Transmittal

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Groundwater Monitoring Report, Fourth Quarter 2016

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March 31, 2017

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This document entitled, ***Groundwater Monitoring Report, Fourth Quarter 2016,*** was prepared by **Stantec Consulting Services Inc. (Stantec)** on behalf of **TOC Holdings Co. (TOC)** for specific application to TOC Facility No. 01-176 in Mountlake Terrace, Washington. Services conducted by Stantec for this project were conducted in accordance with the Environmental Services Contract between **HydroCon Environmental, LLC (HydroCon)** and Stantec. Any reliance on this document by a third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and HydroCon. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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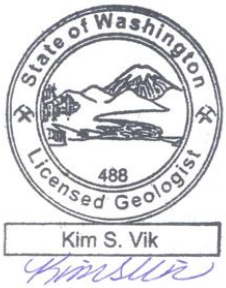

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Acronyms & Abbreviations

µg/L	micrograms per liter
1Q2017	First Quarter 2017
3Q2016	Third Quarter 2016
4Q2016	Fourth Quarter 2016
AO	Agreed Order
bgs	below ground surface
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
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.
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 Fourth Quarter 2016 (4Q2016) groundwater monitoring event 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 were performed by HydroCon Environmental, LLC (HydroCon) and data evaluation was performed by Stantec Consulting Services Inc. (Stantec), as a subconsultant to HydroCon.

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 the 4Q2016 groundwater monitoring activities with an evaluation of the field data and analytical results. The field dates of the 4Q2016 groundwater monitoring event were November 28 to December 9, 2016. Descriptions of the site, adjacent properties and site background are provided in ***Section 2.0.*** The geologic and hydrologic frameworks are described in ***Sections 3.0 and 4.0***, respectively. A summary of the remediation system status is provided in ***Section 5.0***. The scope of work for the 4Q2016 groundwater monitoring event 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 4Q2016 quarterly event are described in ***Section 8.0***, and a summary of the results and a list of conclusions for the 4Q2016 quarterly event 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 vacant commercial building (formerly occupied by Romio's restaurant through June 2014), 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 and immediately west of the TOC, TOC/Farmasonis and Drake properties.

The TOC Site is bordered by 242nd Street Southwest and commercial properties to the north; by 56th Avenue West to the west and residential properties further to the west; by residential properties to the east; and by the Herman Property and Mountlake Senior Property to the south. At the Mountlake Senior Property, construction began for an assisted living facility in February 2015 and continued for approximately one year; a 3-4 story assisted living is now present at this location. The Snohomish/King County boundary is defined by 244th Street, approximately 270 feet to the south of the Site boundary. Descriptions of properties surrounding and included with field activities conducted at the TOC Site are provided in Section 2.2.

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 and located immediately south of the Drake Property. 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 is located immediately south of the Herman Property and 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 2015, field investigations were conducted to determine the extent of petroleum contamination and 109 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 SoundEarth Strategies (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 in ***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-Site at 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 in ***Figure 3.***

At the time of the 4Q2016 quarterly field event, 103 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, and 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. As documented in the *Draft RI Report* (SES 2013), the regional geology consists of Pleistocene-age glacial till locally overlain by pockets of glacial recessional outwash sand (Galster and Laprade 1991).

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. Based on regional geologic unit interpretations for the area, the *Draft RI Report* states subsurface soil is interpreted to consist of the following geologic units, from youngest to oldest: artificial (anthropogenic) fill, Vashon glacial outwash deposits, Vashon glacial till and Vashon glacial outwash deposits (SES 2013).

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 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. For discussion of the monitoring event results in ***Sections 8.0 and 9.0***, 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.

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 outwash/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 is typically dry during the fourth quarter 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 in ***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 on the TOC Property 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 in ***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 in ***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 primary contaminant transport pathway at the TOC Site; however, as described in ***Section 5.0***, the remediation systems appear to be containing contaminant transport from migrating further downgradient.

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.

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 target remediation of residual petroleum-contaminated groundwater, soil vapor and LNAPL (if present) in the Intermediate Zone beneath the TOC Site. As shown in ***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 4Q2016 quarterly field event, 17 of the 22 remediation wells connected to the MPE remediation systems were actively operating. 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) • 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

**well did not operate during 4Q2016.*

*** The transfer pump at Unit 3 was non-operational during November & part of December during 4Q2016.*

Details related to the ongoing operation and maintenance of the MPE remediation systems are provided to Ecology in the quarterly *Remedial Systems Operation and Maintenance (O&M)* and in the *BiMonthly Progress Reports.*

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 20 additional wells were installed at the locations identified in the table below (for a total of 103 active monitoring and remediation wells). The 20 additional wells installed are referred to as the "post-IRAWP wells" and were incorporated into subsequent groundwater monitoring events.

Post-IRAWP Monitoring & Remediation Wells

Property Name	Well ID	
	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 • MW105 • MW108 • MW103 • MW106 • MW109 • MW104 • 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 at the request of TOC, Stantec added these wells to the scope of work for all groundwater monitoring events. Additional details describing 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 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 (two properties south of the TOC Site and directly south of the Herman Property). 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 at the request of TOC to also include the 20 post-IRAWP wells (described in ***Section 6.0***), as well as the four

wells located on the Shin/Choi Property. Six of the 109 wells installed on the TOC Site and adjacent properties have been decommissioned to date. Therefore, 103 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. Because 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. The results of the 2016 annual event were provided in the *2016 Annual Groundwater Monitoring Report* (Stantec 2016).

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 at the request of TOC to also include:

1) Measuring DTW/DTP levels from the 20 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 results of the 4Q2016 quarterly event are provided herein.

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

Sample Location/ Well ID [1]	Property	Sample Location/ Well ID [1]	Property	Sample Location/ Well ID [1]	Property
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 (identified as "RW") are either 2 or 4 inches in diameter.

During this 4Q2016 event, eight (8) of the 30 IRAWP-required wells and three (3) of the Additional wells were either dry or contained insufficient water to purge and/or sample. The eight (8) IRAWP wells included: MW10, MW15, MW20, MW31, MW33, MW45, MW50, and MW52. The three (3) Additional wells included: MW74, MW105, and MW109. To compensate for the 11 dry wells and to obtain additional contaminant distribution data, HydroCon sampled six (6) other wells at the TOC Property during this 4Q2016 event, as follows: MW11 (Intermediate Zone); MW22 (Shallow-Intermediate Zone Intersect); MW24 (Shallow-Intermediate Zone Intersect); MW29 (Shallow-Intermediate Zone Intersect); MW90 (Intermediate Zone); and MW91 (Intermediate Zone).

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

Additional Wells Sampled Quarterly

Shallow Zone Wells		Intermediate Zone Wells	
Well ID	**Property**	**Well ID** [1]	**Property**
MW54	TOC/Farmasonis	**MW57 (4" RW)**	TOC/Farmasonis
MW67	Drake	**MW73**	Shin/Choi
MW68	Drake	**MW74**	Shin/Choi
MW71*	Shin/Choi	**MW95 (4" RW)**	Drake
MW72*	Shin/Choi	**MW96 (4" RW)**	Drake
MW102*	Herman	**MW98 (4" RW)**	Drake
MW104	Herman	**MW101 (4" RW)**	Drake
MW106	Herman	**MW103**	Herman
		MW105	Herman
		MW107	Herman
		MW108	Herman
		MW109	Herman

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

**Sample is not collected from this location if product (LNAPL) is present.*

7.0 GROUNDWATER MONITORING FIELD METHODOLOGY

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

7.1 DTW/DTP Level Measurements

During the 4Q2016 field event, DTW/DTP levels were measured while the remediation systems were turned off to obtain information on baseline (i.e., non-pumping) groundwater flow patterns. DTW/DTP levels were also measured at all well locations 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 4Q2016 field event (on November 28, 2016). The systems were then turned off to allow groundwater levels to recharge and to collect the groundwater well samples, and system-off measurements were collected at the end of the 4Q2016 field event (on December 9, 2016).

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 to measure the DTW/DTP level. When more than one water level meter was selected for a field event, a baseline measurement was collected 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-diameter 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 (located in the 56th Avenue ROW) 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. Wells MW108 and MW109 (installed June 2015) were incorporated into the surveyed well network. The groundwater elevations were then contoured to identify groundwater flow direction and hydraulic gradients.

DTW/DTP level measurements and resulting groundwater elevations for the 4Q2016 event are discussed in ***Sections 8.1 through 8.3*** and presented in ***Table 1-1*** for system-off conditions and ***Table 1-2*** for system-on conditions.

7.2 Groundwater 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***, HydroCon collected groundwater samples from additional Shallow and Intermediate Zone well locations for the purpose of obtaining supplemental information regarding contaminant distribution.

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

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, groundwater samples were collected 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 (e.g., temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation-reduction potential) 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. Following well purging, 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, HydroCon monitored groundwater field parameters using a YSI™ or Quanta™ 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 the analytical laboratory under standard chain-of-custody protocols for laboratory analysis.

7.3 Laboratory Analyses

Groundwater samples were analyzed by Friedman & Bruya, Inc. (located in Seattle, Washington). 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 performed 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, m,p-Xylene, & o-Xylene (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	

Analysis Type	Analysis Method	Sample Location / Well ID
Polycyclic Aromatic Hydrocarbons (PAH)	EPA Method 8270SIM	
Lead (Total & Dissolved)	EPA Method 200.8	

7.4 QA/QC Sampling Methods & Data Quality Review

The scope of work for groundwater monitoring events includes collection and laboratory analyses of groundwater samples for quality assurance/quality control (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 for this 4Q2016 event is provided in the following sections. Analytical results for QA/QC samples collected during this event are included in the laboratory reports provided as ***Appendix A***.

7.4.1 Field Blanks

In accordance with the *Groundwater Monitoring Plan* provided as an attachment to the *Annual Groundwater Monitoring Report* (Stantec 2016), field blanks collected during each groundwater monitoring event 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 on the field days when the non-dedicated equipment is used (normally one per day); these samples are used to assess the thoroughness of the equipment decontamination process. During this event, HydroCon collected four (4) field equipment blanks (over a 3-day period). Water blanks consist of the clean water used to decontaminate the non-dedicated sampling equipment poured directly into sample containers. During this event, HydroCon collected one water blank to evaluate water quality of the laboratory-provided water used for equipment decontamination. In addition, trip blanks were supplied by the laboratory and accompanied the collected groundwater samples to the laboratory. The purpose of the trip blanks was to evaluate the potential of cross-contamination between the sample containers during transport of the samples from the field to the laboratory. The sample IDs for the field blanks collected during this 4Q2016 event are listed in the table below (with the collection date in parentheses).

Field Blanks Collected During 4Q2016 Event

Sample Type	4Q2016
Water Blank	▪ WB01 (12202016)
Trip Blank	▪ TB-01 (11302016) TB-02 (12062016) ▪ TB-03 (12082016) ▪ TB-04 (12082016)
Equipment/Rinsate Blank	▪ EB-01 (12062016) ▪ EB-02 (12072016) ▪ EB-03 (12072016) ▪ EB-04 (12082016)

7.4.2 Blind Field Duplicate Samples

Blind field duplicate samples were collected from the locations identified in the table provided below. Duplicate samples are typically collected from two or more wells located on the TOC Site and from one well located on the Herman or Drake Property. Duplicate sample locations are selected based on locations where concentrations of the constituents analyzed are expected to be elevated. Duplicate samples are collected to evaluate accuracy and precision and determine whether sample collection methods are reproducible. These samples were collected by the same method used to collect the primary sample. Analytical results are provided in the laboratory reports and presented on ***Tables 2-1 through 4-1***.

Fourth Quarter 2016

Sample Location	Property	Sampling Method	Sample ID	Duplicate Sample ID
MW48	56th Avenue ROW	Bailer	MW48	MLT-03
MW57	TOC/Farmasonis	Submersible Pump	MW57	MLT-01
MW73	Shin/Choi	Submersible Pump	MW73	MLT-06
MW69	Drake	Pneumatic Pump	MW69	MLT-04
MW104	Herman	Peristaltic Pump	MW104	MLT-05

8.0 GROUNDWATER MONITORING RESULTS

Groundwater monitoring results for the 4Q2016 quarterly groundwater monitoring event are organized by monitoring well categories based on groundwater zone and well screen intervals intersecting groundwater zones (see discussion in ***Section 4.0***). As previously mentioned, 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 table below. DTW/DTP level measurements and resulting groundwater elevations at individual well locations are presented in ***Table 1-1***. Groundwater elevation results are discussed in ***Section 8.2*** and shown on groundwater elevation contour maps (***Figures 4 through 6***).

A summary of DTW level measurement data and a list of wells where measurable LNAPL was observed for 4Q2016 are provided in the table below. LNAPL measurements are presented in ***Section 8.3***.

System-Off DTW/DTP Level Measurements

	4Q2016
Measurement Date	December 9, 2016
Total Dry Wells [(1)]	18
Total Inaccessible Wells [(2)]	4
Shallowest DTW Level Measurement	9.39 feet bgs (MW61, 56th Avenue ROW, Shallow Zone Well)
Deepest DTW Level Measurement	48.37 feet bgs (MW96, Drake Property, Intermediate Zone Well)
Shallow Zone Wells with Measurable LNAPL*	▪ MW71 (Shin/Choi) ▪ MW72 (Shin/Choi) ▪ MW102 (Herman)

**MW104 (another shallow zone well on Herman Property) exhibited a hydrocarbon odor but no sheen during this 4Q2016 event. Historically, MW104 has contained a sheen, measureable LNAPL, and/or has been dry. During this 4Q16 event, no sheen was observed and the well was sampled.*

[(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). Insufficient water = less than 2 feet of water in the well column.

[(2)] Includes wells that were inaccessible due to a vehicle or equipment blocking the wellhead, or in the case of MW78, the well cover could not be removed during either the system-off DTW/DTP measurement event or the groundwater sampling event. For the 4Q2016 event, the wells that were inaccessible include: MW04, MW78, MW84 and MW97.

As described in ***Section 7.1***, DTW/DTP levels are not measured in 2-inch-diameter remediation wells (MW24, MW27, MW29, MW31, MW41, MW69, and MW70) because the diameter of the water probe is too large to fit past the pump tubing/wiring. In addition, DTP/DTW levels are only measured in MW75 during the annual (first quarter) event because it is located in the 56th Avenue West right-of-way and requires traffic control. 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 (indicated as "dry" on the groundwater elevation contour maps provided as ***Figures 4 through 6***).
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 groundwater elevation contour maps).
3. Wellhead was inaccessible during the field event (indicated as "NM" on the groundwater elevation contour maps).
4. The well was not included in the scope of work for the measurement event, the well was inaccessible (e.g., car parked over well head), or the diameter of the water probe was too large to fit past pump tubing in 2-inch-diameter remediation wells (indicated as "NM" on the groundwater elevation contour maps).

8.2 Groundwater Elevations

Groundwater elevations were determined for this 4Q2016 event when the remediation systems were turned off in order to evaluate groundwater flow patterns during baseline (i.e., non-pumping) conditions. As previously mentioned in ***Section 7.1***, groundwater elevations for system-on conditions were also collected during this event from all accessible well locations to evaluate groundwater flow patterns during active remediation conditions. A discussion of observations for this 4Q2016 quarterly event is provided below for each groundwater zone.

8.2.1 Shallow Zone

Consistent with groundwater elevation data collected during previous events, groundwater flow in the Shallow Zone during this 4Q2016 event appears to be predominantly to the south-southeast, as shown in ***Figure 4***. A relatively consistent horizontal hydraulic gradient ranging from approximately 0.017 to 0.048 feet/feet during this 4Q2106 event is present across the Site and adjacent properties to the south with the maximum gradient occurring at the adjacent properties to the south (i.e., Drake and Herman Properties). Steepening of gradients observed during previous events in the southern portion of the TOC Property were not observed during 4Q2016, possibly related to seasonal variability in precipitation and infiltration rates.

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 this 4Q2016 field event, as shown in ***Figure 5a***. Horizontal hydraulic gradients ranging from approximately 0.02 to 0.4 feet/feet occur across the entire TOC Site and southern properties. 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. As groundwater moves downgradient and encounters higher permeability layers (e.g., gravels and sands), the horizontal hydraulic gradient flattens significantly.

Groundwater elevations based on DTW data collected while the remediation systems were operating are shown in ***Figure 5b***. Comparison of these data with the system-off data indicate that hydraulic control is effectively being achieved on the TOC Property, the north and central portions of the TOC/Farmasonis Property, and the northern portion of the Drake Property but is not as apparent on the central and southern portions of the Drake Property. ***Figure 5c and Table 1-3*** show the differences between the system-on and system-off groundwater elevations with positive values showing hydraulic influence and negative values indicating that the system-off elevations are lower than the system-on data and therefore, groundwater elevations are not influenced by the remediation systems.

8.2.3 Deep Zone

Groundwater flow in the Deep Zone appears to be generally to the south-southeast, consistent with prior data. The horizontal hydraulic gradient is relatively flat at approximately 0.005 feet/feet during this 4Q2016 quarterly event (likely because the wells are screened in high permeability material). Groundwater elevations for the monitoring wells located in the Deep Zone are shown in ***Figure 6***.

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. Because 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 contour 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 (15) 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, including this 4Q2016 event when the depth to water measurement equaled the depth of the well as measured during this quarter's

System-Off and System-On monitoring events. 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 in the three Shallow Zone monitoring wells identified below on the Shin/Choi and Herman Properties during this 4Q2016 quarterly event, consistent with previous events. Compared to last quarter (3Q2016), LNAPL decreased in thickness by approximately 0.5 foot at MW71 and increased in thickness by approximately 0.1 feet at MW72 and MW102. Similar to last quarter (3Q2016), only a hydrocarbon odor was detected during this 4Q2016 event at MW104 (located on the Herman Property). The table below provides LNAPL thicknesses measured at the three locations.

Measurable LNAPL in Shallow Zone Wells during Fourth Quarter 2016 Quarterly Event

Location/Well ID	Property	LNAPL Thickness in feet
MW71	Shin/Choi	2.73
MW72	Shin/Choi	2.05
MW102	Herman	0.87

8.4 Groundwater Quality Results

Analytical results for this 4Q2016 event are provided on ***Tables 2-1 through 4-1***. The types of laboratory analyses performed by Friedman & Bruya for the groundwater samples collected are described in ***Section 7.3***, and analytical reports for this quarterly event are provided in ***Appendix A***. 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 this 4Q2016 event is provided in ***Section 9.1***, followed by a list of conclusions in ***Section 9.2***.

8.4.1 Shallow Zone

The current Shallow Zone well network includes 20 active monitoring wells. 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, HydroCon collected samples from select Shallow Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are described in ***Section 6.2***.

The table below identifies sample concentrations that meet or exceed MTCA Method A cleanup levels during the 4Q2016 event. ***Tables 2-1 and 2-2*** summarize the analytical results for the groundwater samples collected from Shallow Zone wells. Distribution maps for GRPH and benzene concentrations in the Shallow Zone are provided as ***Figures 7 and 8*** for this event. The analytical results indicate that shallow zone concentrations do not exceed MTCA Method A levels for any locations on the TOC Site; exceedances are only observed south of the TOC Site on the Herman and Shin/Choi properties.

4Q2016 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 MW72 MW102 MW104*	Shin/Choi Shin/Choi Herman Herman	LNAPL [1] LNAPL [1] LNAPL [1] 56,000
DRPH [a]	**500**	MW104*	Herman	9,500
Benzene	**5**	MW71 MW72 MW102 MW104*	Shin/Choi Shin/Choi Herman Herman	LNAPL [1] LNAPL [1] LNAPL [1] 8.7
Toluene	**1,000**	MW104*	Herman	1,100
Ethylbenzene	**700**	MW104*	Herman	1,800
Total Xylenes	**1,000**	MW104*	Herman	8,700
Naphthalene	**160**	MW104*	Herman	410
Fluorene	**0.1**	MW104*	Herman	0.17
EDB	**0.01**	MW104*	Herman	0.111
Acenaphthene	**0.1**	MW104*	Herman	0.2

**Sheen or measureable LNAPL has been detected at MW104 in the past but not during this 4Q2016 or the prior 3Q2016 event; only a hydrocarbon odor was detected by HydroCon at MW104 during this 4Q2016 and the prior 3Q2016 event. At MW104 during 4Q2016, Oil Range Petroleum Hydrocarbons (ORPH) was detected at its MTCA Method A cleanup level of 500 ug/L.*

[a] The sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

[1] Samples were not collected from well location due to presence of product (LNAPL). Exceedance of MTCA cleanup levels is expected due to the presence of LNAPL.

8.4.2 Intermediate Zone

At the time of the 4Q2016 event, the Intermediate Zone well network included 62 active wells (18 of which serve as remediation wells). The scope of work defined in the IRAWP requires quarterly groundwater sampling of 28 of the 62 active wells in this zone. As previously discussed, in addition to sampling the required wells, HydroCon also sampled several other select Intermediate Zone wells for the purpose of obtaining additional information regarding contaminant distribution. Additional sampling locations are described in ***Section 6.2***.

The table below identifies sample concentrations that meet or exceed MTCA Method A cleanup levels during the quarterly event. ***Tables 3-1 and 3-2*** summarize the analytical results for the groundwater samples collected from Intermediate Zone wells. Distribution maps for GRPH and benzene concentrations in the Intermediate Zone are provided as ***Figures 9 and 10*** for this 4Q2016 event. The analytical results indicate that Intermediate Zone groundwater concentrations for GRPH, DRPH, and/or benzene exceed the MTCA Method A cleanup levels primarily in two isolated areas on the TOC Site: one near the western boundary of the TOC/Farmasonis and Drake Properties, including wells MW48 and MW57, and one in the southwestern portion of the Drake Property including well MW69. Other exceedances of these constituents plus the others shown in the table below are only found on the Shin/Choi property at MW73.

4Q2016 Analytical Results for Groundwater Samples Exceeding Cleanup Levels (Intermediate Zone)

Analyte	MTCA Method A Cleanup Level (µg/L)	Sample Location/ Well ID [1]	Property	Analytical Results (µg/L)
GRPH	**800 when benzene is present**	MW48 MW57 MW69 (2" RW) MW73	56th Ave ROW TOC/Farmasonis Drake Shin/Choi	10,000 4,600 8,500 75,000
DRPH [a]	**500**	MW69 (2" RW) MW73	Drake Shin/Choi	1,400J 4,100
Benzene	**5**	MW48 MW73	56th Ave ROW Shin/Choi	39 11,000
Total Xylenes	**1,000**	MW73	Shin/Choi	4,840
Ethylbenzene	**700**	MW73	Shin/Choi	1,500
MTBE	**20**	MW73	Shin/Choi	290
EDB	**0.01**	MW73	Shin/Choi	0.073J
Acenaphthene	**15**	MW73	Shin/Choi	0.14
Naphthalene	**160**	MW73	Shin/Choi	290

[a] The sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

J = 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 or based on data validation protocol.

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

Historically, MW74 has been dry or has contained LNAPL. During this 4Q2016, MW74 was nearly dry with an insufficient amount of water for purging or sampling; hence, MW74 was not sampled during this 4Q2016 event.

During this 4Q2016, MW73 exhibited a strong hydrocarbon odor.

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. GRPH and benzene concentrations in wells that intersect multiple groundwater zones are shown on the Intermediate Zone distribution maps provided as ***Figures 9 and 10*** for this 4Q2016 event.

8.4.4.1 Shallow-Intermediate Zone Intersect Wells

The current Shallow-Intermediate Zone intersect well network includes 14 active wells (four of which serve as remediation wells). 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; however, four wells (MW22, MW24, MW28, and MW29) were also selected by HydroCon for the purpose of obtaining additional information regarding contaminant distribution. During this 4Q2016 event, five of the six were sampled (MW28 was not sampled). As shown in ***Table 4-1***, the analytical results of the samples collected did not exceed MTCA Method A cleanup levels for 4Q2016. Because MTBE, EDC, EDB, and PAHs were not analyzed for any of these samples, a groundwater quality results table for common fuel additives is not provided for

this zone. Total and dissolved lead were analyzed at MW29 during 4Q2016: dissolved lead was detected at 2.18 micrograms per Liter (ug/L) but the concentration is below the dissolved lead MTCA Method A cleanup level of 15 ug/L; total lead was detected at 174 ug/L (above the total lead MTCA Method A cleanup of 15 ug/L).

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 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, trip blanks, and equipment/rinsate blanks are provided in the laboratory reports provided as ***Appendix A***.

9.0 SUMMARY OF RESULTS & CONCLUSIONS

A summary of the results and a list of conclusions for this 4Q2016 quarterly groundwater monitoring event are provided in ***Sections 9.1 and 9.2***, respectively.

9.1 Summary of 4Q2016 Results

9.1.1 DTW/DTP Level Measurements

- DTW level measurements ranged from 9.39 feet bgs for MW61 (a Shallow Zone well located within the 56th Avenue ROW) to 48.37 feet bgs for MW96 (an Intermediate Zone well located on the Drake 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). A hydrocarbon odor (but not a sheen or measureable product thickness) was detected at MW104 on the Herman Property, a well that historically has contained LNAPL.
- Comparison of system-on and system-off groundwater elevations indicate that the remediation systems on the TOC Property (Unit 1) and the TOC/Farmasonis Property (Unit 2) are providing effective hydraulic control, but to a lesser extent on the Drake Property (Unit 3).

9.1.2 Groundwater Quality

- **Shallow Zone:** Concentrations did not exceed MTCA Method A cleanup levels in any of the groundwater samples collected from the TOC Site. Locations of groundwater samples that exceeded MTCA cleanup levels during 4Q2016 are described below. Samples were not collected from MW71 and MW72 (located on the Shin/Choi Property) due to the presence of product in the wells.
    - As shown in ***Figures 7 and 8***, GRPH and benzene concentrations exceeding MTCA A cleanup levels were observed south of the TOC Site near the northern boundary of the Herman Property at MW104. Also, because LNAPL was observed in MW102 on the Herman Property and MW71 and MW72 on the Shin/Choi Property, the GRPH and benzene plume areas on ***Figures 7 and 8*** included these three locations.
    - In addition, DRPH, toluene, ethlybenzene, xylenes, EDB, fluorene and two PAHs (naphthalene and acenaphthene) exceeded MTCA A cleanup levels in the groundwater sample collected from MW104.
- **Intermediate Zone:** Concentrations exceeding MTCA Method A cleanup levels were detected in groundwater samples collected from the Intermediate Zone wells as described below.
    - As shown in ***Figures 9 and 10***, concentrations of GRPH and/or benzene exceeding MTCA cleanup levels were focused in the following areas:
        - Near MW48 (56th Avenue ROW) and MW57 (TOC/Farmasonis); – both wells are located adjacent to the property line shared by the TOC/Farmasonis and Drake Properties;
        - MW69 – Drake Property: located in the southwest portion of the property; and,

  - MW73 – Shin/Choi Property: located in the southwest portion of the property in the vicinity of the historic UST excavation area.

- Concentrations of other constituents exceeding MTCA Method A cleanup levels were focused in the following areas:
  - MW69 – Drake Property: The concentration of DRPH exceeded the cleanup level in the southwest portion of the property.
  - MW73 – Shin/Choi Property: Concentrations of DRPH, toluene, ethylbenzene, xylenes, MTBE, EDB, and two PAHs (acenaphthalene and naphthalene) exceeded cleanup levels.
- **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).
- **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 Conclusions

A list of conclusions based on the results from this 4Q2016 quarterly event is provided below:

- The overall direction of groundwater flow through the Shallow, Intermediate, and Deep Zones is toward the south-southeast, consistent with data from prior events.
- Shallow Zone groundwater impacts from petroleum hydrocarbons are not 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.
- 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 Stantec 2014/2015, and 2016 Annual Groundwater Monitoring Reports), 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 to the area on the west side of the Drake and TOC/Farmasonis property line. Additional impacts from petroleum hydrocarbons in the Intermediate Zone are observed on the Shin/Choi Property in the area near the Herman Property line and in the area of the historic UST excavation. 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 Shin/Choi Property), the Intermediate Zone impacts on the TOC Site appear to be separate from those on the Shin/Choi Property.

- Concentrations of GRPH decreased to less than MTCA Method A cleanup level at MW108 following two quarters of GRPH being above Method A cleanup level (1,600 and 4,800 ug/L during 2Q2016 and 3Q2016, respectively). Comparison of groundwater elevations vs GRPH concentrations since MW108 was installed in June 2015 does not reveal any particular pattern except for a possible delayed response of a higher concentration following a higher groundwater elevation (2Q2016) and a lower concentration following a lower groundwater elevation (4Q2016). A similar delayed response is apparent at nearby MW86. Comparison of the concentrations just north of the Drake-Herman property boundaries indicates significantly lower GRPH concentrations currently and historically than at MW108. Therefore, the impacts at MW108 do not appear to be related to impacts on the TOC Site. The somewhat elevated GRPH concentrations during 2Q2016 and 3Q2016 at this location could be related to recent exposure of petroleum-impacted soil on the east side of the Herman Property during construction activities on Mountlake Senior Property and subsequent increased infiltration and downward migration to the intermediate zone through the exposed soil.

- 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. The remediation systems on these properties continue to operate to remove contamination from these areas.

10.0 FUTURE GROUNDWATER MONITORING TASKS

Several groundwater monitoring wells in the IRAWP do not exhibit contaminant concentrations above cleanup levels, in part due to the progress of the remediation. As detailed in a memorandum to Ecology, dated January 12, 2017, 65 wells were proposed for elimination from the monitoring program based on the analysis presented in the memorandum. Approval of a reduced groundwater monitoring scope from 106 to 38 monitoring wells was provided in a letter from Ecology, dated March 28, 2017. Performance of additional groundwater monitoring is pending submittal and Ecology approval of a revised Groundwater Monitoring Work Plan for future annual and quarterly sampling events as a formal revision to the Agreed Order.

11.0 REFERENCES

Ecology 2007. Washington State Department of Ecology. *Table 720-1, Method A Cleanup Levels for Ground Water.* Model Toxics Control Act Regulation and Statute. Cleanup Regulation Chapter 173-340 WAC. October 12.

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

Ecology 2014. Washington State Department of Ecology. Comments provided to SES re: *Draft Remedial Investigation (RI) Report, TOC Holdings Co. Facility No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043*. January 3 (approximate).

EPA 2010. United States Environmental Protection Agency. *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*. Updated January 19.

Galster, R.W and W.T. Laprade (Galster and Laprade). 1991. "Geology of Seattle, Washington, United States of America." *Bulletin of the Association of Engineering Geologists.* v 28 (no. 3): p 235–302.

Lenhard and Parker 1990. Lenhard, R. J. and Parker, J. C. *Estimation of Free Hydrocarbon Volume from Fluid Levels in Monitoring Wells.* Groundwater, 28: 57–67. doi: 10.1111/j.1745-6584.1990.tb02229.x. January.

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

SES 2013. Sound Environmental Services. *Draft Remedial Investigation (RI) Report, TOC Holdings Co. Facility No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043*. November 27.

Stantec 2014 and 2015. Stantec Consulting Services Inc. *2014 and 2015 Annual Groundwater Monitoring Report, TOC Holdings Co. Facility No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043; dated September 17, 2014 and July 31, 2015,* respectively.

Stantec 2016. Stantec Consulting Services Inc. *2016 Annual Groundwater Monitoring Report, TOC Holdings Co. Facility No. 01-176, 24205 56th Avenue West, Mountlake Terrace, Washington 98043.* June 30.

Time Oil Company [sic] (Time Oil Co.) 1975. *Blueprint Drawing No. 1390: Conduits, Piping, Electrical Service, Lighting, Retaining Wall & Lot Drainage, Mountlake Terrace, Wash*. September 8.

WSDOT 2014. Washington State Department of Transportation. *Traffic Control Plan: Left and Center Lane Closure Two-Way Left Turn Lane Standard Plan, K-26 40-01*. Revised March 30.

Tables

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	10/2/2009	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	12/9/2016	10:30	358.71	10.84	347.87	0	
MW03	TOC	12/9/2016	10:35	361.85	12.77	349.08	0	
MW04	56th Ave ROW	12/9/2016	10:40	361.96	NM	NM	NM	Truck parked on top
MW05	242nd St ROW	12/9/2016	16:50	363.70	12.17	351.53	0	
MW06	TOC	12/9/2016	10:20	358.98	11.94	347.04	0	
MW07	TOC/Farmasonis	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	12/9/2016	10:50	360.34	22.80	338.54	0	
MW09	TOC	12/9/2016	10:32	360.32	25.65	335.67	0	335.67?? DTW field sheet=25.65', not 26.65'
MW10	TOC	12/9/2016	10:25	357.91	32.63	325.28	0	Screen diameter tapers = 2"
MW11 (4" RW)	TOC	12/9/2016	10:41	362.34	24.14	338.20	0	
MW12	56th Ave ROW	12/9/2016	15:07	357.65	10.78	346.87	0	
MW13	56th Ave ROW	12/9/2016	15:06	357.34	41.53	DRY	DRY	DTW measure.=below bottom of well
MW14	TOC/Farmasonis	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15	TOC	12/9/2016	10:42	357.56	DRY	DRY	DRY	Dry at ~37' below top of casing (= top of pump)
MW16	242nd St ROW	12/9/2016	10:45	365.18	47.70	317.48	0	Dry (DTW = well TD)
MW17	TOC/Farmasonis	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	12/9/2016	10:24	357.91	23.70	334.21	0	
MW19	TOC	12/9/2016	10:27	358.86	12.34	346.52	0	Screen diameter tapers
MW20	TOC	12/9/2016	10:24	359.93	33.83	326.10	0	
MW21	TOC	4/16/2012	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	12/9/2016	10:26	358.52	29.20	329.32	0	
MW23	TOC	12/9/2016	10:28	357.08	39.21	317.87	0	DRY (only ~0.15' water column)
MW24 (4" RW)	TOC	12/9/2016	10:34	361.97	29.79	332.18	0	
MW25	TOC	12/9/2016	10:31	358.70	27.78	330.92	0	
MW26	TOC	12/9/2016	10:47	363.81	47.93	315.88	0	
MW27 (2" RW)	TOC	12/9/2016	0.45	362.51	NM	NM	NM	
MW28	TOC	12/9/2016	10:23	358.41	27.75	330.66	0	
MW29 (2" RW)	TOC	12/9/2016	0.43	358.93	NM	NM	NM	
MW30	TOC/Farmasonis	12/9/2016	10:15	356.46	40.97	315.49	0	
MW31 (2" RW)	TOC/Farmasonis	12/9/2016	0.43	357.08	NM	NM	NM	
MW32 (4" RW)	TOC	12/9/2016	10:37	359.95	24.79	335.16	0	
MW33	TOC	12/9/2016	10:24	358.24	39.36	318.88	0	DRY. DTW = below well TD (by 5')
MW34	TOC	12/9/2016	10:18	357.88	11.15	346.73	0	
MW35	TOC	12/9/2016	10:19	358.46	39.89	318.61	0	DRY. DTW = below well TD
MW36	TOC	12/9/2016	10:20	357.98	42.45	315.53	0	
MW37	TOC	12/9/2016	10:21	358.90	23.45	335.45	0	
MW38	TOC	12/9/2016	10:43	364.42	18.73	345.69	0	
MW39	TOC/Farmasonis	12/9/2016	15:54	355.88	40.88	315.00	0	
MW40	TOC/Farmasonis	12/9/2016	16:20	356.32	41.03	315.29	0	
MW41 (2" RW)	TOC/Farmasonis	12/9/2016	0.68	356.14	NM	NM	NM	
MW42	TOC/Farmasonis	12/9/2016	14:35	356.43	39.88	316.55	0	DRY. DTW = well TD
MW43	56th Ave ROW	12/9/2016	10:54	358.84	34.59	324.25	0	
MW44	56th Ave ROW	12/9/2016	14:41	354.93	38.65	DRY	DRY	DRY. 0.05' water column
MW45	56th Ave ROW	12/9/2016	14:54	356.49	39.43	317.06	0	DRY. Only ~0.25' water column
MW46	56th Ave ROW	12/9/2016	10:59	357.00	43.26	313.74	0	DRY. Only ~0.15' water column
MW47	56th Ave ROW	12/9/2016	10:55	355.47	41.67	313.80	0	DRY. Only ~0.03' water column
MW48	56th Ave ROW	12/9/2016	11:02	355.41	42.18	313.23	0	
MW49	56th Ave ROW	12/9/2016	14:40	356.44	43.20	313.24	0	
MW50	56th Ave ROW	12/9/2016	14:41	361.99	36.05	325.94	0	
MW51	56th Ave ROW	12/9/2016	13:37	352.66	41.29	311.42	0	
MW52	56th Ave ROW	12/9/2016	11:03	355.61	43.45	312.16	0	DRY. Only ~0.35' water column
MW53	56th Ave ROW	12/9/2016	10:53	359.85	43.51	316.34	0	
MW54	TOC/Farmasonis	12/9/2016	15:20	357.93	11.71	346.22	0	
MW55	56th Ave ROW	12/9/2016	11:00	356.50	43.64	312.86	0	
MW56	TOC/Farmasonis	12/9/2016	15:45	357.49	43.97	313.52	0	
MW57 (4" RW)	TOC/Farmasonis	12/9/2016	14:50	356.42	42.80	313.62	0	
MW58	TOC/Farmasonis	12/9/2016	14:30	355.40	43.02	312.38	0	
MW59	TOC/Farmasonis	12/9/2016	15:46	356.51	43.15	313.36	0	
MW60	56th Ave ROW	12/9/2016	10:55	358.58	43.62	314.96	0	
MW61	56th Ave ROW	12/9/2016	10:57	357.17	9.39	347.78	0	
MW62	56th Ave ROW	12/9/2016	10:52	360.50	11.12	349.38	0	
MW63	56th Ave ROW	12/9/2016	14:34	355.11	42.71	312.40	0	
MW64	56th Ave ROW	12/9/2016	14:36	355.18	40.54	314.64	0	
MW65	Drake	12/9/2016	14:07	353.08	41.30	311.78	0	
MW66	TOC/Farmasonis	12/9/2016	15:50	355.75	42.24	313.51	0	
MW67	Drake	12/9/2016	13:40	355.73	13.31	342.42	0	
MW68	Drake	12/9/2016	14:00	355.11	13.56	341.55	0	

TABLE 1-1
Depth-to-Groundwater Level and Product Thickness Measurements (System Off)
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW69 (2" RW)	Drake	12/9/2016	0.57	353.76	NM	NM	NM	
MW70 (2" RW)	Drake	12/9/2016	0.46	354.17	NM	NM	NM	
MW71	Shin/Choi	12/9/2016	13:20	347.92	16.00	334.11	2.74	DTP = 13.26'
MW72	Shin/Choi	12/9/2016	13:15	347.38	18.39	330.63	2.05	DTP = 16.34'
MW73	Shin/Choi	12/9/2016	13:07	347.33	39.07	308.26	0	
MW74	Shin/Choi	12/9/2016	13:10	347.94	38.70	309.24	0	DRY. ~0.7' water column
MW75	56th Ave ROW	12/9/2016	NA	354.78	NM	NM	NM	Gauged only in Q1 Annual event
MW76	Drake	12/9/2016	14:27	351.69	39.39	312.30	0	
MW77	Drake	12/9/2016	14:25	349.95	38.50	311.45	0	
MW78	Drake	12/9/2016	NA	349.90	NM	NM	NM	Sealed Closed
MW79	TOC/Farmasonis	12/9/2016	16:14	353.98	12.18	341.80	0	
MW80	TOC/Farmasonis	12/9/2016	16:10	353.83	14.11	339.72	0	
MW81	TOC/Farmasonis	12/9/2016	16:09	355.60	12.46	313.14	0	
MW82	TOC/Farmasonis	12/9/2016	17:00	355.59	27.48	328.11	0	
MW83	TOC/Farmasonis	11/21/2011	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	12/9/2016	13:30	353.75	NM	NM	NM	Car parked on top
MW85	Drake	12/9/2016	14:11	351.28	39.76	311.52	0	
MW86	Drake	12/9/2016	14:10	352.72	41.29	311.43	0	
MW87	Drake	12/9/2016	14:21	349.72	38.25	311.47	0	
MW88	Drake	12/9/2016	14:28	351.63	18.69	332.94	0	
MW89	Drake	12/9/2016	13:31	353.86	42.18	311.68	0	
MW90 (4" RW)	TOC	12/9/2016	10:40	362.87	28.25	334.62	0	
MW91 (4" RW)	TOC	12/9/2016	10:37	362.67	25.35	337.32	0	
MW92 (4" RW)	TOC/Farmasonis	12/9/2016	16:30	357.91	44.25	313.66	0	Dry. 0.85' water column on top of pump
MW93 (4" RW)	TOC/Farmasonis	12/9/2016	16:32	355.97	42.24	313.73	0	Dry. Only 0.05' water column on top of pump
MW94 (4" RW)	TOC/Farmasonis	12/9/2016	15:30	357.94	40.00	317.94	0	Dry. ~0.45' water column on top of pump
MW95 (4" RW)	Drake	12/9/2016	13:40	354.67	42.65	312.02	0	
MW96 (4" RW)	Drake	12/9/2016	14:40	356.00	48.37	307.63	0	
MW97 (4" RW)	Drake	12/9/2016	NA	354.29	NM	NM	0	Car parked on top
MW98 (2" RW)	Drake	12/9/2016	13:55	354.75	NM	NM	NM	System well 2"
MW99 (4" RW)	Drake	12/9/2016	14:02	353.58	38.80	314.78	0	
MW100	TOC/Farmasonis	12/9/2016	16:01	355.75	19.81	335.94	0	
MW101 (4" RW)	Drake	12/9/2016	14:09	352.05	40.44	311.61	0	
MW102	Herman	12/9/2016	13:27	352.39	16.87	336.22	0.87	DTP = 16.00'
MW103	Herman	12/9/2016	13:27	352.21	42.86	309.35	0	
MW104	Herman	12/9/2016	13:25	353.00	14.51	338.49	0	
MW105	Herman	12/9/2016	13:20	353.05	41.91	311.14	0	DRY. ~0.8' water column
MW106	Herman	12/9/2016	15:10	349.24	12.24	337.00	0	
MW107	Herman	12/9/2016	13:11	349.56	39.31	310.25	0	
MW108	Herman	12/9/2016	15:22	351.09	39.82	311.27	0	
MW109	Herman	12/9/2016	13:15	353.35	40.70	312.65	0	DRY. ~0.3' water column

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 Hydrocarbo
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 Quarter 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Well type	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW01	TOC	Abandoned	10/2/2009	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	Monitoring Well	11/28/2016	14:52	358.71	11.33	347.38	0	
MW03	TOC	Monitoring Well	11/28/2016	14:59	361.85	15.12	346.73	0	
MW04	56th Ave ROW	Monitoring Well	11/28/2016	15:09	361.96	NM	NM	NM	Car parked on top
MW05	242nd St ROW	Monitoring Well	11/28/2016	15:08	363.70	13.58	350.12	0	
MW06	TOC	Monitoring Well	11/28/2016	14:43	358.98	14.67	344.31	0	DRY. Only ~0.6' water column
MW07	TOC/Farmasonis	NA	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	Monitoring Well	11/28/2016	15:11	360.34	26.26	334.08	0	
MW09	TOC	Monitoring Well	11/28/2016	14:56	360.32	30.65	329.67	0	
MW10	TOC	Monitoring Well	11/28/2016	14:51	357.91	38.12	319.79	0	Well dia. = 4", screen tapers = 2"; DRY (~0.2' H2O)
MW11 (4" RW)	TOC	4" Remediation Well	11/28/2016	15:00	362.34	32.75	329.59	0	
MW12	56th Ave ROW	Monitoring Well	11/28/2016	15:21	357.65	11.90	345.75	0	
MW13	56th Ave ROW	Monitoring Well	11/28/2016	15:22	357.34	41.46	DRY	DRY	DRY
MW14	TOC/Farmasonis	NA	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW15	TOC	Monitoring Well	11/28/2016	14:39	357.56	41.95	DRY	DRY	DRY (DTW measure=below bottom of casing)
MW16	242nd St ROW	Monitoring Well	11/28/2016	15:07	365.18	47.69	DRY	DRY	DRY
MW17	TOC/Farmasonis	NA	11/29/2004	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	4" Remediation Well	11/28/2016	14:45	357.91	DRY	DRY	DRY	DRY at top of pump (~28.7' below top of casing)
MW19	TOC	Monitoring Well	11/28/2016	14:50	358.86	13.69	344.17	0	
MW20	TOC	Monitoring Well	11/28/2016	14:53	359.93	39.51	320.42	0	DRY. Only ~0.6' water column
MW21	TOC	NA	4/16/2012	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	Monitoring Well	11/28/2016	14:49	358.52	30.08	328.44	0	
MW23	TOC	Monitoring Well	11/28/2016	14:38	357.08	39.17	317.91	0	
MW24 (4" RW)	TOC	4" Remediation Well	11/28/2016	14:57	361.97	33.33	328.64	0	
MW25	TOC	Monitoring Well	11/28/2016	14:55	358.70	38.75	320.15	0	DRY (DTW measure=below bottom of casing)
MW26	TOC	Monitoring Well	11/28/2016	15:09	363.81	48.33	315.48	0	
MW27 (2" RW)	TOC	2" Remediation Well	11/28/2016	NM	362.51	NM	NM	NM	2"
MW28	TOC	Monitoring Well	11/28/2016	14:47	358.41	29.03	329.38	0	DRY. Only ~1' water column
MW29 (2" RW)	TOC	2" Remediation Well	11/28/2016	NM	358.93	NM	NM	NM	2"
MW30	TOC/Farmasonis	Monitoring Well	11/28/2016	14:36	356.46	41.75	314.71	0	
MW31 (2" RW)	TOC/Farmasonis	2" Remediation Well	11/28/2016	NM	357.08	NM	NM	NM	2"
MW32 (4" RW)	TOC	4" Remediation Well	11/28/2016	14:54	359.95	29.08	330.87	0	
MW33	TOC	Monitoring Well	11/28/2016	14:48	358.24	34.35	323.89	0	DRY. Only 0.25' water column
MW34	TOC	Monitoring Well	11/28/2016	14:40	357.88	10.21	347.67	0	
MW35	TOC	Monitoring Well	11/28/2016	14:41	358.46	39.69	321.77	0	DRY. Only 0.1' water column
MW36	TOC	Monitoring Well	11/28/2016	14:42	357.98	42.82	315.16	0	DRY. Only ~0.9' water column
MW37	TOC	Monitoring Well	11/28/2016	14:44	358.90	29.76	329.14	0	
MW38	TOC	Monitoring Well	11/28/2016	15:06	364.42	23.40	341.02	0	
MW39	TOC/Farmasonis	Monitoring Well	11/28/2016	14:02	355.88	41.66	314.22	0	
MW40	TOC/Farmasonis	Monitoring Well	11/28/2016	15:32	356.32	41.73	314.59	0	
MW41 (2" RW)	TOC/Farmasonis	2" Remediation Well	11/28/2016	15:33	356.14	NM	NM	NM	2"
MW42	TOC/Farmasonis	Monitoring Well	11/28/2016	15:35	356.43	39.42	317.01	0	DRY. Only ~0.05' water column
MW43	56th Ave ROW	Monitoring Well	11/28/2016	15:14	358.84	39.92	324.42	0	
MW44	56th Ave ROW	Monitoring Well	11/28/2016	15:42	354.93	38.62	DRY	DRY	DRY. Only ~0.1' water column
MW45	56th Ave ROW	Monitoring Well	11/28/2016	16:52	356.49	39.42	317.07	0	DRY. Only ~0.1' water column
MW46	56th Ave ROW	Monitoring Well	11/28/2016	15:17	357.00	43.22	313.78	0	DRY. Only ~0.2' water column
MW47	56th Ave ROW	Monitoring Well	11/28/2016	15:19	355.47	41.65	DRY	DRY	DRY. Only ~0.05' water column
MW48	56th Ave ROW	Monitoring Well	11/28/2016	15:37	355.41	43.01	312.40	0	
MW49	56th Ave ROW	Monitoring Well	11/28/2016	16:50	356.44	43.97	312.47	0	
MW50	56th Ave ROW	Monitoring Well	11/28/2016	13:10	361.99	37.61	323.78	0	DRY; small water column
MW51	56th Ave ROW	Monitoring Well	11/28/2016	16:23	352.66	41.26	311.40	0	
MW52	56th Ave ROW	Monitoring Well	11/28/2016	15:20	355.61	42.85	312.76	0	DRY. Only ~1' water column
MW53	56th Ave ROW	Monitoring Well	11/28/2016	15:13	359.85	44.55	315.30	0	
MW54	TOC/Farmasonis	Monitoring Well	11/28/2016	15:24	357.93	13.01	344.92	0	
MW55	56th Ave ROW	Monitoring Well	11/28/2016	15:17	356.50	39.98	316.52	0	
MW56	TOC/Farmasonis	Monitoring Well	11/28/2016	15:25	357.49	44.60	312.89	0	
MW57 (4" RW)	TOC/Farmasonis	4" Remediation Well	11/28/2016	15:37	356.42	42.37	314.05	0	42.37' = top of pump; should be entered "DRY"?
MW58	TOC/Farmasonis	Monitoring Well	11/28/2016	15:33	355.40	43.08	312.32	0	
MW59	TOC/Farmasonis	Monitoring Well	11/28/2016	15:27	356.51	43.69	312.82	0	
MW60	56th Ave ROW	Monitoring Well	11/28/2016	15:15	358.58	44.72	313.86	0	
MW61	56th Ave ROW	Monitoring Well	11/28/2016	15:16	357.17	9.87	347.30	0	
MW62	56th Ave ROW	Monitoring Well	11/28/2016	15:12	360.50	10.29	350.21	0	
MW63	56th Ave ROW	Monitoring Well	11/28/2016	15:40	355.11	42.94	312.17	0	
MW64	56th Ave ROW	Monitoring Well	11/28/2016	15:39	355.18	41.01	314.17	0	
MW65	Drake	Monitoring Well	11/28/2016	15:57	353.08	41.17	311.91	0	
MW66	TOC/Farmasonis	Monitoring Well	11/28/2016	15:30	355.75	42.88	312.87	0	
MW67	Drake	Monitoring Well	11/28/2016	15:44	355.73	14.93	340.80	0	
MW68	Drake	Monitoring Well	11/28/2016	15:52	355.11	14.54	340.57	0	
MW69 (2" RW)	Drake	2" Remediation Well	11/28/2016	15:51	353.76	NM	NM	NM	2" and Car parked on top
MW70 (2" RW)	Drake	2" Remediation Well	11/28/2016	NM	354.17	NM	NM	NM	2"
MW71	Shin/Choi	Monitoring Well	11/28/2016	16:42	347.92	15.99	334.11	2.73	Prod.
MW72	Shin/Choi	Monitoring Well	11/28/2016	16:47	347.38	18.39	330.63	2.05	Prod.

TABLE 1-2
Depth-to-Groundwater Level and Product Thickness Measurements (System On)
Second Quarter 2015
TOC Facility #01-176; Mountlake Terrace, Washington

Well Identifier (a)	Property	Well type	Date	Time (24:00)	Reference Elevation (feet) (b)	DTW (feet) (c)	Groundwater Elevation (feet) (d, e)	Product (LNAPL) Thickness (feet)	Notes / Observations
MW73	Shin/Choi	Monitoring Well	11/28/2016	16:45	347.33	39.02	308.31	0	
MW74	Shin/Choi	Monitoring Well	11/28/2016	16:40	347.94	38.93	309.01	0	DRY. ~0.55' water column
MW75	56th Ave ROW	Monitoring Well	11/28/2016	NM	354.78	NM	NM	NM	Gauged only in Q1 Annual event
MW76	Drake	Monitoring Well	11/28/2016	16:07	351.69	39.80	311.89	0	
MW77	Drake	Monitoring Well	11/28/2016	16:04	349.95	38.29	311.66	0	
MW78	Drake	Monitoring Well	11/28/2016	NM	349.90	NM	NM	NM	Sealed Closed
MW79	TOC/Farmasonis	Monitoring Well	11/28/2016	14:31	353.98	14.89	339.09	0	
MW80	TOC/Farmasonis	Monitoring Well	11/28/2016	14:30	353.83	17.05	336.78	0	
MW81	TOC/Farmasonis	Monitoring Well	11/28/2016	13:59	355.60	43.15	312.45	0	
MW82	TOC/Farmasonis	Monitoring Well	11/28/2016	14:32	355.59	29.63	325.96	0	DRY. Only 0.27' water column
MW83	TOC/Farmasonis	NA	11/21/2011	NA	NA	NA	NA	NA	**WELL DECOMMISSIONED (REPLACED WITH MW100)**
MW84	Drake	Monitoring Well	11/28/2016	15:48	353.75	42.04	311.71	0	
MW85	Drake	Monitoring Well	11/28/2016	16:00	351.28	39.60	311.68	0	
MW86	Drake	Monitoring Well	11/28/2016	15:59	352.72	40.98	311.74	0	
MW87	Drake	Monitoring Well	11/28/2016	16:06	349.72	38.45	311.27	0	
MW88	Drake	Monitoring Well	11/28/2016	16:10	351.63	22.17	329.46	0	
MW89	Drake	Monitoring Well	11/28/2016	15:49	353.86	42.14	311.72	0	
MW90 (4" RW)	TOC	4" Remediation Well	11/28/2016	15:02	362.87	35.15	327.72	0	
MW91 (4" RW)	TOC	4" Remediation Well	11/28/2016	14:58	362.67	32.50	330.17	0	
MW92 (4" RW)	TOC/Farmasonis	4" Remediation Well	11/28/2016	15:22	357.91	44.69	313.22	0	45.1'=top of pump (~0.4' water)
MW93 (4" RW)	TOC/Farmasonis	4" Remediation Well	11/28/2016	15:29	355.97	42.09	313.88	0	42.09' = top of pump
MW94 (4" RW)	TOC/Farmasonis	4" Remediation Well	11/28/2016	15:24	357.94	40.58	317.36	0	40.58' = top of pump
MW95 (4" RW)	Drake	4" Remediation Well	11/28/2016	15:46	354.67	42.40	312.27	0	
MW96 (4" RW)	Drake	4" Remediation Well	11/28/2016	15:37	356.00	39.73	316.27	0	
MW97 (4" RW)	Drake	4" Remediation Well	11/28/2016	15:54	354.29	41.25	313.04	0	
MW98 (2" RW)	Drake	4" Remediation Well	11/28/2016	NM	354.75	NM	NM	NM	2"
MW99 (4" RW)	Drake	4" Remediation Well	11/28/2016	NM	353.58	NM	NM	NM	Car parked on top
MW100	TOC/Farmasonis	Monitoring Well	11/28/2016	13:58	355.75	19.84	335.91	0	
MW101 (4" RW)	Drake	4" Remediation Well	11/28/2016	15:57	352.05	40.13	311.92	0	
MW102	Herman	Monitoring Well	11/28/2016	16:32	352.39	16.86	336.23	0.87	DTP = 15.99'
MW103	Herman	Monitoring Well	11/28/2016	16:31	352.21	43.13	309.08	0	
MW104	Herman	Monitoring Well	11/28/2016	16:28	353.00	14.50	338.50	0	
MW105	Herman	Monitoring Well	11/28/2016	16:26	353.05	41.60	311.45	0	DRY. ~1.1' water column
MW106	Herman	Monitoring Well	11/28/2016	16:35	349.24	11.92	337.32	0	
MW107	Herman	Monitoring Well	11/28/2016	16:34	349.56	39.10	310.46	0	
MW108	Herman	Monitoring Well	11/28/2016	16:29	351.09	39.62	311.47	0	
MW109	Herman	Monitoring Well	11/28/2016	16:24	353.35	40.70	312.65	0	DRY. ~0.3' water column

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 1-3
Comparison of System-Off and System-On Groundwater Elevations
Fourth Quarter 2016
TOC Facility #01-176; Mountlake Terrace, Washington

	Property	Groundwater Zone	Groundwater Elevation - System-Off (feet)	Groundwater Elevation - System-On (feet)	System Off-System On (feet)	Notes / Observations
MW01	TOC	NA	NA	NA		**WELL DECOMMISSIONED 10/02/2009**
MW02	TOC	Shallow	347.87	347.38	0.49	
MW03	TOC	Shallow	349.08	346.73	2.35	
MW04	56th Ave ROW	Shallow	NM	NM		Car parked over well
MW05	242nd St ROW	Shallow	351.53	350.12	1.41	
MW06	TOC	Shallow	347.04	344.31	2.73	
MW07	TOC/Farmasonis	NA	NA	NA		**WELL DECOMMISSIONED 11/29/2004**
MW08	56th Ave ROW	Shallow-Intermediate	338.54	334.08	4.46	
MW09	TOC	Shallow-Intermediate	334.67	329.67	5.00	
MW10	TOC	Intermediate	325.28	DRY		
MW11 (4" RW)	TOC	Intermediate	338.20	329.59	8.61	
MW12	56th Ave ROW	Shallow	346.87	345.75	1.12	
MW13	56th Ave ROW	Intermediate	DRY	DRY		
MW14	TOC/Farmasonis	NA	NA	NA		**WELL DECOMMISSIONED 11/29/2004**
MW15	TOC	Intermediate	NM	DRY		
MW16	242nd St ROW	Intermediate-Deep	DRY	DRY		
MW17	TOC/Farmasonis	NA	NA	NA		**WELL DECOMMISSIONED 11/29/2004**
MW18 (4" RW)	TOC	Shallow-Intermediate	334.21	NM		
MW19	TOC	Shallow	346.52	345.17	1.35	
MW20	TOC	Intermediate	326.10	DRY		
MW21	TOC	NA	NA	NA		**WELL DECOMMISSIONED 04/16/2012**
MW22	TOC	Shallow-Intermediate	329.32	328.44	0.88	
MW23	TOC	Intermediate	317.87	317.91	-0.04	
MW24 (2" RW)	TOC	Shallow-Intermediate	332.18	328.64	3.54	
MW25	TOC	Intermediate	330.92	DRY		
MW26	TOC	Deep	315.88	315.48	0.40	
MW27 (2" RW)	TOC	Shallow-Intermediate	NM	NM		
MW28	TOC	Shallow-Intermediate	330.66	329.38	1.28	
MW29 (2" RW)	TOC	Shallow-Intermediate	NM	NM		
MW30	TOC/Farmasonis	Deep	315.49	314.71	0.78	
MW31 (2" RW)	TOC/Farmasonis	Intermediate	NM	NM		
MW32 (4" RW)	TOC	Intermediate	335.16	330.87	4.29	
MW33	TOC	Intermediate	DRY	DRY		
MW34	TOC	Shallow	346.73	347.64	-0.91	
MW35	TOC	Intermediate	DRY	DRY		
MW36	TOC	Intermediate	315.53	DRY		
MW37	TOC	Shallow-Intermediate	335.45	329.14	6.31	
MW38	TOC	Shallow-Intermediate	345.69	341.02	4.67	
MW39	TOC/Farmasonis	Deep	315.00	314.22	0.78	
MW40	TOC/Farmasonis	Deep	315.29	314.59	0.70	
MW41 (2" RW)	TOC/Farmasonis	Intermediate	NM	NM		
MW42	TOC/Farmasonis	Intermediate	DRY	DRY	#VALUE!	
MW43	56th Ave ROW	Shallow-Intermediate	324.25	321.42	2.83	
MW44	56th Ave ROW	Intermediate	DRY	DRY		
MW45	56th Ave ROW	Intermediate	DRY	DRY		

TABLE 1-3
Comparison of System-Off and System-On Groundwater Elevations
Fourth Quarter 2016
TOC Facility #01-176; Mountlake Terrace, Washington

	Property	Groundwater Zone	Groundwater Elevation - System-Off (feet)	Groundwater Elevation - System-On (feet)	System Off-System On (feet)	Notes / Observations
MW46	56th Ave ROW	Intermediate	DRY	DRY		
MW47	56th Ave ROW	Intermediate	DRY	DRY		
MW48	56th Ave ROW	Intermediate	313.23	312.40	0.83	
MW49	56th Ave ROW	Intermediate	313.24	312.47	0.77	
MW50	56th Ave ROW	Intermediate	325.94	324.38	1.56	
MW51	56th Ave ROW	Intermediate	311.37	311.40	-0.03	
MW52	56th Ave ROW	Intermediate	DRY	DRY		
MW53	56th Ave ROW	Intermediate	316.34	315.30	1.04	
MW54	TOC/Farmasonis	Shallow	346.22	344.92	1.30	
MW55	56th Ave ROW	Intermediate	312.86	316.52	-3.66	appears anomalous
MW56	TOC/Farmasonis	Intermediate	313.52	312.89	0.63	
MW57 (4" RW)	TOC/Farmasonis	Intermediate	313.62	NM		
MW58	TOC/Farmasonis	Intermediate	312.38	312.32	0.06	
MW59	TOC/Farmasonis	Intermediate	313.36	312.82	0.54	
MW60	56th Ave ROW	Intermediate	314.96	313.86	1.10	
MW61	56th Ave ROW	Shallow	347.78	347.30	0.48	
MW62	56th Ave ROW	Shallow	349.38	350.21	-0.83	appears anomalous
MW63	56th Ave ROW	Intermediate	312.40	312.17	0.23	
MW64	56th Ave ROW	Deep	314.64	314.17	0.47	
MW65	Drake	Intermediate	311.78	311.91	-0.13	
MW66	TOC/Farmasonis	Intermediate	313.51	312.87	0.64	
MW67	Drake	Shallow	342.42	340.80	1.62	
MW68	Drake	Shallow	341.55	340.57	0.98	
MW69 (2" RW)	Drake	Intermediate	NM	NM		
MW70 (2" RW)	Drake	Intermediate	NM	NM		
MW71	Shin/Choi	Shallow	334.11	334.11	0.00	Product in well
MW72	Shin/Choi	Shallow	330.63	330.63	0.00	Product in well
MW73	Shin/Choi	Intermediate	308.26	308.31	-0.05	
MW74	Shin/Choi	Intermediate	DRY	DRY		
MW75	56th Ave ROW	Intermediate	NM	NM		Well is only measured during annual (first quarter) event and is subject to Traffic Control Plan (WSDOT 2014).
MW76	Drake	Intermediate	312.30	311.89	0.41	
MW77	Drake	Intermediate	311.45	311.66	-0.21	
MW78	Drake	Deep	NM	NM		Cannot get well cover off both events
MW79	TOC/Farmasonis	Shallow	341.80	339.09	2.71	
MW80	TOC/Farmasonis	Shallow	339.72	336.78	2.94	
MW81	TOC/Farmasonis	Intermediate	313.14	312.45	0.69	
MW82	TOC/Farmasonis	Shallow-Intermediate	328.11	325.96	2.15	
MW83	TOC/Farmasonis	NA	NA	NA		**WELL DECOMMISSIONED 11/21/2011 (REPLACED WITH MW100)**
MW84	Drake	Intermediate	NM	311.71		Car parked over well during system-off event
MW85	Drake	Intermediate	311.52	311.68	-0.16	
MW86	Drake	Intermediate	311.43	311.74	-0.31	
MW87	Drake	Intermediate	311.47	311.27	0.20	
MW88	Drake	Shallow-Intermediate	332.94	329.46	3.48	
MW89	Drake	Intermediate	311.68	311.72	-0.04	
MW90 (4" RW)	TOC	Intermediate	334.62	327.72	6.90	
MW91 (4" RW)	TOC	Intermediate	337.32	330.17	3.18	
MW92 (4" RW)	TOC/Farmasonis	Intermediate	313.66	313.22	0.44	
MW93 (4" RW)	TOC/Farmasonis	Intermediate	313.73	313.88	-0.15	
MW94 (4" RW)	TOC/Farmasonis	Intermediate	317.94	317.36	0.58	

TABLE 1-3
Comparison of System-Off and System-On Groundwater Elevations
Fourth Quarter 2016
TOC Facility #01-176; Mountlake Terrace, Washington

	Property	Groundwater Zone	Groundwater Elevation - System-Off (feet)	Groundwater Elevation - System-On (feet)	System Off-System On (feet)	Notes / Observations
MW95 (4" RW)	Drake	Intermediate	312.02	312.27	-0.25	
MW96 (4" RW)	Drake	Intermediate	307.63	316.27	-8.64	appears anomalous
MW97 (4" RW)	Drake	Intermediate	NM	313.04	--	Car parked on well during system-off event
MW98 (2" RW)	Drake	Intermediate	NM	NM		
MW99 (4" RW)	Drake	Intermediate	314.78	NM		Car parked on well during system-on event
MW100	TOC/Farmasonis	Shallow-Intermediate	335.94	335.91	0.03	
MW101 (4" RW)	Drake	Intermediate	311.61	311.92	-0.31	
MW102	Herman	Shallow	336.22	336.23	-0.01	product in well
MW103	Herman	Intermediate	309.35	309.08	0.27	
MW104	Herman	Shallow	338.49	338.50	-0.01	
MW105	Herman	Intermediate	DRY	DRY		
MW106	Herman	Shallow	337.00	337.32	-0.32	
MW107	Herman	Intermediate	310.25	310.46	-0.21	
MW108	Herman	Intermediate	311.27	311.47	-0.20	
MW109	Herman	Intermediate	DRY	DRY		

Notes:
Yellow highlighted values indicate where the difference between the System-Off and System-On groundwater elevations are positive, indicating hydraulic control by the remediation system in the area.

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

TABLE 2-1
Groundwater Quality Results for Select Constituents
Shallow Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	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)	Diesel-Range (DRPH)[2]	Motor-Oil Range (ORPH)[2]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[3]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[4]**	**NE[4]**
MW54	TOC/Farmasonis	12/8/2016	MW54	Peristaltic Pump	100U	70U	350U	0.35U	1U	1U	3U	2U	1U
MW67	Drake	12/7/2016	MW67	Peristaltic Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW68	Drake	12/7/2016	MW68	Peristaltic Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW71	Shin/Choi	NA	--	--	LNAPL								
MW72	Shin/Choi	NA	--	--	LNAPL								
MW102	Herman	NA	--	--	LNAPL								
MW104	Herman	12/2/2016	MW104	Peristaltic Pump	**56000**	**9500**	**500**	**8.7**	**1100**	**1,800**	**8,700**	**6,500**	**2,200**
MW104 (duplicate)*	Herman	12/2/2016	*MLT-05*	Peristaltic Pump	**54000**	**8100**	**450**	**4.8**	**1000**	**1,800**	**8,800**	**6,600**	**2,200**
MW106	Herman	12/5/2016	MW106	Submersible Pump	100U	**95**	250U	0.35U	1U	1U	3U	2U	1U

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

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

Red denotes sample concentration equals or 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] For samples with detected concentrations of DRPH or ORPH, the sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.

[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.

Well MW104 is periodically dry. LNAPL/sheen has been detected in the past but currently only has a strong HC odor.

-- = Sample was not collected.

* = 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.

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.

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.

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

WAC = Washington Administrative Code

TABLE 2-2
Groundwater Quality Results for Common Fuel Additives
Shallow Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier	Property	Date	Sample Identifier	Sample Method	Analytical Results (µg/L)																					
					Volatile Organic Compounds			Metals		Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons[1]																
					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)					**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**
MW54	TOC/Farmasonis	12/8/2016	MW54	Peristaltic Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	NA	0.06U	0.06U	0.06U
MW67	Drake	12/7/2016	MW67	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW68	Drake	12/7/2016	MW68	Peristaltic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW71	Shin/Choi	NA	--	--	LNAPL																				
MW72	Shin/Choi	NA	--	--	LNAPL																				
MW102	Herman	NA	--	--	LNAPL																				
MW104	Herman	12/2/2016	MW104	Peristaltic Pump	1U	1U	**0.111**	1U	1U	**0.2**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.17**	NA	**410**	**0.084**	0.06U
MW104 (duplicate)*	Herman	12/2/2016	*MLT-05*	Peristaltic Pump	1U	1U	**0.068**	1U	1U	**0.2**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.18**	NA	**410**	**0.092**	0.06U
MW106	Herman	12/5/2016	MW106	Submersible Pum	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U

NOTES & DEFINITIONS:

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

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

Red denotes sample concentration equals or 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 cle

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

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

[a] Well was dry but LNAPL is typically observed at this location.

[b] Concentrations of all PAH constituents analyzed (excluding napthalene) were not detected at or above the MRLs in the sample collected from MW104; however, the MRLs wer elevated due to sample dilution and exceeded the MTCA cleanup level.

-- = Sample was not collected.

* = 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.

R = Total lead results for samples MW106 and MLT-06 were rejected based on data review and data validation and are considered unusable.

LABORATORY NOTES:

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

ACRONYMS:

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

PAH = Polycyclic Aromatic Hydrocarbons

WAC = Washington Administrative Code

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

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 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	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)[3]	Benzene	Toluene	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					1,000/800[4]	500	500	5	1,000	700	1,000	NE[5]	NE[5]
MW10	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW11	TOC	11/29/2016	MW11	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW15	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW20	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW31 (2" RW)	TOC/Farmasonis	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW32 (4" RW)	TOC	11/29/2016	MW32	Pneumatic Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW33	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW45	56th Ave ROW	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	12/7/2016	MW48	Bailer	10,000	NA	NA	39	18	170	967	930	37
MW48 (duplicate)*	56th Ave ROW	12/7/2016	*MLT-03*	Bailer	9,700	NA	NA	39	18	160	935	900	35
MW49	56th Ave ROW	12/8/2016	MW49	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW50	56th Ave ROW	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW51	56th Ave ROW	12/6/2016	MW51	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW52	56th Ave ROW	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW53	56th Ave ROW	12/8/2016	MW53	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW55	56th Ave ROW	12/7/2016	MW55	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW56	TOC/Farmasonis	12/8/2016	MW56	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW57 (4" RW)	TOC/Farmasonis	11/30/2016	MW57	Submersible Pump	4,600	NA	NA	3.4	2.7	18	284	270	14
MW57 (4" RW)(duplicate)*	TOC/Farmasonis	11/30/2016	*MLT-01*	Submersible Pump	4,300	NA	NA	3.3	2.8	19	295	280	15
MW58	TOC/Farmasonis	12/8/2016	MW58	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW59	TOC/Farmasonis	12/8/2016	MW59	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW60	56th Ave ROW	12/8/2016	MW60	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW63	56th Ave ROW	12/7/2016	MW63	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW65	Drake	12/7/2016	MW65	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW66	TOC/Farmasonis	12/8/2016	MW66	Bailer	100U	250U	50U	0.35U	1U	1U	3U	2U	1U
MW69 (2" RW)	Drake	12/8/2016	MW69	Pneumatic Pump	8,500	250U	1400J	0.49	1U	31	172.8	170	2.8
MW69 (2" RW)(duplicate)*	Drake	12/8/2016	*MLT-04*	Pneumatic Pump	7,600	250U	890J	0.56	1.1	35	193.2	190	3.2
MW70 (2" RW)	Drake	11/30/2016	MW70	Pneumatic Pump	100U	290U	60J	1U	1U	1U	3U	2U	1U
MW73	Shin/Choi	12/1/2016	MW73	Submersible Pump	75,000	250U	4,100	11,000	210	1,500	4,840	4,300	540
MW73 (duplicate)*	Shin/Choi	12/1/2016	*MLT-06*	Submersible Pump	79,000	250U	3,700	9,700	180	1,500	4,480	4,000	480
MW74	Shin/Choi	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	12/6/2016	MW77	Submersible Pump	100U	250U	180J	0.35U	1U	1U	3U	2U	1U
MW84	Drake	12/7/2016	MW84	Submersible Pump	240	250U	94J	0.35U	1U	1U	3U	2U	1U
MW85	Drake	12/6/2016	MW85	Submersible Pump	100U	250U	50U	0.35U	1U	1U	3U	2U	1U
MW86	Drake	12/6/2016	MW86	Submersible Pump	100U	250U	77J	0.35U	1U	1U	3U	2U	1U
MW89	Drake	12/7/2016	MW89	Submersible Pump	100U	250U	50U	0.35U	1U	1U	3U	2U	1U
MW90	TOC	11/29/2016	MW90	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	2.5
MW91	TOC	11/29/2016	MW91	Submersible Pump	100U	250U	360J	0.35U	1U	1U	3U	2U	1U
MW95 (4" RW)	Drake	11/30/2016	MW95	Pneumatic Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW96 (4" RW)	Drake	11/30/2016	MW96	Pneumatic Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW98 (4" RW)	Drake	11/30/2016	MW98	Pneumatic Pump	150	NA	NA	2.5	1U	1U	3U	2U	1U
MW101 (4" RW)	Drake	12/6/2016	MW101	Pneumatic Pump	100U	250U	63	0.35U	1U	1U	3U	2U	1U
MW103	Herman	12/5/2016	MW103	Bailer	100U	250U	66J	0.35U	1U	1U	3U	2U	1U
MW105	Herman	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW107	Herman	12/5/2016	MW107	Submersible Pump	100U	250U	55	0.35U	1U	1U	3U	2U	1U
MW108	Herman	12/5/2016	MW108	Bailer	670	250U	240	0.54	1U	1U	3U	2U	1U
MW109	Herman	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, Table 720-1 of WAC 173-340-900, revised October 12, 2007.
Groundwater samples were analyzed by Friedman & Bruya, Inc. The analytical laboratory reports are included as an appendix.
Red denotes sample concentration equals or 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) For groundwater samples with detected concentrations of DRPH, the sample chromatographic pattern does not resemble the diesel extended analysis standard used for quantitation.
(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.
-- = Sample was not collected.
* = 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.

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 by the laboratory or based on data validation protocol.

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
WAC = Washington Administrative Code

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA
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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 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	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)					**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	NA	--	--	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW11	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW15	TOC	NA	--	--	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
MW20	TOC	NA	--	--	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	NA	--	--	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	11/29/2016	MW32	Pneumatic Pump	NA	NA	NA	1U	**5.47**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW33	TOC	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW45	56th Ave ROW	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48	56th Ave ROW	12/7/2016	MW48	Bailer	NA	NA	NA	**4.52**	**5.48**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW48 (duplicate)	56th Ave ROW	12/7/2016	*MLT-03*	Bailer	NA	NA	NA	**4.62**	**5.19**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW49	56th Ave ROW	12/8/2016	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
MW50	56th Ave ROW	NA	--	--	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	12/6/2016	MW51	Submersible Pump	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	NA	--	--	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	12/8/2016	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
MW55	56th Ave ROW	12/7/2016	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
MW56	TOC/Farmasonis	12/8/2016	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	11/30/2016	MW57	Submersible Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW57 (4" RW)(duplicate)*	TOC/Farmasonis	11/30/2016	*MLT-01*	Submersible 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	12/8/2016	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	12/8/2016	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	12/8/2016	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	12/7/2016	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	12/7/2016	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
MW66	TOC/Farmasonis	12/8/2016	MW66	Bailer	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW69 (2" RW)	Drake	12/8/2016	MW69	Pneumatic Pump	1U	NA		NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**11**	0.06U	0.06U
MW69 (2" RW)(duplicate)*	Drake	12/8/2016	*MLT-04*	Pneumatic Pump	1U	0.01U	1U	1U	1U	**0.06**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**16**	0.06U	0.06U
MW70 (2" RW)	Drake	11/30/2016	MW70	Pneumatic Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW73	Shin/Choi	12/1/2016	MW73	Submersible Pump	**290**	1U	**0.073J**	1U	1U	**0.14**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**290**	0.06U	0.06U
MW73	Shin/Choi	12/1/2016	*MLT-06*	Submersible Pump	**250**	1U	**0.055J**	1U	1U	**0.13**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**270**	0.06U	0.06U
MW74	Shin/Choi	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW77	Drake	12/6/2016	MW77	Submersible Pump	1U	0.01U	1U	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW84	Drake	12/7/2016	MW84	Submersible Pump	1U	0.01U	1U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.23**	0.06U	0.06U
MW85	Drake	12/6/2016	MW85	Submersible Pump	1U	NA	NA	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW86	Drake	12/6/2016	MW86	Submersible Pump	1U	1U	0.01U	1U	**3.82**	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW89	Drake	12/7/2016	MW89	Submersible Pump	1U	NA	NA	NA	NA	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW90	TOC	11/29/2016	MW90	Submersible Pump	NA	NA	NA	1U	**9.93**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW91	TOC	11/29/2016	MW91	Submersible Pump	1U	NA	NA	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW95 (4" RW)	Drake	11/30/2016	MW95	Pneumatic Pump	1U	NA	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	11/30/2016	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	NA
MW98 (4" RW)	Drake	11/30/2016	MW98	Pneumatic Pump	1U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW101 (4" RW)	Drake	12/6/2016	MW101	Pneumatic Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW103	Herman	12/5/2016	MW103	Bailer	**3**	0.01U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW105	Herman	NA	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW107	Herman	12/5/2016	MW107	Submersible Pump	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
MW108	Herman	12/5/2016	MW108	Bailer	1U	1U	0.01U	1U	1U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U	**0.94**	0.06U	0.06U
MW109	Herman	NA	--	--	NA	NA	NA	NA	NA	NA	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, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

LABORATORY NOTES:

TABLE 3-2
Groundwater Quality Results for Common Fuel Additives
Intermediate Zone Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	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)					**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**

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

Red denotes sample concentration equals or 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] With the exception of Napthalene, preliminary screening results for carcinogenic 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 PAHs must meet using the toxicity equivalency methodology of WAC 173-340-708(8).

-- = Sample was not collected.

* = 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.

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.

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

PAH = Polycyclic Aromatic Hydrocarbons

MTCA = Model Toxics Control Act

WAC = Washington Administrative Code

TABLE 4-1
Groundwater Quality Results for Select Constituents
Shallow-Intermediate Zone Intersect Wells
Second, Third and Fourth Quarters 2015
TOC Facility #01-176; Mountlake Terrace, WA

Sample Location/ Well Identifier[1]	Property	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	Ethylbenzene	Total Xylenes	m, p-Xylene	o-Xylene
MTCA Method A Cleanup Level (µg/L)					**1,000/800[3]**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE[4]**	**NE[4]**
MW09	TOC	12/8/2016	MW09	Submersible Pump	100U	NA	NA	0.35U	1U	**1**	**3.5**	**3.5**	1U
MW22	TOC	12/8/2016	MW22	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW24	TOC	11/29/2016	MW24	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U
MW27 (2" RW)	TOC	11/29/2016	MW27	Submersible Pump	**150**	NA	NA	0.35U	1U	1U	**7.3**	**2.4**	**4.9**
MW28	TOC		MW28		NA	NA	NA	NA	NA	NA	NA	NA	NA
MW29	TOC	11/29/2016	MW29	Submersible Pump	100U	NA	NA	0.35U	1U	1U	3U	2U	1U

NOTES & DEFINITIONS:

Well screens intersect Shallow and Intermediate Zone conditions.

Groundwater quality results are presented based on exceedance of MTCA Method A Cleanup Levels, Table 720-1 of WAC 173-340-900, revised October 12, 2007.

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

Red denotes sample concentration equals or 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] 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.

-- = Sample was not collected.

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

WAC = Washington Administrative Code

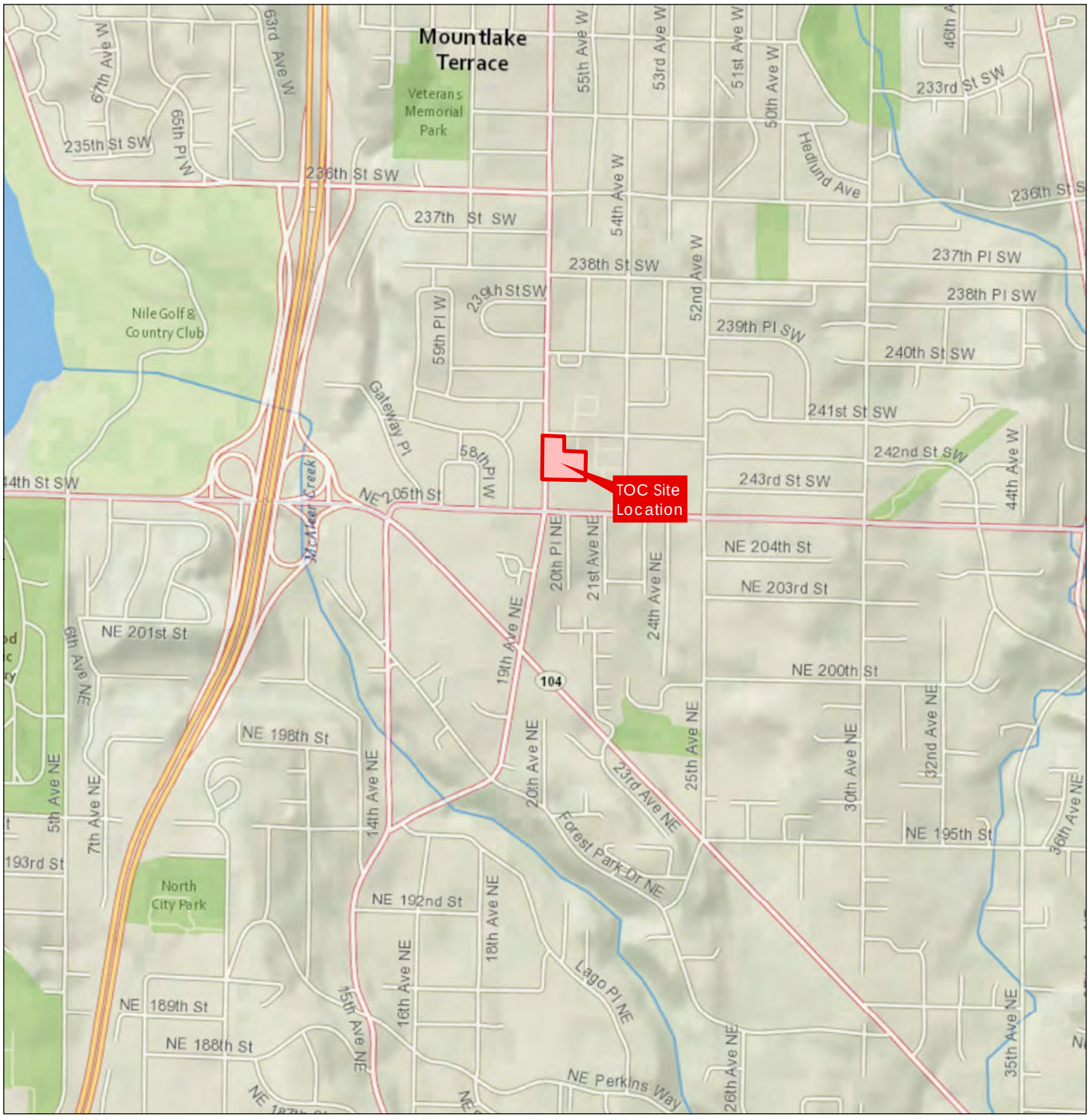
LABORATORY NOTES:

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

LIST OF PROPERTIES:

TOC = 24205 56th Avenue West, Mountlake Terrace WA

Figures



Legend

TOC Site Location

Figure No.
1

Title
Project Location

Client/Project
TOC Holdings Co.

Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace,
Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 600 1,200 Feet
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Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

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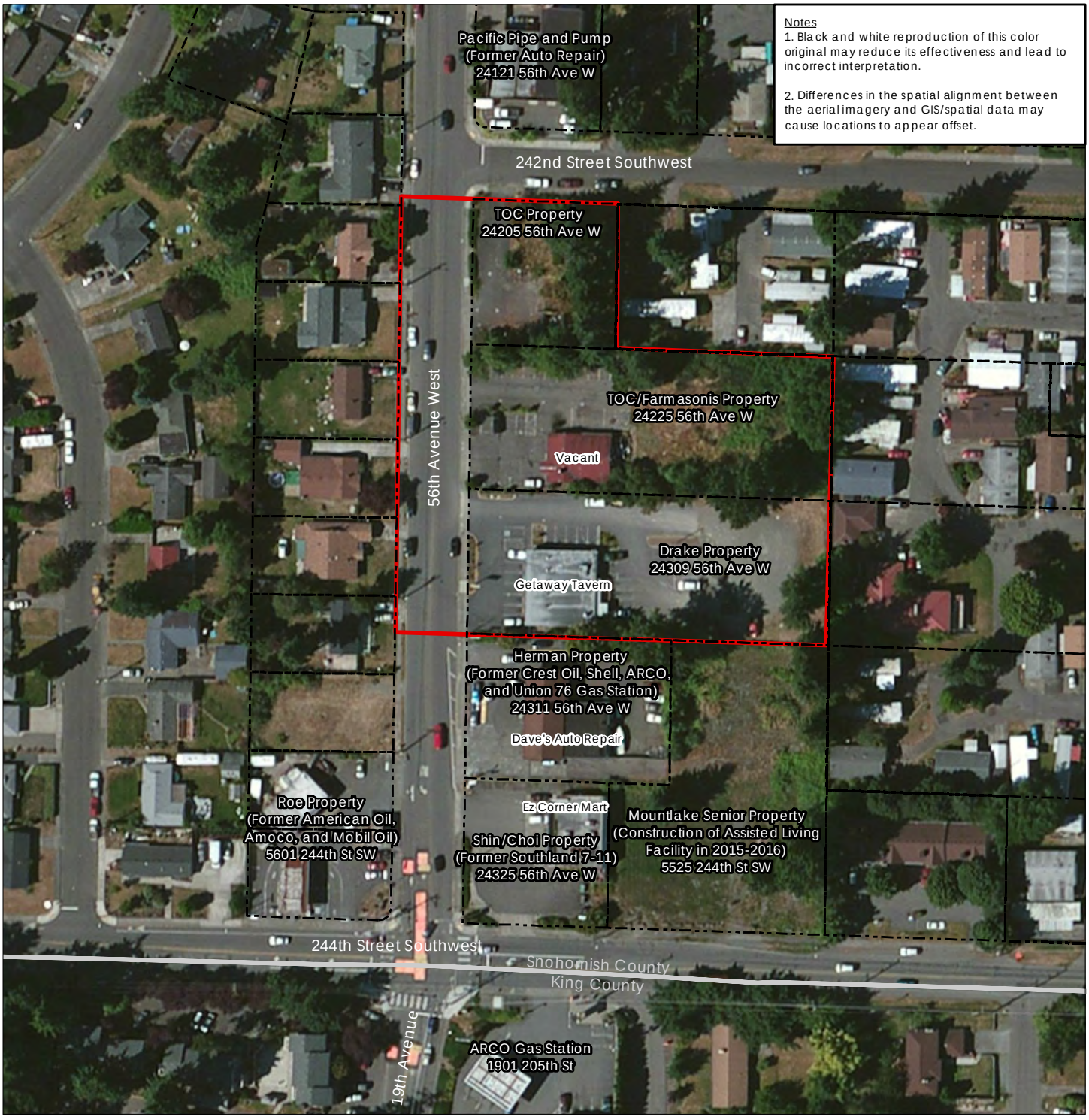

Notes
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Content may not reflect National Geographic's current map

Legend
- Parcel Boundary
- Site Boundary
- County Boundary

Figure No.
2

Title
Site Map

Client/Project
TOC Holdings Co.

Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace,
Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
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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
Tanks Removed 1991
TOC Property
Unit 1 Treatment System
Stormwater Infiltration Pit (1975)
Unit 3 Treatment System
Utility Shed
TOC/Farmasonis Property
Vacant
Drake Property
Getaway Tavern
Herman Property
Tanks Removed 2001
Dave's Auto Repair
Unconfirmed UST Locations (Status Unknown)
Unconfirmed UST Locations (Status Unknown)
Unconfirmed UST Location (Status Unknown, Identified in 2001)
Ez Corner Mart
Shin/Choi Property
Tanks Removed 1996
Mountlake Senior Property

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

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

- Shallow Groundwater Zone Monitoring Well Location
- Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones)
- Intermediate Groundwater Zone Monitoring Well Location
- Deep Groundwater Zone Monitoring Well Location
- Abandoned Monitoring Well Location
- Historic Underground Storage Tank
- Fiber Optic Line
- Gas Line
- Sewer Line
- Stormwater Line
- Water Line
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Stormwater Pit
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
3

Title
Locations of Wells and Remediation Systems

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

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Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

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.

3. Measurable product (LNAPL) was observed in MW71, MW72, and MW102.

4. Data from MW80 may be anomalous and not used for contouring.

MW05 351.53
MW03 349.08
MW04 NM
MW62 349.38
MW02 347.87
MW19 346.52
MW06 347.04
MW34 346.73
TOC Property
MW54 346.22
MW12 346.87
MW61 347.78
TOC/Farmasonis Property
MW79 341.80
MW80 339.72
MW67 342.42
MW68 341.55
Drake Property
MW104 338.49
Herman Property
MW102 336.22
MW106 337.00
MW71 334.11
Mountlake Senior Property
MW72 330.63
Shin/Choi Property

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 331.32 — Shallow Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
4

Title
Groundwater Elevation Contours, Shallow Zone (System Off), December 9, 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

0 60 120 Feet
1:720 (At Original document size of 11x17)

N

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Definitions
Dry = Insufficient groundwater in monitoring well for DTW measurement or the top of pump was encountered prior to the groundwater level in remediation wells.
NM = Not Measured
DTW = Depth to Water

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

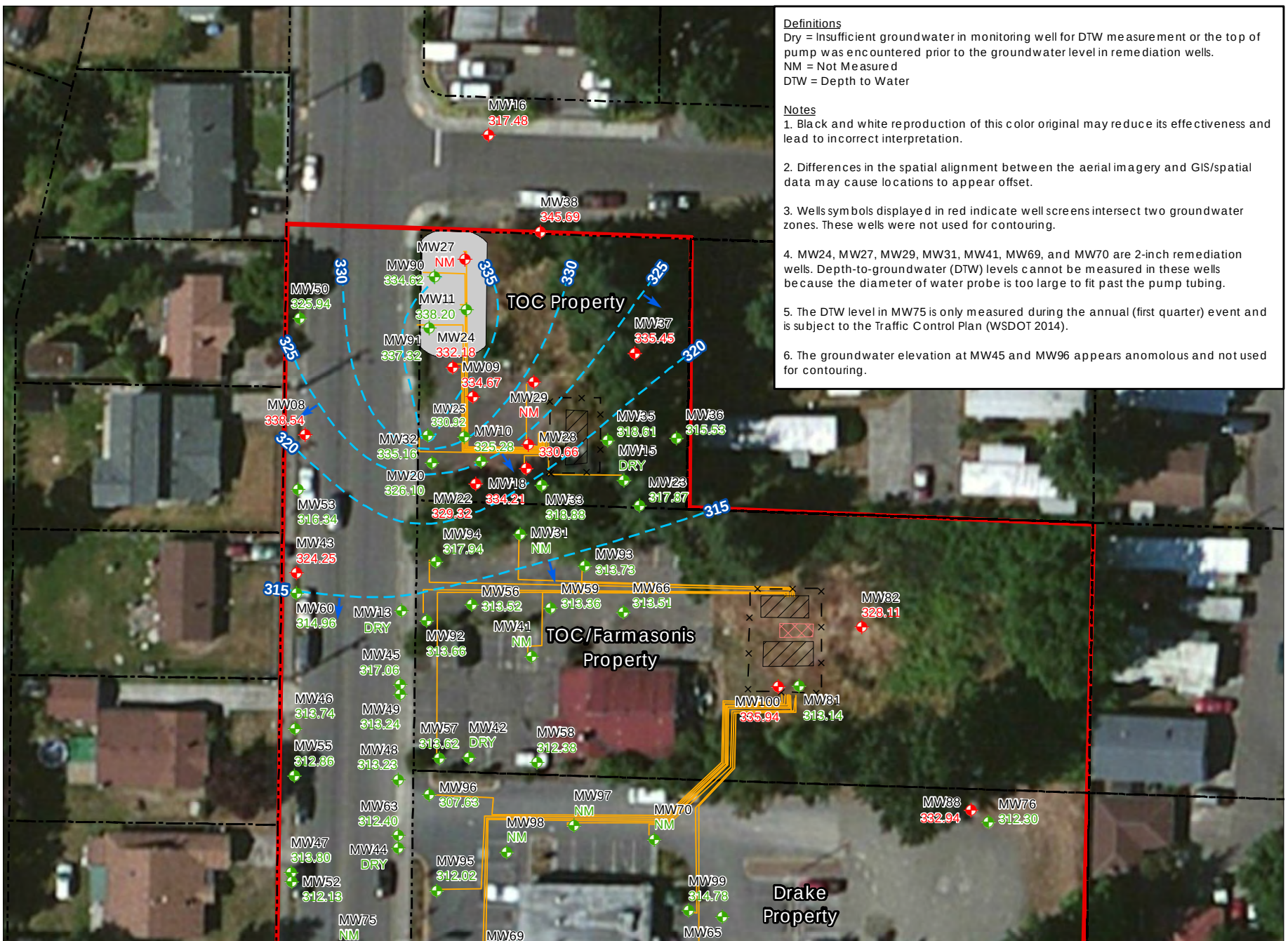
2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Wells symbols displayed in red indicate well screens intersect two groundwater zones. These wells were not used for contouring.

4. MW24, 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.

5. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

6. The groundwater elevation at MW45 and MW96 appears anomolous and not used for contouring.



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

- MW72 331.32 — Intermediate Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- MW72 331.32 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
5a

Title
Groundwater Elevation Contours, Intermediate Zone (System Off), December 9, 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Insufficient groundwater in monitoring well for DTW or the top of pump was encountered prior to the groundwater level in remediation wells.
NM = Not Measured
DTW = Depth to Water

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.

3. Wells symbols displayed in red indicate well screens intersect two groundwater zones. These wells were not used for contouring.

4. MW24, 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.

5. The DTW level in MW75 is only measured during the annual (first quarter) event and is subject to the Traffic Control Plan (WSDOT 2014).

6. Data at MW55 and MW96 appear anomlous and not used for contouring.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend

- MW72 331.32 — Intermediate Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- MW72 331.32 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
5b

Title
Groundwater Elevation Contours, Intermediate Zone (System On), November 28, 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Notes

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

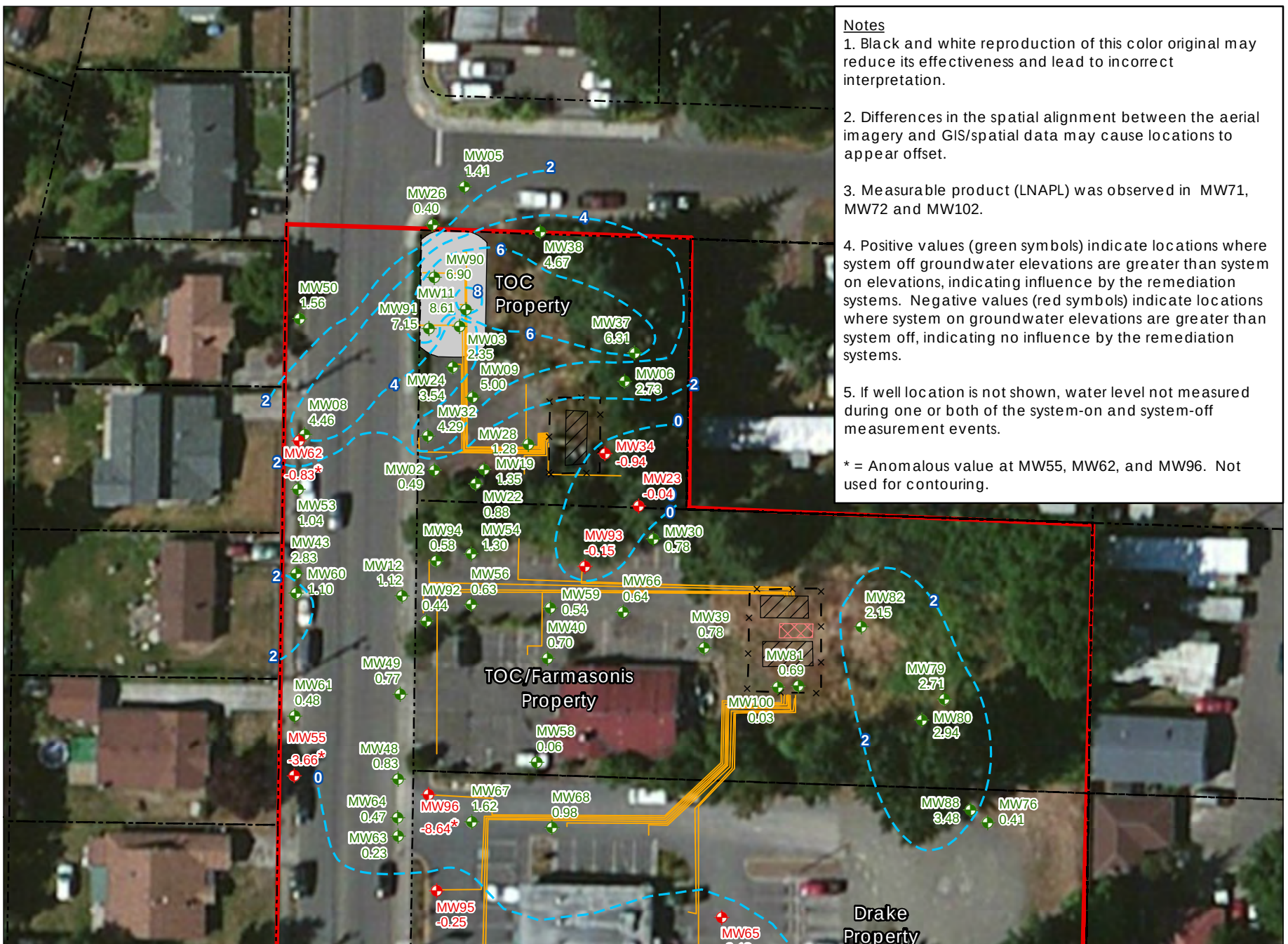
2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

3. Measurable product (LNAPL) was observed in MW71, MW72 and MW102.

4. Positive values (green symbols) indicate locations where system off groundwater elevations are greater than system on elevations, indicating influence by the remediation systems. Negative values (red symbols) indicate locations where system on groundwater elevations are greater than system off, indicating no influence by the remediation systems.

5. If well location is not shown, water level not measured during one or both of the system-on and system-off measurement events.

* = Anomalous value at MW55, MW62, and MW96. Not used for contouring.



Map Details

1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

- Intermediate Groundwater Zone Monitoring Well Location & Negative Groundwater Elevation Comparison (System Off - System On, feet)
- Intermediate Groundwater Zone Monitoring Well Location & Positive Groundwater Elevation Comparison (System Off - System On, feet)
- System On/Off Comparison Contour (System Off - System On, feet)
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
5c

DRAFT

Title
Comparison of System-On and System-Off Groundwater Elevations December 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Insufficient groundwater in monitoring well
NM = Not Measured

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.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

- MW72 331.32 — Deep Groundwater Zone Monitoring Well Location & Groundwater Elevation (feet, mean sea level)
- Groundwater Elevation Contour (feet, mean sea level)
- Approximate Groundwater Flow Direction
- Remediation System Piping
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
6

Title
Groundwater Elevation Contours, Deep Zone (System Off), December 9, 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL= Well was not sampled due to presence of measurable 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 [SES 2011]).

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

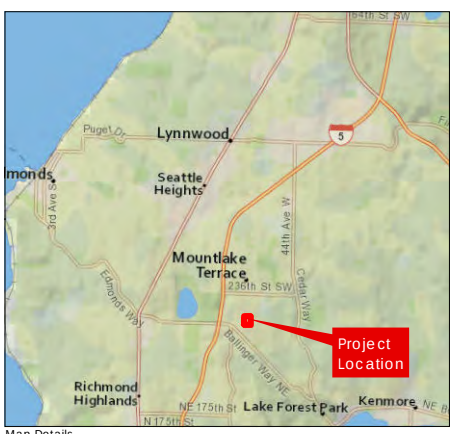
2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

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

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

5. A plume is shown around MW71, MW72 and MW102 because measurable product (LNAPL) was observed at these locations during 3Q2016 and historical product samples collected from these wells contained GRPH.

MW05 NS
MW04 NS
MW03 NS
TOC 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 56000
Herman Property
MW102 LNAPL
MW106 ND
MW71 LNAPL
Shin/Choi Property
Mountlake Senior Property
MW72 LNAPL



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

MW72 800 — Shallow Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)

Remediation System Piping

Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)

Parcel Boundary

Site Boundary

Estimated Historic Soil Excavation

Remediation System Compound

Compound Fence

Equipment Shed

Figure No.
7

Title
GRPH Concentrations
Shallow Zone,
Fourth Quarter 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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Definitions
Dry = Well was not sampled due to insufficient groundwater sample volume.
LNAPL = Well was not sampled due to presence of measurable 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 [SES 2011]).

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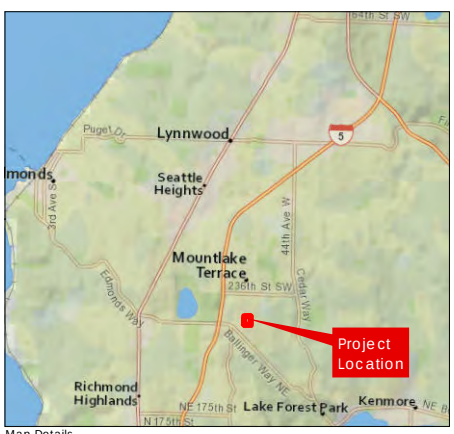
2. Differences in the spatial alignment between the aerial imagery and GIS/spatial data may cause locations to appear offset.

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

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

5. A plume is shown around MW71, MW72 and MW102 because measurable product (LNAPL) was observed at these locations during 3Q2016 and historical product samples collected from these wells contained benzene.

MW05 NS
MW04 NS
MW03 NS
TOC Property
MW06 NS
MW62 NS
MW34 NS
MW19 NS
MW02 NS
MW54 ND
MW12 NS
TOC/Farmasonis Property
MW61 NS
MW79 NS
MW80 NS
MW67 ND
MW68 ND
Drake Property
MW104 8.7
Herman Property
MW106 ND
MW102 LNAPL
MW71 LNAPL
Shin/Choi Property
Mountlake Senior Property
MW72 LNAPL



Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

MW72 5 — Shallow Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)

Remediation System Piping

Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)

Parcel Boundary

Site Boundary

Estimated Historic Soil Excavation

Remediation System Compound

Compound Fence

Equipment Shed

Figure No.
8

Title
Benzene Concentrations
Shallow Zone,
Fourth Quarter 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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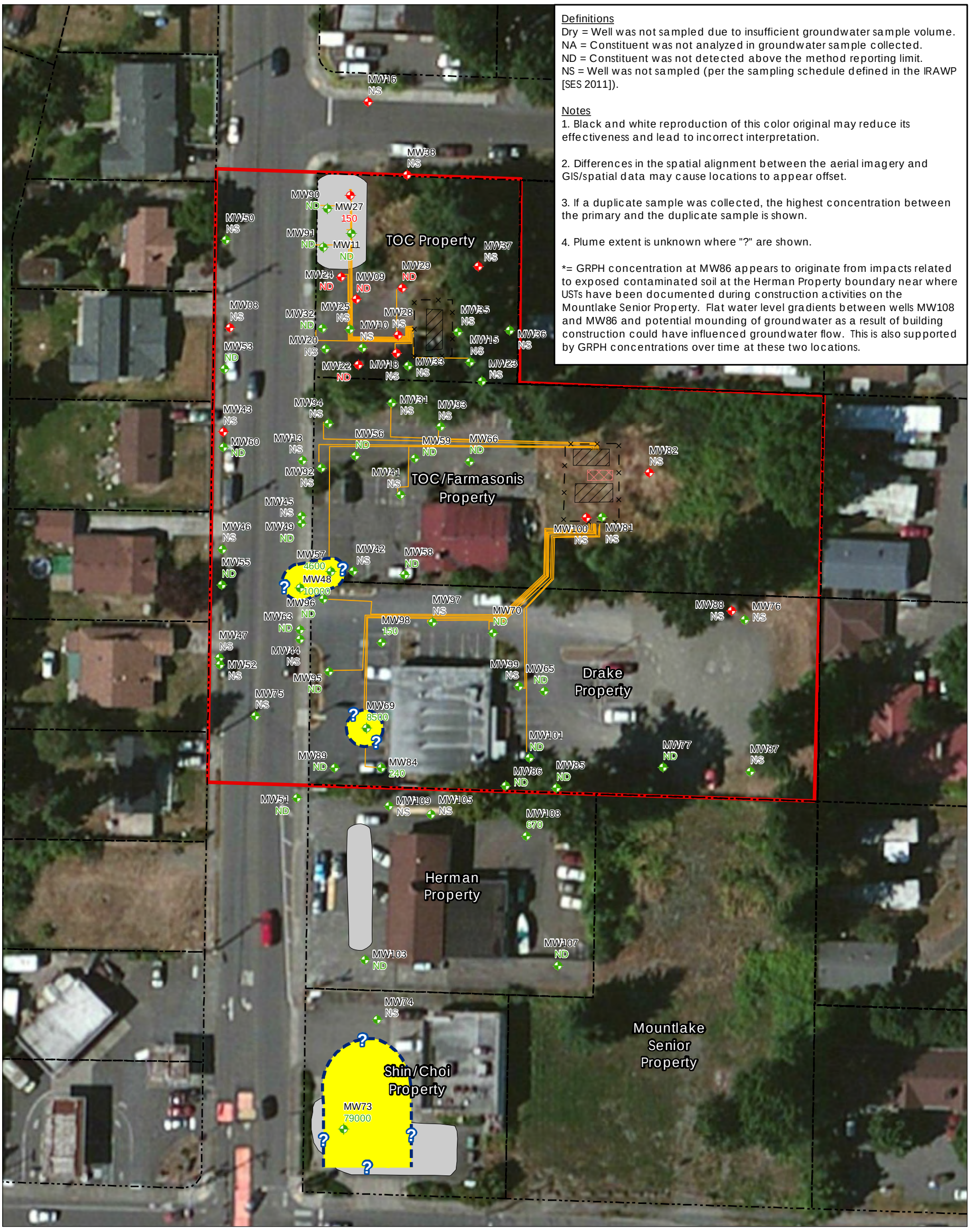

Definitions

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 [SES 2011]).

Notes

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

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

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

*= GRPH concentration at MW86 appears to originate from impacts related to exposed contaminated soil at the Herman Property boundary near where USTs have been documented during construction activities on the Mountlake Senior Property. Flat water level gradients between wells MW108 and MW86 and potential mounding of groundwater as a result of building construction could have influenced groundwater flow. This is also supported by GRPH concentrations over time at these two locations.

Map Details
1. Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet
2. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Legend

- MW72 800 — Intermediate Groundwater Zone Monitoring Well Location & GRPH Concentration (µg/L)
- MW72 800 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & GRPH Concentration (µg/L)
- Remediation System Piping
- Sample Concentration exceeds MTCA Method A Cleanup (800 µg/L when GRPH is present)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
9

Title
GRPH Concentrations
Intermediate Zone,
Fourth Quarter 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

185703259
Prepared by NF
Technical Review by RB
Independent Review by MM

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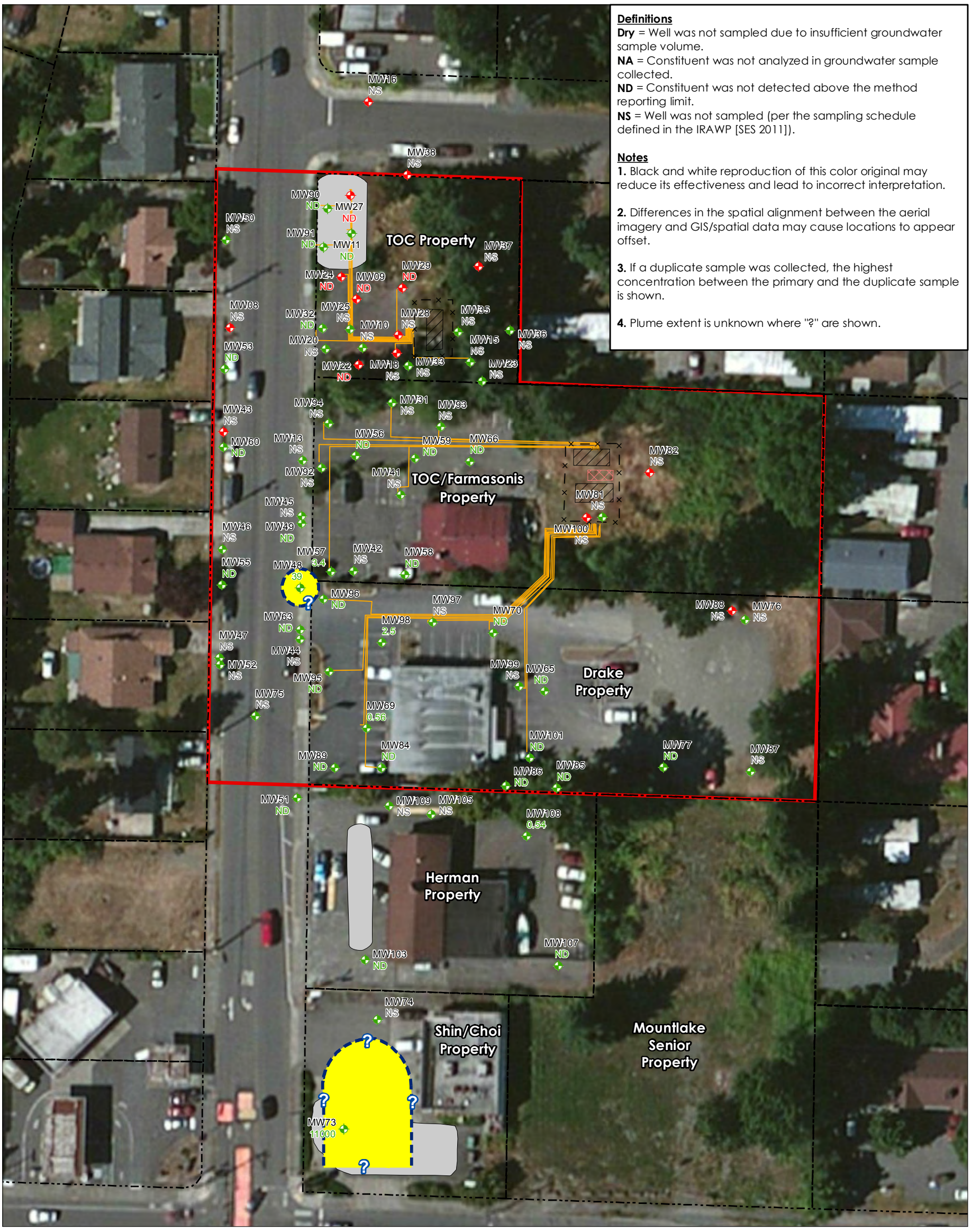

Definitions

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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 [SES 2011]).

Notes

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

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

Map Details
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Legend

- MW72 5 — Intermediate Groundwater Zone Monitoring Well Location & Benzene Concentration (µg/L)
- MW72 5 — Groundwater Zone Intersect Monitoring Well Location (well screen intersects two groundwater zones) & Benzene Concentration (µg/L)
- Remediation System Piping
- Minimum Preliminary Screening Level for Benzene (5 µg/L; MTCA Method A Cleanup Level)
- Parcel Boundary
- Site Boundary
- Estimated Historic Soil Excavation
- Remediation System Compound
- Compound Fence
- Equipment Shed

Figure No.
10

Title
Benzene Concentrations Intermediate Zone, Fourth Quarter 2016

Client/Project
TOC Holdings Co.
Facility 01-176

Project Location
24205-24309 56th Avenue West
Mountlake Terrace, Washington

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Independent Review by MM

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