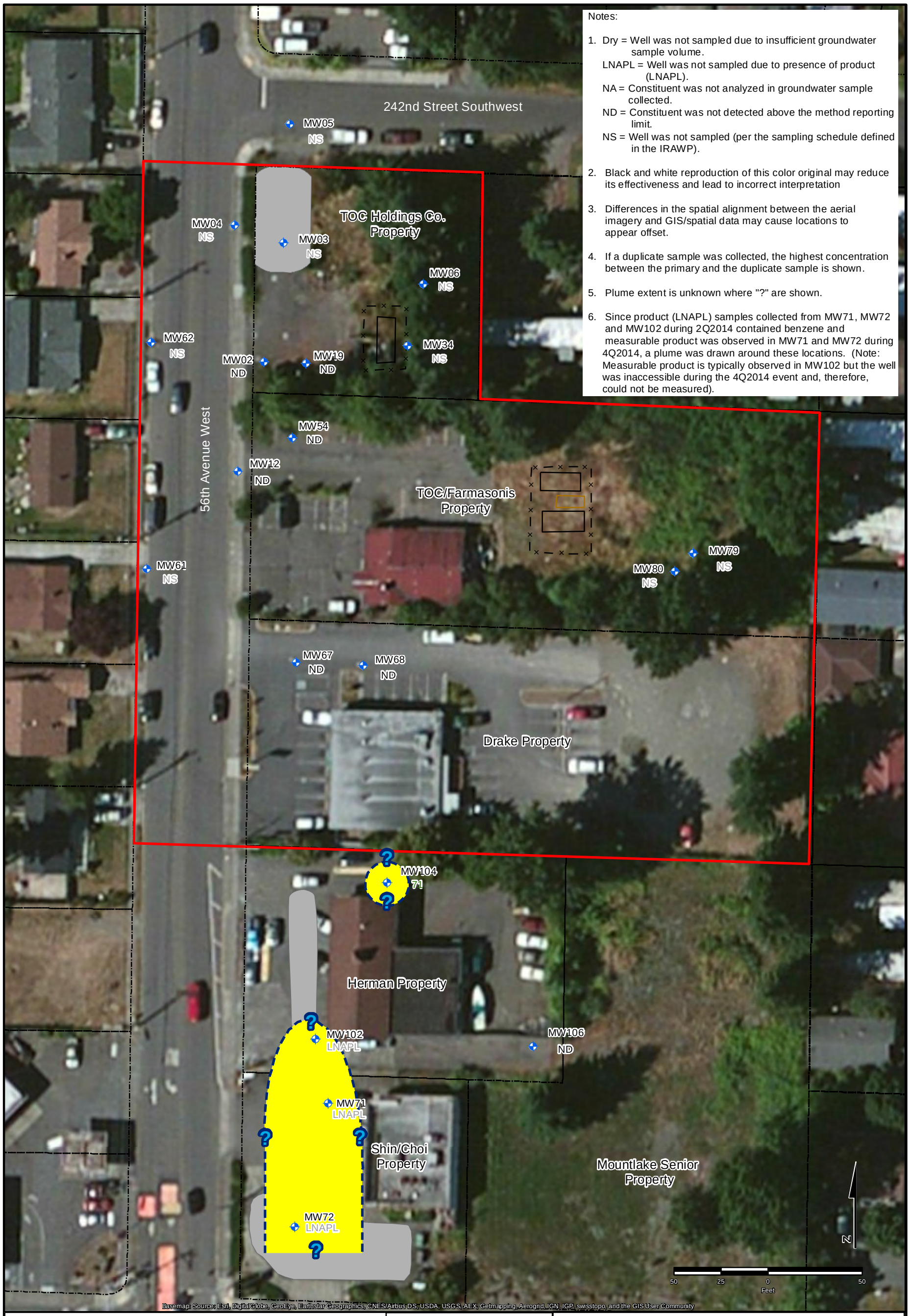


Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   LNAPL = Well was not sampled due to presence of product (LNAPL).
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. Since product (LNAPL) samples collected from MW71, MW72 and MW102 during 2Q2014 contained benzene and measurable product was observed in MW71 and MW72 during 4Q2014, a plume was drawn around these locations. (Note: Measurable product is typically observed in MW102 but the well was inaccessible during the 4Q2014 event and, therefore, could not be measured).

Legend

- Parcels
- MW72 / 5 — Groundwater Sample Location Identifier and Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when benzene is present)
- Site Boundary
- Compound Fence
- Remediation System Compound
- Equipment Shed
- Estimated Historic Excavation

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

FIGURE 18: BENZENE CONCENTRATIONS IN GROUNDWATER, SHALLOW ZONE, DECEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MEDA\DWA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\4Q14 GW Report\Figure18_4Q14_Benzene_UZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).

2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation

3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.

5. Plume extent is unknown where "?" are shown.

242nd Street Southwest

56th Avenue West

MW16 NS
MW38 NS
MW27 390
MW90 NS
MW11 NS
MW50 ND
MW91 NS
MW24 NS
MW37 NS
MW29 NS
MW09 ND
MW08 NS
MW32 2100
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW20 110
MW10 ND
MW18 NS
MW15 270
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 ND
MW94 NS
MW93 NS
MW43 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW49 ND
MW100 NS
MW81 NS
MW46 NS
MW57 NS
MW42 NS
MW58 ND
MW55 ND
MW48 10000
MW96 NS
MW97 NS
MW70 ND
MW88 NS
MW76 NS
MW63 ND
MW44 NS
MW98 NS
MW47 NS
MW52 ND
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 9/17/2013) 960
MW86 ND
MW77 ND
MW87 NS
MW85 ND
MW51 ND
MW105 ND
MW103 ND
MW107 ND
MW74 66000
MW73 87000

TOC Holdings Co. Property
TOC/Farmasonis Property
Drake Property
Herman Property
Shin/Choi Property
Mountlake Senior Property

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 66000 — GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

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

FIGURE 19: GRPH CONCENTRATIONS IN GW, INTERMEDIATE ZONE, JUNE 2014

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

Stantec

U:\Pre_MED\ADW\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\2Q14 GW Report\Figure19_2Q14_GRPH_IZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest consentration between the primary and the duplicate sampe is shown.
5. Plume extent is unknown where "?" are shown.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 NS
MW38 NS
MW27 ND
MW90 NS
MW11 NS
MW50 ND
MW91 NS
MW37 NS
MW24 NS
MW29 NS
MW09 3.4
MW08 NS
MW32 2.6
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW20 12
MW10 ND
MW18 NS
MW15 ND
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 ND
MW94 NS
MW93 NS
MW43 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW49 1.5
MW100 NS
MW81 NS
MW46 NS
MW57 NS
MW42 NS
MW58 ND
MW55 ND
MW48 ND
MW96 NS
MW88 NS
MW76 NS
MW97 NS
MW70 ND
MW63 ND
MW44 NS
MW47 NS
MW52 ND
MW98 NS
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 9/17/2013)
MW77 ND
MW87 NS
MW86 ND
MW85 ND
MW51 ND
MW105 ND
MW103 3.0
MW107 ND
MW74 1800
MW73 2100

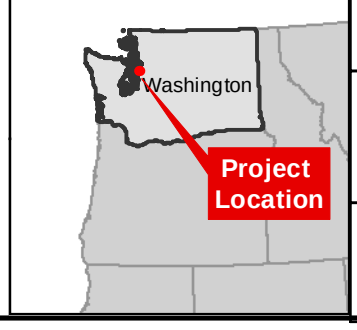
Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 5 — Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when Benzene is present)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation



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

FIGURE 20: BENZENE CONCENTRATIONS IN GW, INTERMEDIATE ZONE, JUNE 2014

Stantec

DRAWN BY	D.H.	DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet		
PROJECT	203700102		

U:\Pre_MEDA\DWA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\2Q14 GW Report\Figure20_2Q14_Benzene_IZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 NS
MW38 NS
MW27 Dry
MW90 NS
MW11 NS
MW50 Dry
MW91 NS
MW37 NS
MW24 NS
MW29 NS
MW09 Dry
MW08 NS
MW32 450
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW20 ND
MW10 Dry
MW18 NS
MW15 ND
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 Dry
MW94 NS
MW93 NS
MW43 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW100 NS
MW81 NS
MW49 ND
MW46 NS
MW57 NS
MW42 NS
MW58 ND
MW55 ND
MW48 8500
MW96 NS
MW88 NS
MW76 NS
MW97 NS
MW70 ND
MW63 ND
MW44 NS
MW98 NS
MW47 NS
MW52 Dry
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 2013)
MW86 1000
MW77 ND
MW87 NS
MW51 ND
780
MW85 ND
MW105 Dry
MW103 ND
MW107 ND
MW74 7100
MW73 81000

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

50 25 0 50
Feet

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 66000 — GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

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

FIGURE 21: GRPH CONCENTRATIONS IN GW, INTERMEDIATE ZONE, SEPTEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MED\ADI\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA1402800\MXDs\WorkingMXDs\3Q14 GW Report\Figure21_3Q14_GRPH_IZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   NA = Constituent was not analyzed in groundwater sample
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.
6. MW48 has elevated reporting limits due to dilution. Concentration at this location is reported as 5U (or not detected at 5ug/L).

242nd Street Southwest
56th Avenue West
TOC Holdings Co. Property
TOC/Farmasonis Property
Drake Property
Herman Property
Shin/Choi Property
Mountlake Senior Property

MW16 NS
MW38 NS
MW27 Dry
MW90 NS
MW11 NS
MW50 Dry
MW91 NS
MW37 NS
MW24 NS
MW29 NS
MW09 Dry
MW08 NS
MW32 2.9
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW20 ND
MW10 Dry
MW18 NS
MW15 ND
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 Dry
MW43 NS
MW94 NS
MW93 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW49 ND
MW100 NS
MW81 NS
MW46 NS
MW57 NS
MW42 NS
MW58 ND
MW55 ND
MW48 5U
MW96 NS
MW88 NS
MW76 NS
MW97 NS
MW70 ND
MW63 ND
MW44 NS
MW47 NS
MW98 NS
MW52 Dry
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 2013) ND
MW77 ND
MW87 NS
MW86 1.8
MW85 ND
MW51 ND
MW105 Dry
MW103 ND
MW107 5.3
MW74 1700
MW73 15000

50 25 0 50
Feet

N

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 5 — Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when Benzene is present)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington
Project Location

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

FIGURE 22: BENZENE CONCENTRATIONS IN GW, INTERMEDIATE ZONE, SEPTEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MED\ADI\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA14.02800\MXDs\WorkingMXDs\3Q14 GW Report\Figure22_3Q14_Benzene_IZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 NS
MW38 NS
MW27 ND
MW90 NS
MW11 NS
MW50 Dry
MW91 NS
MW37 NS
MW24 NS
MW29 NS
MW09 210
MW08 NS
MW32 ND
MW35 NS
MW25 NS
MW28 NS
MW36 NS
MW20 Dry
MW10 ND
MW18 NS
MW15 (Pump Removed 12/16/2014)
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 Dry
MW94 NS
MW93 NS
MW43 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW49 ND
MW100 NS
MW81 NS
MW46 NS
MW57 4700
MW42 NS
MW58 ND
MW55 ND
MW48 7700
MW96 ND
MW88 NS
MW76 NS
MW97 NS
MW70 Dry
MW63 ND
MW44 NS
MW98 NS
MW47 NS
MW52 Dry
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 9/17/2013)
MW77 ND
MW87 NS
MW86 ND
MW85 ND
MW51 620 ND
MW105 Dry
MW103 ND
MW107 ND
MW74 Dry
MW73 69000

N

50 25 0 50
Feet

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 66000 — GRPH Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Site Boundary
- × — × Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington — Project Location

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

FIGURE 23: GRPH CONCENTRATIONS IN GW, INTERMEDIATE ZONE, DECEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MED\ADI\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA\402800\MXDs\WorkingMXDs\4Q14 GW Report\Figure23_4Q14_GRPH_IZ_Map.mxd

Notes:

1. Dry = Well was not sampled due to insufficient groundwater sample volume.
   NA = Constituent was not analyzed in groundwater sample collected.
   ND = Constituent was not detected above the method reporting limit.
   NS = Well was not sampled (per the sampling schedule defined in the IRAWP).
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation
3. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.
4. If a duplicate sample was collected, the highest concentration between the primary and the duplicate sample is shown.
5. Plume extent is unknown where "?" are shown.

242nd Street Southwest

56th Avenue West

TOC Holdings Co. Property

TOC/Farmasonis Property

Drake Property

Herman Property

Shin/Choi Property

Mountlake Senior Property

MW16 NS
MW38 NS
MW27 ND
MW90 NS
MW11 NS
MW50 Dry
MW91 NS
MW37 NS
MW24 NS
MW29 NS
MW09 ND
MW08 NS
MW32 ND
MW25 NS
MW28 NS
MW35 NS
MW36 NS
MW20 Dry
MW10 ND
MW18 NS
MW15 (Pump Removed 12/16/2014)
MW53 ND
MW22 NS
MW33 Dry
MW23 NS
MW31 Dry
MW94 NS
MW93 NS
MW43 NS
MW60 ND
MW56 ND
MW59 ND
MW66 ND
MW13 NS
MW92 NS
MW82 NS
MW41 NS
MW45 Dry
MW49 ND
MW100 NS
MW81 NS
MW46 NS
MW57 2.2
MW42 NS
MW58 ND
MW55 ND
MW48 67
MW96 ND
MW88 NS
MW76 NS
MW97 NS
MW70 Dry
MW63 ND
MW44 NS
MW47 NS
MW98 NS
MW52 Dry
MW95 NS
MW99 NS
MW65 ND
MW75 NS
MW69 Dry
MW101 NS
MW89 ND
MW84 (Pump Removed 9/17/2013)
MW77 ND
MW87 NS
MW86 ND
MW85 ND
MW51 ND
MW105 Dry
MW103 1.3
MW107 ND
MW74 Dry
MW73 13000

Basemap: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

50 25 0 50
Feet

N

Legend

- Parcels
- MW73 — Intermediate Groundwater Zone Well Location
- MW88 — Well Location Where Screen Intersects Two Groundwater Zones
- 5 — Benzene Concentration (µg/L)
- Sample concentration exceeds MTCA Method A Cleanup (5 µg/L when Benzene is present)
- Site Boundary
- Compound Fence
- Equipment Shed
- Remediation System Compound
- System Piping
- Estimated Historic Excavation

Washington
Project Location

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

FIGURE 24: BENZENE CONCENTRATIONS IN GW, INTERMEDIATE ZONE, DECEMBER 2014

Stantec

DRAWN BY	D.H.
DATE DRAWN	2/10/2016
SCALE	1 in = 50 feet
PROJECT	203700102

U:\Pre_MED\AD\WA\Clients\Time_Oil\TOC-MountlakeTerrace_BA\402800\MXDs\WorkingMXDs\4Q14 GW Report\Figure24_4Q14_Benzene_IZ_Map.mxd

Appendix A

Laboratory Analytical Reports – Groundwater Samples, Second Quarter 2014

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 20, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 16, 2014 from the TOC_01-176, WORFDB8 F&BI 406254 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
STN0620R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406254 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406254 -01	MW50
406254 -02	MW52

All quality control requirements were acceptable.

Date of Report: 06/20/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406254
Date Extracted: 06/17/14
Date Analyzed: 06/17/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW50 406254-01	<1	<1	<1	<3	<100	92
MW52 406254-02	<1	<1	<1	<3	<100	90
Method Blank 04-1218 MB	<1	<1	<1	<3	<100	91

Date of Report: 06/20/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406254

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: 406256-05 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	101	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.

RoW 4062254

SAMPLE CHAIN OF CUSTODY

ME 06/16/14 V1

Page # 1 of 1

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

SAMPLERS (signature) Avadon
PROJECT NAME/NO. TOC-MLT
PO# 2037140857
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
MW50	01 A-C	6.13.14	0930	W	3		X	X										
MW52	02 A-C	6.13.14	0945	W	3		X	X										

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:	Avadon	Antonela Vadon	Stantec	6.16.14	1200
Received by:		VING	FBI	6-16-14	2:00 pm
Relinquished by:					
Received by:			Samples received at 3 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 16, 2014 from the TOC_01-176, WORFDB8 F&BI 406255 project. There are 28 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
STN0701R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406255 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406255 -01	MW74
406255 -02	MW73
406255 -03	TB-061614-3

EDB was detected in samples MW74 and MW73 by method 8011. However, the results could not be confirmed by 8260C and are likely due to interferences from other compounds present in the sample.

All other quality control requirements were acceptable.

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255
Date Extracted: 06/17/14
Date Analyzed: 06/17/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW74 406255-01 1/200	66,000	92
MW73 406255-02 1/200	87,000	97
Method Blank 04-1218 MB	<100	92

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255
Date Extracted: 06/17/14
Date Analyzed: 06/17/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
TB-061614-3 406255-03	<1	<1	<1	<3	<100	92
Method Blank 04-1218 MB	<1	<1	<1	<3	<100	91

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255
Date Extracted: 06/17/14
Date Analyzed: 06/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW74 406255-01	4,200 x	<250	92
MW73 406255-02 1/1.2	5,900 x	<300	82
Method Blank 04-1239 MB	<50	<250	84

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW74	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	406255-01
Date Analyzed:	06/19/14	Data File:	406255-01.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	7.39

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	406255-02
Date Analyzed:	06/19/14	Data File:	406255-02.051
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	4.30

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	I4-383 mb
Date Analyzed:	06/19/14	Data File:	I4-383 mb.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW74	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	406255-01
Date Analyzed:	06/19/14	Data File:	406255-01.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	102	60	125

Analyte:	Concentration ug/L (ppb)
Lead	5.88

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	406255-02
Date Analyzed:	06/19/14	Data File:	406255-02.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/19/14	Lab ID:	I4-385 mb
Date Analyzed:	06/19/14	Data File:	I4-385 mb.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/17/14	Lab ID:	406255-01
Date Analyzed:	06/17/14	Data File:	061714.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	80	57	121
Toluene-d8	113	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	610 ve
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	1,800 ve
Toluene	2,300 ve
Ethylbenzene	550 ve
m,p-Xylene	1,600 ve
o-Xylene	520 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/17/14	Lab ID:	406255-01 1/200
Date Analyzed:	06/17/14	Data File:	061723.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	96	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	550
1,2-Dichloroethane (EDC)	<200
1,2-Dibromoethane (EDB)	<200
Benzene	12,000
Toluene	7,600
Ethylbenzene	690
m,p-Xylene	2,100
o-Xylene	600

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/17/14	Lab ID:	406255-02
Date Analyzed:	06/17/14	Data File:	061715.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	74	57	121
Toluene-d8	117	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	19
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	2,100 ve
Toluene	1,700 ve
Ethylbenzene	840 ve
m,p-Xylene	2,800 ve
o-Xylene	1,900 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/17/14	Lab ID:	406255-02 1/200
Date Analyzed:	06/17/14	Data File:	061724.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<200
1,2-Dichloroethane (EDC)	<200
1,2-Dibromoethane (EDB)	<200
Benzene	15,000
Toluene	4,100
Ethylbenzene	2,100
m,p-Xylene	6,400
o-Xylene	3,300

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/17/14	Lab ID:	04-1202 mb
Date Analyzed:	06/17/14	Data File:	061708.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
1,2-Dibromoethane (EDB)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255
Date Extracted: 06/16/14
Date Analyzed: 06/16/14 and 06/17/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW74 406255-01	1.7 ve
MW73 406255-02	1.8 ve
Method Blank	<0.01

EDB 1,2-Dibromoethane

Note: The EDB detections could not be confirmed by method 8260C. The results are likely due to false positives caused by interfering compounds.

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW74	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/24/14	Lab ID:	406255-01 1/100
Date Analyzed:	06/26/14	Data File:	062536.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	173 ds	50	150
Benzo(a)anthracene-d12	46 ds	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	62
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(a)pyrene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenz(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/24/14	Lab ID:	406255-02 1/100
Date Analyzed:	06/26/14	Data File:	062608.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	256 ds	50	150
Benzo(a)anthracene-d12	74 ds	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	290
Acenaphthylene	<5
Acenaphthene	<5
Fluorene	<5
Phenanthrene	<5
Anthracene	<5
Fluoranthene	<5
Pyrene	<5
Benz(a)anthracene	<5
Chrysene	<5
Benzo(a)pyrene	<5
Benzo(b)fluoranthene	<5
Benzo(k)fluoranthene	<5
Indeno(1,2,3-cd)pyrene	<5
Dibenz(a,h)anthracene	<5
Benzo(g,h,i)perylene	<5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406255
Date Extracted:	06/24/14	Lab ID:	04-1268 mb2
Date Analyzed:	06/25/14	Data File:	062534.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

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: 406256-05 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 406257-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<250	107	109	64-141	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	103	61-133	20

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

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

Laboratory Code: 406256-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

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

Laboratory Code: 406257-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	9.67	86 b	103 b	79-121	18 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	96	83-115

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406234-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	74-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	69-133
Benzene	ug/L (ppb)	50	4.3	80	76-125
Toluene	ug/L (ppb)	50	2.5	90	76-122
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	110	69-134
Ethylbenzene	ug/L (ppb)	50	1.5	90	69-135
m,p-Xylene	ug/L (ppb)	100	4.7	89	69-135
o-Xylene	ug/L (ppb)	50	1.7	94	60-140

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	96	97	64-147	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	93	73-132	1
Benzene	ug/L (ppb)	50	88	87	69-134	1
Toluene	ug/L (ppb)	50	94	95	72-122	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	111	110	82-125	1
Ethylbenzene	ug/L (ppb)	50	95	95	77-124	0
m,p-Xylene	ug/L (ppb)	100	96	96	83-125	0
o-Xylene	ug/L (ppb)	50	99	99	81-121	0

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 406221-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	119	70-130

Date of Report: 07/01/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406255

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	84	91	67-116	8
Acenaphthylene	ug/L (ppb)	1	89	93	65-119	4
Acenaphthene	ug/L (ppb)	1	86	92	66-118	7
Fluorene	ug/L (ppb)	1	90	95	64-125	5
Phenanthrene	ug/L (ppb)	1	87	93	67-120	7
Anthracene	ug/L (ppb)	1	89	94	65-122	5
Fluoranthene	ug/L (ppb)	1	91	96	65-127	5
Pyrene	ug/L (ppb)	1	89	97	62-130	9
Benz(a)anthracene	ug/L (ppb)	1	81	87	60-118	7
Chrysene	ug/L (ppb)	1	90	97	66-125	7
Benzo(b)fluoranthene	ug/L (ppb)	1	84	92	55-135	9
Benzo(k)fluoranthene	ug/L (ppb)	1	83	90	62-125	8
Benzo(a)pyrene	ug/L (ppb)	1	82	89	58-127	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	84	90	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	87	37-133	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	77	88	34-135	13

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.

SHIN/CHOI PROPERTY

406255

SAMPLE CHAIN OF CUSTODY

ME 06/16/14 V1

Page # 1 of 1

Report To Rebekah Brooks

Company Stantec

Address 19101 36th Ave W, #203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC-MLT

PO# 2037140895

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	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAH	EDC	EDB	Total Pb	Dissolved Pb	Notes
MW 74	01	6.13.14	0900	W	8	X	X	X				X	X	X	X	X	X	
MW 73	02	6.13.14	1100	W	8	X	X	X				X	X	X	X	X	X	
TB-061614-3	03				1		X	X										

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: Vadon	Antonela Vadon	Stantec	6.16.14	1200
Received by:	VINCE	FBI	6-16-14	2:00pm
Relinquished by:				
Received by:		Samples received at 3 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 25, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 16, 2014 from the TOC_01-176, WORFDB8 F&BI 406256 project. There are 29 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
STN0625R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406256 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406256 -01	MW32
406256 -02	MW15
406256 -03	MW09
406256 -04	MW20
406256 -05	MLT-01
406256 -06	MLT-02
406256 -07	WB-061314
406256 -08	MW09
406256 -09	MW09
406256 -10	TB-061614-3
406256 -11	EB-061314

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256
Date Extracted: 06/17/14
Date Analyzed: 06/17/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW32 406256-01	2.6	30	32	180	2,100	99
MW15 406256-02	<1	<1	2.2	7.3	270	89
MW09 406256-03	<1	<1	<1	<3	<100	91
MW20 406256-04	12	5.8	1.8	5.8	110	91
MLT-01 406256-05	<1	<1	<1	<3	<100	93
MLT-02 406256-06	12	6.0	1.8	6.3	110	93
WB-061314 406256-07	<1	<1	<1	<3	<100	91
MW09 406256-08	3.4	2.9	<1	4.6	<100	91
MW09 406256-09	<1	<1	<1	<3	<100	90
TB-061614-3 406256-10	<1	<1	<1	<3	<100	95

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256
Date Extracted: 06/17/14
Date Analyzed: 06/17/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
EB-061314 406256-11	2.0	2.0	<1	<3	<100	91
Method Blank 04-1218 MB	<1	<1	<1	<3	<100	91

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256
Date Extracted: 06/17/14
Date Analyzed: 06/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW20 406256-04	170	<250	83
MLT-02 406256-06	230	<250	77
WB-061314 406256-07 1/1.1	<55	<280	78
EB-061314 406256-11	<50	<250	78
Method Blank 04-1239 MB	<50	<250	84

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-01
Date Analyzed:	06/19/14	Data File:	406256-01.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	4.03

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-07
Date Analyzed:	06/19/14	Data File:	406256-07.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-11
Date Analyzed:	06/19/14	Data File:	406256-11.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	104	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	I4-383 mb
Date Analyzed:	06/19/14	Data File:	I4-383 mb.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-01
Date Analyzed:	06/19/14	Data File:	406256-01.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.97

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-07
Date Analyzed:	06/19/14	Data File:	406256-07.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	406256-11
Date Analyzed:	06/19/14	Data File:	406256-11.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/19/14	Lab ID:	I4-385 mb
Date Analyzed:	06/19/14	Data File:	I4-385 mb.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW20	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-04
Date Analyzed:	06/17/14	Data File:	061710.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	96	63	127
4-Bromofluorobenzene	96	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-06
Date Analyzed:	06/17/14	Data File:	061711.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	96	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-07
Date Analyzed:	06/17/14	Data File:	061712.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	94	63	127
4-Bromofluorobenzene	96	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-11
Date Analyzed:	06/17/14	Data File:	061713.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	93	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	04-1202 mb
Date Analyzed:	06/17/14	Data File:	061708.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	97	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW20	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-04 1/2
Date Analyzed:	06/20/14	Data File:	061933.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	110	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-06 1/2
Date Analyzed:	06/20/14	Data File:	062007.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	108	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-07 1/2
Date Analyzed:	06/18/14	Data File:	061811.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	50	150
Benzo(a)anthracene-d12	106	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-061314	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/17/14	Lab ID:	406256-11 1/2
Date Analyzed:	06/18/14	Data File:	061812.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	50	150
Benzo(a)anthracene-d12	109	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.51
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406256
Date Extracted:	06/18/14	Lab ID:	04-1230 mb3
Date Analyzed:	06/19/14	Data File:	061906.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	50	150
Benzo(a)anthracene-d12	105	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

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: 406256-05 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	95	65-118
Toluene	ug/L (ppb)	50	97	72-122
Ethylbenzene	ug/L (ppb)	50	96	73-126
Xylenes	ug/L (ppb)	150	96	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 406257-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<250	107	109	64-141	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	103	61-133	20

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

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

Laboratory Code: 406256-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

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

Laboratory Code: 406257-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	9.67	86 b	103 b	79-121	18 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	96	83-115

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406234-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	74-127

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	96	97	64-147	1

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406256

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 406257-03 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	88	90	23-153	2
Acenaphthylene	ug/L (ppb)	1	<0.1	88	88	63-104	0
Acenaphthene	ug/L (ppb)	1	<0.1	89	91	59-109	2
Fluorene	ug/L (ppb)	1	<0.1	89	91	67-108	2
Phenanthrene	ug/L (ppb)	1	<0.1	87	91	65-100	4
Anthracene	ug/L (ppb)	1	<0.1	88	91	57-100	3
Fluoranthene	ug/L (ppb)	1	<0.1	89	91	63-110	2
Pyrene	ug/L (ppb)	1	<0.1	88	92	63-107	4
Benz(a)anthracene	ug/L (ppb)	1	<0.1	71	77	60-93	8
Chrysene	ug/L (ppb)	1	<0.1	81	88	60-102	8
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	35 vo	37 vo	62-91	6
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	35 vo	37 vo	51-98	6
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	33 vo	34 vo	60-86	3
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	16	17	10-98	6
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	17	17	10-97	0
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	17	17	10-102	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	86	90	67-116	5
Acenaphthylene	ug/L (ppb)	1	88	92	65-119	4
Acenaphthene	ug/L (ppb)	1	88	92	66-118	4
Fluorene	ug/L (ppb)	1	90	94	64-125	4
Phenanthrene	ug/L (ppb)	1	88	92	67-120	4
Anthracene	ug/L (ppb)	1	90	91	65-122	1
Fluoranthene	ug/L (ppb)	1	90	93	65-127	3
Pyrene	ug/L (ppb)	1	90	94	62-130	4
Benz(a)anthracene	ug/L (ppb)	1	83	85	60-118	2
Chrysene	ug/L (ppb)	1	92	94	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	86	88	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	85	82	62-125	4
Benzo(a)pyrene	ug/L (ppb)	1	83	82	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	84	87	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	77	79	37-133	3
Benzo(g,h,i)perylene	ug/L (ppb)	1	81	84	34-135	4

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.

TOC Property 406256

SAMPLE CHAIN OF CUSTODY

ME 06/16/14

AEI 3/COC/03

Page # 1 of 2

Send Report To Rebekah Brooks

Company Stantec

Address 19101 36th Ave Suite 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS (*signature*) AVadar

PROJECT NAME/NO. TOC - MLT

PO# 20371408S

REMARKS
Containers designated for lead analyses were labeled total or dissolved.

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	TOTAL Pb	DISSOLVED Pb	MTBE	PAH			Notes
~~MW 10~~		~~6·10·14~~	~~1000~~	~~W~~	~~3~~		X	X										
MW 32	01 A-E	6·10·14	1050	W	5		X	X				X	X					
~~MW 29~~		~~6·10·14~~	~~1055~~	~~W~~	~~3~~		X	X										
MW 15	02 A-C	6·11·14	1430	W	3		X	X										
MW 09	03 A-C	6·13·14	1345	W	3		X	X										Peristaltic
MW 20	04 A-F	6·13·14	1400	W	6	X	X	X						X	X			
MLT-01	05 A-C	6·13·14	1415	W	3		X	X										
MLT-02	06 A-F	6·13·14	1415	W	6	X	X	X						X	X			
WB-061314	07 A-H	6·13·14	1530	W	8	X	X	X				X	X	X	X			
MW 09	08 A-E	6·13·14	1530	W	3		X	X										Submersible

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:	AVadar	Antonela Vadar	Stantec	6.16.14	1200
Received by:		VINH	FBI	6/16/14	200 PM
Relinquished by:					
Received by:			Samples received at 3 °C		

TOC Property 406256 [redacted] **SAMPLE CHAIN OF COUSTODY** ME 06/16/14 [redacted] AI3/ / 605 / V3

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

SAMPLERS (*signature*) Avadon	
PROJECT NAME/NO. TOC-MLT	PO# 203714085
REMARKS	

Page # 2 of 2

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb	MTBE	PAH			Notes
MW09	09 A-C	6.13.14	1600	W	3		X	X										Bailer
~~[illegible]~~ TB-06164-3	10				1		X	X										Sample Label TB-061614-2 (NP)
EB-061314	11 A-H	6.13.14	1600	W	8	X	X	X				X	X	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: Avadon	Antonelo Vadon	Stantec	6.16.14	1200
Received by: Vinh	VINH	FBI	6-16-14	2:00pm
Relinquished by:				
Received by:		Samples received at 3 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 25, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 16, 2014 from the TOC_01-176, WORFDB8 F&BI 406257 project. There are 22 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
STN0625R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 16, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406257 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406257 -01	MW31
406257 -02	MW66
406257 -03	MW54
406257 -04	MW48
406257 -05	MW49
406257 -06	MW59
406257 -07	MW56
406257 -08	MW58
406257 -09	EB-061414
406257 -10	TB-061614-2

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257
Date Extracted: 06/17/14 and 06/18/14
Date Analyzed: 06/17/14 and 06/18/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW31 406257-01	<1	<1	<1	<3	<100	87
MW66 406257-02	<1	<1	<1	<3	<100	87
MW54 406257-03	<1	<1	<1	<3	<100	88
MW48 406257-04	<1	11	37	610	10,000	90
MW49 406257-05	1.5	1.6	<1	<3	<100	87
MW59 406257-06	<1	<1	<1	<3	<100	87
MW56 406257-07	<1	<1	<1	<3	<100	87
MW58 406257-08	<1	<1	<1	<3	<100	88
EB-061414 406257-09	<1	<1	<1	<3	<100	87
TB-061614-2 406257-10	<1	<1	<1	<3	<100	86
Method Blank 04-1219 MB	<1	<1	<1	<3	<100	90

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257
Date Extracted: 06/17/14
Date Analyzed: 06/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW66 406257-02	<50	<250	94
MW54 406257-03	<50	<250	98
Method Blank 04-1239 MB	<50	<250	84

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW31	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	406257-01
Date Analyzed:	06/19/14	Data File:	406257-01.052
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

Analyte:	Concentration ug/L (ppb)
Lead	11.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	406257-04
Date Analyzed:	06/19/14	Data File:	406257-04.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Lead	3.91

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	I4-383 mb
Date Analyzed:	06/19/14	Data File:	I4-383 mb.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW31	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	406257-01
Date Analyzed:	06/19/14	Data File:	406257-01.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	9.67

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	406257-04
Date Analyzed:	06/19/14	Data File:	406257-04.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.46

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/19/14	Lab ID:	I4-385 mb
Date Analyzed:	06/19/14	Data File:	I4-385 mb.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW66	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/18/14	Lab ID:	406257-02
Date Analyzed:	06/18/14	Data File:	061811.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW54	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/18/14	Lab ID:	406257-03
Date Analyzed:	06/18/14	Data File:	061812.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	96	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/18/14	Lab ID:	04-1243 mb
Date Analyzed:	06/18/14	Data File:	061809.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	95	63	127
4-Bromofluorobenzene	97	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW66	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/17/14	Lab ID:	406257-02 1/2
Date Analyzed:	06/20/14	Data File:	061932.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	132	50	150
Benzo(a)anthracene-d12	90	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW54	Client:	Stantec
Date Received:	06/16/14	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/17/14	Lab ID:	406257-03 1/2
Date Analyzed:	06/18/14	Data File:	061814.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	50	150
Benzo(a)anthracene-d12	93	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406257
Date Extracted:	06/18/14	Lab ID:	04-1230 mb3
Date Analyzed:	06/19/14	Data File:	061906.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	50	150
Benzo(a)anthracene-d12	105	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

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: 406257-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	<1	89	88	50-150	1
Toluene	ug/L (ppb)	50	<1	94	92	50-150	2
Ethylbenzene	ug/L (ppb)	50	<1	95	93	50-150	2
Xylenes	ug/L (ppb)	150	<3	85	84	50-150	1
Gasoline	ug/L (ppb)	1,000	<100	97	97	50-150	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	72-119
Toluene	ug/L (ppb)	50	102	71-113
Ethylbenzene	ug/L (ppb)	50	105	72-114
Xylenes	ug/L (ppb)	150	91	72-113
Gasoline	ug/L (ppb)	1,000	104	70-119

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 406257-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<250	107	109	64-141	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	103	61-133	20

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

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

Laboratory Code: 406256-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

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

Laboratory Code: 406257-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	9.67	86 b	103 b	79-121	18 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	96	83-115

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406257-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	94	94	74-127	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	98	64-147	4

Date of Report: 06/25/14
Date Received: 06/16/14
Project: TOC_01-176, WORFDB8 F&BI 406257

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 406257-03 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	88	90	23-153	2
Acenaphthylene	ug/L (ppb)	1	<0.1	88	88	63-104	0
Acenaphthene	ug/L (ppb)	1	<0.1	89	91	59-109	2
Fluorene	ug/L (ppb)	1	<0.1	89	91	67-108	2
Phenanthrene	ug/L (ppb)	1	<0.1	87	91	65-100	4
Anthracene	ug/L (ppb)	1	<0.1	88	91	57-100	3
Fluoranthene	ug/L (ppb)	1	<0.1	89	91	63-110	2
Pyrene	ug/L (ppb)	1	<0.1	88	92	63-107	4
Benz(a)anthracene	ug/L (ppb)	1	<0.1	71	77	60-93	8
Chrysene	ug/L (ppb)	1	<0.1	81	88	60-102	8
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	35 vo	37 vo	62-91	6
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	35 vo	37 vo	51-98	6
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	33 vo	34 vo	60-86	3
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	16	17	10-98	6
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	17	17	10-97	0
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	17	17	10-102	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	86	90	67-116	5
Acenaphthylene	ug/L (ppb)	1	88	92	65-119	4
Acenaphthene	ug/L (ppb)	1	88	92	66-118	4
Fluorene	ug/L (ppb)	1	90	94	64-125	4
Phenanthrene	ug/L (ppb)	1	88	92	67-120	4
Anthracene	ug/L (ppb)	1	90	91	65-122	1
Fluoranthene	ug/L (ppb)	1	90	93	65-127	3
Pyrene	ug/L (ppb)	1	90	94	62-130	4
Benz(a)anthracene	ug/L (ppb)	1	83	85	60-118	2
Chrysene	ug/L (ppb)	1	92	94	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	86	88	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	1	85	82	62-125	4
Benzo(a)pyrene	ug/L (ppb)	1	83	82	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	84	87	36-142	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	77	79	37-133	3
Benzo(g,h,i)perylene	ug/L (ppb)	1	81	84	34-135	4

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.

TOC/FARMASONIS PROPERTY 406257 [redacted]LE CHAIN OF CUSTODY ME 06/16/14 V4/A13/BC4 C04

Send Report To Rebekah Brooks

Company Stantec

Address 19101 36th Ave W, #203

City, State, ZIP Lynnwood WA 98036

Phone # 425.977.4994 Fax # 425.449.4097

SAMPLERS (*signature*) AVadon

PROJECT NAME/NO.	PO#
TOC - MLT	203714085

REMARKS
Bottles for lead analyses were labeled dissolved or total.

Page # ____ of ____

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

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

Sample ID	Lab ID (NP)	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb	MTBE	PAH			Notes
MW31	01 A-G	6.11.14	1500	W	5		X	X				X	X					
MW66	02 A-F	6.11.14	1600	W	6	X	X	X						X	X			
MW54	03 A-R	6.12.14	0910	W	18	X	X	X						X	X			MS/MSD
MW48	04 A-E	6.12.14	1000	W	5		X	X				X	X					
MW49	05 A-C	6.14.14	1115	W	3		X	X										
MW59	06	6.14.14	1215	W	3		X	X										
MW56	07	6.14.14	1320	W	3		X	X										
MW58	08	6.14.14	1430	W	3		X	X										
EB-061414	09	6.14.14	1500	W	3		X	X										
TB-061614-2	10				1		X	X										

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	AVadon	Antonello Vadon	Stantec	6.16.14	1200
Received by:	[signature]	VINH	FBI	6-16-14	2:00 pm
Relinquished by:					
Received by:			**Samples received at** 3 **°C**		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 20, 2014 from the TOC_01-176, WORFDB8 F&BI 406392 project. There are 42 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
STN0701R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 20, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406392 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406392 -01	MW67
406392 -02	MW68
406392 -03	MW65
406392 -04	MW77
406392 -05	MW51
406392 -06	MW63
406392 -07	MW89
406392 -08	MW70
406392 -09	MW84
406392 -10	MW86
406392 -11	MW85
406392 -12	MLT-03
406392 -13	EB-062014
406392 -14	TB-062014-1

Sample MW70 was filtered at the laboratory on June 20, 2014. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392
Date Extracted: 06/23/14
Date Analyzed: 06/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW67 406392-01	<1	<1	<1	<3	<100	94
MW68 406392-02	<1	<1	<1	<3	<100	94
MW65 406392-03	<1	<1	<1	<3	<100	93
MW77 406392-04	<1	<1	<1	<3	<100	93
MW51 406392-05	<1	<1	<1	<3	<100	93
MW63 406392-06	<1	<1	<1	<3	<100	94
MW89 406392-07	<1	<1	<1	<3	<100	93
MW70 406392-08	<1	<1	<1	<3	<100	92
MW84 406392-09	<1	<1	5.9	17	960	96
MW86 406392-10	<1	<1	<1	<3	<100	91
MW85 406392-11	<1	<1	<1	<3	<100	95

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392
Date Extracted: 06/23/14
Date Analyzed: 06/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MLT-03 406392-12	<1	<1	<1	<3	<100	91
EB-062014 406392-13	<1	<1	<1	<3	<100	91
TB-062014-1 406392-14	<1	<1	<1	<3	<100	92
Method Blank 04-1280 MB	<1	<1	<1	<3	<100	94

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392
Date Extracted: 06/24/14
Date Analyzed: 06/25/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW67 406392-01	<50	<250	75
MW68 406392-02	<50	<250	85
MW70 406392-08 1/1.2	85 x	<300	83
MW86 406392-10	<50	<250	87
MLT-03 406392-12	<50	<250	91
EB-062014 406392-13	<50	<250	102
Method Blank 04-1293 MB	<50	<250	74

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-08
Date Analyzed:	06/24/14	Data File:	406392-08.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.48

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-10
Date Analyzed:	06/24/14	Data File:	406392-10.056
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-12
Date Analyzed:	06/24/14	Data File:	406392-12.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-062014	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-13
Date Analyzed:	06/24/14	Data File:	406392-13.059
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	107	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	I4-394 mb
Date Analyzed:	06/24/14	Data File:	I4-394 mb.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW70 f	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-08
Date Analyzed:	06/24/14	Data File:	406392-08.020
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-10
Date Analyzed:	06/24/14	Data File:	406392-10.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-12
Date Analyzed:	06/24/14	Data File:	406392-12.022
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-062014	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-13
Date Analyzed:	06/24/14	Data File:	406392-13.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	I4-395 mb
Date Analyzed:	06/24/14	Data File:	I4-395 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-01
Date Analyzed:	06/23/14	Data File:	062310.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-02
Date Analyzed:	06/23/14	Data File:	062311.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-03
Date Analyzed:	06/23/14	Data File:	062312.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	97	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-04
Date Analyzed:	06/23/14	Data File:	062313.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-07
Date Analyzed:	06/23/14	Data File:	062314.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW70	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-08
Date Analyzed:	06/23/14	Data File:	062315.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-09
Date Analyzed:	06/23/14	Data File:	062316.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	102	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-10
Date Analyzed:	06/23/14	Data File:	062317.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-11
Date Analyzed:	06/23/14	Data File:	062318.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-12
Date Analyzed:	06/23/14	Data File:	062319.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-062014	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	406392-13
Date Analyzed:	06/23/14	Data File:	062308.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	102	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/23/14	Lab ID:	04-1275 mb
Date Analyzed:	06/23/14	Data File:	062307.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392
Date Extracted: 06/24/14
Date Analyzed: 06/24/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW70 406392-08	<0.01
MW86 406392-10	<0.01
MLT-03 406392-12	<0.01
EB-062014 406392-13	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW67	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-01 1/2
Date Analyzed:	06/27/14	Data File:	062635.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	50	150
Benzo(a)anthracene-d12	97	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW68	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-02 1/2
Date Analyzed:	06/27/14	Data File:	062638.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	113	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW70	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-08 1/2
Date Analyzed:	06/27/14	Data File:	062633.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	50	150
Benzo(a)anthracene-d12	100	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW86	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-10 1/2
Date Analyzed:	06/27/14	Data File:	062634.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	92	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-12 1/2
Date Analyzed:	06/27/14	Data File:	062636.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	84	50	150
Benzo(a)anthracene-d12	91	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-062014	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	406392-13 1/2
Date Analyzed:	06/27/14	Data File:	062637.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	97	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406392
Date Extracted:	06/24/14	Lab ID:	04-1268 mb2
Date Analyzed:	06/25/14	Data File:	062534.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

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: 406392-04 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	98	72-122
Ethylbenzene	ug/L (ppb)	50	97	73-126
Xylenes	ug/L (ppb)	150	97	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	93	61-133	10

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

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

Laboratory Code: 406396-07 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	103	79-121	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	109	83-115

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

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

Laboratory Code: 406400-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	99	90	79-121	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406396-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	78-113

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	100	100	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	97	97	79-109	0

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 406392-13 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	87	70-130

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406392

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	84	91	67-116	8
Acenaphthylene	ug/L (ppb)	1	89	93	65-119	4
Acenaphthene	ug/L (ppb)	1	86	92	66-118	7
Fluorene	ug/L (ppb)	1	90	95	64-125	5
Phenanthrene	ug/L (ppb)	1	87	93	67-120	7
Anthracene	ug/L (ppb)	1	89	94	65-122	5
Fluoranthene	ug/L (ppb)	1	91	96	65-127	5
Pyrene	ug/L (ppb)	1	89	97	62-130	9
Benz(a)anthracene	ug/L (ppb)	1	81	87	60-118	7
Chrysene	ug/L (ppb)	1	90	97	66-125	7
Benzo(b)fluoranthene	ug/L (ppb)	1	84	92	55-135	9
Benzo(k)fluoranthene	ug/L (ppb)	1	83	90	62-125	8
Benzo(a)pyrene	ug/L (ppb)	1	82	89	58-127	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	84	90	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	87	37-133	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	77	88	34-135	13

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.

Drake Property 406392

SAMPLE CHAIN OF CUSTODY ME 06/20/14 CO5/Al2/V5

Page # 1 of 2

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

SAMPLERS (signature) Avadon
PROJECT NAME/NO. TOC MLT
PO# 2037140B5
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	MTBE	PAHs	Total lead	Dissolved lead	EDC	EDB	Notes
MW67	01 A-2	6-17-14	0950	W	6	X	X	X				X	X					
MW68	02	6-17-14	1100	W	6	X	X	X				X	X					
MW65	03 A-2	6-17-14	1330	W	4		X	X				X						
MW77	04	6-17-14	1340	W	4		X	X				X						
MW51	05A A-1	6-17-14	1445	W	3		X	X										
MW63	06 A-1	6-19-14	1245	W	3		X	X										
MW89	07 A-2	6-20-14	0900	W	4		X	X				X						
MW70	08 A-1	6-20-14	0945	W	8	X	X	X				X	X	X	X	X	X	
MW84	09 A-2	6-20-14	0955	W	4		X	X				X						
MW86	10 A-1	6-20-14	1115	W	8	X	X	X				X	X	X	X	X	X	

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: Avadon	Antonelo Vadon	Stantec	6-20-14	1500
Received by:	James Bruya	F&B	6/23	0930
Relinquished by:				
Received by: Ned 6/20 by UPS		Samples received at 3 °C		

~~TOC / [illegible]~~ DKANE's Property 406392 **SAMPLE CHAIN OF CUSTODY** ME 06/20/14 VOS/ A12/ U3

Page # 2 of 2

Send Report To: Rebekah Brooks
Company: Stantec
Address: 1910 36th Ave. W, Suite 203
City, State, ZIP: Lynnwood WA 98036
Phone #: 425-977-4994 Fax #: 425-449-4097

SAMPLERS (*signature*): AVadon

PROJECT NAME/NO.	PO#
TOC MLT	203711405

REMARKS: Sample EB-062014 → please filter for dissolved lead analysis. MW-70

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	MTBE	PAH	Total Lead	Diss. Lead	EDC	EDB	Notes
MW85	11 A-D	6-20-14	1245	W	4		X	X				X						
MLT-03	12 A-H	6-20-14	1145	W	8	X	X	X				X	X	X	X	X	X	
EB-062014	13 A-G	6-20-14	1300	W	7	X	X	X				X	X	X	X	X	X	Run PAHs if enough sample
TB-062014-1	14			W	1		X	X										

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	AVadon	Antonello Vadon	Stantec	6-20-14	1500
Received by:	[signature]	James Bruya	F&B	6-23	930
Relinquished by:					
Received by:	rec'd 6/20 by VU				

Samples received at 3 °C

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 27, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 20, 2014 from the TOC_01-176, WORFDB8 F&BI 406393 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
STN0627R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 20, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406393 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406393 -01	MW10
406393 -02	MW27

All quality control requirements were acceptable.

Date of Report: 06/27/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406393
Date Extracted: 06/23//14
Date Analyzed: 06/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW10 406393-01	<1	<1	<1	<3	<100	92
MW27 406393-02	<1	1.6	7.1	44	390	95
Method Blank 04-1280 MB	<1	<1	<1	<3	<100	94

Date of Report: 06/27/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406393

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: 406392-04 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	96	65-118
Toluene	ug/L (ppb)	50	98	72-122
Ethylbenzene	ug/L (ppb)	50	97	73-126
Xylenes	ug/L (ppb)	150	97	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TOC Property 466393 **SAMPLE CHAIN OF CUSTODY** ME 06/20/14 V1

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 36th Ave. W, Suite 203

City, State, ZIP Lynnwood, WA 98036

Phone # 425-977-4994 Fax # 425-449-4097

SAMPLERS *(signature)* AVadon

PROJECT NAME/NO.: TOC MLT

PO#: 203714085

REMARKS:

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

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
MW10	01A	6.16.14	1550	W	3		X	X										
MW27	02	6.19.14	1600	W	3		X	X										

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadon	Antonela Vadon	Stantec	6.20.14	1500
Received by: Ann Bruya	James Bruya	F&B	6/20	1500
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.
Kurt Johnson, B.S.
Eric Young, B.S.

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

June 27, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 20, 2014 from the TOC_01-176, WORFDB8 F&BI 406394 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
STN0627R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 20, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406394 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406394 -01	MW53
406394 -02	MW60
406394 -03	MW55

All quality control requirements were acceptable.

Date of Report: 06/27/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406394
Date Extracted: 06/24/14
Date Analyzed: 06/24/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW53 406394-01	<1	<1	<1	<3	<100	93
MW60 406394-02	<1	<1	<1	<3	<100	92
MW55 406394-03	<1	<1	<1	<3	<100	92
Method Blank 04-1281 MB	<1	<1	<1	<3	<100	91

Date of Report: 06/27/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406394

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: 406406-01 (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	89	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	90	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	99	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.

ROW 406394

SAMPLE CHAIN OF CUSTODY

ME 06/20/14 V1

Page # 1 of 1

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

SAMPLERS (*signature*) AVadon
PROJECT NAME/NO. TOC - MLT
PO# R0371408J
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
MW53	01 A C	6-19-14	1125	W	3		X	X										
MW60	02 A C	6-19-14	1420	W	3		X	X										
MW55	03 A C	6-19-14	1535	W	3		X	X										

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	AVadon	Antonelle Vadon	Stantec	6-20-14	1500
Received by:		Eric Law	FB	6/20/14	1502
Relinquished by:					
Received by:					

Samples received at 3 °C

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

July 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on June 20, 2014 from the TOC_01-176, WORFDB8 F&BI 406396 project. There are 45 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
STN0701R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 20, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 406396 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
406396 -01	MW104
406396 -02	MW105
406396 -03	MW103
406396 -04	MW106
406396 -05	MW102-P
406396 -06	MW107
406396 -07	EB-061914
406396 -08	WB-061914

The hydrocarbon fuel scan of sample MW102-P will be issued in a separate report.

Sample EB-061914 was filtered at the laboratory on June 20, 2014. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396
Date Extracted: 06/24/14
Date Analyzed: 06/24/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW104 406396-01	<1	10	57	210	2,400	99
MW105 406396-02	<1	<1	<1	<3	<100	91
MW103 406396-03	3.0	1.3	<1	<3	<100	92
MW106 406396-04	<1	<1	<1	<3	<100	92
MW107 406396-06	<1	<1	<1	<3	<100	91
EB-061914 406396-07	<1	<1	<1	<3	<100	92
WB-061914 406396-08	<1	<1	<1	<3	<100	91
Method Blank 04-1281 MB	<1	<1	<1	<3	<100	91

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396
Date Extracted: 06/24/14
Date Analyzed: 06/25/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW104 406396-01	1,700 x	260 x	82
MW105 406396-02	<50	<250	90
MW103 406396-03	120 x	<250	89
MW106 406396-04	320 x	<250	88
MW107 406396-06	59 x	<250	95
EB-061914 406396-07	<50	<250	85
WB-061914 406396-08	<50	<250	90
Method Blank 04-1293 MB	<50	<250	74

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-01
Date Analyzed:	06/24/14	Data File:	406396-01.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW105	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-02
Date Analyzed:	06/24/14	Data File:	406396-02.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	1.21

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-03
Date Analyzed:	06/24/14	Data File:	406396-03.041
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	4.69

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-04
Date Analyzed:	06/24/14	Data File:	406396-04.042
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-06
Date Analyzed:	06/24/14	Data File:	406396-06.043
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-07
Date Analyzed:	06/24/14	Data File:	406396-07.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-08
Date Analyzed:	06/24/14	Data File:	406396-08.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	104	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	I4-394 mb
Date Analyzed:	06/24/14	Data File:	I4-394 mb.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-01
Date Analyzed:	06/24/14	Data File:	406396-01.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW105	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-02
Date Analyzed:	06/24/14	Data File:	406396-02.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-03
Date Analyzed:	06/24/14	Data File:	406396-03.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

Analyte:	Concentration ug/L (ppb)
Lead	3.84

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-04
Date Analyzed:	06/24/14	Data File:	406396-04.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-06
Date Analyzed:	06/24/14	Data File:	406396-06.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-061914 f	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-07
Date Analyzed:	06/24/14	Data File:	406396-07.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-08
Date Analyzed:	06/24/14	Data File:	406396-08.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	I4-395 mb
Date Analyzed:	06/24/14	Data File:	I4-395 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW104	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-01
Date Analyzed:	06/23/14	Data File:	062329.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW105	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-02
Date Analyzed:	06/23/14	Data File:	062320.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-03
Date Analyzed:	06/23/14	Data File:	062321.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	170 ve
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-03 1/10
Date Analyzed:	06/24/14	Data File:	062406.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	160
1,2-Dichloroethane (EDC)	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-04
Date Analyzed:	06/23/14	Data File:	062322.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-06
Date Analyzed:	06/23/14	Data File:	062323.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-07
Date Analyzed:	06/23/14	Data File:	062324.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	406396-08
Date Analyzed:	06/23/14	Data File:	062309.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/23/14	Lab ID:	04-1275 mb
Date Analyzed:	06/23/14	Data File:	062307.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396
Date Extracted: 06/24/14
Date Analyzed: 06/24/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW104 409396-01	<0.01
MW105 409396-02	<0.01
MW103 409396-03	<0.01
MW106 409396-04	<0.01
MW107 409396-06	<0.01
EB-061914 409396-07	<0.01
WB-061914 409396-08	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-01 1/20
Date Analyzed:	06/26/14	Data File:	062609.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	131 ds	50	150
Benzo(a)anthracene-d12	73 ds	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	22
Acenaphthylene	<1
Acenaphthene	<1
Fluorene	<1
Phenanthrene	<1
Anthracene	<1
Fluoranthene	<1
Pyrene	<1
Benz(a)anthracene	<1
Chrysene	<1
Benzo(a)pyrene	<1
Benzo(b)fluoranthene	<1
Benzo(k)fluoranthene	<1
Indeno(1,2,3-cd)pyrene	<1
Dibenz(a,h)anthracene	<1
Benzo(g,h,i)perylene	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW105	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-02 1/2
Date Analyzed:	06/26/14	Data File:	062610A.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	50	150
Benzo(a)anthracene-d12	81	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW103	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-03 1/2
Date Analyzed:	06/26/14	Data File:	062611.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	50	150
Benzo(a)anthracene-d12	75	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW106	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-04 1/2
Date Analyzed:	06/27/14	Data File:	062639.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	103	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	0.27
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW107	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-06 1/2
Date Analyzed:	06/26/14	Data File:	062612.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	81	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-07 1/2
Date Analyzed:	06/26/14	Data File:	062613.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	86	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-061914	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	406396-08 1/2
Date Analyzed:	06/26/14	Data File:	062614.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	83	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/24/14	Lab ID:	04-1268 mb2
Date Analyzed:	06/25/14	Data File:	062534.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

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: 406406-01 (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	89	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	90	73-126
Xylenes	ug/L (ppb)	150	91	74-118
Gasoline	ug/L (ppb)	1,000	99	69-134

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	84	93	61-133	10

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

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

Laboratory Code: 406396-07 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	103	79-121	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	109	83-115

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

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

Laboratory Code: 406400-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	99	90	79-121	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406396-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	78-113

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	100	100	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	97	97	79-109	0

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 406392-13 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	87	70-130

Date of Report: 07/01/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	84	91	67-116	8
Acenaphthylene	ug/L (ppb)	1	89	93	65-119	4
Acenaphthene	ug/L (ppb)	1	86	92	66-118	7
Fluorene	ug/L (ppb)	1	90	95	64-125	5
Phenanthrene	ug/L (ppb)	1	87	93	67-120	7
Anthracene	ug/L (ppb)	1	89	94	65-122	5
Fluoranthene	ug/L (ppb)	1	91	96	65-127	5
Pyrene	ug/L (ppb)	1	89	97	62-130	9
Benz(a)anthracene	ug/L (ppb)	1	81	87	60-118	7
Chrysene	ug/L (ppb)	1	90	97	66-125	7
Benzo(b)fluoranthene	ug/L (ppb)	1	84	92	55-135	9
Benzo(k)fluoranthene	ug/L (ppb)	1	83	90	62-125	8
Benzo(a)pyrene	ug/L (ppb)	1	82	89	58-127	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	84	90	36-142	7
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	87	37-133	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	77	88	34-135	13

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.

Herman Property 406396

SAMPLE CHAIN OF CUSTODY

ME 6/20/14 V4/AT6/C04

Page # 1 of 1

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

SAMPLERS (signature) Abadon

PROJECT NAME/NO. TOC-MLT

PO# 2037140B5

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	MTBE	PAHs	Total Lead	Dissolved Lead	HFS-Fingerprint	EDC	EDB	Notes
MW 104	01 A-H	6-17-14	1500	W	8	X	X	X				X	X	X	X		X	X	
MW 105	02	6-18-14	1315	W	8	X	X	X				X	X	X	X		X	X	
MW 103	03	6-18-14	1500	W	8	X	X	X				X	X	X	X		X	X	
MW 106	04	6-18-14	1500	W	8	X	X	X				X	X	X	X		X	X	
MW 102-P	05	6-19-14	0945	~~W~~ P	1											X			
MW 107	06 A-H	6-19-14	1015	W	8	X	X	X				X	X	X	X		X	X	
EB-061914	07	6-19-14	1600	W	8	X	X	X				X	X	X	X		X	X	
WB-061914	08	6-19-14	1600	W	8	X	X	X				X	X	X	X		X	X	
~~TB-062014~~		~~6-20-14~~		W	1		X	X											not received, mg 6/20/14

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: Abadon	Antonio Vadon	Stantec	6-20-14	1500
Received by: Qlush	VINH	FBI	6/20/14	1530
Relinquished by:				
Received by:		Samples received at 3 °C		

Appendix B

Laboratory Analytical Reports – Groundwater Samples, Third Quarter 2014

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

September 29, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409360 project. There are 10 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
STN0929R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409360 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409360 -01	MW48

All quality control requirements were acceptable.

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409360
Date Extracted: 09/24/14
Date Analyzed: 09/24/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW48 409360-01 1/5	<5	12	<5	100	8,500	97
Method Blank 04-1909 MB	<1	<1	<1	<3	<100	87

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409360
Date Extracted:	09/23/14	Lab ID:	409360-01
Date Analyzed:	09/23/14	Data File:	409360-01.041
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Lead	3.13

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409360
Date Extracted:	09/23/14	Lab ID:	I4-596 mb
Date Analyzed:	09/23/14	Data File:	I4-596 mb.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409360
Date Extracted:	09/23/14	Lab ID:	409360-01
Date Analyzed:	09/24/14	Data File:	409360-01.022
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Lead	10.2

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409360
Date Extracted:	09/23/14	Lab ID:	I4-594 mb
Date Analyzed:	09/24/14	Data File:	I4-594 mb.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409360

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: 409355-02 (Duplicate)

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

Laboratory Code: 409362-03 (Matrix Spike)

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

Laboratory Code: Laboratory Control Sample

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

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409360

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

Laboratory Code: 409353-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409360

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

Laboratory Code: 409310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	94	96	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

409360

SAMPLE CHAIN OF CUSTODY

ME 9/19/14 AI 2/VI

Page # ____ of ____

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave # 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax # ____

SAMPLERS (signature) A Vadon

PROJECT NAME/NO. TOC-MLT

PO# 2037144085

REMARKS (ROW/DRAKE)

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	Total Pb	Dissolved Pb					Notes
MW48	01 A-E	9-18-14	1600	Water	5		X	X				X	X					

ANALYSES REQUESTED

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: A Vadon	Antonelo Vadon	Stantec	9-19-18	1500
Received by: Hoa Nguyen	HOA NGUYEN	FBJ	"	
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

October 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409361 project. There are 20 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
STN1001R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409361 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409361 -01	MW70

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361
Date Extracted: 09/22/14
Date Analyzed: 09/22/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW70 409361-01	<1	<1	<1	<3	<100	98
Method Blank 04-1909 MB	<1	<1	<1	<3	<100	87

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361
Date Extracted: 09/22/14
Date Analyzed: 09/23/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW70 409361-01	110 x	<250	74
Method Blank 04-1930 MB2	<50	<250	98

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/23/14	Lab ID:	409361-01
Date Analyzed:	09/24/14	Data File:	409361-01.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/23/14	Lab ID:	I4-594 mb
Date Analyzed:	09/24/14	Data File:	I4-594 mb.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW70	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/23/14	Lab ID:	409361-01
Date Analyzed:	09/23/14	Data File:	409361-01.042
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/23/14	Lab ID:	I4-596 mb
Date Analyzed:	09/23/14	Data File:	I4-596 mb.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW70	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/22/14	Lab ID:	409361-01
Date Analyzed:	09/22/14	Data File:	092212.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW70 409361-01	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW70	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/22/14	Lab ID:	409361-01 1/2
Date Analyzed:	09/23/14	Data File:	092310.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	50	150
Benzo(a)anthracene-d12	102	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409361
Date Extracted:	09/22/14	Lab ID:	04-1931 mb 1/2
Date Analyzed:	09/23/14	Data File:	092307.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	114	50	150
Benzo(a)anthracene-d12	96	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

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

Laboratory Code: 409355-02 (Duplicate)

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

Laboratory Code: 409362-03 (Matrix Spike)

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

Laboratory Code: Laboratory Control Sample

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

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<250	124	126	52-149	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	114	112	58-134	2

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

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

Laboratory Code: 409310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	94	96	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

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

Laboratory Code: 409353-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	100	69-133	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	93	95	73-132	2

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 409361-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	117	70-130

Date of Report: 10/01/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409361

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 409362-03 1/2 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Acenaphthylene	ug/L (ppb)	1	<0.1	96	99	50-150	3
Acenaphthene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Fluorene	ug/L (ppb)	1	<0.1	98	99	50-150	1
Phenanthrene	ug/L (ppb)	1	<0.1	94	97	50-150	3
Anthracene	ug/L (ppb)	1	<0.1	95	98	50-150	3
Fluoranthene	ug/L (ppb)	1	<0.1	101	103	50-150	2
Pyrene	ug/L (ppb)	1	<0.1	90	93	50-150	3
Benz(a)anthracene	ug/L (ppb)	1	<0.1	86	91	50-150	6
Chrysene	ug/L (ppb)	1	<0.1	91	97	50-150	6
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	46 vo	54	50-150	16
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	47 vo	54	50-150	14
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	46 vo	53	50-150	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	22 vo	19 vo	50-150	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	23 vo	19 vo	50-150	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	23 vo	20 vo	50-150	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	93	70-130	2
Acenaphthylene	ug/L (ppb)	1	96	96	70-130	0
Acenaphthene	ug/L (ppb)	1	94	95	70-130	1
Fluorene	ug/L (ppb)	1	100	99	70-130	1
Phenanthrene	ug/L (ppb)	1	94	98	70-130	4
Anthracene	ug/L (ppb)	1	93	93	70-130	0
Fluoranthene	ug/L (ppb)	1	99	102	70-130	3
Pyrene	ug/L (ppb)	1	95	99	70-130	4
Benz(a)anthracene	ug/L (ppb)	1	95	100	70-130	5
Chrysene	ug/L (ppb)	1	100	103	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	1	81	84	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	1	88	89	70-130	1
Benzo(a)pyrene	ug/L (ppb)	1	80	82	70-130	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	70-130	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	77	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	74	78	70-130	5

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.

409361

SAMPLE CHAIN OF CUSTODY ME 9/19/14 AI3/E04/V1

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

SAMPLERS (signature) AWadon
PROJECT NAME/NO. 203714085 PO#
TOC - MLT
REMARKS Dissolved metals are filtered (DRAKE PROPERTY)

Page # ____ of ____

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	PAHs	EDC	EDB	Total Pb	Dissolved Pb	Notes
MW70	01 AA	9-19-14	0830	Water	8	X	X	X				X	X	X	X	X	X	
																		Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AWadon	Antonelle Wadon	Stantec	9-19-14	1500
Received by:	HONG NGUYEN	FBI	"	
Relinquished by:				
Received by:				

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

September 29, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 19, 2014 from the TOC_01-176, WORFDB8 F&BI 409362 project. There are 18 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
STN0929R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 19, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409362 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409362-01	MW32
409362-02	MW15
409362-03	MW54
409362-04	TB-091914-2

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362
Date Extracted: 09/22/14
Date Analyzed: 09/22/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW32 409362-01	2.9	4.7	15	26	450	92
MW15 409362-02	<1	<1	<1	<3	<100	90
MW54 409362-03	<1	<1	<1	<3	<100	78
TB-091914-2 409362-04	<1	<1	<1	<3	<100	89
Method Blank 04-1909 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362
Date Extracted: 09/22/14
Date Analyzed: 09/23/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW54 409362-03	<50	<250	90
Method Blank 04-1930 MB2	<50	<250	98

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/23/14	Lab ID:	409362-01
Date Analyzed:	09/23/14	Data File:	409362-01.043
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Lead	50.8

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/23/14	Lab ID:	I4-596 mb
Date Analyzed:	09/23/14	Data File:	I4-596 mb.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/23/14	Lab ID:	409362-01
Date Analyzed:	09/24/14	Data File:	409362-01.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

Analyte:	Concentration ug/L (ppb)
Lead	62.2

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/23/14	Lab ID:	I4-594 mb
Date Analyzed:	09/24/14	Data File:	I4-594 mb.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW54	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/22/14	Lab ID:	409362-03 1/2
Date Analyzed:	09/23/14	Data File:	092311.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	118	50	150
Benzo(a)anthracene-d12	102	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/22/14	Lab ID:	04-1931 mb 1/2
Date Analyzed:	09/23/14	Data File:	092307.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	114	50	150
Benzo(a)anthracene-d12	96	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW54	Client:	Stantec
Date Received:	09/19/14	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/22/14	Lab ID:	409362-03
Date Analyzed:	09/22/14	Data File:	092213.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409362
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

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

Laboratory Code: 409355-02 (Duplicate)

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

Laboratory Code: 409362-03 (Matrix Spike)

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

Laboratory Code: Laboratory Control Sample

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

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	<250	124	126	52-149	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	114	112	58-134	2

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

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

Laboratory Code: 409353-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

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

Laboratory Code: 409310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	94	96	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 409362-03 1/2 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Acenaphthylene	ug/L (ppb)	1	<0.1	96	99	50-150	3
Acenaphthene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Fluorene	ug/L (ppb)	1	<0.1	98	99	50-150	1
Phenanthrene	ug/L (ppb)	1	<0.1	94	97	50-150	3
Anthracene	ug/L (ppb)	1	<0.1	95	98	50-150	3
Fluoranthene	ug/L (ppb)	1	<0.1	101	103	50-150	2
Pyrene	ug/L (ppb)	1	<0.1	90	93	50-150	3
Benz(a)anthracene	ug/L (ppb)	1	<0.1	86	91	50-150	6
Chrysene	ug/L (ppb)	1	<0.1	91	97	50-150	6
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	46 vo	54	50-150	16
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	47 vo	54	50-150	14
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	46 vo	53	50-150	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	22 vo	19 vo	50-150	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	23 vo	19 vo	50-150	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	23 vo	20 vo	50-150	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	93	70-130	2
Acenaphthylene	ug/L (ppb)	1	96	96	70-130	0
Acenaphthene	ug/L (ppb)	1	94	95	70-130	1
Fluorene	ug/L (ppb)	1	100	99	70-130	1
Phenanthrene	ug/L (ppb)	1	94	98	70-130	4
Anthracene	ug/L (ppb)	1	93	93	70-130	0
Fluoranthene	ug/L (ppb)	1	99	102	70-130	3
Pyrene	ug/L (ppb)	1	95	99	70-130	4
Benz(a)anthracene	ug/L (ppb)	1	95	100	70-130	5
Chrysene	ug/L (ppb)	1	100	103	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	1	81	84	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	1	88	89	70-130	1
Benzo(a)pyrene	ug/L (ppb)	1	80	82	70-130	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	70-130	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	77	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	74	78	70-130	5

Date of Report: 09/29/14
Date Received: 09/19/14
Project: TOC_01-176, WORFDB8 F&BI 409362

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3

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.

409362

SAMPLE CHAIN OF CUSTODY ME 9/19/14 V3/AI2/E04

Page ____ of ____

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

SAMPLERS (signature) Abadon
PROJECT NAME/NO. TOC MLT
PO# 20371405
REMARKS Dissolved metals are filtered (TOC + TOC/FARMASONIS PROPERTIES)

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	Dissolved Pb	MTBE	PAHs			Notes
MW32	01A-E	9-18-14	1300	Water	5		X	X				X	X					
MW15	02A-C	9-18-14	1430	Water	3		X	X										
MW54	03A-C	9-18-14	1530	Water	15	X	X	X						X	X			MS/MSD Sample
TB-091914-2	04	—	—	Water	1		X	X										

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Abadon	Antonio Vaden	Stantec	9-19-14	1500
Received by:	HONG NGUYEN	FBI	9/19/14	
Relinquished by:				
Received by:				

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

September 25, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 22, 2014 from the TOC_01-176, WORFDB8 F&BI 409378 project. There are 4 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 22, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409378 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409378 -01	MW51

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409378
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW51 409378-01	<1	<1	<1	<3	<100	90
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409378

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

Laboratory Code: 409358-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

409378

SAMPLE CHAIN OF CUSTODY

ME 09-22-14

v2

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature) AVadan

PROJECT NAME/NO. TOC-MLT

PO# 203714085

REMARKS ROW

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												
MW51	01 A-C	9.2014	1210	Water	3		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadan	Antonela Vadan	Stantec	9-22-14	1230
Received by: Nhan Phan	Nhan Phan	FEDEX	9-22-14	0930
Relinquished by:				
Received by:		Samples received at	2 °C	

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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Eric Young, B.S.

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Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 25, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 22, 2014 from the TOC_01-176, WORFDB8 F&BI 409379 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0925R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 22, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409379 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409379 -01	MW66

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW66 409379-01	<1	<1	<1	<3	<100	90
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW66 409379-01	<50	<250	96
Method Blank 04-1938 MB	<50	<250	105

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW66	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409379
Date Extracted:	09/22/14	Lab ID:	409379-01
Date Analyzed:	09/22/14	Data File:	092222.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409379
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW66	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409379
Date Extracted:	09/23/14	Lab ID:	409379-01 1/2
Date Analyzed:	09/23/14	Data File:	092317.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	135	50	150
Benzo(a)anthracene-d12	106	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409379
Date Extracted:	09/23/14	Lab ID:	04-1931 mb2 1/2
Date Analyzed:	09/23/14	Data File:	092316.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	132	50	150
Benzo(a)anthracene-d12	100	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379

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

Laboratory Code: 409358-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	111	108	63-142	3

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409379

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 409362-03 1/2 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Acenaphthylene	ug/L (ppb)	1	<0.1	96	99	50-150	3
Acenaphthene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Fluorene	ug/L (ppb)	1	<0.1	98	99	50-150	1
Phenanthrene	ug/L (ppb)	1	<0.1	94	97	50-150	3
Anthracene	ug/L (ppb)	1	<0.1	95	98	50-150	3
Fluoranthene	ug/L (ppb)	1	<0.1	101	103	50-150	2
Pyrene	ug/L (ppb)	1	<0.1	90	93	50-150	3
Benz(a)anthracene	ug/L (ppb)	1	<0.1	86	91	50-150	6
Chrysene	ug/L (ppb)	1	<0.1	91	97	50-150	6
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	46 vo	54	50-150	16
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	47 vo	54	50-150	14
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	46 vo	53	50-150	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	22 vo	19 vo	50-150	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	23 vo	19 vo	50-150	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	23 vo	20 vo	50-150	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	93	70-130	2
Acenaphthylene	ug/L (ppb)	1	96	96	70-130	0
Acenaphthene	ug/L (ppb)	1	94	95	70-130	1
Fluorene	ug/L (ppb)	1	100	99	70-130	1
Phenanthrene	ug/L (ppb)	1	94	98	70-130	4
Anthracene	ug/L (ppb)	1	93	93	70-130	0
Fluoranthene	ug/L (ppb)	1	99	102	70-130	3
Pyrene	ug/L (ppb)	1	95	99	70-130	4
Benz(a)anthracene	ug/L (ppb)	1	95	100	70-130	5
Chrysene	ug/L (ppb)	1	100	103	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	1	81	84	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	1	88	89	70-130	1
Benzo(a)pyrene	ug/L (ppb)	1	80	82	70-130	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	70-130	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	77	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	74	78	70-130	5

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.

409379

SAMPLE CHAIN OF CUSTODY

ME 09-22-14

EDD/V2

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave # 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature) Abadon

PROJECT NAME/NO. TOC-MLT

PO# 2037114085

REMARKS TOC Property

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	PAHs	MTBE					Notes
MW66	01 A-F	9-2014	1500	Water	6	X	X	X				X	X					

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Abadon	Antonio Vadon	Stantec	9-22-14	1230
Received by:	Nhan Phan	FedEx	9-22-14	1400
Relinquished by:				
Received by:		Samples received at 2 °C		

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

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

September 25, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 22, 2014 from the TOC_01-176, WORFDB8 F&BI 409380 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN0925R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 22, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409380 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409380 -01	MW67
409380 -02	MW68
409380 -03	TB-092214-2

All quality control requirements were acceptable.

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409380
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW67 409380-01	<1	<1	<1	<3	<100	86
MW68 409380-02	<1	<1	<1	<3	<100	87
TB-092214-2 409380-03	<1	<1	<1	<3	<100	88
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409380
Date Extracted:	09/22/14	Lab ID:	409380-01
Date Analyzed:	09/22/14	Data File:	092223.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409380
Date Extracted:	09/22/14	Lab ID:	409380-02
Date Analyzed:	09/22/14	Data File:	092224.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409380
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409380

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

Laboratory Code: 409358-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 09/25/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409380

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3

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.

409380

SAMPLE CHAIN OF CUSTODY

ME 09-22-14 [redacted] V2

[redacted] # 1 of 1

[redacted] Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave, # 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax # ____

SAMPLERS (*signature*) AVadon

PROJECT NAME/NO.	PO#
TOC MLT	203714085

REMARKS

DRAKE Property

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	MTBE	Notes
MW67	01 B	9-20-14	1100	water	4		X	X				X	
MW68	02 L	9-20-14	1215	water	4		X	X				X	
TB-092214-2	03	-	-	water	1		X	X					

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	AVadon	Antonela Vaelon	Stantec	9-22-14	1230
Received by:	[signature]	Nhan Phan	FeBT	9-22-14	1900
Relinquished by:					
Received by:			Samples received at 2 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

October 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 22, 2014 from the TOC_01-176, WORFDB8 F&BI 409381 project. There are 24 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
STN1001R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 22, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409381 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409381 -01	MW73
409381 -02	MW74
409381 -03	MW74

The 8011 EDB detection in sample MW73 could not be confirmed by 8260C and may be due to interfering compounds.

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All quality control requirements were acceptable.

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381
Date Extracted: 09/23/14
Date Analyzed: 09/23/14 and 09/24/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW73 409381-01 1/100	15,000	3,600	1,900	9,200	81,000	88
MW74 409381-02 1/40	1,700	310	67	290	7,100	87
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW73 409381-01	4,600 x	<250	117
MW74 409381-03	3,000 x	390 x	97
Method Blank 04-1930 MB3	<50	<250	101

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	409381-01
Date Analyzed:	09/24/14	Data File:	409381-01.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	88	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	I4-594 mb
Date Analyzed:	09/24/14	Data File:	I4-594 mb.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	409381-01
Date Analyzed:	09/23/14	Data File:	409381-01.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	102	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	I4-596 mb
Date Analyzed:	09/23/14	Data File:	I4-596 mb.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/22/14	Lab ID:	409381-01
Date Analyzed:	09/22/14	Data File:	092225.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	78	57	121
Toluene-d8	112	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW74	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/22/14	Lab ID:	409381-02 1/10
Date Analyzed:	09/23/14	Data File:	092308.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	580

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW73 409381-01	0.41
Method Blank	<0.01

EDB 1,2-Dibromoethane

Note: The 8011 EDB detection in sample MW73 could not be confirmed by 8260C and may be due to interfering compounds.

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	409381-01 1/2
Date Analyzed:	09/23/14	Data File:	092323.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	128	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	150 ve
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW73	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	409381-01 1/200
Date Analyzed:	09/25/14	Data File:	092523.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	230 d	50	150
Benzo(a)anthracene-d12	93 d	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	330
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW74	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	409381-03 1/2
Date Analyzed:	09/23/14	Data File:	092324.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	50	150
Benzo(a)anthracene-d12	113	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.24
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, F&BI 409381
Date Extracted:	09/23/14	Lab ID:	04-1931 mb2 1/2
Date Analyzed:	09/23/14	Data File:	092316.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	132	50	150
Benzo(a)anthracene-d12	100	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

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: 409358-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	114	103	58-134	10

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

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

Laboratory Code: 409310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	94	96	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

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

Laboratory Code: 409353-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	100	69-133	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	93	95	73-132	2

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 409361-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	117	70-130

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 409362-03 1/2 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Acenaphthylene	ug/L (ppb)	1	<0.1	96	99	50-150	3
Acenaphthene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Fluorene	ug/L (ppb)	1	<0.1	98	99	50-150	1
Phenanthrene	ug/L (ppb)	1	<0.1	94	97	50-150	3
Anthracene	ug/L (ppb)	1	<0.1	95	98	50-150	3
Fluoranthene	ug/L (ppb)	1	<0.1	101	103	50-150	2
Pyrene	ug/L (ppb)	1	<0.1	90	93	50-150	3
Benz(a)anthracene	ug/L (ppb)	1	<0.1	86	91	50-150	6
Chrysene	ug/L (ppb)	1	<0.1	91	97	50-150	6
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	46 vo	54	50-150	16
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	47 vo	54	50-150	14
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	46 vo	53	50-150	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	22 vo	19 vo	50-150	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	23 vo	19 vo	50-150	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	23 vo	20 vo	50-150	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	93	70-130	2
Acenaphthylene	ug/L (ppb)	1	96	96	70-130	0
Acenaphthene	ug/L (ppb)	1	94	95	70-130	1
Fluorene	ug/L (ppb)	1	100	99	70-130	1
Phenanthrene	ug/L (ppb)	1	94	98	70-130	4
Anthracene	ug/L (ppb)	1	93	93	70-130	0
Fluoranthene	ug/L (ppb)	1	99	102	70-130	3
Pyrene	ug/L (ppb)	1	95	99	70-130	4
Benz(a)anthracene	ug/L (ppb)	1	95	100	70-130	5
Chrysene	ug/L (ppb)	1	100	103	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	1	81	84	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	1	88	89	70-130	1
Benzo(a)pyrene	ug/L (ppb)	1	80	82	70-130	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	70-130	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	77	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	74	78	70-130	5

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.

409381

SAMPLE CHAIN OF CUSTODY

ME 09-22-14

V2/AD2/EDD

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave # 203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature) AVadon

PROJECT NAME/NO. TOC MLT

PO# 203714085

REMARKS SHIN/CHOI PROPERTY

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

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

						ANALYSES REQUESTED												
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	PAHs	Total Pb	Dissolved Pb	MTBE	EDC	EDB	Notes
MW73	01 A-H	9-21-14	1030	Water	8	X	X	X				X	X	X	X	X	X	
MW74	02 A D	9-21-14	1100	Water	4		X	X							X			
MW74	03 A B	9-22-14	1045	Water	2	X						X						* 1 ½ amber bottles (well dry).

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadon	Antonelo Vadon	Stantec	9-22-14	1230
Received by:	Nhan Phan	FBI	9-22-14	1400
Relinquished by:				
Received by:		received at 2 °C		

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

October 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 22, 2014 from the TOC_01-176, WORFDB8 F&BI 409382 project. There are 36 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
STN1001R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 22, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409382 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409382 -01	MW103
409382 -02	MW107
409382 -03	MW106
409382 -04	WB-092114
409382 -05	EB-092114
409382 -06	TB-092214

Several 8270D compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

All other quality control requirements were acceptable.

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW103 409382-01	<1	<1	<1	<3	<100	88
MW107 409382-02	5.3	2.1	<1	4.0	<100	88
MW106 409382-03	<1	<1	<1	<3	<100	89
WB-092114 409382-04	<1	<1	<1	<3	<100	91
EB-092114 409382-05	1.6	<1	<1	<3	<100	85
TB-092214 409382-06	<1	<1	<1	<3	<100	89
Method Blank 04-1911 MB	<1	<1	<1	<3	<100	87

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382
Date Extracted: 09/23/14
Date Analyzed: 09/23/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW103 409382-01 1/1.2	170 x	<300	112
MW107 409382-02	66 x	<250	104
MW106 409382-03	400 x	<250	101
WB-092114 409382-04	<50	<250	114
EB-092114 409382-05	<50	<250	110
Method Blank 04-1930 MB3	<50	<250	101

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-01
Date Analyzed:	09/24/14	Data File:	409382-01.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.64

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-02
Date Analyzed:	09/24/14	Data File:	409382-02.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-03
Date Analyzed:	09/24/14	Data File:	409382-03.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-04
Date Analyzed:	09/24/14	Data File:	409382-04.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-05
Date Analyzed:	09/24/14	Data File:	409382-05.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	I4-594 mb
Date Analyzed:	09/24/14	Data File:	I4-594 mb.011
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-01
Date Analyzed:	09/23/14	Data File:	409382-01.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-02
Date Analyzed:	09/23/14	Data File:	409382-02.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-03
Date Analyzed:	09/23/14	Data File:	409382-03.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-04
Date Analyzed:	09/23/14	Data File:	409382-04.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-05
Date Analyzed:	09/23/14	Data File:	409382-05.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	I4-596 mb
Date Analyzed:	09/23/14	Data File:	I4-596 mb.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	409382-01
Date Analyzed:	09/23/14	Data File:	092307.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	10
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	409382-02
Date Analyzed:	09/22/14	Data File:	092228.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	409382-03
Date Analyzed:	09/22/14	Data File:	092229.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	409382-04
Date Analyzed:	09/22/14	Data File:	092230.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	409382-05
Date Analyzed:	09/22/14	Data File:	092231.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/22/14	Lab ID:	04-1878 mb
Date Analyzed:	09/22/14	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW103 409382-01	<0.01
MW107 409382-02	<0.01
MW106 409382-03	<0.01
WB-092114 409382-04	<0.01
EB-092114 409382-05	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW103	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-01 1/2
Date Analyzed:	09/23/14	Data File:	092318.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	123	50	150
Benzo(a)anthracene-d12	106	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW107	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-02 1/2
Date Analyzed:	09/23/14	Data File:	092319.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	129	50	150
Benzo(a)anthracene-d12	105	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.17
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW106	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-03 1/2
Date Analyzed:	09/23/14	Data File:	092320.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	117	50	150
Benzo(a)anthracene-d12	126	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	0.22
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	WB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-04 1/2
Date Analyzed:	09/23/14	Data File:	092321.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	135	50	150
Benzo(a)anthracene-d12	105	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-092114	Client:	Stantec
Date Received:	09/22/14	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	409382-05 1/2
Date Analyzed:	09/23/14	Data File:	092322.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	142	50	150
Benzo(a)anthracene-d12	103	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.10
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409382
Date Extracted:	09/23/14	Lab ID:	04-1931 mb2 1/2
Date Analyzed:	09/23/14	Data File:	092316.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	132	50	150
Benzo(a)anthracene-d12	100	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

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

Laboratory Code: 409358-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	88	65-118
Toluene	ug/L (ppb)	50	91	72-122
Ethylbenzene	ug/L (ppb)	50	92	73-126
Xylenes	ug/L (ppb)	150	92	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	114	103	58-134	10

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

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

Laboratory Code: 409310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	94	96	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

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

Laboratory Code: 409353-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	103	83-115

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409362-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	100	100	74-127	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	100	69-133	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	97	64-147	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	93	95	73-132	2

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 409361-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	117	70-130

Date of Report: 10/01/14
Date Received: 09/22/14
Project: TOC_01-176, WORFDB8 F&BI 409382

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 409362-03 1/2 (Matrix Spike) 1/2

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Acenaphthylene	ug/L (ppb)	1	<0.1	96	99	50-150	3
Acenaphthene	ug/L (ppb)	1	<0.1	92	95	50-150	3
Fluorene	ug/L (ppb)	1	<0.1	98	99	50-150	1
Phenanthrene	ug/L (ppb)	1	<0.1	94	97	50-150	3
Anthracene	ug/L (ppb)	1	<0.1	95	98	50-150	3
Fluoranthene	ug/L (ppb)	1	<0.1	101	103	50-150	2
Pyrene	ug/L (ppb)	1	<0.1	90	93	50-150	3
Benz(a)anthracene	ug/L (ppb)	1	<0.1	86	91	50-150	6
Chrysene	ug/L (ppb)	1	<0.1	91	97	50-150	6
Benzo(b)fluoranthene	ug/L (ppb)	1	<0.1	46 vo	54	50-150	16
Benzo(k)fluoranthene	ug/L (ppb)	1	<0.1	47 vo	54	50-150	14
Benzo(a)pyrene	ug/L (ppb)	1	<0.1	46 vo	53	50-150	14
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	<0.1	22 vo	19 vo	50-150	15
Dibenz(a,h)anthracene	ug/L (ppb)	1	<0.1	23 vo	19 vo	50-150	19
Benzo(g,h,i)perylene	ug/L (ppb)	1	<0.1	23 vo	20 vo	50-150	14

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	91	93	70-130	2
Acenaphthylene	ug/L (ppb)	1	96	96	70-130	0
Acenaphthene	ug/L (ppb)	1	94	95	70-130	1
Fluorene	ug/L (ppb)	1	100	99	70-130	1
Phenanthrene	ug/L (ppb)	1	94	98	70-130	4
Anthracene	ug/L (ppb)	1	93	93	70-130	0
Fluoranthene	ug/L (ppb)	1	99	102	70-130	3
Pyrene	ug/L (ppb)	1	95	99	70-130	4
Benz(a)anthracene	ug/L (ppb)	1	95	100	70-130	5
Chrysene	ug/L (ppb)	1	100	103	70-130	3
Benzo(b)fluoranthene	ug/L (ppb)	1	81	84	70-130	4
Benzo(k)fluoranthene	ug/L (ppb)	1	88	89	70-130	1
Benzo(a)pyrene	ug/L (ppb)	1	80	82	70-130	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	73	75	70-130	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	72	77	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	74	78	70-130	5

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.

409382

SAMPLE CHAIN OF CUSTODY

NE 09-22-14

V2/AIG/EDS

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

SAMPLERS (signature) Abadan

PROJECT NAME/NO. TOC-MLT

PO# 2037114085

REMARKS HERMAN PROPERTY

Page # of

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PAHs	Total Pb	Dissolved Pb	MTBE	EDB	EDB	Notes
MW103	01	9-21-14	1200	Water	8	X	X	X				X	X	X	X	X	X	
MW107	02		1315		8	X	X	X				X	X	X	X	X	X	
MW106	03		1330		8	X	X	X				X	X	X	X	X	X	
WB-092114	04		1415		8	X	X	X				X	X	X	X	X	X	
EB-092114	05		1430		8	X	X	X				X	X	X	X	X	X	
TB-092214	06	—	—	Water	1		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Abadan	Antonello Vadon	Stantec	9-22-14	1230
Received by: Mapan	Nhan Phan	FeBI	9-22-14	1400
Relinquished by:				
Received by:		Samples received at 2 °C		

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

October 1, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409476 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
STN1001R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409476 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409476 -01	MW49
409476 -02	MW63
409476 -03	MW53
409476 -04	MW55
409476 -05	MW60

All quality control requirements were acceptable.

Date of Report: 10/01/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409476
Date Extracted: 09/26/14
Date Analyzed: 09/26/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW49 409476-01	<1	<1	<1	<3	<100	88
MW63 409476-02	<1	<1	<1	<3	<100	86
MW53 409476-03	<1	<1	<1	<3	<100	89
MW55 409476-04	<1	<1	<1	<3	<100	86
MW60 409476-05	<1	<1	<1	<3	<100	87
Method Blank 04-1946 MB	<1	<1	<1	<3	<100	84

Date of Report: 10/01/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409476

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	95	96	72-119	1
Toluene	ug/L (ppb)	50	95	95	71-113	0
Ethylbenzene	ug/L (ppb)	50	93	94	72-114	1
Xylenes	ug/L (ppb)	150	86	86	72-113	0
Gasoline	ug/L (ppb)	1,000	87	86	70-119	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.

409476

SAMPLE CHAIN OF CUSTODY

ME 09-25-14 V3

Page # 1 of 1

Send Report To Rebekah Brooks
Company Stantec
Address 9101 W 36th Ave. #203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Abadon
PROJECT NAME/NO. TOC-MLT
PO# 2037142851
REMARKS ROW

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
MW49	01 A-C	9-22-14	1515	Water	3		X	X										
MW63	02	9-23-14	1300		3		X	X										
MW53	03	9-24-14	1340		3		X	X										
MW55	04	9-24-14	1445		3		X	X										
MW60	05	9-25-14	0845		3		X	X										

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Abadon	Antonio Vadon	Stantec	9-25-14	0900
Received by:	Eric Towne	F&B	9/25	1020
Relinquished by:				
Received by:		Samples received at 4 °C		

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

FORMS\COC\COC.DOC

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

October 7, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409477 project. There are 9 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
STN1007R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409477 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409477 -01	MW20
409477 -02	MW56
409477 -03	MLT-01
409477 -04	MW59
409477 -05	MW58
409477 -06	EB-092214
409477 -07	TB-092514-2

All quality control requirements were acceptable.

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409477
Date Extracted: 09/26/14
Date Analyzed: 09/26/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW20 409477-01	<1	<1	<1	<3	<100	86
MW56 409477-02	<1	<1	<1	<3	<100	86
MLT-01 409477-03	<1	<1	<1	<3	<100	87
MW59 409477-04	<1	<1	<1	<3	<100	85
MW58 409477-05	<1	<1	<1	<3	<100	85
EB-092214 409477-06	<1	<1	<1	<3	<100	87
TB-092514-2 409477-07	<1	<1	<1	<3	<100	86
Method Blank 04-1946 MB	<1	<1	<1	<3	<100	84

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW20	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409477
Date Extracted:	09/25/14	Lab ID:	409477-01
Date Analyzed:	09/30/14	Data File:	093013.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-01	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409477
Date Extracted:	09/25/14	Lab ID:	409477-03
Date Analyzed:	09/30/14	Data File:	093014.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	97	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092214	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409477
Date Extracted:	09/25/14	Lab ID:	409477-06
Date Analyzed:	09/30/14	Data File:	093018.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	104	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409477
Date Extracted:	09/25/14	Lab ID:	04-1903 mb
Date Analyzed:	09/25/14	Data File:	092507.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409477

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: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	50	95	96	72-119	1
Toluene	ug/L (ppb)	50	95	95	71-113	0
Ethylbenzene	ug/L (ppb)	50	93	94	72-114	1
Xylenes	ug/L (ppb)	150	86	86	72-113	0
Gasoline	ug/L (ppb)	1,000	87	86	70-119	1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409477

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409450-42 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	101	101	70-122	0

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.

409477

SAMPLE CHAIN OF CUSTODY

ME 09/25/14 V3

Page # 1 of 1

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

SAMPLERS (signature) AVadon
PROJECT NAME/NO. TOC-MLT
PO# 20371485
REMARKS TOC Property

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	MTBE						Notes
✓	MW20	01 A-D	9-22-14	1130	Water	4		X	X				X						
✓	MW56	02 A-C	9-22-14	1140		3		X	X										
✓	MLT-01	03 A-D	9-22-14	1200		4		X	X				X						
✓	MW59	04 A-C	9-22-14	1330		3		X	X										
✓	MW58	05 A-C	9-22-14	1420		3		X	X										
✓	EB-092214	06 A-D	9-22-14	1545		4		X	X				X						
	TB-092514-2	07	-	-	Water	1		X	X										

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadon	Antonela Vadon	Stantec	09-25-14	0900
Received by:	Eric Yoder	F+B	9/25/14	1050
Relinquished by:				
Received by:				

Samples received at 4 °C

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

October 7, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409478 project. There are 28 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
STN1007R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409478 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409478 -01	MW104
409478 -02	MLT-02

The 8011 EDB detections could not be confirmed by 8260C and may be due to interfering compounds.

All quality control requirements were acceptable.

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478
Date Extracted: 09/30/14
Date Analyzed: 10/01/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW104 409478-01 1/20	45,000	105
MLT-02 409478-02 1/100	47,000	94
Method Blank 04-1951 MB	<100	90

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW104 409478-01	7,500 x	370 x	93
MLT-02 409478-02	8,300 x	400 x	102
Method Blank 04-1975 MB	<50	<250	104

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-01
Date Analyzed:	09/29/14 14:43:12	Data File:	409478-01.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	82	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-02
Date Analyzed:	09/29/14 14:47:00	Data File:	409478-02.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	85	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	I4-612 mb
Date Analyzed:	09/29/14 14:58:23	Data File:	I4-612 mb.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	10/01/14	Lab ID:	409478-01
Date Analyzed:	10/02/14	Data File:	409478-01.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	10/01/14	Lab ID:	409478-02
Date Analyzed:	10/02/14	Data File:	409478-02.051
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	10/01/14	Lab ID:	I4-616 mb
Date Analyzed:	10/02/14	Data File:	I4-616 mb.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-01 1/10
Date Analyzed:	09/29/14	Data File:	092915.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	90	111
Toluene-d8	101	64	137
4-Bromofluorobenzene	103	81	119

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<10
1,2-Dichloroethane (EDC)	<10
Benzene	35
Toluene	6,400 ve
Ethylbenzene	2,000 ve
m,p-Xylene	5,000 ve
o-Xylene	2,100 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-01 1/100
Date Analyzed:	09/29/14	Data File:	092913.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	90	111
Toluene-d8	99	64	137
4-Bromofluorobenzene	101	81	119

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<100
1,2-Dichloroethane (EDC)	<100
Benzene	36
Toluene	6,700
Ethylbenzene	2,000
m,p-Xylene	5,200
o-Xylene	2,100

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-02 1/10
Date Analyzed:	09/29/14	Data File:	092916.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	90	111
Toluene-d8	101	64	137
4-Bromofluorobenzene	102	81	119

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<10
1,2-Dichloroethane (EDC)	<10
Benzene	32
Toluene	5,700 ve
Ethylbenzene	1,700 ve
m,p-Xylene	4,400 ve
o-Xylene	1,800 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-02 1/100
Date Analyzed:	09/29/14	Data File:	092914.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	90	111
Toluene-d8	100	64	137
4-Bromofluorobenzene	102	81	119

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<100
1,2-Dichloroethane (EDC)	<100
Benzene	35
Toluene	6,000
Ethylbenzene	1,700
m,p-Xylene	4,600
o-Xylene	1,800

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/25/14	Lab ID:	04-1903 mb
Date Analyzed:	09/25/14	Data File:	092507.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW104 409478-01	0.13
MLT-02 409478-02	0.13
Method Blank	<0.01

EDB 1,2-Dibromoethane

Note: The EDB detections could not be confirmed by 8260C and may be due to interfering compounds.

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-01 1/2
Date Analyzed:	09/30/14	Data File:	093008.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	158 vo	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	190 ve
Acenaphthylene	<0.1
Acenaphthene	0.20
Fluorene	0.11
Phenanthrene	0.11
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW104	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-01 1/200
Date Analyzed:	10/01/14	Data File:	100138.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	386 d	50	150
Benzo(a)anthracene-d12	152 d	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	340
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-02 1/2
Date Analyzed:	09/30/14	Data File:	093021.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	50	150
Benzo(a)anthracene-d12	170 vo	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	210 ve
Acenaphthylene	<0.1
Acenaphthene	0.21
Fluorene	0.12
Phenanthrene	0.12
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	409478-02 1/200
Date Analyzed:	10/01/14	Data File:	100137.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	351 d	50	150
Benzo(a)anthracene-d12	156 d	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	360
Acenaphthylene	<10
Acenaphthene	<10
Fluorene	<10
Phenanthrene	<10
Anthracene	<10
Fluoranthene	<10
Pyrene	<10
Benz(a)anthracene	<10
Chrysene	<10
Benzo(a)pyrene	<10
Benzo(b)fluoranthene	<10
Benzo(k)fluoranthene	<10
Indeno(1,2,3-cd)pyrene	<10
Dibenz(a,h)anthracene	<10
Benzo(g,h,i)perylene	<10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409478
Date Extracted:	09/29/14	Lab ID:	04-1976 mb2 1/2
Date Analyzed:	09/30/14	Data File:	093007.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	50	150
Benzo(a)anthracene-d12	85	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 409500-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	96	69-134

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	97	109	58-134	12

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

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

Laboratory Code: 409413-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

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

Laboratory Code: 409436-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	100	111	79-121	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409450-42 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	68-125
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	93	78-113
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	99	73-117
Ethylbenzene	ug/L (ppb)	50	<1	103	71-120
m,p-Xylene	ug/L (ppb)	100	<2	107	63-128
o-Xylene	ug/L (ppb)	50	<1	109	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	101	101	70-122	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	97	79-109	1
Benzene	ug/L (ppb)	50	96	97	81-108	1
Toluene	ug/L (ppb)	50	99	99	83-108	0
Ethylbenzene	ug/L (ppb)	50	103	103	84-110	0
m,p-Xylene	ug/L (ppb)	100	107	107	84-112	0
o-Xylene	ug/L (ppb)	50	108	109	82-113	1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 409361-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	117	70-130

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409478

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	86	90	70-130	5
Acenaphthylene	ug/L (ppb)	1	87	98	70-130	12
Acenaphthene	ug/L (ppb)	1	89	100	70-130	12
Fluorene	ug/L (ppb)	1	93	100	70-130	7
Phenanthrene	ug/L (ppb)	1	82	94	70-130	14
Anthracene	ug/L (ppb)	1	86	96	70-130	11
Fluoranthene	ug/L (ppb)	1	79	92	70-130	15
Pyrene	ug/L (ppb)	1	79	97	70-130	20
Benz(a)anthracene	ug/L (ppb)	1	89	95	70-130	7
Chrysene	ug/L (ppb)	1	87	97	70-130	11
Benzo(b)fluoranthene	ug/L (ppb)	1	109	101	70-130	8
Benzo(k)fluoranthene	ug/L (ppb)	1	111	98	70-130	12
Benzo(a)pyrene	ug/L (ppb)	1	98	98	70-130	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	106	110	70-130	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	104	112	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	103	106	70-130	3

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.

409478

SAMPLE CHAIN OF CUSTODY

ME 09/25/14 V3/E03/AI2

Page # 1 of 1

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

SAMPLERS (signature) A Vaden
PROJECT NAME/NO. TOC-MLT
PO# 2037140 85
REMARKS Total and diss metals bottles are marked HERMAN PROPERTY

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	PAHs	Pb Total	Pb Dissolved	MTBE	EDC	EDB	Notes
MW104	01 A-H	9-23-14	0940	Water	8	X	X	X				X	X	X	X	X	X	
MLT-02	02 A-H	9-23-14	1000	Water	8	X	X	X				X	X	X	X	X	X	
~~EB 092314~~		9-23-14	1530	Water	~~4~~	X	X	X				X	X	X	X	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: A Vaden	Antonelo Vaden	Stantec	9-25-14	0900
Received by:	Eric Flores	FB	9/25/14	0900
Relinquished by:				
Received by:		Samples received at 4 °C		

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

October 7, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on September 25, 2014 from the TOC_01-176, WORFDB8 F&BI 409479 project. There are 34 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
STN1007R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 25, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 409479 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
409479 -01	MW84
409479 -02	MW89
409479 -03	MW65
409479 -04	MW77
409479 -05	EB-092314
409479 -06	MW86
409479 -07	MLT-03
409479 -08	MW85
409479 -09	EB-092414
409479 -10	TB-092514-1

All quality control requirements were acceptable.

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479
Date Extracted: 09/29/14
Date Analyzed: 09/29/14 and 09/30/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW84 409479-01	<1	<1	4.9	15	780	97
MW89 409479-02	<1	<1	<1	<3	<100	85
MW65 409479-03	<1	<1	<1	<3	<100	90
MW77 409479-04	<1	<1	<1	<3	<100	91
EB-092314 409479-05	<1	<1	<1	<3	<100	92
MW86 409479-06	1.8	1.9	1.2	<3	1,000	92
MLT-03 409479-07	1.8	1.9	1.2	3.1	930	95
MW85 409479-08	<1	<1	<1	<3	<100	91
EB-092414 409479-09	<1	<1	<1	<3	<100	92
TB-092514-1 409479-10	<1	<1	<1	<3	<100	85
Method Blank 04-1949 MB	<1	<1	<1	<3	<100	86

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW86 409479-06	180 x	<250	100
MLT-03 409479-07	140 x	<250	99
EB-092414 409479-09	<50	<250	92
Method Blank 04-1975 MB	<50	<250	104

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-06
Date Analyzed:	09/29/14 14:50:49	Data File:	409479-06.051
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	90	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-07
Date Analyzed:	09/29/14 15:17:25	Data File:	409479-07.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-092414	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-09
Date Analyzed:	09/29/14 15:21:13	Data File:	409479-09.059
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	I4-612 mb
Date Analyzed:	09/29/14 14:58:23	Data File:	I4-612 mb.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	87	60	125

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

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Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	10/01/14	Lab ID:	409479-06
Date Analyzed:	10/02/14	Data File:	409479-06.052
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	10/01/14	Lab ID:	409479-07
Date Analyzed:	10/02/14	Data File:	409479-07.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-092414	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	10/01/14	Lab ID:	409479-09
Date Analyzed:	10/02/14	Data File:	409479-09.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	10/01/14	Lab ID:	I4-616 mb
Date Analyzed:	10/02/14	Data File:	I4-616 mb.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-01
Date Analyzed:	09/26/14	Data File:	092616.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	94	108
Toluene-d8	105	91	107
4-Bromofluorobenzene	98	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-02
Date Analyzed:	09/26/14	Data File:	092617.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	94	108
Toluene-d8	102	91	107
4-Bromofluorobenzene	98	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-03
Date Analyzed:	09/26/14	Data File:	092618.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	94	108
Toluene-d8	100	91	107
4-Bromofluorobenzene	97	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-04
Date Analyzed:	09/26/14	Data File:	092619.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	94	108
Toluene-d8	100	91	107
4-Bromofluorobenzene	97	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092314	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-05
Date Analyzed:	09/26/14	Data File:	092620.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	94	108
Toluene-d8	102	91	107
4-Bromofluorobenzene	101	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-06
Date Analyzed:	09/26/14	Data File:	092621.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	94	108
Toluene-d8	107	91	107
4-Bromofluorobenzene	100	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-07
Date Analyzed:	09/26/14	Data File:	092622.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	94	108
Toluene-d8	107	91	107
4-Bromofluorobenzene	97	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-08
Date Analyzed:	09/26/14	Data File:	092623.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	94	108
Toluene-d8	102	91	107
4-Bromofluorobenzene	98	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-092414	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	409479-09
Date Analyzed:	09/26/14	Data File:	092624.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	94	108
Toluene-d8	102	91	107
4-Bromofluorobenzene	98	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/26/14	Lab ID:	04-1964 mb
Date Analyzed:	09/26/14	Data File:	092608.D
Matrix:	Water	Instrument:	GCMS7
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	94	108
Toluene-d8	100	91	107
4-Bromofluorobenzene	96	91	110

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
1,2-Dichloroethane (EDC)	<1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479
Date Extracted: 09/29/14
Date Analyzed: 09/29/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	EDB
MW86 409479-06	<0.01
MLT-03 409479-07	<0.01
EB-092414 409479-09	<0.01
Method Blank	<0.01

EDB 1,2-Dibromoethane

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW86	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-06 1/2
Date Analyzed:	09/30/14	Data File:	093016.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	50	150
Benzo(a)anthracene-d12	110	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-07 1/2
Date Analyzed:	09/30/14	Data File:	093017.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	50	150
Benzo(a)anthracene-d12	107	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	EB-092414	Client:	Stantec
Date Received:	09/25/14	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	409479-09 1/2
Date Analyzed:	09/30/14	Data File:	093018.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	113	50	150
Benzo(a)anthracene-d12	110	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 409479
Date Extracted:	09/29/14	Lab ID:	04-1976 mb2 1/2
Date Analyzed:	09/30/14	Data File:	093007.D
Matrix:	Water	Instrument:	GCMS10
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	50	150
Benzo(a)anthracene-d12	85	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

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: 409479-02 (Duplicate)

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	86	65-118
Toluene	ug/L (ppb)	50	89	72-122
Ethylbenzene	ug/L (ppb)	50	89	73-126
Xylenes	ug/L (ppb)	150	89	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	97	109	58-134	12

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

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

Laboratory Code: 409413-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	103	103	79-121	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

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

Laboratory Code: 409436-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	100	111	79-121	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 409493-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	113	80-114
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	101	81-114

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	119 vo	120 vo	81-118	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	105	107	81-113	2

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR 1,2-DIBROMOETHANE BY EPA METHOD 8011 MODIFIED

Laboratory Code: 409361-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 10)
1,2-Dibromoethane	ug/L (ppb)	<0.01	<0.01	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
1,2-Dibromoethane	ug/L (ppb)	0.10	117	70-130

Date of Report: 10/07/14
Date Received: 09/25/14
Project: TOC_01-176, WORFDB8 F&BI 409479

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	86	90	70-130	5
Acenaphthylene	ug/L (ppb)	1	87	98	70-130	12
Acenaphthene	ug/L (ppb)	1	89	100	70-130	12
Fluorene	ug/L (ppb)	1	93	100	70-130	7
Phenanthrene	ug/L (ppb)	1	82	94	70-130	14
Anthracene	ug/L (ppb)	1	86	96	70-130	11
Fluoranthene	ug/L (ppb)	1	79	92	70-130	15
Pyrene	ug/L (ppb)	1	79	97	70-130	20
Benz(a)anthracene	ug/L (ppb)	1	89	95	70-130	7
Chrysene	ug/L (ppb)	1	87	97	70-130	11
Benzo(b)fluoranthene	ug/L (ppb)	1	109	101	70-130	8
Benzo(k)fluoranthene	ug/L (ppb)	1	111	98	70-130	12
Benzo(a)pyrene	ug/L (ppb)	1	98	98	70-130	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	106	110	70-130	4
Dibenz(a,h)anthracene	ug/L (ppb)	1	104	112	70-130	7
Benzo(g,h,i)perylene	ug/L (ppb)	1	103	106	70-130	3

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.

479
~~409478~~ (NP)

SAMPLE CHAIN OF COUSTODY

ME 09/25/14 V3/CU3/AI3

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

SAMPLERS (*signature*) AVadon

PROJECT NAME/NO.	PO#
TOC-MLT	203714085

REMARKS Total and diss metals. Bottles are marked (Field Filtered). Drake Property

Page # 1 of 1

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	PAHS	Pb Total	Pb Dissolved	MTBE	EDC	EDB	Notes
MW84	01 A-D	9-23	1015	Water	4		X	X							X			
MW89	02	9-23	1145		4		X	X							X			
MW65	03	9-23	1345		4		X	X							X			
MW77	04	9-23	1445		4		X	X							X			
EB-092314	05	9-23	1530		4		X	X							X			
MW86	06 A-H	9-24	1015		8	X	X	X				X	X	X	X	X	X	
MLT-03	07 A-H	9-24	1045		8	X	X	X				X	X	X	X	X	X	
MW85	08 A-D	9-24	1210		4		X	X							X			
EB-092414	09 A-H	9-24	1600		8	X	X	X				X	X	X	X	X	X	
TB-092514-1	10	—	—	Water	1		X	X										

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: AVadon	Antonelo Vadon	Stantec	9-25-14	0900
Received by: [signature]	Eric Young	F&B	9/25	1030
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\COC.DOC

Appendix C

Laboratory Analytical Reports – Groundwater Samples, Fourth Quarter 2014

Stantec

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

December 23, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2014 from the TOC_01-176, WORFDB8 F&BI 412247 project. There are 8 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
STN1223R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412247 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412247 -01	MW96
412247 -02	MW67

All quality control requirements were acceptable.

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412247
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW96 412247-01	<100	114
MW67 412247-02	<100	114
Method Blank 04-2489 MB	<100	106

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW96	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412247
Date Extracted:	12/16/14	Lab ID:	412247-01
Date Analyzed:	12/16/14	Data File:	121608.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	97	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	3.0
o-Xylene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW67	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412247
Date Extracted:	12/16/14	Lab ID:	412247-02
Date Analyzed:	12/16/14	Data File:	121609.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412247
Date Extracted:	12/16/14	Lab ID:	04-2460 mb
Date Analyzed:	12/16/14	Data File:	121607.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412247

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 412251-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	<100	96	95	53-117	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412247

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	97	68-125	1
Benzene	ug/L (ppb)	50	<0.35	93	92	79-109	1
Toluene	ug/L (ppb)	50	<1	95	94	73-117	1
Ethylbenzene	ug/L (ppb)	50	<1	97	96	71-120	1
m,p-Xylene	ug/L (ppb)	100	<2	99	98	63-128	1
o-Xylene	ug/L (ppb)	50	<1	101	101	64-129	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	95	70-122	0
Benzene	ug/L (ppb)	50	91	91	81-108	0
Toluene	ug/L (ppb)	50	93	94	83-108	1
Ethylbenzene	ug/L (ppb)	50	96	97	84-110	1
m,p-Xylene	ug/L (ppb)	100	98	98	84-112	0
o-Xylene	ug/L (ppb)	50	98	100	82-113	2

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.

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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.

DRAKE Chain

412247

SAMPLE CHAIN OF CUSTODY

ME 12/15/14

V3

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood WA 98036

Phone #4259774994 Fax #

SAMPLERS (signature) Dana Hutchins

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	MTBE						Notes
MW96	01A-D	12-11-14	1200	W	4		X	X				X						
MW67	02	12-11-14	1500	W	4		X	X				X						
													Samples received at	1°				

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	12-15-14	1200
Received by: Nhan Phan	Nhan Phan	FCSI	12/15/14	1400
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2014 from the TOC_01-176, WORFDB8 F&BI 412248 project. There are 15 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
STN1230R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412248 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412248 -01	MW103

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW103 412248-01	<100	118
Method Blank 04-2489 MB	<100	106

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
MW103 412248-01	<50	<250	103
Method Blank 04-2495 MB2	<50	<250	88

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/18/14	Lab ID:	412248-01
Date Analyzed:	12/18/14	Data File:	412248-01.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/18/14	Lab ID:	I4-810 mb
Date Analyzed:	12/18/14	Data File:	I4-810 mb.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW103	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/16/14	Lab ID:	412248-01
Date Analyzed:	12/16/14	Data File:	412248-01.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	76	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.70

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/16/14	Lab ID:	I4-804 mb
Date Analyzed:	12/16/14	Data File:	I4-804 mb.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW103	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/16/14	Lab ID:	412248-01
Date Analyzed:	12/16/14	Data File:	121612.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	9.1
Benzene	1.3
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412248
Date Extracted:	12/16/14	Lab ID:	04-2460 mb
Date Analyzed:	12/16/14	Data File:	121607.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 412251-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	<100	96	95	53-117	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	101	86	63-142	16

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248

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

Laboratory Code: 412248-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248

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

Laboratory Code: 412225-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	95	101	79-121	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412248

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	97	68-125	1
Benzene	ug/L (ppb)	50	<0.35	93	92	79-109	1
Toluene	ug/L (ppb)	50	<1	95	94	73-117	1
Ethylbenzene	ug/L (ppb)	50	<1	97	96	71-120	1
m,p-Xylene	ug/L (ppb)	100	<2	99	98	63-128	1
o-Xylene	ug/L (ppb)	50	<1	101	101	64-129	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	95	70-122	0
Benzene	ug/L (ppb)	50	91	91	81-108	0
Toluene	ug/L (ppb)	50	93	94	83-108	1
Ethylbenzene	ug/L (ppb)	50	96	97	84-110	1
m,p-Xylene	ug/L (ppb)	100	98	98	84-112	0
o-Xylene	ug/L (ppb)	50	98	100	82-113	2

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.

Herman 412248

SAMPLE CHAIN OF CUSTODY

ME 12/15/14 V3/AI3

Send Report To Rebekah Brooks
Company Stantec
Address 19101 W 36th Ave. #1203
City, State, ZIP Lynnwood WA 98036
Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 203700102
PO#
REMARKS Dissolved Pb samples are field filtered. Total bottels are labled (total) and dissolved (diss).

Page # ____ of ____

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	MTBE	Total Pb	dissolved Pb				Notes
MW103	01 G	12-13-14	0945	W	7	X	X	X				X	X	X				
																		Samples received at 1 °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	12-15-14	1100
Received by: Nhan Phan	Nhan Phan	FBI	12/15/14	1400
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2014 from the TOC_01-176, WORFDB8 F&BI 412249 project. There are 10 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
STN1230R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412249 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412249 -01	MW48
412249 -02	MW51

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412249
Date Extracted: 12/16/14
Date Analyzed: 12/16/14 and 12/18/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW48 412249-01 1/20	67	21	<20	440	7,700	104
MW51 412249-02	<1	<1	<1	<3	<100	103
Method Blank 04-2489 MB	<1	<1	<1	<3	<100	108

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412249
Date Extracted:	12/18/14	Lab ID:	412249-01
Date Analyzed:	12/18/14	Data File:	412249-01.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Lead	8.14

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412249
Date Extracted:	12/18/14	Lab ID:	I4-810 mb
Date Analyzed:	12/18/14	Data File:	I4-810 mb.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW48	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412249
Date Extracted:	12/16/14	Lab ID:	412249-01
Date Analyzed:	12/16/14	Data File:	412249-01.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	77	60	125

Analyte:	Concentration ug/L (ppb)
Lead	10.5

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412249
Date Extracted:	12/16/14	Lab ID:	I4-804 mb
Date Analyzed:	12/16/14	Data File:	I4-804 mb.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412249

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: 412251-01 (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: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	<100	96	95	53-117	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	97	65-118
Toluene	ug/L (ppb)	50	99	72-122
Ethylbenzene	ug/L (ppb)	50	101	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412249

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

Laboratory Code: 412248-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 12/30/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412249

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

Laboratory Code: 412225-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	95	101	79-121	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ROW

412249 [redacted]

SAMPLE CHAIN OF CUSTODY

ME [redacted] 12/15/14 V3/ A13

Page # [redacted] of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax # ____

SAMPLERS (*signature*) Dana Hutchins

PROJECT NAME/NO. TOCMLT/203700102

PO#

REMARKS Total Pb Bottels are labled (Total) and dissolved Bottels (diss)

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb	diss Pb					Notes
MW48	01 A-E	12-11-14	1300	W	5		X	X				X	X					diss Pb are Field Filtered.
MW51	02 A-C	12-12-14	1522	W	3		X	X										

Samples received at 1° °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	12-15-14	1200
Received by: [signature]	Nhan Phan	FeBI	12-15-14	1400
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 18, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2014 from the TOC_01-176, WORFDB8 F&BI 412250 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Kim Vik
STN1218R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412250 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412250 -01	MW27
412250 -02	MW32
412250 -03	MW19
412250 -04	MW10
412250 -05	MW02
412250 -06	MW12
412250 -07	MW09-SVB
412250 -08	MLT-1

All quality control requirements were acceptable.

Date of Report: 12/18/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412250
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW27 412250-01	<1	<1	<1	4.2	<100	111
MW32 412250-02	<1	<1	<1	<3	<100	113
MW19 412250-03	<1	<1	<1	<3	<100	110
MW10 412250-04	<1	<1	<1	<3	<100	110
MW02 412250-05	<1	<1	<1	<3	<100	109
MW12 412250-06	<1	<1	<1	<3	<100	113
MW09-SVB 412250-07	<1	<1	<1	<3	210	122
MLT-1 412250-08	<1	<1	<1	<3	160	120
Method Blank 04-2489 MB	<1	<1	<1	<3	<100	108

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW32	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412250
Date Extracted:	12/16/14	Lab ID:	412250-02
Date Analyzed:	12/16/14	Data File:	412250-02.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	68	60	125

Analyte:	Concentration ug/L (ppb)
Lead	14.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412250
Date Extracted:	12/16/14	Lab ID:	I4-804 mb
Date Analyzed:	12/16/14	Data File:	I4-804 mb.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	101	60	125

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

Date of Report: 12/18/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412250

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: 412251-01 (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: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	<100	96	95	53-117	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	97	65-118
Toluene	ug/L (ppb)	50	99	72-122
Ethylbenzene	ug/L (ppb)	50	101	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 12/18/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412250

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

Laboratory Code: 412225-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	95	101	79-121	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	100	83-115

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TOC

412250

SAMPLE CHAIN OF CUSTODY

ME 12/15/14 (V3) AI2

Page # ____ of 1

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

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

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

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

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Total Pb						Notes
MW27	01 A-C	12-11-14	1116	W	3		X	X				X						not enough sample for diss Pb. MW27
MW32	02 A-D	12-11-14	1330	W	4		X	X				X						
MW19	03 A-C	12-11-14	1435	W	3		X	X										
MW10	04	12-11-14	1518	W	3		X	X										
MW02	05	12-10-14	1400	W	3		X	X										
MW12	06	12-10-14	1150	W	3		X	X										
MW09-SUB	07	12-13-14	1200	W	3		X	X										
MLT-1	08	12-13-14	1130	W	3		X	X										
																		Samples received at 1° °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	12-15-14	1200
Received by: Nhan Phan	Nhan Phan	FEBI	12-15-14	1400
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 23, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 15, 2014 from the TOC_01-176, WORFDB8 F&BI 412251 project. There are 10 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
STN1223R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 15, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412251 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412251 -01	MW54
412251 -02	MW57
412251 -03	MW56
412251 -04	MW59
412251 -05	EB-121314
412251 -06	WB-121314
412251 -07	TB-121514

All quality control requirements were acceptable.

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412251
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW54 412251-01	<100	111
MW57 412251-02	4,700	ip
Method Blank 04-2489 MB	<100	106

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412251
Date Extracted: 12/16/14
Date Analyzed: 12/16/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW56 412251-03	<1	<1	<1	<3	<100	116
MW59 412251-04	<1	<1	<1	<3	<100	113
EB-121314 412251-05	<1	<1	<1	<3	<100	114
WB-121314 412251-06	<1	<1	<1	<3	<100	106
TB-121514 412251-07	<1	<1	<1	<3	<100	110
Method Blank 04-2489 MB	<1	<1	<1	<3	<100	108

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW54	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412251
Date Extracted:	12/16/14	Lab ID:	412251-01
Date Analyzed:	12/16/14	Data File:	121610.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	97	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW57	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412251
Date Extracted:	12/16/14	Lab ID:	412251-02
Date Analyzed:	12/16/14	Data File:	121611.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	102	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	2.2
Toluene	2.8
Ethylbenzene	62
m,p-Xylene	420 ve
o-Xylene	16

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW57	Client:	Stantec
Date Received:	12/15/14	Project:	TOC_01-176, WORFDB8 F&BI 412251
Date Extracted:	12/16/14	Lab ID:	412251-02 1/10
Date Analyzed:	12/16/14	Data File:	121618.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<10
Benzene	<3.5
Toluene	<10
Ethylbenzene	60
m,p-Xylene	400
o-Xylene	15

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412251
Date Extracted:	12/16/14	Lab ID:	04-2460 mb
Date Analyzed:	12/16/14	Data File:	121607.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412251

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: 412251-01 (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: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	ug/L (ppb)	1,000	<100	96	95	53-117	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	97	65-118
Toluene	ug/L (ppb)	50	99	72-122
Ethylbenzene	ug/L (ppb)	50	101	73-126
Xylenes	ug/L (ppb)	150	100	74-118
Gasoline	ug/L (ppb)	1,000	97	69-134

Date of Report: 12/23/14
Date Received: 12/15/14
Project: TOC_01-176, WORFDB8 F&BI 412251

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	98	97	68-125	1
Benzene	ug/L (ppb)	50	<0.35	93	92	79-109	1
Toluene	ug/L (ppb)	50	<1	95	94	73-117	1
Ethylbenzene	ug/L (ppb)	50	<1	97	96	71-120	1
m,p-Xylene	ug/L (ppb)	100	<2	99	98	63-128	1
o-Xylene	ug/L (ppb)	50	<1	101	101	64-129	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	95	70-122	0
Benzene	ug/L (ppb)	50	91	91	81-108	0
Toluene	ug/L (ppb)	50	93	94	83-108	1
Ethylbenzene	ug/L (ppb)	50	96	97	84-110	1
m,p-Xylene	ug/L (ppb)	100	98	98	84-112	0
o-Xylene	ug/L (ppb)	50	98	100	82-113	2

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.

ROMIO'S 412251

SAMPLE CHAIN OF CUSTODY

ME 12/15/14 V3

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 / 203700602
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	MTBE						Notes
MW54	01A-L	12-11-14	1236	W	12		X	X				X						MS/MSD
MW57	02A-D	12-11-14	1045	W	4		X	X				X						
MW56	03A-C	12-13-14	1345	W	3		X	X										
MW59	04	12-13-14	1445	W	3		X	X										
EB-121314	05	12-13-14	1506	W	3		X	X										
WB-121314	06	12-13-14	1515	W	3		X	X										
TB-121514	07	-	-	W	1		X	X										

Samples received at 1° on

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	12-15-14	1200
Received by:	Nhan Phan	FCBI	12/15/14	1400
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 17, 2014 from the TOC_01-176, WORFDB8 F&BI 412301 project. There are 27 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
STN1230R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 17, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412301 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412301 -01	MW107
412301 -02	MW106
412301 -03	EB-121614
412301 -04	MW-104
412301 -05	MLT-03

The 8260C benzene results of the dilutions of samples MW-104 and MLT-03 are partially due to carryover from previous sample injections. However, full concentration analysis of the samples are included in the report without qualifiers.

All other quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301
Date Extracted: 12/19/14
Date Analyzed: 12/19/14 and 12/22/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW107 412301-01	<100	108
MW106 412301-02	<100	109
MW-104 412301-04 1/100	52,000	115
MLT-03 412301-05 1/100	54,000	111
Method Blank 04-2515 MB	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301
Date Extracted: 12/19/14
Date Analyzed: 12/19/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
EB-121614 412301-03	<1	<1	<1	<3	<100	107
Method Blank 04-2515 MB	<1	<1	<1	<3	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301
Date Extracted: 12/18/14
Date Analyzed: 12/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW107 412301-01	<50	<250	84
MW106 412301-02	130 x	<250	81
MW-104 412301-04	11,000 x	740 x	84
MLT-03 412301-05	10,000 x	730 x	77
Method Blank 04-2532 MB2	<50	<250	82

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/22/14	Lab ID:	412301-01
Date Analyzed:	12/23/14	Data File:	412301-01.012
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/22/14	Lab ID:	412301-02
Date Analyzed:	12/23/14	Data File:	412301-02.016
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-104	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/22/14	Lab ID:	412301-04
Date Analyzed:	12/23/14	Data File:	412301-04.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/22/14	Lab ID:	412301-05
Date Analyzed:	12/23/14	Data File:	412301-05.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/22/14	Lab ID:	I4-815 mb
Date Analyzed:	12/23/14	Data File:	I4-815 mb.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW107	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-01
Date Analyzed:	12/18/14	Data File:	412301-01.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	100	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW106	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-02
Date Analyzed:	12/18/14	Data File:	412301-02.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-104	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-04
Date Analyzed:	12/18/14	Data File:	412301-04.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	92	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-03	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-05
Date Analyzed:	12/18/14	Data File:	412301-05.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	I4-810 mb
Date Analyzed:	12/18/14	Data File:	I4-810 mb.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW107	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-01
Date Analyzed:	12/18/14	Data File:	121811.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW106	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-02
Date Analyzed:	12/18/14	Data File:	121812.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	2.2
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-104	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-04
Date Analyzed:	12/18/14	Data File:	121813.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	85	117
Toluene-d8	107	93	107
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	71
Toluene	1,600 ve
Ethylbenzene	670 ve
m,p-Xylene	2,000 ve
o-Xylene	1,400 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-104	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-04 1/50
Date Analyzed:	12/19/14	Data File:	121929.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	101	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<50
Benzene	88 c
Toluene	6,300
Ethylbenzene	1,700
m,p-Xylene	5,200
o-Xylene	2,200

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-05
Date Analyzed:	12/18/14	Data File:	121814.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	85	117
Toluene-d8	107	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	69
Toluene	1,600 ve
Ethylbenzene	670 ve
m,p-Xylene	2,000 ve
o-Xylene	1,400 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-03	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	412301-05 1/50
Date Analyzed:	12/19/14	Data File:	121930.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	103	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<50
Benzene	90 c
Toluene	6,300
Ethylbenzene	1,700
m,p-Xylene	5,200
o-Xylene	2,200

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412301
Date Extracted:	12/18/14	Lab ID:	04-2525 mb
Date Analyzed:	12/18/14	Data File:	121810.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301

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: 412295-03 (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	99	65-118
Toluene	ug/L (ppb)	50	102	72-122
Ethylbenzene	ug/L (ppb)	50	105	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	110	61-133	15

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301

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

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	112	110	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301

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

Laboratory Code: 412248-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412301

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	97	73-117
Ethylbenzene	ug/L (ppb)	50	<1	99	71-120
m,p-Xylene	ug/L (ppb)	100	<2	102	63-128
o-Xylene	ug/L (ppb)	50	<1	105	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	98	70-122	3
Benzene	ug/L (ppb)	50	93	95	81-108	2
Toluene	ug/L (ppb)	50	97	96	83-108	1
Ethylbenzene	ug/L (ppb)	50	100	100	84-110	0
m,p-Xylene	ug/L (ppb)	100	102	102	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	82-113	2

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.

Herman

412301

SAMPLE CHAIN OF CUSTODY

ME 12-17-14

V5/A04/A13

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave, #203

City, State, ZIP Lynnwood WA 98036

Phone #425 977 4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 203700102

PO#

REMARKS diss Pb samples were Field filtered and labled (diss) (total)

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	MTBE	total Pb	diss Pb				Notes
MW107	01 A-G	12-15-14	1115	W	7	X	X	X				X	X	X				
MW106	02 V	12-15-14	1225	W	7	X	X	X				X	X	X				
EB-121614	03 A-C	12-16-14	1600	W	3		X	X										
MW104	04 V	12-17-14	1330	W	7	X	X	X				X	X	X				
MLT-03	05 V	12-17-14	1345	W	7	X	X	X				X	X	X				
																		Samples received at 2 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-17-14	1530
Received by: DCO	DCO	F&B	12-17-14	16:00
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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 17, 2014 from the TOC_01-176, WORFDB8 F&BI 412302 project. There are 22 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
STN1230R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 17, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412302 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412302 -01	MW73
412302 -02	EB-121514
412302 -03	WB-121514

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302
Date Extracted: 12/19/14
Date Analyzed: 12/19/14 and 12/22/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW73 412302-01 1/100	69,000	112
EB-121514 412302-02	<100	110
WB-121514 412302-03	<100	106
Method Blank 04-2515 MB	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302
Date Extracted: 12/18/14
Date Analyzed: 12/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW73 412302-01	4,300 x	<250	86
EB-121514 412302-02	<50	<250	86
WB-121514 412302-03	<50	<250	92
Method Blank 04-2535 MB	<50	<250	84

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/22/14	Lab ID:	412302-01
Date Analyzed:	12/23/14	Data File:	412302-01.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.18

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/22/14	Lab ID:	412302-02
Date Analyzed:	12/23/14	Data File:	412302-02.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	98	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	WB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/22/14	Lab ID:	412302-03
Date Analyzed:	12/23/14	Data File:	412302-03.029
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	95	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/22/14	Lab ID:	I4-815 mb
Date Analyzed:	12/23/14	Data File:	I4-815 mb.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW73	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-01
Date Analyzed:	12/18/14	Data File:	412302-01.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

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

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	EB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-02
Date Analyzed:	12/18/14	Data File:	412302-02.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	WB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-03
Date Analyzed:	12/18/14	Data File:	412302-03.051
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	I4-810 mb
Date Analyzed:	12/18/14	Data File:	I4-810 mb.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-01
Date Analyzed:	12/18/14	Data File:	121815.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	91	85	117
Toluene-d8	102	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	90
Benzene	1,300 ve
Toluene	860 ve
Ethylbenzene	690 ve
m,p-Xylene	2,100 ve
o-Xylene	1,500 ve

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW73	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-01 1/500
Date Analyzed:	12/22/14	Data File:	122215.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<500
Benzene	13,000
Toluene	920
Ethylbenzene	1,600
m,p-Xylene	5,400
o-Xylene	2,500

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-02
Date Analyzed:	12/19/14	Data File:	121927.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WB-121514	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	412302-03
Date Analyzed:	12/18/14	Data File:	121827.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	85	117
Toluene-d8	97	93	107
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412302
Date Extracted:	12/18/14	Lab ID:	04-2525 mb
Date Analyzed:	12/18/14	Data File:	121810.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 412295-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	97	63-142	10

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302

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

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	112	110	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302

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

Laboratory Code: 412248-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412302

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	97	73-117
Ethylbenzene	ug/L (ppb)	50	<1	99	71-120
m,p-Xylene	ug/L (ppb)	100	<2	102	63-128
o-Xylene	ug/L (ppb)	50	<1	105	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	98	70-122	3
Benzene	ug/L (ppb)	50	93	95	81-108	2
Toluene	ug/L (ppb)	50	97	96	83-108	1
Ethylbenzene	ug/L (ppb)	50	100	100	84-110	0
m,p-Xylene	ug/L (ppb)	100	102	102	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	82-113	2

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.

Stantec 412302

SAMPLE CHAIN OF CUSTODY

ME 12-17-14

V5/A04/AI

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave #203

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 2037 00102

PO#

REMARKS diss Pb are Field Filtered and LabFiltered (Total) Cdiss).

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	MTBE	total Pb	diss Pb	Notes
MW73	01 MG	12-15-14	1040	W	7	X	X	X				X	X	X	
EB-121514	02	12-15-14	1615	W	7	X	X	X				X	X	X	
WB-121514	03	12-15-14	1630	W	7	X	X	X				X	X	X	
													Samples received at		2 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Diana Hutchins	Stantec	12-17-14	1530
Received by: Dana	Dana	F&B	"	16:00
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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 17, 2014 from the TOC_01-176, WORFDB8 F&BI 412303 project. There are 10 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
STN1230R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 17, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412303 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412303 -01	MW66
412303 -02	MW58
412303 -03	TB-121714-1
412303 -04	TB-121714-2

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303
Date Extracted: 12/19/14
Date Analyzed: 12/19/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW66 412303-01	<100	108
Method Blank 04-2515 MB	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303
Date Extracted: 12/19/14
Date Analyzed: 12/19/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW58 412303-02	<1	<1	<1	<3	<100	107
TB-121714-1 412303-03	<1	<1	<1	<3	<100	101
TB-121714-2 412303-04	<1	<1	<1	<3	<100	110
Method Blank 04-2515 MB	<1	<1	<1	<3	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303
Date Extracted: 12/18/14
Date Analyzed: 12/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW66 412303-01	190 x	<250	82
Method Blank 04-2532 MB2	<50	<250	82

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW66	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412303
Date Extracted:	12/18/14	Lab ID:	412303-01
Date Analyzed:	12/18/14	Data File:	121828.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412303
Date Extracted:	12/18/14	Lab ID:	04-2525 mb
Date Analyzed:	12/18/14	Data File:	121810.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303

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: 412295-03 (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	99	65-118
Toluene	ug/L (ppb)	50	102	72-122
Ethylbenzene	ug/L (ppb)	50	105	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	110	61-133	15

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412303

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	97	73-117
Ethylbenzene	ug/L (ppb)	50	<1	99	71-120
m,p-Xylene	ug/L (ppb)	100	<2	102	63-128
o-Xylene	ug/L (ppb)	50	<1	105	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	98	70-122	3
Benzene	ug/L (ppb)	50	93	95	81-108	2
Toluene	ug/L (ppb)	50	97	96	83-108	1
Ethylbenzene	ug/L (ppb)	50	100	100	84-110	0
m,p-Xylene	ug/L (ppb)	100	102	102	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	82-113	2

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.

Romio's

412303

SAMPLE CHAIN OF CUSTODY ME 12-17-14

VS

Page # 1 of 1/A04

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

SAMPLERS (signature) Dana Hutchins
PROJECT NAME/NO. TOC MLT / 205700102
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	MTBE	Notes
MW66	01 A-E	12-15-14	1425	W	5	X	X	X				X	
MW58	02 A-C	12-16-14	1440	W	3		X	X					
TB-121714-1	03	-	-	W	1		X	X					
TB-121714-2	04	-	-	W	1		X	X					
													Samples received at 2 °C

ANALYSES REQUESTED

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	Stantec	12-17-14	1500
Received by: Dave	DAVE	F&B	12-17-14	16:00
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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 17, 2014 from the TOC_01-176, WORFDB8 F&BI 412304 project. There are 8 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
STN1230R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 17, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412304 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412304 -01	MW49
412304 -02	MW60
412304 -03	MW53
412304 -04	MW55
412304 -05	MW63
412304 -06	EB-121714

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412304
Date Extracted: 12/19/14
Date Analyzed: 12/19/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
EB-121714 412304-06	<100	110
Method Blank 04-2515 MB	<100	103

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412304
Date Extracted: 12/19/14
Date Analyzed: 12/19/14

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

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 52-124)
MW49 412304-01	<1	<1	<1	<3	<100	110
MW60 412304-02	<1	<1	<1	<3	<100	103
MW53 412304-03	<1	<1	<1	<3	<100	101
MW55 412304-04	<1	<1	<1	<3	<100	108
MW63 412304-05	<1	<1	<1	<3	<100	108
Method Blank 04-2515 MB	<1	<1	<1	<3	<100	103

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	EB-121714	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412304
Date Extracted:	12/18/14	Lab ID:	412304-06
Date Analyzed:	12/18/14	Data File:	121829.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412304
Date Extracted:	12/18/14	Lab ID:	04-2525 mb
Date Analyzed:	12/18/14	Data File:	121810.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412304

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: 412295-03 (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	99	65-118
Toluene	ug/L (ppb)	50	102	72-122
Ethylbenzene	ug/L (ppb)	50	105	73-126
Xylenes	ug/L (ppb)	150	104	74-118
Gasoline	ug/L (ppb)	1,000	101	69-134

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412304

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	97	73-117
Ethylbenzene	ug/L (ppb)	50	<1	99	71-120
m,p-Xylene	ug/L (ppb)	100	<2	102	63-128
o-Xylene	ug/L (ppb)	50	<1	105	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	98	70-122	3
Benzene	ug/L (ppb)	50	93	95	81-108	2
Toluene	ug/L (ppb)	50	97	96	83-108	1
Ethylbenzene	ug/L (ppb)	50	100	100	84-110	0
m,p-Xylene	ug/L (ppb)	100	102	102	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	82-113	2

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.

20W

412304

SAMPLE CHAIN OF CUSTODY

ME 12-17-14

VS

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave # 203

City, State, ZIP Lynnwood WA 98036

Phone # 4259774994 Fax #

SAMPLERS (signature) Dana Hutchins

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	MTBE						Notes
MW49	01 A-C	12-15-14	1450	W	3		X	X										
MW60	02	12-15-14 (16 ND)	1540	W	3		X	X										
MW53	03	12-15-14	1618	W	3		X	X										
MW55	04	12-16-14	1450	W	3		X	X										
MW63	05	12-17-14	1015	W	3		X	X										
EB-121714	06 B	12-17-14	1430	W	4		X	X				X						
																		Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-17-14	1530
Received by: Dana	DANA	FEDEX	11	16:00
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

December 30, 2014

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

Dear Ms. Brooks:

Included are the results from the testing of material submitted on December 17, 2014 from the TOC_01-176, WORFDB8 F&BI 412305 project. There are 24 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
STN1230R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 17, 2014 by Friedman & Bruya, Inc. from the Stantec TOC_01-176, WORFDB8 F&BI 412305 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Stantec
412305 -01	MW86
412305 -02	MLT-02
412305 -03	MW85
412305 -04	MW84
412305 -05	MW68
412305 -06	MW89
412305 -07	MW65
412305 -08	MW77

All quality control requirements were acceptable.

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305
Date Extracted: 12/19/14
Date Analyzed: 12/20/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW86 412305-01	<100	101
MLT-02 412305-02	<100	106
MW85 412305-03	<100	104
MW84 412305-04	620	119
MW68 412305-05	<100	105
MW89 412305-06	<100	105
MW65 412305-07	<100	103
MW77 412305-08	<100	99
Method Blank 04-2517 MB	<100	108

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305
Date Extracted: 12/18/14
Date Analyzed: 12/18/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW86 412305-01	<50	<250	88
MLT-02 412305-02	<50	<250	100
Method Blank 04-2535 MB	<50	<250	84

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/22/14	Lab ID:	412305-01
Date Analyzed:	12/23/14	Data File:	412305-01.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	103	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	MLT-02	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/22/14	Lab ID:	412305-02
Date Analyzed:	12/23/14	Data File:	412305-02.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	97	60	125

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

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/22/14	Lab ID:	I4-815 mb
Date Analyzed:	12/23/14	Data File:	I4-815 mb.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW86	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-01
Date Analyzed:	12/18/14	Data File:	412305-01.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	94	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MLT-02	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-02
Date Analyzed:	12/18/14	Data File:	412305-02.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	96	60	125

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

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	NA	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	I4-810 mb
Date Analyzed:	12/18/14	Data File:	I4-810 mb.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	99	60	125

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

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW86	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-01
Date Analyzed:	12/18/14	Data File:	121830.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MLT-02	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-02
Date Analyzed:	12/18/14	Data File:	121831.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW85	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-03
Date Analyzed:	12/18/14	Data File:	121832.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW84	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-04
Date Analyzed:	12/18/14	Data File:	121833.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	2.3
m,p-Xylene	8.7
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW68	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-05
Date Analyzed:	12/18/14	Data File:	121834.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW89	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-06
Date Analyzed:	12/18/14	Data File:	121835.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW65	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-07
Date Analyzed:	12/18/14	Data File:	121836.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	98	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW77	Client:	Stantec
Date Received:	12/17/14	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	412305-08
Date Analyzed:	12/18/14	Data File:	121837.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	93	107
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 412305
Date Extracted:	12/18/14	Lab ID:	04-2525 mb
Date Analyzed:	12/18/14	Data File:	121810.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	SP

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	93	107
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 412305-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	97	63-142	10

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305

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

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	112	110	79-121	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	108	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305

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

Laboratory Code: 412248-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	<1	107	106	79-121	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	104	83-115

Date of Report: 12/30/14
Date Received: 12/17/14
Project: TOC_01-176, WORFDB8 F&BI 412305

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412301-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Toluene	ug/L (ppb)	50	<1	97	73-117
Ethylbenzene	ug/L (ppb)	50	<1	99	71-120
m,p-Xylene	ug/L (ppb)	100	<2	102	63-128
o-Xylene	ug/L (ppb)	50	<1	105	64-129

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	98	70-122	3
Benzene	ug/L (ppb)	50	93	95	81-108	2
Toluene	ug/L (ppb)	50	97	96	83-108	1
Ethylbenzene	ug/L (ppb)	50	100	100	84-110	0
m,p-Xylene	ug/L (ppb)	100	102	102	84-112	0
o-Xylene	ug/L (ppb)	50	102	104	82-113	2

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.

DRAFT

412305

SAMPLE CHAIN OF CUSTODY

ME 12-17-14

VS / ADU / AT3

Page # 1 of 1

Send Report To Rebekah Brooks

Company Stantec

Address 19101 W 36th Ave #103

City, State, ZIP Lynnwood WA 98036

Phone # 425-977-4994 Fax #

SAMPLERS (signature) Dana Hutchins

PROJECT NAME/NO. TOC MLT / 203700102

PO#

REMARKS diss Pb samples are Field Filtered (diss) and Labled Total

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	MTBE	diss Pb	Total Pb				Notes
MW86	01 A-G	12-15-14	1400	W	7	X	X	X				X	X	X				
MLT-02	02	12-15-14	1430	W	7	X	X	X				X	X	X				
MW85	03 A-D	12-15-14	1530	W	4		X	X				X						
MW84	04	12-16-14	1115	W	4		X	X				X						
MW68	05	12-17-14	1110	W	4		X	X				X						
MW89	06	12-17-14	1230	W	4		X	X				X						
MW65	07	12-17-14	1314	W	4		X	X				X						
MW77	08	12-17-14	1340	W	4		X	X				X						

Samples received at 2 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Dana Hutchins	Dana Hutchins	STANTEC	12-17-14	1530
Received by: DO	DO	F&B	12-17-14	16:00
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Appendix D

Laboratory Analytical Reports – Product Sample, MW102 (Herman Property), Second Quarter 2014

Stantec

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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July 9, 2014

Rebekah Brooks, Project Manager
Stantec
11130 NE 33rd Pl Suite 200
Bellevue, WA 98004

Dear Ms. Brooks:

Included are the results from the additional testing of material submitted on June 20, 2014 from the TOC_01-176, WORFDB8 F&BI 406396 project. There are 9 pages included in this report.

The sample MW 102-P was diluted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes. In addition, the sample MW 102-P was analyzed for volatile organic compounds using a GC fitted with a mass spectrometer (MS); and organometallic compounds using an inductively coupled plasma mass spectrometer (ICP-MS). The results of this testing, including the associated quality assurance, are also enclosed.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. 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.

Kurt Johnson
Chemist

Enclosures
STN0709R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/09/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396
Date Extracted: 06/24/14
Date Analyzed: 06/24/14

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)

Sample ID	GC Characterization
MW 102-P	The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds. The patterns displayed by these peaks are indicative of gasoline. The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-C_7 to *n*-C_{13} showing a maximum near *n*-C_8. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed the presence of peaks, at varying levels, that are indicative of toluene, ethylbenzene, the xylenes, C3-benzenes, and methylnaphthalenes. These compounds are characteristic of the constituents commonly found in gasoline. The relative abundance of the volatile and semivolatile constituents present indicates that substantial degradation has not occurred to the fuel. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

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ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW 102-P	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/27/14	Lab ID:	406396-05 1/2000
Date Analyzed:	06/27/14	Data File:	062737.D
Matrix:	Product	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	62	142
Toluene-d8	104	51	121
4-Bromofluorobenzene	102	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Ethanol	<100,000	2-Hexanone	<1,000
Dichlorodifluoromethane	<1,000	1,3-Dichloropropane	<100
Chloromethane	<1,000	Tetrachloroethene	<100
Vinyl chloride	<100	Dibromochloromethane	<100
Bromomethane	<100	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	26,000 ve
Acetone	<1,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	100,000 ve
Methylene chloride	<500	o-Xylene	40,000 ve
t-Butyl alcohol (TBA)	<5,000	Styrene	<100
Methyl t-butyl ether (MTBE)	<100	Isopropylbenzene	1,900
trans-1,2-Dichloroethene	<100	Bromoform	<100
Diisopropyl ether (DIPE)	<100	n-Propylbenzene	7,300
1,1-Dichloroethane	<100	Bromobenzene	<100
Ethyl t-butyl ether (ETBE)	<100	1,3,5-Trimethylbenzene	14,000
2,2-Dichloropropane	<100	1,1,2,2-Tetrachloroethane	<100
cis-1,2-Dichloroethene	<100	1,2,3-Trichloropropane	<100
Chloroform	<100	2-Chlorotoluene	<100
2-Butanone (MEK)	<1,000	4-Chlorotoluene	<100
t-Amyl methyl ether (TAME)	<100	tert-Butylbenzene	<100
1,2-Dichloroethane (EDC)	<100	1,2,4-Trimethylbenzene	43,000 ve
1,1,1-Trichloroethane	<100	sec-Butylbenzene	710
1,1-Dichloropropene	<100	p-Isopropyltoluene	380
Carbon tetrachloride	<100	1,3-Dichlorobenzene	<100
Benzene	11,000	1,4-Dichlorobenzene	<100
Trichloroethene	<100	1,2-Dichlorobenzene	<100
1,2-Dichloropropane	<100	1,2-Dibromo-3-chloropropane	<1,000
Bromodichloromethane	<100	1,2,4-Trichlorobenzene	<100
Dibromomethane	<100	Hexachlorobutadiene	<500
4-Methyl-2-pentanone	<1,000	Naphthalene	5,200
cis-1,3-Dichloropropene	<100	1,2,3-Trichlorobenzene	<100
Toluene	100,000 ve	Butane	<1,000 L
trans-1,3-Dichloropropene	<100	Pentane	3,800 L
1,1,2-Trichloroethane	<100	Isooctane	<1,000 L

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ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	06/27/14	Lab ID:	04-1308 mb 1/2000
Date Analyzed:	06/27/14	Data File:	062720.D
Matrix:	Product	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	62	142
Toluene-d8	99	51	121
4-Bromofluorobenzene	96	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Ethanol	<100,000	2-Hexanone	<1,000
Dichlorodifluoromethane	<1,000	1,3-Dichloropropane	<100
Chloromethane	<1,000	Tetrachloroethene	<100
Vinyl chloride	<100	Dibromochloromethane	<100
Bromomethane	<100	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	<100
Acetone	<1,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	<200
Methylene chloride	<500	o-Xylene	<100
t-Butyl alcohol (TBA)	<5,000	Styrene	<100
Methyl t-butyl ether (MTBE)	<100	Isopropylbenzene	<100
trans-1,2-Dichloroethene	<100	Bromoform	<100
Diisopropyl ether (DIPE)	<100	n-Propylbenzene	<100
1,1-Dichloroethane	<100	Bromobenzene	<100
Ethyl t-butyl ether (ETBE)	<100	1,3,5-Trimethylbenzene	<100
2,2-Dichloropropane	<100	1,1,2,2-Tetrachloroethane	<100
cis-1,2-Dichloroethene	<100	1,2,3-Trichloropropane	<100
Chloroform	<100	2-Chlorotoluene	<100
2-Butanone (MEK)	<1,000	4-Chlorotoluene	<100
t-Amyl methyl ether (TAME)	<100	tert-Butylbenzene	<100
1,2-Dichloroethane (EDC)	<100	1,2,4-Trimethylbenzene	<100
1,1,1-Trichloroethane	<100	sec-Butylbenzene	<100
1,1-Dichloropropene	<100	p-Isopropyltoluene	<100
Carbon tetrachloride	<100	1,3-Dichlorobenzene	<100
Benzene	<100	1,4-Dichlorobenzene	<100
Trichloroethene	<100	1,2-Dichlorobenzene	<100
1,2-Dichloropropane	<100	1,2-Dibromo-3-chloropropane	<1,000
Bromodichloromethane	<100	1,2,4-Trichlorobenzene	<100
Dibromomethane	<100	Hexachlorobutadiene	<500
4-Methyl-2-pentanone	<1,000	Naphthalene	<100
cis-1,3-Dichloropropene	<100	1,2,3-Trichlorobenzene	<100
Toluene	<100	Butane	<1,000 L
trans-1,3-Dichloropropene	<100	Pentane	<1,000 L
1,1,2-Trichloroethane	<100	Isooctane	<1,000 L

Analysis For Total Organic Lead and Manganese By EPA Method 200.8

Client ID:	MW 102-P	Client:	Stantec
Date Received:	06/20/14	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	07/03/14	Lab ID:	406396-05
Date Analyzed:	07/03/14	Data File:	406396-05.059
Matrix:	Product	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Analyte:	Concentration mg/kg (ppm)
Organic Lead	55.8
Organic Manganese	<1

Analysis For Total Organic Lead and Manganese By EPA Method 200.8

Client ID:	Method Blank	Client:	Stantec
Date Received:	Not Applicable	Project:	TOC_01-176, WORFDB8 F&BI 406396
Date Extracted:	07/03/14	Lab ID:	I4-425 mb
Date Analyzed:	07/03/14	Data File:	I4-425 mb.054
Matrix:	Product	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Analyte:	Concentration mg/kg (ppm)
Organic Lead	<1
Organic Manganese	<1

Date of Report: 07/09/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF PRODUCT SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 406396-05 1/2000 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet wt)	Duplicate Result (Wet wt)	RPD (Limit 20)
Ethanol	mg/kg (ppm)	<100,000	<100,000	nm
Dichlorodifluoromethane	mg/kg (ppm)	<1,000	<1,000	nm
Chloromethane	mg/kg (ppm)	<1,000	<1,000	nm
Vinyl chloride	mg/kg (ppm)	<100	<100	nm
Bromomethane	mg/kg (ppm)	<100	<100	nm
Chloroethane	mg/kg (ppm)	<100	<100	nm
Trichlorofluoromethane	mg/kg (ppm)	<100	<100	nm
Acetone	mg/kg (ppm)	<1,000	<1,000	nm
1,1-Dichloroethene	mg/kg (ppm)	<100	<100	nm
Methylene chloride	mg/kg (ppm)	<500	<500	nm
t-Butyl alcohol (TBA)	mg/kg (ppm)	<5,000	<5,000	nm
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	<100	<100	nm
trans-1,2-Dichloroethene	mg/kg (ppm)	<100	<100	nm
Diisopropyl ether (DIPE)	mg/kg (ppm)	<100	<100	nm
1,1-Dichloroethane	mg/kg (ppm)	<100	<100	nm
Ethyl t-butyl ether (ETBE)	mg/kg (ppm)	<100	<100	nm
2,2-Dichloropropane	mg/kg (ppm)	<100	<100	nm
cis-1,2-Dichloroethene	mg/kg (ppm)	<100	<100	nm
Chloroform	mg/kg (ppm)	<100	<100	nm
2-Butanone (MEK)	mg/kg (ppm)	<1,000	<1,000	nm
t-Amyl methyl ether (TAME)	mg/kg (ppm)	<100	<100	nm
1,2-Dichloroethane (EDC)	mg/kg (ppm)	<100	<100	nm
1,1,1-Trichloroethane	mg/kg (ppm)	<100	<100	nm
1,1-Dichloropropene	mg/kg (ppm)	<100	<100	nm
Carbon tetrachloride	mg/kg (ppm)	<100	<100	nm
Benzene	mg/kg (ppm)	11,000	11,000	0
Trichloroethene	mg/kg (ppm)	<100	<100	nm
1,2-Dichloropropane	mg/kg (ppm)	<100	<100	nm
Bromodichloromethane	mg/kg (ppm)	<100	<100	nm
Dibromomethane	mg/kg (ppm)	<100	<100	nm
4-Methyl-2-pentanone	mg/kg (ppm)	<1,000	<1,000	nm
cis-1,3-Dichloropropene	mg/kg (ppm)	<100	<100	nm
Toluene	mg/kg (ppm)	100,000	100,000	0
trans-1,3-Dichloropropene	mg/kg (ppm)	<100	<100	nm
1,1,2-Trichloroethane	mg/kg (ppm)	<100	<100	nm
2-Hexanone	mg/kg (ppm)	<1,000	<1,000	nm
1,3-Dichloropropane	mg/kg (ppm)	<100	<100	nm
Tetrachloroethene	mg/kg (ppm)	<100	<100	nm
Dibromochloromethane	mg/kg (ppm)	<100	<100	nm
1,2-Dibromoethane (EDB)	mg/kg (ppm)	<100	<100	nm
Chlorobenzene	mg/kg (ppm)	<100	<100	nm
Ethylbenzene	mg/kg (ppm)	26,000	27,000	4
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	<100	<100	nm
m,p-Xylene	mg/kg (ppm)	100,000	110,000	10
o-Xylene	mg/kg (ppm)	40,000	41,000	2
Styrene	mg/kg (ppm)	<100	<100	nm
Isopropylbenzene	mg/kg (ppm)	1,900	2,000	5
Bromoform	mg/kg (ppm)	<100	<100	nm
n-Propylbenzene	mg/kg (ppm)	7,300	8,000	9
Bromobenzene	mg/kg (ppm)	<100	<100	nm
1,3,5-Trimethylbenzene	mg/kg (ppm)	14,000	14,000	0
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	<100	<100	nm
1,2,3-Trichloropropane	mg/kg (ppm)	<100	<100	nm
2-Chlorotoluene	mg/kg (ppm)	<100	<100	nm
4-Chlorotoluene	mg/kg (ppm)	<100	<100	nm
tert-Butylbenzene	mg/kg (ppm)	<100	<100	nm
1,2,4-Trimethylbenzene	mg/kg (ppm)	43,000	46,000	7
sec-Butylbenzene	mg/kg (ppm)	710	780	9
p-Isopropyltoluene	mg/kg (ppm)	380	410	8
1,3-Dichlorobenzene	mg/kg (ppm)	<100	<100	nm
1,4-Dichlorobenzene	mg/kg (ppm)	<100	<100	nm
1,2-Dichlorobenzene	mg/kg (ppm)	<100	<100	nm
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	<1,000	<1,000	nm
1,2,4-Trichlorobenzene	mg/kg (ppm)	<100	<100	nm
Hexachlorobutadiene	mg/kg (ppm)	<500	<500	nm
Naphthalene	mg/kg (ppm)	5,200	5,500	6
1,2,3-Trichlorobenzene	mg/kg (ppm)	<100	<100	nm

Date of Report: 07/09/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF PRODUCT SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample 1/2000

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Ethanol	mg/kg (ppm)	25,000	120	115	10-189	4
Dichlorodifluoromethane	mg/kg (ppm)	500	35	40	10-141	13
Chloromethane	mg/kg (ppm)	500	65	70	31-129	7
Vinyl chloride	mg/kg (ppm)	500	70	75	38-134	7
Bromomethane	mg/kg (ppm)	500	140	150	28-170	7
Chloroethane	mg/kg (ppm)	500	120	120	10-152	0
Trichlorofluoromethane	mg/kg (ppm)	500	85	90	17-143	6
Acetone	mg/kg (ppm)	2500	80	80	25-160	0
1,1-Dichloroethene	mg/kg (ppm)	500	105	110	39-154	5
Methylene chloride	mg/kg (ppm)	500	85	90	31-150	6
t-Butyl alcohol (TBA)	mg/kg (ppm)	2,500	95	95	27-173	0
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	500	95	100	53-144	5
trans-1,2-Dichloroethene	mg/kg (ppm)	500	100	105	44-141	5
Diisopropyl ether (DIPE)	mg/kg (ppm)	500	100	105	72-122	5
1,1-Dichloroethane	mg/kg (ppm)	500	100	105	60-130	5
Ethyl t-butyl ether (ETBE)	mg/kg (ppm)	500	105	110	63-127	5
2,2-Dichloropropane	mg/kg (ppm)	500	110	110	31-139	0
cis-1,2-Dichloroethene	mg/kg (ppm)	500	115	115	53-130	0
Chloroform	mg/kg (ppm)	500	105	110	47-138	5
2-Butanone (MEK)	mg/kg (ppm)	2500	105	105	28-157	0
t-Amyl methyl ether (TAME)	mg/kg (ppm)	500	100	100	51-135	0
1,2-Dichloroethane (EDC)	mg/kg (ppm)	500	105	105	41-149	0
1,1,1-Trichloroethane	mg/kg (ppm)	500	100	105	35-154	5
1,1-Dichloropropene	mg/kg (ppm)	500	105	110	55-130	5
Carbon tetrachloride	mg/kg (ppm)	500	110	115	26-151	4
Benzene	mg/kg (ppm)	500	95	100	66-126	5
Trichloroethene	mg/kg (ppm)	500	100	100	65-127	0
1,2-Dichloropropane	mg/kg (ppm)	500	105	105	58-125	0
Bromodichloromethane	mg/kg (ppm)	500	105	110	48-139	5
Dibromomethane	mg/kg (ppm)	500	100	100	57-132	0
4-Methyl-2-pentanone	mg/kg (ppm)	2500	100	100	27-158	0
cis-1,3-Dichloropropene	mg/kg (ppm)	500	105	105	58-123	0
Toluene	mg/kg (ppm)	500	100	95	70-118	5
trans-1,3-Dichloropropene	mg/kg (ppm)	500	100	100	58-127	0
1,1,2-Trichloroethane	mg/kg (ppm)	500	100	95	62-123	5
2-Hexanone	mg/kg (ppm)	2500	105	105	23-163	0
1,3-Dichloropropane	mg/kg (ppm)	500	110	105	65-123	5
Tetrachloroethene	mg/kg (ppm)	500	100	100	65-115	0
Dibromochloromethane	mg/kg (ppm)	500	95	95	60-137	0
1,2-Dibromoethane (EDB)	mg/kg (ppm)	500	95	95	66-124	0
Chlorobenzene	mg/kg (ppm)	500	105	105	67-126	0
Ethylbenzene	mg/kg (ppm)	500	100	100	68-125	0
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	500	100	100	58-132	0
m,p-Xylene	mg/kg (ppm)	1,000	100	100	69-127	0
o-Xylene	mg/kg (ppm)	500	100	105	63-127	5
Styrene	mg/kg (ppm)	500	110	110	68-126	0
Isopropylbenzene	mg/kg (ppm)	500	110	110	61-129	0
Bromoform	mg/kg (ppm)	500	105	105	49-144	0
n-Propylbenzene	mg/kg (ppm)	500	100	95	58-128	5
Bromobenzene	mg/kg (ppm)	500	100	100	64-128	0
1,3,5-Trimethylbenzene	mg/kg (ppm)	500	105	105	59-126	0
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	500	100	100	54-123	0
1,2,3-Trichloropropane	mg/kg (ppm)	500	110	105	52-125	5
2-Chlorotoluene	mg/kg (ppm)	500	100	100	62-127	0
4-Chlorotoluene	mg/kg (ppm)	500	100	100	62-128	0
tert-Butylbenzene	mg/kg (ppm)	500	100	100	53-131	0
1,2,4-Trimethylbenzene	mg/kg (ppm)	500	100	100	59-128	0
sec-Butylbenzene	mg/kg (ppm)	500	100	100	43-136	0
p-Isopropyltoluene	mg/kg (ppm)	500	100	100	42-138	0
1,3-Dichlorobenzene	mg/kg (ppm)	500	100	100	64-127	0
1,4-Dichlorobenzene	mg/kg (ppm)	500	105	100	63-124	5
1,2-Dichlorobenzene	mg/kg (ppm)	500	100	100	67-126	0
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	500	100	100	20-162	0
1,2,4-Trichlorobenzene	mg/kg (ppm)	500	95	95	40-139	0
Hexachlorobutadiene	mg/kg (ppm)	500	100	95	16-154	5
Naphthalene	mg/kg (ppm)	500	105	95	50-150	10
1,2,3-Trichlorobenzene	mg/kg (ppm)	500	100	100	41-141	0

Date of Report: 07/09/14
Date Received: 06/20/14
Project: TOC_01-176, WORFDB8 F&BI 406396

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF PRODUCT SAMPLES FOR ORGANIC LEAD AND MANGANESE USING EPA METHOD 200.8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Organic Lead	mg/kg (ppm)	10	71	71	50-150	0

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.

Herman Property 406396

SAMPLE CHAIN OF CUSTODY

ME 6/20/14 V4/AI 6/c04

Page # 1 of 1

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

SAMPLERS (signature) Abadon
PROJECT NAME/NO. TOC-MLT
PO# 2037140B5
REMARKS

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

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

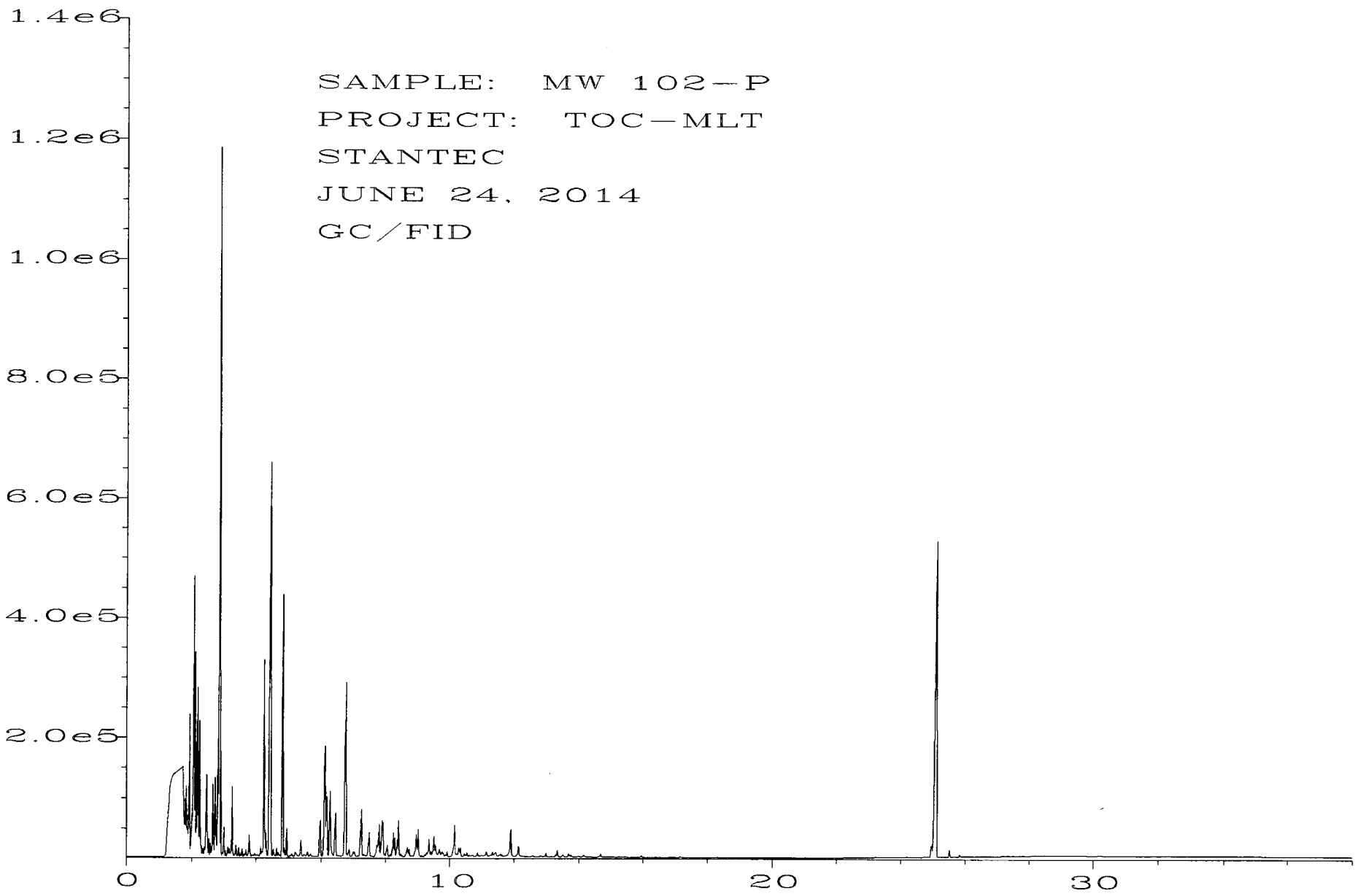
V= added per KJ 6/25/14

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	5+ VOCs by 8260	SVOCs by 8270	HFS	MTBE	PAHs	Total Lead	Dissolved Lead	ATS-Tagging	EDC	EDB	Total org. Pb/Mn	Notes
MW 104	01 A-H	6-17-14	1500	W	8	X	X	X				X	X	X	X		X	X		
MW 105	02	6-18-14	1315	W	8	X	X	X				X	X	X	X		X	X		
MW 103	03	6-18-14	1500	W	8	X	X	X				X	X	X	X		X	X		
MW 106	04	6-18-14	1500	W	8	X	X	X				X	X	X	X		X	X		
MW 102-P	05	6-19-14	0945	~~W~~ P	1				✓							X			✓	
MW 107	06 A-H	6-19-14	1015	W	8	X	X	X				X	X	X	X		X	X		
EB-061914	07	6-19-14	1600	W	8	X	X	X				X	X	X	X		X	X		
WB-061914	08	6-19-14	1600	W	8	X	X	X				X	X	X	X		X	X		
~~TB-062014~~		~~6-20-14~~		W	1		X	X												not received, no sample

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: Abadon	Antonelo Vadon	Stantec	6-20-14	1500
Received by: [illegible]	VINH	FBI	6/20/14	1530
Relinquished by:				
Received by:		Samples received at 3 °C		



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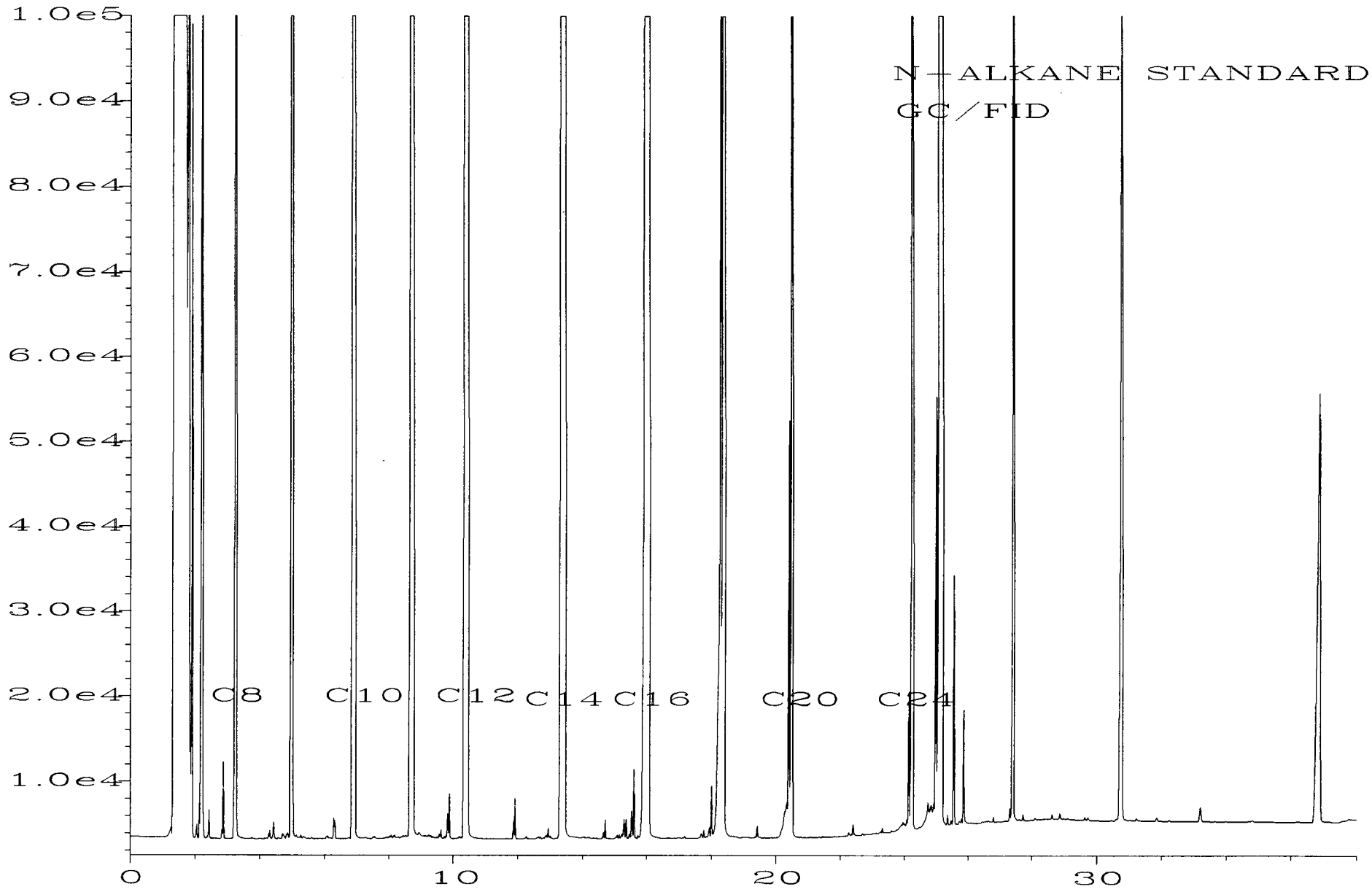

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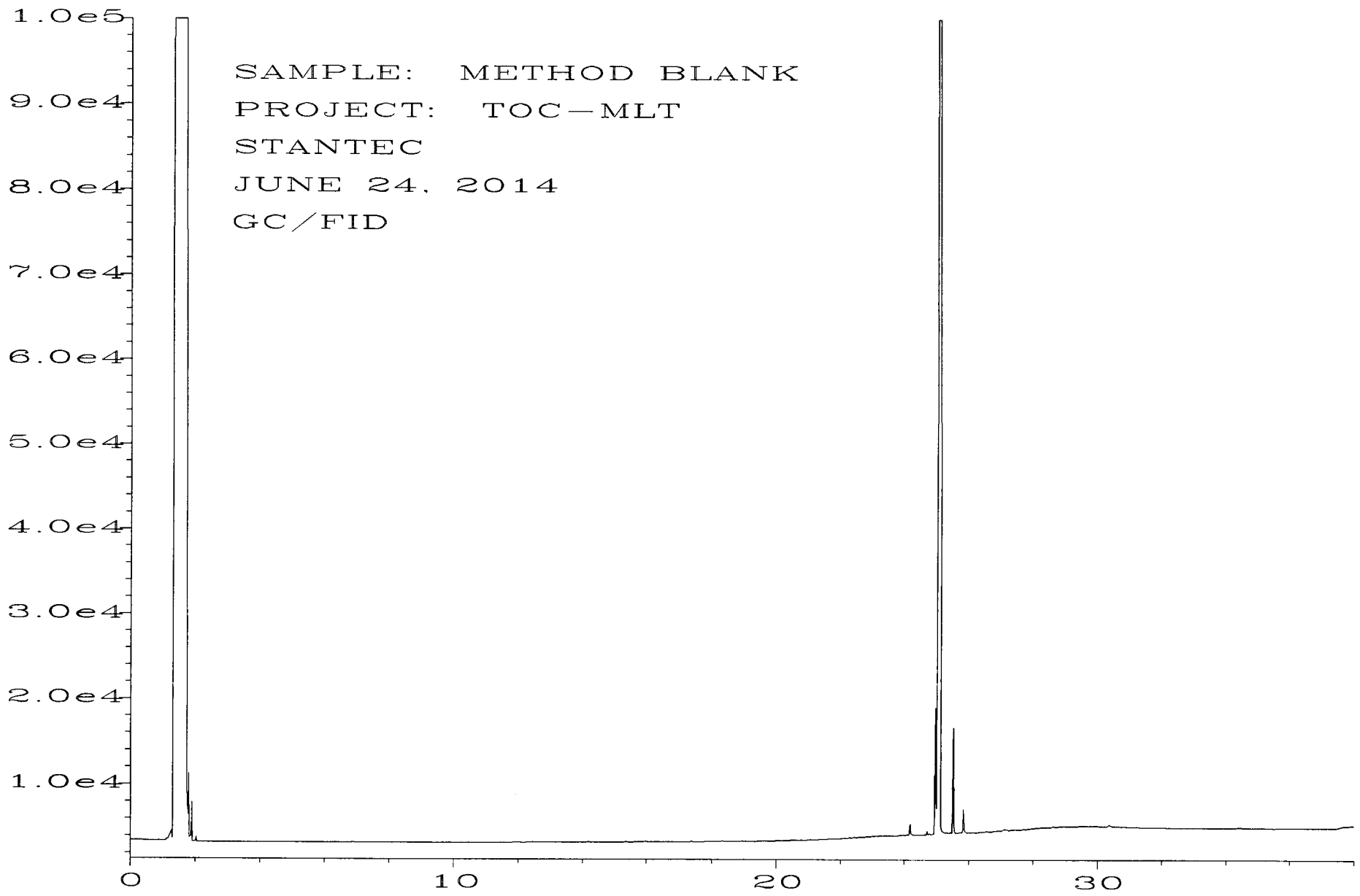

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Appendix E

Laboratory Analytical Reports – Historical Product Sample, TOC Property, 2005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 19, 2005

Jim Burgess, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Burgess:

Included are the results from the testing of material submitted on December 5, 2005 from the Time Oil 01-476, F&BI 512038 project. The product sample submitted for forensic evaluation arrived in good condition. Upon arrival, the sample PPW113005 was placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample PPW113005 was diluted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

In addition, the sample PPW113005 was analyzed for paraffin, isoparaffin, aromatic, naphthene, and olefin (PIANO) constituents using a GC fitted with a mass spectrometer (MS); and organometallic compounds using a GC fitted with an electron capture detector (ECD). The results of this testing, including the associated quality assurance, are also enclosed.

Based on the data generated, the material present in the sample PPW113005 is indicative of gasoline. The GC/FID trace of a typical undegraded gasoline is provided as Figure 1. The GC/FID trace of the sample PPW113005 is provided as Figure 2.

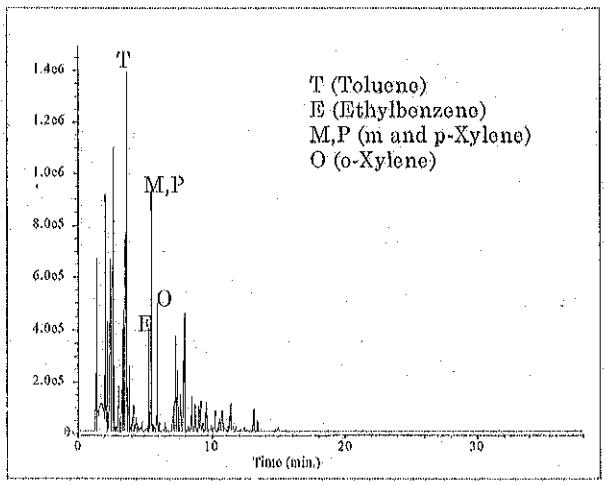


Figure 1. Undegraded Gasoline

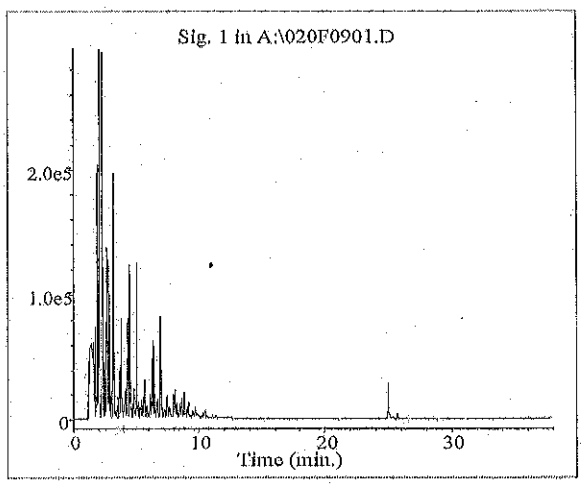


Figure 2. PPW113005

The results for selected constituents from the PIANO analysis of the sample PPW113005 are provided in Table 1. For comparison, included in Table 1 are levels of *n*-butane, *n*-pentane, isooctane, benzene, toluene, ethylbenzene, and the xylenes in a "Typical" undegraded gasoline.[1] It should also be noted that the results indicate that the sample does not contain the ethers MTBE, DIPE, ETBE, or TAME above 0.01 % (w/w).

Table 1. Selected Constituents from the PIANO Analysis (w/w%)

Sample ID	*n*-Butane	*n*-Pentane	Isooctane	Benzene	Toluene	Ethylbenzene	Xylenes
PPW113005	<0.01	0.14	0.87	0.01	0.02	0.59	2.2
Typical	3.9-4.7	5.8-10.9	0.32-4.6	0.12-3.5	2.7-22	0.36-2.9	3.2-8.3

As shown in Table 1, the level of the highly volatile constituents *n*-butane and *n*-pentane in the sample PPW113005 are below the expected concentration range for a typical undegraded gasoline. In addition, the volatile and water soluble aromatic hydrocarbons benzene and toluene are also present below the typical range found in undegraded gasoline.

Review of the general and detailed chemical composition of the sample PPW113005 shows that water washing is likely the dominant weathering process occurring at this location. Based on the degree of weathering seen in the sample PPW113005, the fuel present is likely related to a historic release.

Review of the GC/ECD results shows that organic lead and organic manganese were identified in the sample PPW113005. These compounds were historically used as antiknock additives in gasoline until they were phased out of use on or before January of 1996. Some of the organic lead species, such as dimethyldiethyl lead (DMDEL) and methyltriethyl lead (MTEL) have only been in use since 1960. The manganese additive methylcyclopentadienyl manganese tricarbonyl (MMT) became commercially available in approximately 1958.

Further review of the GC/ECD results shows that the sample PPW113005 had an organic lead content of approximately 2.3 g Pb/gallon. This level of organic lead is consistent with leaded gasoline manufactured before 1986. The suite of organometallic compounds present in the sample PPW113005 is consistent with fuel manufactured between 1960 and 1986.

---

[1] "Selection of Representative TPH Fractions Based on Fate and Transport Considerations - Total Petroleum Hydrocarbon Criteria Working Group Series Volume 3", J.B. Gustafson, J.G. Tell and D. Orem, Amherst Scientific Publishers, Amherst, MA, 1997, ISBN 1-884-940-12-9.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson
Project Manager

Enclosures
SOU1219R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Extracted: 12/06/05
Date Analyzed: 12/15/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)

Sample ID	GC Characterization
PPW113005	The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds. The patterns displayed by these peaks are indicative of gasoline. The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-C_7 to *n*-C_{13} showing a maximum near *n*-C_7. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 100°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that the gasoline present has undergone extensive degradation. The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

Laboratory ID 512038-01
Client ID PPW113005

Compound	Weight Percent
Propane	<0.01
Methanol	<0.01
Isobutane	<0.01
2-Methyl-1-propene	<0.01
Ethanol	<0.01
n-Butane	<0.01
t-2-Butene	<0.01
c-2-Butene	<0.01
Isopropanol	<0.01
3-Methyl-1-butene	<0.01
Isopentane	0.05
tert-Butanol	<0.01
1-Pentene	<0.01
2-Methyl-1-butene	<0.01
n-Propanol	<0.01
n-Pentane	0.14
t-2-Pentene	<0.01
c-2-Pentene	<0.01
2-Methyl-2-butene	<0.01
MTBE	<0.01
sec-Butanol	<0.01
4-Methyl-1-pentene	<0.01
Isobutanol	<0.01
2,3-Dimethylbutane	0.17
Cyclopentane	0.02
2-Methylpentane	1.02
DIPE	<0.01
3-Methylpentane	0.79
1-Hexene	<0.01
ETBE	<0.01
n-Hexane	1.63

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

Laboratory ID 512038-01
Client ID PPW113005

Compound	Weight Percent
t-2-Hexene	0.01
2-Methyl-1-pentene	0.01
2-Methyl-2-pentene	0.01
c-2-Hexene	0.01
2,2-Dimethylpentane	0.17
2,4-Dimethylpentane	0.36
Methylcyclopentane	0.80
2,2,3-Trimethylbutane	0.05
Benzene	0.01
1-Methylcyclopentene	0.02
TAME	<0.01
3,3-Dimethylpentane	0.15
Cyclohexane	0.70
2-Methylhexane	2.05
2,3-Dimethylpentane	0.82
1,1-Dimethylcyclopentane	0.32
3-Methylhexane	2.54
c-1,3-Dimethylcyclopentane	0.71
3-Ethylpentane	0.24
Isooctane	0.87
t-1,2-Dimethylcyclopentane	1.02
1-Heptene	0.01
n-Heptane	5.73
t-3-Heptene	0.02
c-3-Heptene	0.03
t-2-Heptene	0.07
c-2-Heptene	0.01
2,2-Dimethylhexane	0.21
2,5-Dimethylhexane	0.68
Methylcyclohexane	3.84
2,4-Dimethylhexane	0.71
Ethylcyclopentane	0.41

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

Laboratory ID 512038-01
Client ID PPW113005

Compound	Weight Percent
t-1,c-2,4-Trimethylcyclopentane	0.85
t-1,c-2,3-Trimethylcyclopentane	0.63
2,3,4-Trimethylpentane	0.20
Toluene	0.02
2,3-Dimethylhexane	0.60
2-Methylheptane	2.71
3-Methylheptane	2.57
4-Methylheptane	1.04
3-Ethylhexane	0.44
1-Octene	0.01
1,2,3-Trimethylcyclopentane	0.18
t-1,2-Dimethylcyclohexane	2.58
n-Octane	3.75
1-Ethyl-1-methylcyclopentane	0.26
c-2-Octene	0.03
c-1,2-Dimethylcyclohexane	0.81
Isopropylcyclopentane	0.06
2,5-Dimethylheptane	0.83
3,5-Dimethylheptane	0.22
n-Propylcyclopentane	0.27
Ethylbenzene	0.59
2,3-Dimethylheptane	0.46
3,4-Dimethylheptane	0.19
2-Methyloctane	1.01
m-Xylene	1.09
p-Xylene	0.66
3-Methyloctane	1.33
1-Nonene	<0.01
3,3-Diethylpentane	<0.01
t-3-Nonene	0.08
c3-Nonene	0.04
o-Xylene	0.43

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

Laboratory ID 512038-01
Client ID PPW113005

Compound	Weight Percent
n-Nonane	3.06
Isobutylcyclopentane	<0.01
t-2-Nonene	0.07
c-2-Nonene	0.02
Isopropylbenzene	0.10
3,3-Dimethyloctane	0.08
n-Butylcyclopentane	0.11
n-Propylbenzene	0.34
2,3-Dimethyloctane	0.18
1-Methyl-3-ethylbenzene	1.07
1-Methyl-4-ethylbenzene	0.38
2-Methylnonane	0.59
3-Ethyloctane	0.18
3-Methylnonane	0.59
1,3,5-Trimethylbenzene	0.77
1-Methyl-2-ethylbenzene	0.38
1,2,4-Trimethylbenzene	1.71
tert-Butylbenzene	<0.01
n-Decane	2.29
Isobutylbenzene	0.17
Isopropylcyclohexane	0.34
sec-Butylbenzene	0.13
1-Methyl-3-isopropylbenzene	0.14
Isobutylcyclohexane	<0.01
1-Methyl-4-isopropylbenzene	0.11
1,2,3-Trimethylbenzene	0.42
Indan	0.10
1-Methyl-3-n-propylbenzene	0.47
1-Methyl-4-n-propylbenzene	0.20
n-Butylbenzene	0.36
1,3-Dimethyl-5-ethylbenzene	0.61
1,2-Diethylbenzene	0.07

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

Laboratory ID 512038-01
Client ID PPW113005

Compound	Weight Percent
1-Methyl-2-n-propylbenzene	0.13
1,4-Dimethyl-2-ethylbenzene	0.27
1,2-Dimethyl-4-ethylbenzene	0.43
1,3-Dimethyl-2-ethylbenzene	0.05
1,2-Dimethyl-3-ethylbenzene	0.07
n-Undecane	0.74
1,2,4,5-Tetramethylbenzene	0.25
2-Methylbutylbenzene	0.03
n-Pentylbenzene	0.04
Methylindan	0.13
1-tert-Butyl-3,5-dimethylbenzene	<0.01
1-tert-Butyl-4-ethylbenzene	<0.01
n-Dodecane	0.20
1,3,5-Triethylbenzene	<0.01
1,2,4-Triethylbenzene	<0.01
Naphthalene	0.14
n-Hexylbenzene	0.03
2-Methylnaphthalene	0.18
n-Tridecane	0.12
1-Methylnaphthalene	0.08
n-Tetradecane	0.02
n-Pentadecane	0.01

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Analyzed: 12/08/05

RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR PARAFFINS, ISOPARAFFINS, OLEFINS, NAPHTHENES, AND AROMATICS USING ASTM D5134-92 MODIFIED
Results Reported as % by Weight

PIANO SUMMARY

Laboratory ID 512038-01
Client ID PPW113005

	Weight Percent
Total Identified Compounds	68.31
Oxygenated Compounds	0.00
Hydrocarbon Compounds	68.31
Unidentified Compounds	31.69
Total	100

	Paraffins	Isoparaffins	Aromatics	Naphthenes	Olefins	Total
C3	<0.01					<0.01
C4	<0.01	<0.01			<0.01	<0.01
C5	0.14	0.05		0.02	<0.01	0.21
C6	1.63	1.98	0.01	1.50	0.05	5.16
C7	5.73	6.37	0.02	6.29	0.14	18.56
C8	3.75	10.04	2.76	5.65	0.04	22.25
C9	3.06	4.03	5.26	0.45	0.22	13.03
C10	2.29	1.63	3.72	<0.01		7.64
C11	0.74		0.34			1.08
C12	0.20		0.03			0.24
C13	0.12					0.12
C14	0.02					0.02
C15	0.01					0.01
Total	17.70	24.10	12.14	13.92	0.45	68.31

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038
Date Extracted: 12/06/05
Date Analyzed: 12/06/05 and 12/07/05

RESULTS FROM THE ANALYSIS OF PRODUCT SAMPLES FOR ORGANIC LEAD SPECIATION AND MANGANESE BY METHOD 8082 MODIFIED

Results Reported as µg/g (ppm)

Sample ID Laboratory ID	TML	TMEL	DMDEL	MTEL	TEL	MMT	Surrogate (% Rec.) (Limit 50-150)
PPW113005 d 512038-01	44	84	160	210	310	1	72
Method Blank	<1	<1	<1	<1	<1	<1	94

TML	Tetramethyl Lead
TMEL	Trimethylethyl Lead
DMDEL	Dimethyldiethyl Lead
MTEL	Methyltriethyl Lead
TEL	Tetraethyl Lead
MMT	Methylcyclopentadienyl Manganese Tricarbonyl

d - The sample was diluted for TMEL and TEL.

Date of Report: 12/19/05
Date Received: 12/05/05
Project: Time Oil 01-476, F&BI 512038

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF PRODUCT SAMPLES FOR ORGANIC LEAD AND MANGANESE BY EPA METHOD 8082 MODIFIED

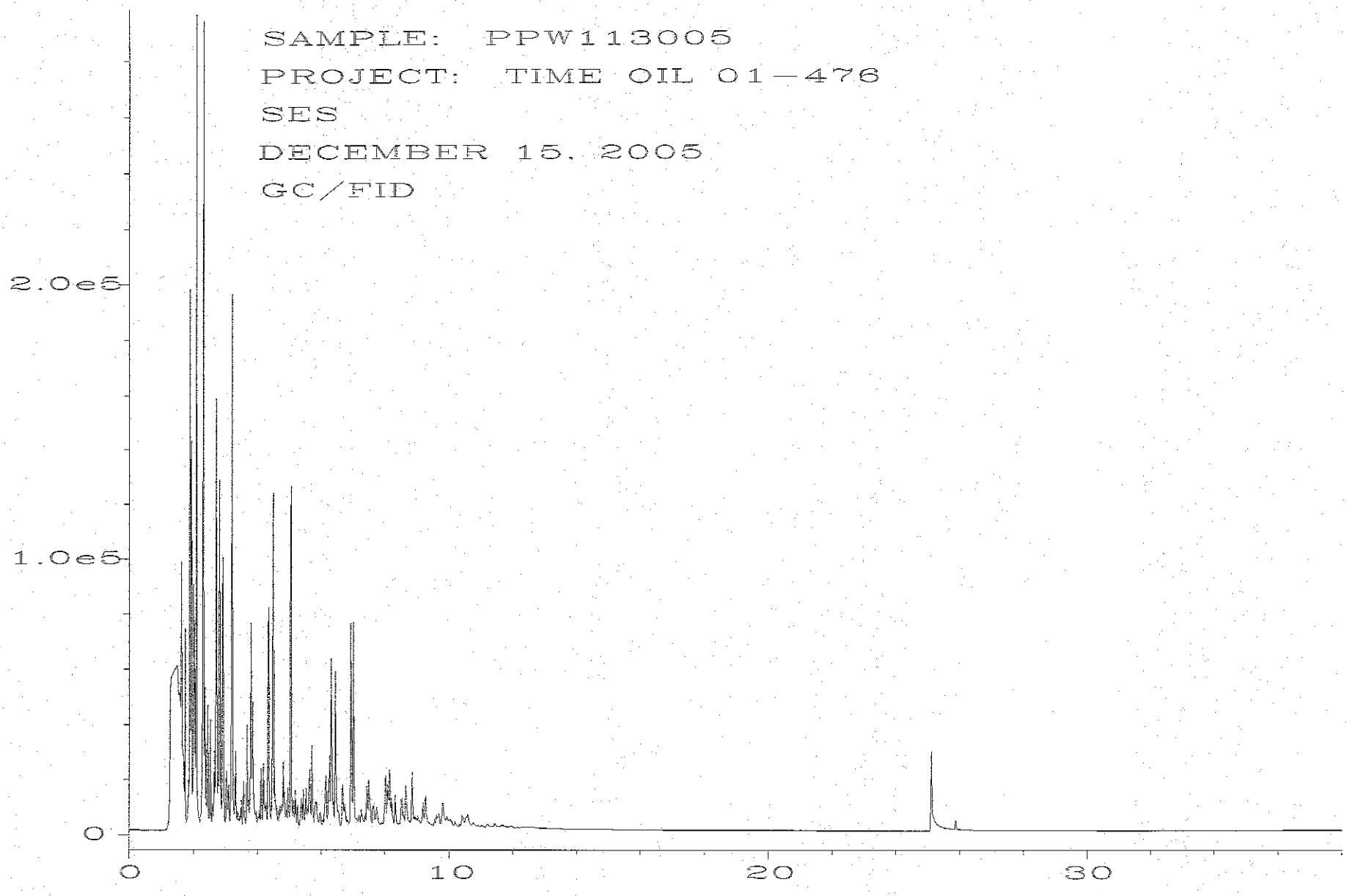
Laboratory Code: 511280-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Tetramethyl lead	µg/g (ppm)	<1	<1	nm
Tetraethyl lead	µg/g (ppm)	2.3	2.2	4
MMT	µg/g (ppm)	<1	<1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Tetramethyl lead	µg/g (ppm)	50	89	90	70-130	1
Tetraethyl lead	µg/g (ppm)	50	95	97	70-130	2
MMT	µg/g (ppm)	50	95	96	70-130	1

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



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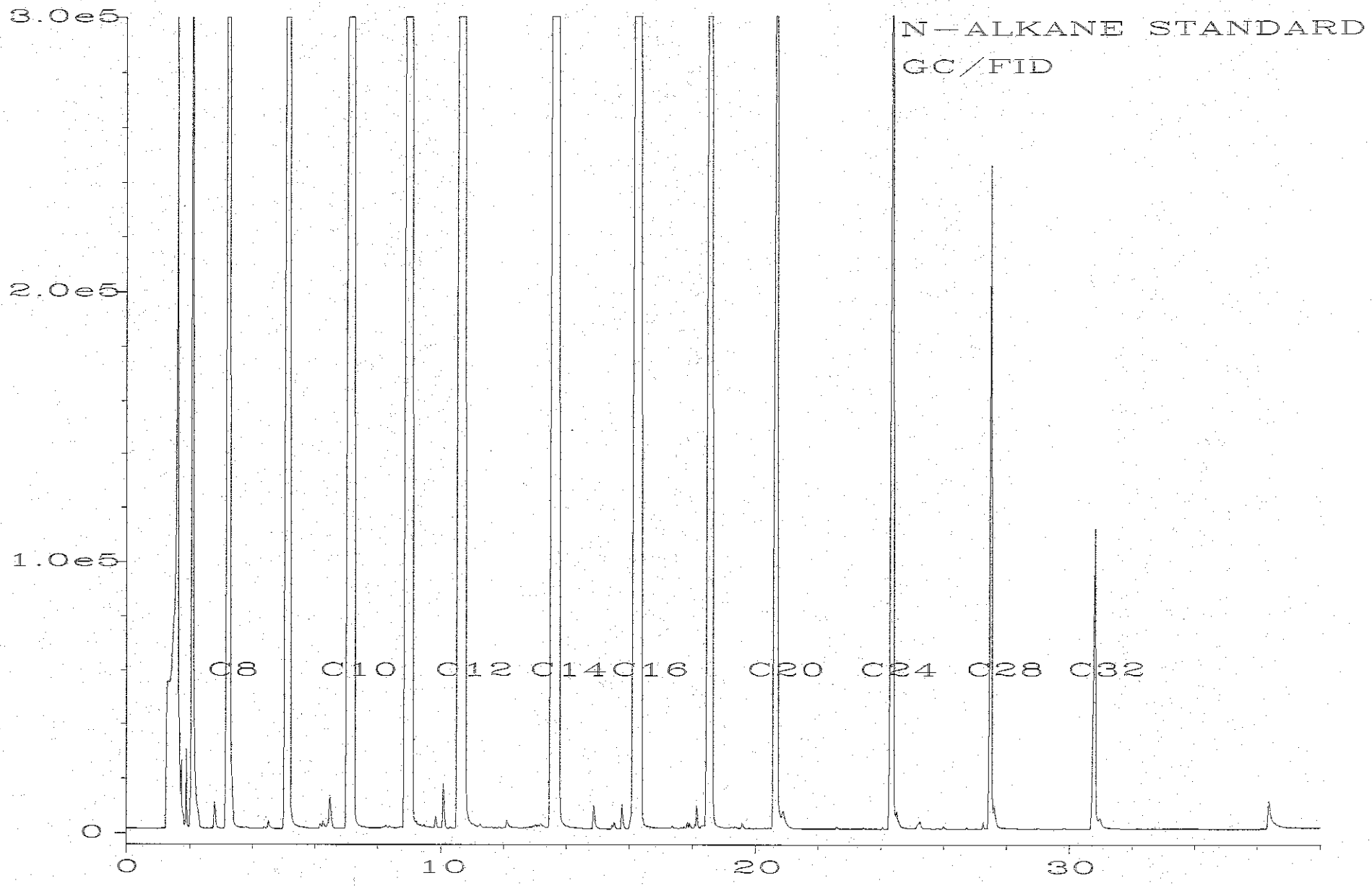

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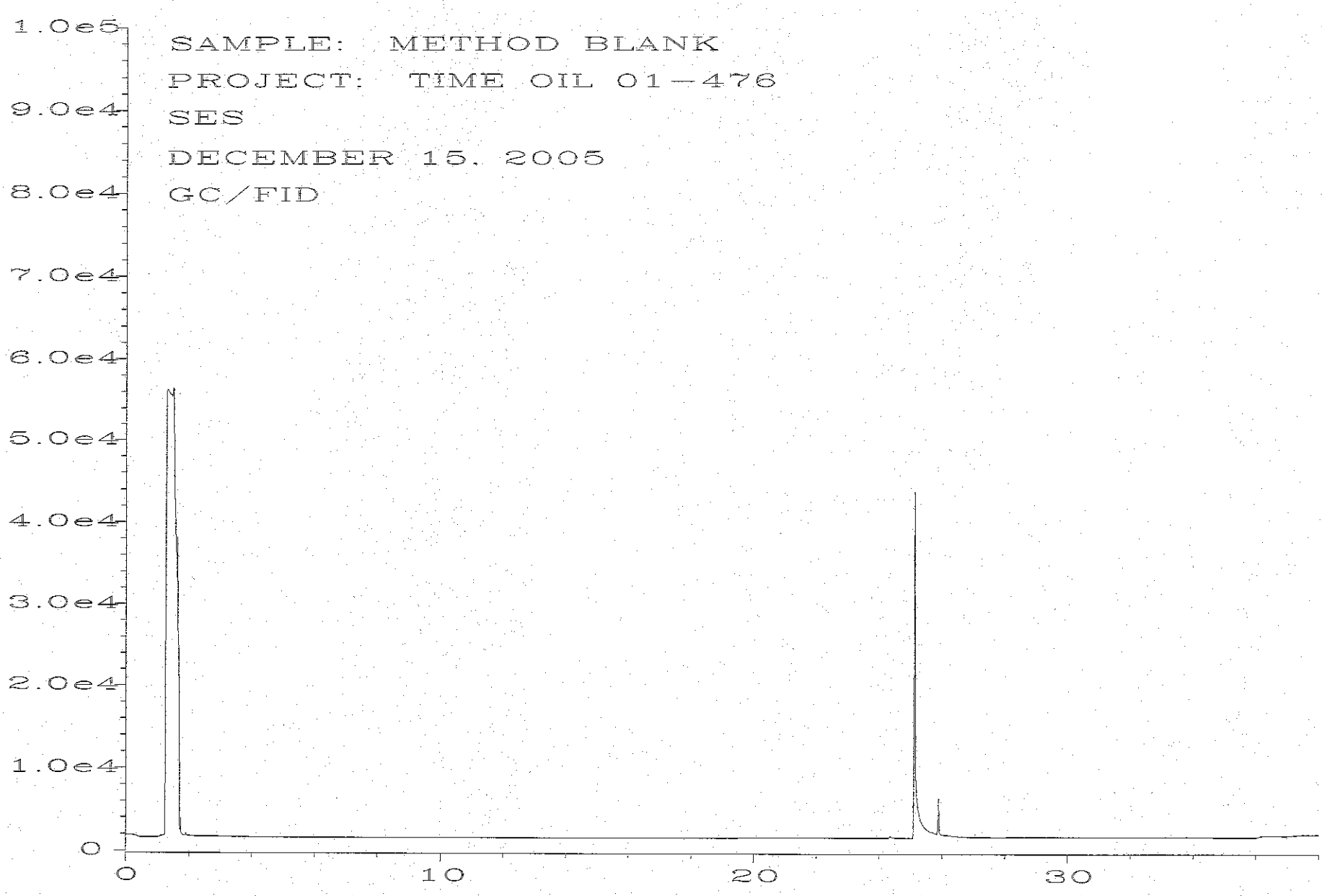

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512038

SAMPLE CHAIN OF CUSTODY

ME 12/05/05

C02

Send Report To JIM BURGESS

Company Sound Environmental Strategies

Address 2400 Airport Way S., Suite 200

City, State, ZIP Seattle, WA 98134-2020

Phone # (206) 306-1900 Fax # (206) 306-1907

SAMPLERS *(signature)*

PROJECT NAME/NO. TIME Ck 01-476

PO #

REMARKS

MOUNTLAKE TERRACE

Page # 1 of 1

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

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

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS							Notes
PPW113005	01	11/30/05	1600	Product	1													LAB TO COORDINATE
(Received w/Hel)																		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Larry Namba	Larry Namba	Sound Enviro. Strat.	12/02/05	12:00
Received by: Eric Young	Eric Young	FBI	12/3/05	12:00
Relinquished by:				
Received by:				

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