

Site Assessment Work Plan

Former Shell-Branded Wholesale Facility
1349 NW State Avenue
Chehalis, Washington

November 2017

Site Assessment
Work Plan

Washington Department of Ecology
P.O. Box 47775
Olympia, WA 98504

Re: **Site Assessment Work Plan**
Former Shell-Branded Wholesale Facility
1349 NW State Avenue
Chehalis, Washington
Facility Site ID: 47829194
Cleanup Site ID: 9388

Dear Sir or Madame:

The attached report has been prepared by AECOM on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). This Work Plan describes the Site assessment activities that will be conducted at 1349 Northwest State Avenue located in Chehalis, Washington (the Site). The purpose of the Site Assessment is to gather site-specific data to provide further delineation of impacts detected in groundwater at the Site.

If you have any questions or require additional information, please contact the undersigned at (503) 222-7200.

Sincerely,
AECOM



Clifford J. Pearson
Project Manager

cc: Mr. John Robbins, Shell Oil Products (electronic)
Harnek Dhudwal, Property Owner

Table of Contents

1.	Introduction	5
1.1	Background	5
1.2	Previous Environmental Investigations and Remedial Activities	5
1.3	Existing Conditions	6
2.	Geology and Hydrogeology	6
3.	Objectives	6
4.	Field Activities	6
4.1	Preliminary Planning.....	7
4.1.1	Health and Safety	7
4.1.2	Utility Locating and Clearance	7
4.1.3	Field Documentations	8
4.2	Groundwater Monitoring Well Installation	8
4.3	Soil Sampling.....	8
4.4	Groundwater Sampling	9
4.5	Sample Handling	9
4.6	Investigation Derived Waste	9
4.7	Decontamination Procedures	10
5.	Reporting	10
6.	Limitations.....	10
	Appendix A Historical Boring Logs	13
	Appendix B Standard Operating Procedures (SOPs).....	14
	Appendix C Field Forms.....	15

Figures

Figure 1	Vicinity Map
Figure 2	Site Plan
Figure 3	Concentrations in Groundwater and Contours (June 9, 2017)
Figure 4	Proposed Sample Locations

Tables

Table 1	Summary of Soil Analytical Data
Table 2	Summary of Groundwater Data

Appendices

Appendix A	Historical Boring Logs
Appendix B	Standard Operating Procedures (SOPs)
Appendix C	Field Forms

List of Acronyms

bgs	below ground surface
Blaze	Blaze Environmental Management, Inc.
Boateng	Boateng & Associates, Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
Ecology	Washington Department of Ecology
EPA	Environmental Protection Agency
ESE	Environmental Science & Engineering, Inc.
HASP	Health and Safety Plan
ID	identification
IDW	investigation derived waste
MTCA	Model Toxics Control Act
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
ppm	parts per million
PPE	personal protective equipment
PVC	polyvinyl chloride
SOP	standard operating procedure
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons as diesel
TPH-G	total petroleum hydrocarbons as gasoline
TPH-O	total petroleum hydrocarbons as oil
USTs	underground storage tanks
VOCs	volatile organic compounds
WUCC	Washington Utilities Coordinating Council

1. Introduction

AECOM has prepared this *Site Assessment Work Plan* (Work Plan) on behalf of Shell for the Former Shell-Branded Wholesale Facility located at 1349 Northwest State Avenue, Chehalis, Lewis County, Washington (the Site; Figure 1). The purpose of this Work Plan is to further delineate the lateral extents of petroleum impacted groundwater at the Site.

1.1 Background

The Site is a former Shell-branded wholesale facility located on the southwest corner of the intersection of Northwest State Avenue and Northwest Maryland Avenue in Chehalis, Lewis County, Washington (Figure 1).

Current Site facilities include a station building, two product dispensers, one diesel and three gasoline 10,000-gallon underground storage tanks (USTs). Former facilities included a 1,000-gallon waste oil UST, a 1,000-gallon heating oil UST, and an above ground storage waste oil tank.

1.2 Previous Environmental Investigations and Remedial Activities

1994 UST Removal and Installation of a Stage II Vapor Recovery System: Between February and March 1994, Environmental Science & Engineering, Inc. (ESE) completed compliance soil sampling during the installation of a Stage II vapor recovery system and the removal of one 1,000-gallon waste oil UST and one 1,000-gallon heating oil UST. The former waste oil UST and the former heating oil UST are shown on Figure 2. ESE collected four soil samples from the dispenser islands, four samples from the product piping trenches, six soil samples from the waste oil UST excavation, and five soil samples from the heating oil UST excavation. Soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-G), TPH as diesel (TPH-D), TPH as oil (TPH-O), benzene, toluene, ethylbenzene, and xylenes (BTEX). Concentrations of TPH-G, TPH-D, and benzene exceeded the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A Cleanup Levels in soil samples collected. Sample locations are shown on Figure 2 and analytical data is presented on Table 1 and Table 2.

1994 Monitoring Well Installation: In November 1994, Blaze Environmental Management, Inc. (Blaze) installed three monitoring wells (MW-1 through MW-3, Figure 2) at the Site. Soil samples were collected and analyzed for TPH-G, TPH-D, BTEX, and total lead. Benzene exceeded the MTCA Method A Cleanup Levels in soil samples at soil boring MW-1 at 10 and 15 feet below ground surface (bgs, Table 1). Blaze collected groundwater samples from monitoring wells MW-1 through MW-3 and analyzed them for TPH-G, TPH-D, and BTEX. TPH-G, benzene, and xylenes exceeded the MTCA Method A Cleanup Levels in groundwater samples collected from monitoring well MW-2 (Table 2).

1995 Monitoring Well Installation: In September 1995, Boateng & Associates, Inc. (Boateng) installed two monitoring wells (MW-4 and MW-5, Figure 2) at the Site. Soil samples were collected and analyzed for TPH-G, TPH-D, BTEX, and total lead. No analytes exceeded the MTCA Method A Cleanup Levels (Table 1). Boateng collected groundwater samples from monitoring wells MW-1 through MW-5 and analyzed them for TPH-G, TPH-D, BTEX, and total lead. TPH-G, TPH-D, and BTEX exceeded the MTCA Method A Cleanup Levels in groundwater samples collected from monitoring well MW-2 (Table 2).

1995 Additional Monitoring Well Installation: In November 1995, Boateng installed monitoring wells MW-6 and MW-7 at the Site (Figure 2). Soil Samples were collected and analyzed for TPH-G, TPH-D, BTEX, and total lead. No analytes exceeded the MTCA Method A Cleanup Levels in soil (Table 1). Boateng collected groundwater samples from monitoring wells MW-2 and MW-4 through MW-7 and analyzed them for TPH-G, TPH-D, BTEX, and total lead. TPH-G, TPH-D, and benzene exceeded the

MTCA Method A Cleanup Levels in groundwater samples collected from MW-2, MW-6, and MW-7 (Table 2).

1997 Monitoring Well Installation: In July 1997, Boateng installed monitoring well MW-8 at the Site. Soil samples were collected and analyzed for TPH-G, TPH-D, BTEX, and total lead. No analytes exceeded the MTCA Method A Cleanup Levels in soil (Table 1). Boateng collected groundwater samples from MW-8 and analyzed them for TPH-G, TPH-D, BTEX, and dissolved lead. TPH-D exceeded the MTCA Method A Cleanup Levels in groundwater samples collected at MW-8 (Table 2).

2012 Site Investigation: Conestoga Rovers & Associates installed one monitoring well (MW-9) and advanced additional borings to collect confirmation samples adjacent to the two southern dispensers in July 2012. Detected concentration of TPH-G, TPH-D, TPH-O, and lead were reported below respective MTCA Method A Cleanup Levels (Table 1).

1.3 Existing Conditions

Eleven groundwater monitoring wells are associated with the Site (MW-1 through MW-11). Site facilities include a station building, two product dispensers, one diesel and three gasoline 10,000-gallon USTs. Monitoring well locations and current site features are included on Figure 2.

During 2016 and 2017, the monitoring wells that exceed MTCA Method A Cleanup Levels include MW-2, MW-5, MW-6, and MW-10. Concentrations of benzene, toluene, and TPH-G above MTCA Method A Cleanup Levels were reported in monitoring well MW-2. Monitoring wells MW-5 and MW-10 reported concentrations of TPH-D above MTCA Method A Cleanup Levels. Monitoring well MW-6 had a single benzene concentration above MTCA Method A Cleanup Levels, however the value is assumed to be an error given the historical concentrations in the monitoring well have been reported below laboratory method limits since 2005. Groundwater data is presented in Table 2 and the most recent data (June 9, 2017) is presented on Figure 3.

2. Geology and Hydrogeology

According to historical boring logs (Appendix A), the Site appears to be underlain primarily by a layer of silt or silty sandy on top of clay. Borings SB-2 and SB-3, advanced in 2012, encountered refusal due to a concrete layer or fill material at about 3.8 feet bgs and 6 feet bgs, respectively.

During prior drilling activities, groundwater was found at an approximate depth of 10 to 15 feet bgs. Groundwater flow at the Site flows predominately to the west, northwest.

3. Objectives

The objectives of the proposed activities described in this Work Plan are to provide additional assessment of downgradient groundwater conditions by advancing three soil borings, collecting soil samples, installing three groundwater monitoring wells, and collecting groundwater samples.

4. Field Activities

All work will be conducted according to Standard Operating Procedures (SOPs) compiled in Appendix B. The scope of work may be amended based on observations during field work indicating the need to move well locations or further advance locations beyond the anticipated depth. This section describes the field activities that will be completed as part of monitoring well installation including soil and groundwater sampling.

4.1 Preliminary Planning

The following ancillary tasks that will be conducted to support the scope of work at the Site include:

- Preparation of a site-specific Health and Safety Plan (HASP)
- Utility locating and clearance

Common work activities that also will be conducted to support the Site assessment include the following:

- Field documentation
- Equipment decontamination
- Management of investigation derived wastes (IDW)

SOPs are included in Appendix B and Site-specific field forms are included in Appendix C.

4.1.1 Health and Safety

A HASP will be prepared to cover the activities proposed. The HASP will be prepared in accordance with Occupational Safety and Health Administration (OSHA) requirements and will include the following information, at a minimum:

- Project scope of work
- Designated personnel and description of qualifications, including Site Safety Officer and emergency contacts
- Job safety analyses
- Required training
- Emergency response procedures, including Occupational Clinic, Hospital locations, and emergency routes

The HASP will be reviewed and signed by all personnel before beginning work at the Site. In addition, all personnel working at the Site will be trained in Shell's Life Saving Rules.

Daily tailgate safety meetings shall be conducted to review health and safety procedures for the day, detail any health and safety near misses, and identify any deficiencies in the health and safety program. A list of unresolved health and safety deficiencies will be discussed daily, as needed. The content of each daily tailgate safety meeting will be recorded on the Daily Tailgate Meeting form included in Appendix C, which will be signed by the meeting attendees.

4.1.2 Utility Locating and Clearance

The Utility Notification Center through Washington Utilities Coordinating Council (WUCC) will be notified no less than 72 hours prior to conducting subsurface activities to provide clearance along the proposed intrusive soil boring locations. In addition, a private underground utility locating service will be contacted to clear the boring locations of potential underground utilities prior to initiating advancement of the soil borings.

Additionally, the first five feet of each boring will be cleared using a vacuum truck/air knife to minimize potential damage to underground utilities or structures not identified by WUCC or the private utility locating service. If pea gravel or fill material (i.e., indication of a potential buried utility) or refusal is encountered, borings will be abandoned and a new location will be identified based on the clearance of utilities.

4.1.3 Field Documentations

Field personnel will document all sampling activities in either a field notebook or field forms. Site-specific field forms are included in Appendix C. Each entry will include date, personnel, subcontractor personnel, activities conducted, measurements made (including instrument calibration), deviations from the Work Plan (if any), and descriptions of any concurrent Site operations activities that might affect sample collection.

4.2 Groundwater Monitoring Well Installation

AECOM proposes to install three on-site groundwater monitoring wells (MW-12, MW-13 and MW-14, Figure 4). Based on the previous investigations conducted at the Site, AECOM assumes the boring will be advanced to a depth of approximately 15 feet bgs.

Prior to drilling at each proposed monitoring well location, the drilling rods and casing will be decontaminated using a steam cleaner or a solution of Alconox (or equivalent) with potable water followed by a rinse. Dedicated tubing and disposable gloves should not be reused and must be disposed of properly. Standard operating procedures (SOPs) for decontamination are in Appendix B.

A qualified AECOM field representative will complete a boring/well log for each boring. The drillers will collect continuous soil core samples, and AECOM will screen the soil samples based on visual observations, organic vapor monitoring, and pan water sheen testing. Organic vapor monitoring, using a photoionization detector (PID) calibrated against isobutylene (or equivalent) reference gas, will be performed as a head space analysis. This analysis is completed by placing soil in a plastic sample bag and shaking the material. The PID probe is then inserted in the bag and the concentration of volatile organic vapors present within the headspace is measured in parts per million (ppm). Water pan sheen testing consists of placing a small amount of soil in a black gold miner's pan with water and observing for sheen. The following sheen descriptions will be used:

- None (N);
- Slight (S): Light, colorless, dissipating film, spotty to globular;
- Moderate (M): Light to heavy irregular film with some color or iridescence; and
- Heavy (H): Heavy, colorful, iridescent film which spreads rapidly; sheen flows off the sample.

The proposed monitoring wells will be completed as two-inch diameter monitoring wells constructed of schedule 40 polyvinyl chloride (PVC) piping, screened from approximately 5 to 15 feet bgs. The monitoring wells will be installed in compliance with Washington State Regulations by a licensed well driller. Well construction details will be included on the boring/well log (Appendix C).

Following installation, the monitoring wells will be developed by purging water until a minimum of five to ten casing volumes has been removed and the water is free of sediment to the extent practicable. The monitoring well location and elevation will be surveyed and added to the existing monitoring well network.

4.3 Soil Sampling

Two soil samples will be collected from each boring. Samples will be collected at the most impacted intervals based on field screening results. If impacts to soil are not identified during drilling, one soil sample will be collected from less than 3 feet bgs and one soil sample will be collected from within the vadose zone. Samples will be placed into laboratory-provided sample containers either by hand (sampler will wear an unused nitrile glove) or by using a decontaminated stainless steel scoop. After collection, samples will be labeled and placed in a cooler on ice and shipped to the laboratory under a Shell Chain-of-Custody form. The remaining portion of the samples will be used to describe soil type according to the

Unified Soil Classification System which includes particle size, distribution, color, gradation, plasticity and moisture content. In addition, observations, PID readings, and pan sheen test results will be recorded on field logs (Appendix C). Soil sampling procedures are further discussed in the SOP in Appendix B.

The samples will be submitted to Test America Laboratory for analysis under standard laboratory turnaround times, for the following tests:

- TPH-G by Method NWTPH-Gx
- TPH-D by Method NWTPH-Dx
- BTEX by the US Environmental Protection Agency (EPA) Method 8260B

All method-required quality control will be completed by the laboratory conducting the analyses and reported with the analytical results.

4.4 Groundwater Sampling

Upon completion of well development, groundwater samples will be collected from the monitoring well using standard low-flow sampling techniques (Appendix B). Groundwater samples will be submitted for the following analyses:

- TPH-G by Method NWTPH-Gx
- TPH-D by Method NWTPH-Dx
- BTEX by EPA Method 8260B

All method-required quality control will be completed by the laboratory conducting the analyses and reported with the analytical results.

4.5 Sample Handling

Potential sources of contamination in the field include sampling equipment, vehicles, and dust. Sample handling will be minimized and sources of contamination will be carefully avoided. Samplers will wear disposable nitrile gloves during all sample handling procedures.

After sample collection, samples will be kept in the custody of field personnel until formally transferred to the laboratory or shipper. Chain-of-custody records will be maintained by AECOM to document and verify sample transfer to the laboratory. Custody seals will be affixed to the shipping containers and will contain, at a minimum, the signature of the person responsible for the samples and the date when the custody seal was applied.

All samples will be labeled and accompanied by a Shell Chain-of-Custody form when delivered to the laboratory for analysis. Information on the sample label shall contain, at a minimum, sample identification number, and sampling date and time. Soil and groundwater samples will promptly be placed in a cooler with ice after collection and subsequently shipped to the laboratory.

Sample labeling, handling and documentation procedures are further discussed in the SOPs included in Appendix B.

4.6 Investigation Derived Waste

Soil and decontamination and purge water generated during monitoring well installation, development, and sampling activities will be handled as IDW. IDW will be placed in labeled 55-gallon steel drums and stored on-site for disposal. Composite samples of soil cuttings will be collected and submitted for waste characterization. Groundwater samples collected during the first round of groundwater sampling will be

used for IDW characterization of decontamination and purge water. Following characterization, waste drums will be transported off-site for disposal at a Shell-approved treatment, storage, and disposal facility.

Additional IDW such as personal protective equipment (PPE) and disposable sampling equipment will be placed in trash bags and disposed of as municipal waste.

4.7 Decontamination Procedures

All non-dedicated, reusable sampling equipment will be decontaminated between each boring location and between sample locations to prevent cross-contamination during the field activities. Smaller non disposable equipment will be cleaned, at a minimum, with a detergent/water bath and subsequently rinsed with distilled water.

Non-disposable sampling equipment used during drilling and sample collection will be decontaminated using a steam pressure washer or the following procedure: 1) initial water rinse, 2) water with Alconox solution rinse, and 3) final water rinse.

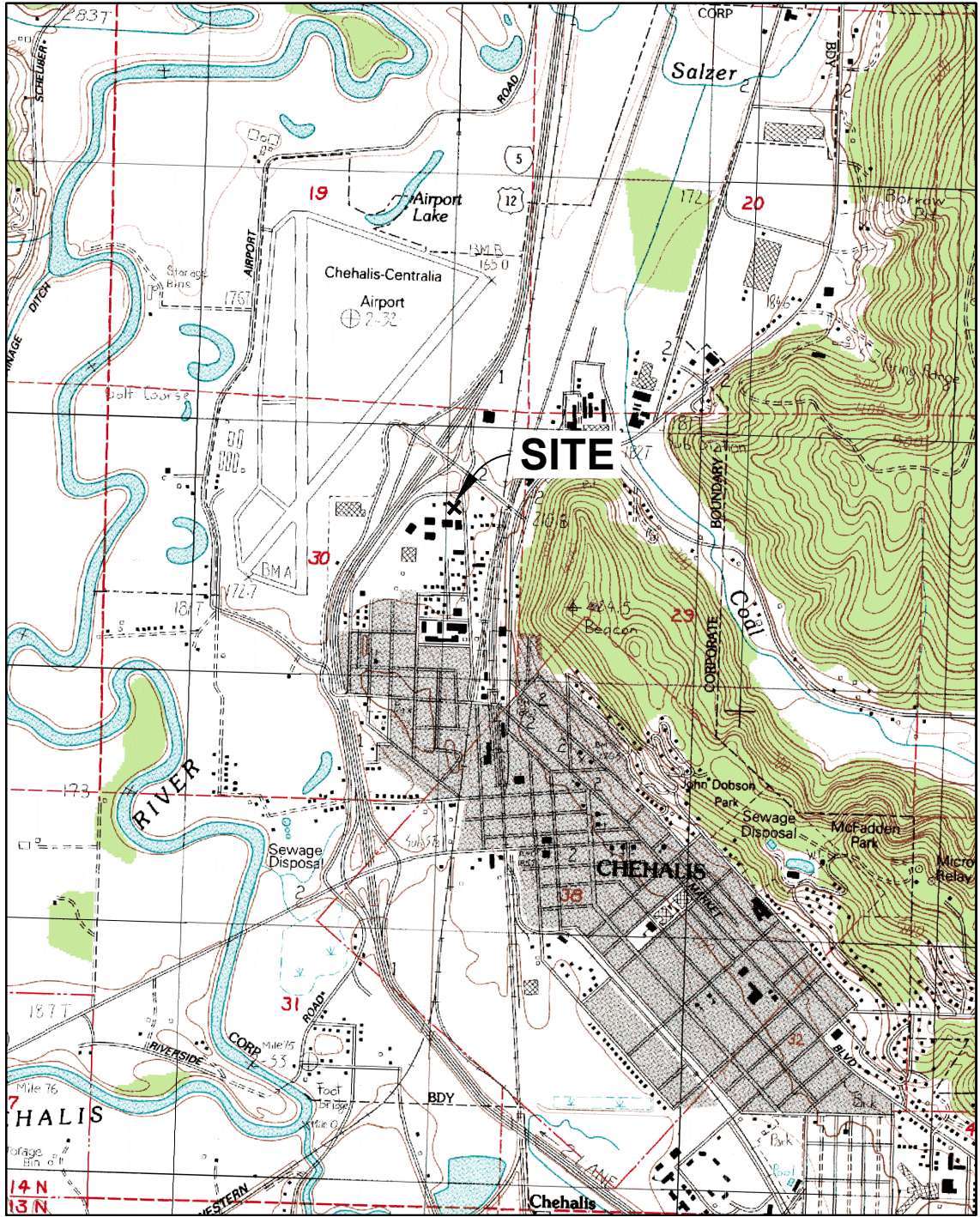
5. Reporting

The results of this investigation will be evaluated and summarized in a Site Assessment Report. The report will provide a summary of field work and methods used and include interpretation of laboratory data, which will be screened against the Ecology MTCA Method A Cleanup Levels. Figures illustrating sample and monitoring well locations, boring logs, tables presenting laboratory data, and copies of laboratory data reports will be included in the report.

6. Limitations

AECOM has prepared this Work Plan for the sole use of Shell Oil Products, US (Shell) in accordance with the Agreement under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this Work Plan or any other services provided by us. This Work Plan may not be relied upon by any other party without the prior and express written agreement of AECOM. Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant change. The conclusions and recommendations contained in this Work Plan are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from third parties has not been independently verified by AECOM, unless otherwise stated in the Work Plan.

Figures



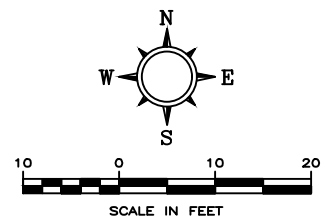
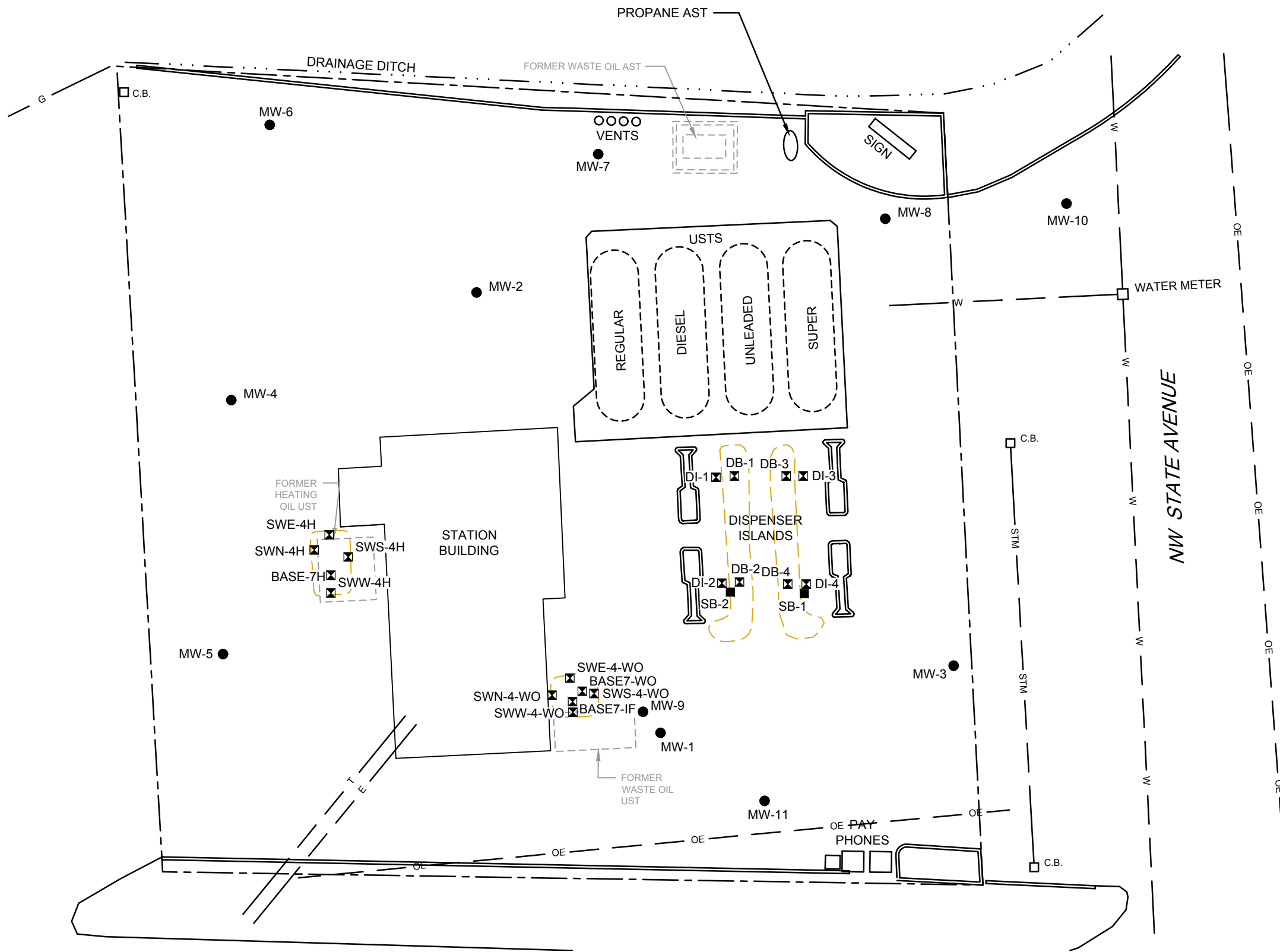
CENTRALIA, WASHINGTON USGS TOPOGRAPHIC 7.5' SERIES QUADRANGLE 1985.

VICINITY MAP

FORMER SHELL-BRANDED WHOLESALE FACILITY
 OCTOBER 2017 1349 NORTHWEST STATE AVENUE
 60528005 CHEHALIS, WASHINGTON



FIGURE 1



LEGEND

---	APPROXIMATE PROPERTY BOUNDARY
MW-1 ●	MONITORING WELL LOCATION
DI-1 ☒	SOIL SAMPLE LOCATION (ESE, 1994)
SB-1 ■	SOIL BORING LOCATION
- - - - -	EXCAVATION EXTENT (ESE, 1994)
□ C.B.	CATCH BASIN
— OE —	OVERHEAD ELECTRIC LINE
— G —	GAS LINE
— T —	TELEPHONE LINE
— W —	WATER LINE
— STM —	STORMWATER LINE

CONSTRUCTION
EQUIPMENT AND
REPAIR

SOURCE:
BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR &
STATEWIDE LAND SURVEYING INC. DATED 9/28/12.
ORIGINAL FIGURE CREATED BY GHD.

NOTE:
WASHINGTON STATE PLANE COORDINATE SYSTEM NAD 83/CORS 96
EPOCH 2002.00, SOUTH ZONE 4602, IN U.S. SURVEY FEET.



OCTOBER 2017
60528005

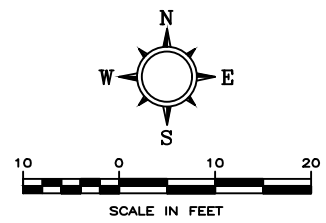
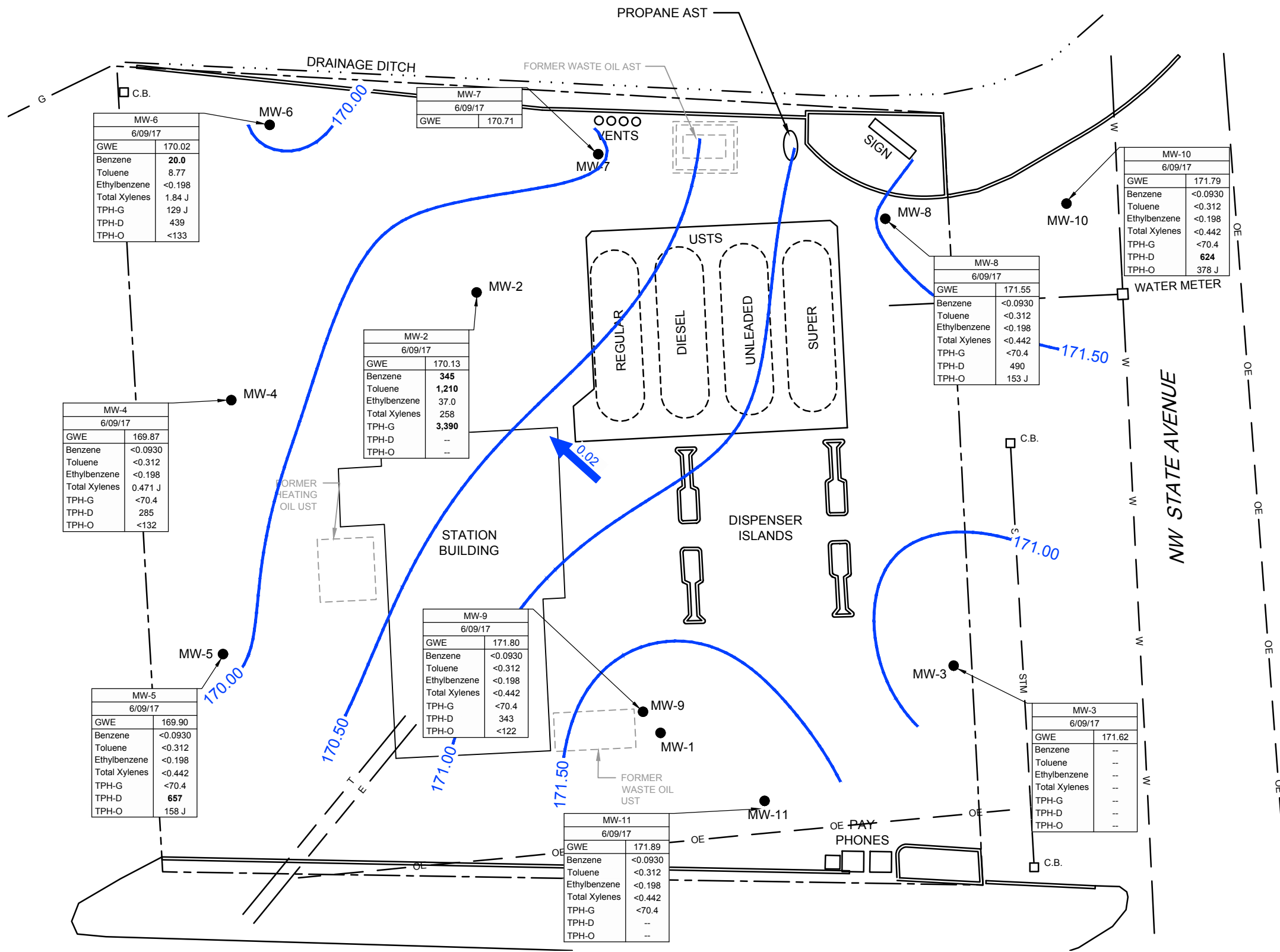
SITE PLAN

FORMER SHELL-BRANDED WHOLESALE FACILITY
1349 NORTHWEST STATE AVENUE
CHEHALIS, WASHINGTON

FIGURE 2

C:\2521158 Shell\2017\1349 NW State Avenue\900-CAD_015\910 CAD\20-SHEETS\Work_Plan\Fig 2 Site Plan.DWG Oct. 13, 2017 - 1:00pm

D:\2521158_Shell\2017\1349 NW State Avenue\900-CAD_GIS\910 CAD\20-SHEETS\Work_Plan\Fig 3 Concentrations in GW & Contours - 6-09-17.DWG Oct 13, 2017 - 1:05pm



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MW-1 ● MONITORING WELL LOCATION
- C.B. CATCH BASIN
- OE --- OVERHEAD ELECTRIC LINE
- G --- GAS LINE
- T --- TELEPHONE LINE
- W --- WATER LINE
- STM --- STORMWATER LINE
- 171.00 — GROUNDWATER ELEVATION CONTOUR, IN FEET, REFERENCED TO AN ARBITRARY DATUM
- 0.02 → GROUNDWATER FLOW DIRECTION AND GRADIENT

NOTES:

- GWE = GROUNDWATER ELEVATION
- TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE RANGE
- TPH-D = TOTAL PETROLEUM HYDROCARBONS AS DIESEL RANGE
- TPH-O = TOTAL PETROLEUM HYDROCARBONS AS OIL
- -- = NOT SAMPLED
- < = ANALYTE WAS NOT DETECTED AT OR ABOVE THE INDICATED LABORATORY REPORTING LIMIT
- J = THE REPORTED VALUE IS ESTIMATED
- ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).

CONSTRUCTION EQUIPMENT AND REPAIR

SOURCE:
BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR & STATEWIDE LAND SURVEYING INC. DATED 9/28/12.
ORIGINAL FIGURE CREATED BY GHD.

NOTE:
WASHINGTON STATE PLANE COORDINATE SYSTEM NAD 83/CORS 96
EPOCH 2002.00, SOUTH ZONE 4602, IN U.S. SURVEY FEET.

CONCENTRATIONS IN GROUNDWATER & CONTOURS - JUNE 9, 2017

OCTOBER 2017
60528005

FORMER SHELL-BRANDED WHOLESALE FACILITY
1349 NORTHWEST STATE AVENUE
CHEHALIS, WASHINGTON



FIGURE 3

MW-6 6/09/17	
GWE	170.02
Benzene	20.0
Toluene	8.77
Ethylbenzene	<0.198
Total Xylenes	1.84 J
TPH-G	129 J
TPH-D	439
TPH-O	<133

MW-7 6/09/17	
GWE	170.71

MW-10 6/09/17	
GWE	171.79
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	<0.442
TPH-G	<70.4
TPH-D	624
TPH-O	378 J

MW-8 6/09/17	
GWE	171.55
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	<0.442
TPH-G	<70.4
TPH-D	490
TPH-O	153 J

MW-2 6/09/17	
GWE	170.13
Benzene	345
Toluene	1,210
Ethylbenzene	37.0
Total Xylenes	258
TPH-G	3,390
TPH-D	--
TPH-O	--

MW-4 6/09/17	
GWE	169.87
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	0.471 J
TPH-G	<70.4
TPH-D	285
TPH-O	<132

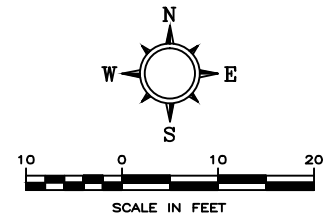
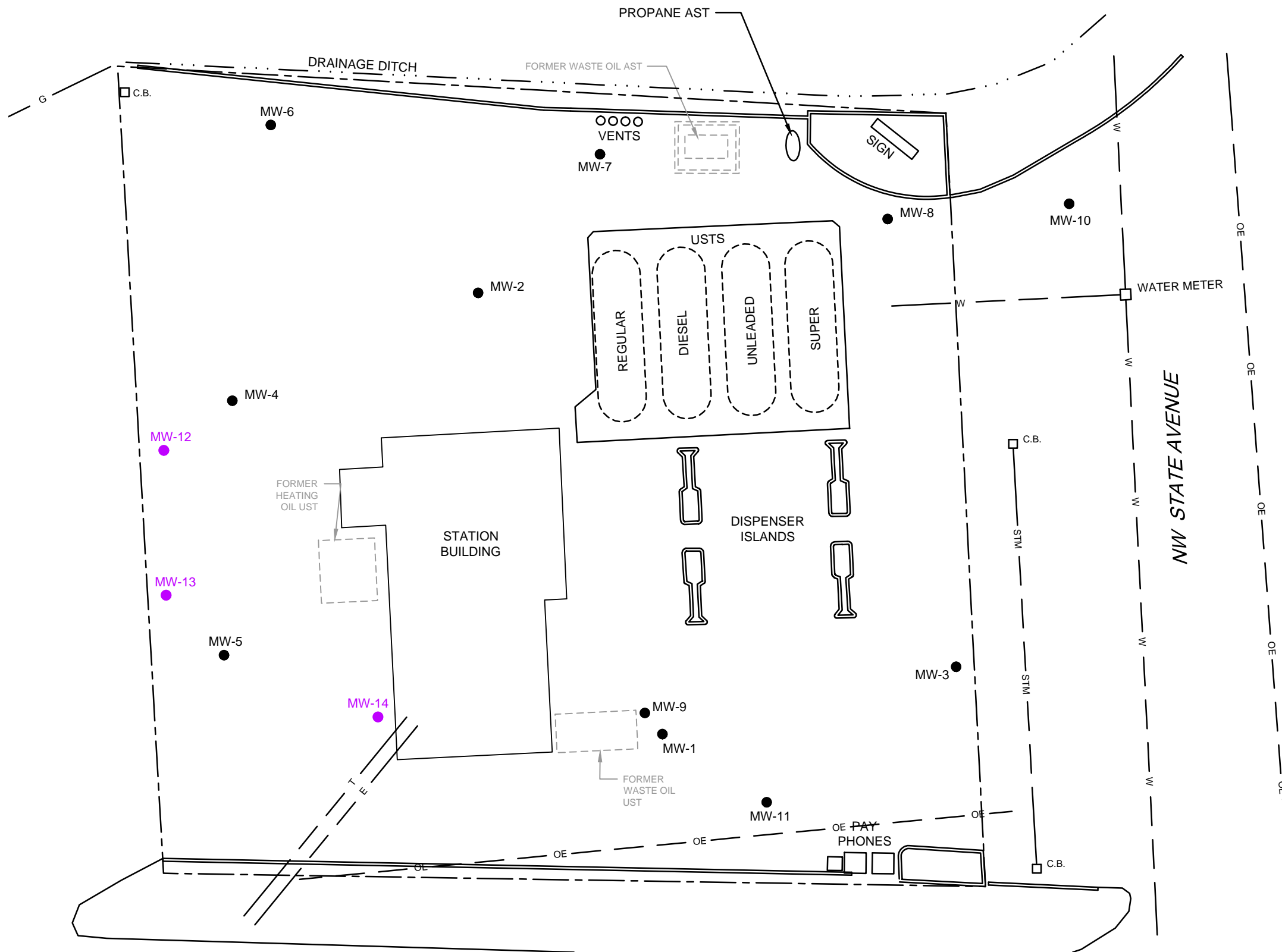
MW-9 6/09/17	
GWE	171.80
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	<0.442
TPH-G	<70.4
TPH-D	343
TPH-O	<122

MW-5 6/09/17	
GWE	169.90
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	<0.442
TPH-G	<70.4
TPH-D	657
TPH-O	158 J

MW-3 6/09/17	
GWE	171.62
Benzene	--
Toluene	--
Ethylbenzene	--
Total Xylenes	--
TPH-G	--
TPH-D	--
TPH-O	--

MW-11 6/09/17	
GWE	171.89
Benzene	<0.0930
Toluene	<0.312
Ethylbenzene	<0.198
Total Xylenes	<0.442
TPH-G	<70.4
TPH-D	--
TPH-O	--

F:\25211158 Shell\2017\1349 NW State Avenue\800-CAD_05\910 CAD\20-SHEETS\Work_Plan\Fig 4 Proposed Sample Locations V2.DWG Nov 09, 2017 - 3:35pm



LEGEND

---	APPROXIMATE PROPERTY BOUNDARY
MW-1 ●	MONITORING WELL LOCATION
MW-12 ●	PROPOSED MONITORING WELL LOCATION
□ C.B.	CATCH BASIN
— OE —	OVERHEAD ELECTRIC LINE
— G —	GAS LINE
— T —	TELEPHONE LINE
— W —	WATER LINE
— STM —	STORMWATER LINE

CONSTRUCTION
EQUIPMENT AND
REPAIR

SOURCE:
BASEMAP MODIFIED FROM DRAWING PROVIDED BY SECOR &
STATEWIDE LAND SURVEYING INC. DATED 9/28/12.
ORIGINAL FIGURE CREATED BY GHD.

NOTE:
WASHINGTON STATE PLANE COORDINATE SYSTEM NAD 83/CORS 96
EPOCH 2002.00, SOUTH ZONE 4602, IN U.S. SURVEY FEET.



OCTOBER 2017
60528005

PROPOSED SAMPLE LOCATIONS
FORMER SHELL-BRANDED WHOLESALE FACILITY
1349 NORTHWEST STATE AVENUE
CHEHALIS, WASHINGTON

FIGURE 4

Tables

Table 1
Summary of Soil Data
Former Shell-Branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Boring ID	Sample ID	Sample Date	Sample Depth (feet bgs)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	EDB	EDC	Total Lead
Model Toxics Control Act Method A Cleanup Levels				30/100 ¹	2,000	2,000	0.03	7	6	9	0.005	NE	250
DI-1	DI-1	2/28/1994	2	4,500	--	--	<1.0	15	29	390	--	--	--
DI-2	DI-2	2/28/1994	2.5	26	14	--	<0.050	<0.050	<0.050	0.19	--	--	--
DI-3	DI-3	2/28/1994	2.5	91	--	--	<0.050	<0.050	0.3	4.2	--	--	--
DI-4	DI-4	2/28/1994	3	4,200	2,400	--	<1.0	<0.050	2.5	53	--	--	--
DB-1	DB-1	2/28/1994	3	<1.0	--	--	<0.050	<0.050	<0.050	<0.10	--	--	--
DB-2	DB-2	2/28/1994	3	58	<10	--	0.15	0.1	0.6	1.6	--	--	--
DB-3	DB-3	2/28/1994	3	1.8	--	--	0.050	<0.050	<0.050	<0.10	--	--	--
DB-4	DB-4	2/28/1994	3	1.9	<10	--	<0.050	<0.050	<0.050	0.010	--	--	--
SWS-4H	SWS-4H	3/2/1994	4	--	20	--	--	--	--	--	--	--	--
SWN-4H	SWN-4H	3/2/1994	4	--	<10	--	--	--	--	--	--	--	--
SWW-4H	SWW-4H	3/2/1994	4	--	<10	--	--	--	--	--	--	--	--
SWE-4H	SWE-4H	3/2/1994	4	--	<10	--	--	--	--	--	--	--	--
BASE-7H	BASE-7H	3/2/1994	7	--	12	--	--	--	--	--	--	--	--
SWW-4-WO	SWW-4-WO	3/2/1994	4	--	--	<100	--	--	--	--	--	--	--
SWN-4-WO	SWN-4-WO	3/2/1994	4	--	--	<100	--	--	--	--	--	--	--
SWE-4-WO	SWE-4-WO	3/2/1994	4	--	--	<100	--	--	--	--	--	--	--
SWS-4-WO	SWS-4-WO	3/2/1994	4	--	--	<100	--	--	--	--	--	--	--
BASE-7-WO	BASE-7-WO	3/2/1994	7	--	--	260	--	--	--	--	--	--	--
BASE-7-IF	BASE-7-IF	3/2/1994	7.5	--	--	140	--	--	--	--	--	--	--
MW-1	MW-1	11/2/1994	5	<1.0	16	--	<0.050	<0.050	<0.050	<0.10	--	--	--
	MW-1	11/2/1994	10	<1.0	11	--	0.051	<0.050	<0.050	<0.10	--	--	--
	MW-1	11/2/1994	15	<1.0	<10	--	0.053	<0.050	0.055	0.13	--	--	--
MW-2	MW-2	11/2/1994	10	<1.0	<10	--	<0.050	<0.050	<0.050	<0.10	--	--	--
	MW-2	11/2/1994	15	<1.0	<10	--	<0.050	<0.050	<0.050	<0.10	--	--	--
MW-3	MW-3	11/2/1994	5	<1.0	21	--	<0.050	<0.050	<0.050	<0.10	--	--	--
	MW-3	11/2/1994	10	<1.0	21	--	<0.050	<0.050	<0.050	<0.10	--	--	--
	MW-3	11/2/1994	15	<1.0	<10	--	<0.050	<0.050	<0.050	<0.10	--	--	--
MW-4	MW-4	9/9/1995	7	<4	280	--	<0.4	<0.4	<0.4	<0.4	--	--	8.6
MW-5	MW-5	9/9/1995	7	<3	84	--	<0.3	<0.3	<0.3	<0.3	--	--	--
MW-6	MW-6	11/16/1995	7.5	ND	45	--	<0.4	<0.4	0.9	5.3	--	--	11.0
MW-7	MW-7	11/16/1995	7.5	41	68	--	<0.4	<0.4	<0.4	<0.4	--	--	9.7
MW-8	MW-8	7/22/1997	7.5	<5.00	325	--	<0.0500	<0.0500	<0.0500	<0.100	--	--	<10.0
SB-1	SO-241795-072312-JS-SB1-3	7/23/2012	3	<1.5	4	12	<0.0061	<0.0061	<0.0061	<0.0061	--	--	--
	SO-241795-072312-JS-SB1-5.5	7/23/2012	5.5	17	19	<14	<0.0051	<0.0051	<0.0051	<0.0051	--	--	--
SB-2	SO-241795-072312-JS-SB2-2.5	7/23/2012	2.5	<1.2	--	--	<0.0056	<0.0056	<0.0056	<0.0056	--	--	--
	SO-241795-072312-JS-SB2-3.5	7/23/2012	3.5	<1.3	--	--	<0.0055	<0.0055	<0.0055	<0.0055	--	--	--
MW-9	SO-241795-072512-JS-MW9-6	7/25/2012	6	2.8	6	30	<0.0060	<0.0060	<0.0060	<0.0060	--	--	--
	SO-241795-072512-JS-MW9-10	7/25/2012	10	3.0	200	990	<0.0088	<0.0088	<0.0088	<0.0058	<0.0088	<0.0088	27
	SO-241795-072512-JS-MW9-15	7/25/2012	15	<1.9	<5.3	<16	<0.0083	<0.0083	<0.0083	<0.0083	--	--	--

Notes:

All results in milligrams per kilogram (mg/kg)

< = Not detected at laboratory reporting limit.

-- = Not analyzed, not available

BOLD = Concentrations exceed the MTCA Method A Cleanup Levels

bgs = below ground surface

EDB = 1,2-dibromoethane

EDC = 1,2-dichloroethane

TPH-G = Total petroleum hydrocarbons as gasoline

TPH-D = Total petroleum hydrocarbons as diesel

TPH-O = Total petroleum hydrocarbons as oil

¹ = Cleanup levels for TPH-G are 30 mg/kg if benzene is present and is 100 mg/kg benzene is non-detected and the total of ethylbenzene, toluene, and total xylenes are less than 1% of the gasoline mixture.

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-1	179.36	06/11/94	8.90	170.46	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-1	179.36	09/12/95	9.48	169.88	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-1	179.36	11/27/95	6.81	172.55	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	02/20/97	6.40	172.96	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-1	179.36	05/20/97	7.10	172.26	ND	878	ND	ND	0.9	ND	ND	---	---	---	---	---
MW-1	179.36	07/31/97	7.79	171.57	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	08/20/97	8.24	171.12	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	11/17/97	8.20	171.16	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	02/19/98	6.35	173.01	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	05/22/98	7.16	172.20	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	08/26/98	8.64	170.72	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	11/30/98	6.67	172.69	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-1	179.36	04/23/99	7.08	172.28	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	11/22/99	8.56	170.80	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	05/22/00	7.76	171.60	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	10/19/00	9.10	170.26	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	05/09/01	8.88	170.48	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	10/23/01	10.03	169.33	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	7/22/2009*	8.61	170.75	<100	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-1	179.36	10/19/09	9.39	169.97	<100	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-1	179.36	01/06/10	7.33	172.03	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	04/23/10	7.21	172.15	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	07/23/10	7.43	171.93	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	10/06/10	8.60	170.76	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	01/11/11	7.03	172.33	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	05/05/11	7.14	172.22	---	---	---	---	---	---	---	---	---	---	---	---
MW-1	179.36	08/01/11	8.27	171.09	<100	<95.2	<238	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-1	179.36	11/04/11	8.50	170.86	<100	<94.3	<236	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-1	177.93	01/10/12	7.36	170.57	<100	<95.2	<238	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	179.69	06/11/94	8.22	171.47	13,000	2.4	---	1,300	450	650	2,100	---	---	---	---	---
MW-2	179.69	09/12/95	10.66	169.03	3,100	1,100	---	1,200	47	320	430	---	---	---	---	---
MW-2	179.69	11/27/95	7.29	172.40	4,500	1,200	---	1,400	68	430	540	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-2	179.69	02/20/97	7.70	171.99	5,690	1,320	ND	842	36.8	474	598	---	---	---	---	---
MW-2	179.69	05/20/97	8.45	171.24	5,210	ND	ND	488	24.7	395	644	---	---	---	---	---
MW-2	179.69	07/31/97	8.36	171.33	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	179.69	08/20/97	8.97	170.72	5,910	1,130	ND	330	18.6	301	472	---	---	---	---	---
MW-2	179.69	11/17/97	8.44	171.25	4,740	916	ND	307	19.9	375	484	---	---	---	---	---
MW-2	179.69	02/19/98	7.90	171.79	2,600	ND	ND	243	12.6	185	122	---	---	---	---	---
MW-2	179.69	05/22/98	7.97	171.72	4,120	1,030	ND	197	13.1	266	363	---	---	---	---	---
MW-2	179.69	08/26/98	9.26	170.43	3,180	766	ND	146	12	170	232	---	---	---	---	---
MW-2	179.69	11/30/98	7.45	172.24	3,100	728	ND	144	11.8	162	240	---	---	---	---	---
MW-2	179.69	04/23/99	8.08	171.61	2,080	---	---	84.9	6.46	86.2	99.1	---	---	---	---	---
MW-2	179.69	11/22/99	9.19	170.50	1,780	---	---	98	5.94	16.5	64	---	---	---	---	---
MW-2	179.69	05/22/00	8.76	170.93	1,530	---	---	76.5	4.74	31.3	49.6	---	---	---	---	---
MW-2	179.69	10/19/00	11.21	168.48	96.5	---	---	1.41	0.695	1.89	<1.0	---	---	---	---	---
MW-2	179.69	05/09/01	10.12	169.57	1,320	---	---	42.8	4.11	10.1	25.8	---	---	---	---	---
MW-2	179.69	10/23/01	11.69	168.00	1,550	---	---	72.7	5.42	2.63	41.7	---	---	7.01	---	---
MW-2	179.69	08/20/02	10.84	168.85	1,000	300	<500	44	2	2	18	---	---	---	---	---
MW-2	179.69	02/20/03	9.15	170.54	1,400	<250	<500	76	3.8	<1	<1	---	---	3.4	---	---
MW-2	179.69	07/21/03	10.24	169.45	760	370	<500	42	3.3	<1	11	---	---	13	---	---
MW-2	179.69	02/17/04	8.73	170.96	910	<250	<500	31	3.7	<1	4.3	---	---	<1	---	---
MW-2	179.69	08/12/04	10.84	168.85	740	660	<500	19	2.8	<1	9.7	---	---	4.3	---	---
MW-2	179.69	02/08/05	9.75	169.94	920	<250	<500	22	3.8	<1	9.1	---	---	<1	---	---
MW-2	179.69	08/30/05	10.90	168.79	840	270	<500	30	2.3	<1	9.3	---	---	---	---	---
MW-2	179.69	02/09/06	6.96	172.73	575	<236	<472	9.71	1.82	0.755	3.89	---	---	---	---	---
MW-2	179.69	11/07/06	11.16	168.53	796	618	171	9.84	3.15	<0.500	9.43	---	---	<5.00	---	---
MW-2	179.69	03/20/07	9.36	170.33	626	632 a	<500	2.57	1.66	<0.500	<3.00	---	---	---	---	---
MW-2	179.69	06/18/07	11.66	168.03	687	436 b	<500	2.39	1.86	<0.500	3.87	---	---	---	---	---
MW-2	179.69	09/20/07	13.13	166.56	255	798 a	637	1.79	1.76	<0.500	5.12	---	---	---	---	---
MW-2	179.69	12/03/07	10.73	168.96	394	474 e,f	226	2.22	2.31	3.91	7.52	---	---	1.47	---	---
MW-2	179.69	02/27/08	7.63	172.06	665	810	526	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-2	179.69	07/22/08	9.60	170.09	660	580	<100	0.26	1.3	<1.0	1.4	---	---	---	---	---
MW-2	179.69	10/02/08	10.61	169.08	400	300	<100	<0.50	<1	<1	<1	---	---	1.5	---	---
MW-2	179.69	01/21/09	7.45	172.24	300	350	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-2	179.69	04/08/09	8.28	171.41	370	350	110	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-2	179.69	07/22/09	9.84	169.85	---	380	<100	---	---	---	---	---	---	2.3	---	---
MW-2	179.69	10/19/09	10.50	169.19	270	130 h	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-2	179.69	01/06/10	8.58	171.11	370	270 h	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-2	179.69	04/23/10	8.44	171.25	220	400	170	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-2	179.69	07/02/10	8.79	170.90	280 h	120 h	<100	<0.50	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-2	179.69	10/06/10	9.70	169.99	280 h	510 h	350 h	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-2	179.69	01/11/11	8.60	171.09	179	248	<96.2	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	179.69	05/05/11	8.11	171.58	134	146	<95.2	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	179.69	08/01/11	9.30	170.39	220	260	<238	<1.00	<1.00	<1.00	<3.00	---	---	1.06	---	---
MW-2	179.69	11/04/11	9.34	170.35	228	285	<238	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	01/10/12	8.80	169.47	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	178.27	08/08/12	8.51	169.76	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	178.27	01/10/13	8.70	169.57	---	---	---	---	---	---	---	---	---	---	---	---
MW-2	178.27	04/03/13	8.01	170.26	188	244	379	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	09/16/13	8.40	169.87	144	468 / 408	270 / 444	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-2	178.27	12/18/13	8.54	169.73	15,300	253 / 156	201 / 121	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	01/09/14	8.35	169.92	184	293 / 419	428 / 344	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	03/04/14	8.19	170.08	154	194 / 213	112 / 103	10.5	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	06/11/14	7.93	170.34	177	231 / 221	95.7 / 118	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-2	178.27	08/28/14	9.41	168.86	189	303	234	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-2	178.27	12/08/14	8.23	170.04	189	210	93.9	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-2	178.27	03/17/15	7.65	170.62	183	---	---	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-2	178.27	06/08/15	8.42	169.85	127	---	---	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-2	178.27	08/27/15	10.21	168.06	131	---	---	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	30.30
MW-2	178.27	12/22/15	7.08	171.19	310	---	---	46.1	8.79	0.299 J	2.69 J	---	---	---	---	---
MW-2	178.27	03/22/16	7.02	171.25	468	---	---	82.7	15.1	0.255 J	3.92	---	---	---	---	---
MW-2	178.27	06/01/16	8.35	169.92	407	---	---	47.9	15.6	0.734 J	5.62	---	---	---	---	---
MW-2	178.27	09/23/16	9.05	169.22	287	---	---	27.8	8.73	0.402 J	5.72	<0.170	4.28	0.705 J	<0.170	509
MW-2	178.27	12/16/16	8.11	170.16	547	---	---	78.3	97.1	1.81 J	17.2	---	---	---	---	---
MW-2	178.27	03/07/17	7.72	170.55	1,140	---	---	144	384	5.08	36.6	---	---	---	---	---
MW-2	178.27	06/09/17	8.14	170.13	3,390	---	---	345	1,210	37.0	258	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-3	179.45	06/11/94	9.34	170.11	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-3	179.45	09/12/95	9.34	170.11	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-3	179.45	11/27/95	6.62	172.83	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	02/20/97	6.55	172.90	ND	548	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	05/20/97	7.56	171.89	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	07/31/97	7.77	171.68	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	08/20/97	8.22	171.23	ND	290	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	11/17/97	7.03	172.42	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	02/19/98	6.55	172.90	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	05/22/98	7.35	172.10	ND	299	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	08/26/98	8.52	170.93	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	11/30/98	6.68	172.77	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-3	179.45	04/23/99	7.08	172.37	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	11/22/99	8.06	171.39	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	05/22/00	7.62	171.83	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	10/19/00	9.17	170.28	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	05/09/01	8.53	170.92	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	10/23/01	9.72	169.73	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	08/20/02	9.62	169.83	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	02/20/03	7.57	171.88	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	07/21/03	9.32	170.13	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	07/22/09	8.60	170.85	<100	140	<100	<0.5	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-3	179.45	10/19/09	9.21	170.24	<100	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-3	179.45	01/06/10	7.39	172.06	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	04/23/10	7.03	172.42	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	07/02/10	7.40	172.05	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	10/06/10	8.41	171.04	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	01/11/11	7.00	172.45	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	05/05/11	7.00	172.45	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	08/01/11	8.21	171.24	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	179.45	11/04/11	8.65	170.80	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	01/10/12	7.22	170.81	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-3	178.03	08/08/12	8.28	169.75	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	01/10/13	6.60	171.43	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	04/03/13	6.82	171.21	<100	<93.5	<93.5	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-3	178.03	09/16/13	7.80	170.23	<100	176 / 155	122 / 302	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-3	178.03	12/18/13	7.11	170.92	<100	<94.3 / <94.3	<94.3 / 109	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-3	178.03	01/09/14	7.33	170.70	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	03/04/14	6.31	171.72	<100	<95.2 / <95.2	<95.2 / <95.2	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-3	178.03	06/11/14	7.45	170.58	<100	<93.9 / <93.9	<93.9 / <93.9	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-3	178.03	08/28/14	8.63	169.40	<100	95.1	<93.9	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-3	178.03	12/08/14	7.27	170.76	<100	<93.9	114	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-3	178.03	03/17/15	7.02	171.01	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	06/08/15	6.89	171.14	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	08/27/15	9.12	168.91	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	12/22/15	6.20	171.83	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	03/22/16	6.35	171.68	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	06/01/16	7.92	170.11	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	09/23/16	8.49	169.54	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	12/16/16	6.74	171.29	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	03/07/17	6.41	171.62	---	---	---	---	---	---	---	---	---	---	---	---
MW-3	178.03	06/09/17	7.41	170.62	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	09/12/95	8.56	169.02	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-4	177.58	11/27/95	5.63	171.95	<50	490	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-4	177.58	02/20/97	4.65	172.93	55.5	938	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	05/20/97	6.02	171.56	ND	1,090	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	07/31/97	6.90	170.68	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	08/20/97	7.35	170.23	ND	853	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	11/17/97	6.07	171.51	73.9	628	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	02/19/98	5.77	171.81	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	05/22/98	6.52	171.06	ND	499	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	08/26/98	7.66	169.92	ND	419	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	11/30/98	5.80	171.78	51.4	537	ND	ND	ND	ND	ND	---	---	---	---	---
MW-4	177.58	04/23/99	6.50	171.08	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-4	177.58	11/22/99	7.43	170.15	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	05/22/00	6.90	170.68	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	10/19/00	8.47	169.11	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	05/09/01	8.38	169.20	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	10/23/01	9.37	168.21	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	08/20/02	9.11	168.47	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	02/20/03	6.98	170.60	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	07/21/03	8.76	168.82	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	06/18/07	7.71	169.87	<50.0	<250	<500	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-4	177.58	09/20/07	9.07	168.51	<50.0	1,060 a	869	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-4	177.58	12/03/07	7.13	170.45	<250	195	207 f,g	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-4	177.58	02/27/08	4.46	173.12	69.0	636	480	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-4	177.58	07/22/08	7.82	169.76	<100	330	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	10/02/08	8.63	168.95	<100	150	<100	<0.50	<1	<1	<1	---	---	<1	---	---
MW-4	177.58	01/21/09	5.24	172.34	<100	240	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	04/08/09	6.68	170.90	<100	300	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	7/22/2009*,**	7.87	169.71	---	250	<100	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
MW-4	177.58	10/19/09	8.59	168.99	<100	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	01/06/10	6.51	171.07	<100	230	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	04/23/10	6.51	171.07	<100	290	140	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	07/02/10	6.62	170.96	<100	<100	<100	<0.50	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-4	177.58	10/06/10	7.89	169.69	<100	330 h	290 h	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-4	177.58	01/11/11	6.14	171.44	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	05/05/11	6.42	171.16	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	177.58	08/01/11	7.51	170.07	<100	933	409	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-4	177.58	11/04/11	7.73	169.85	<100	393	<240	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	01/10/12	6.21	169.97	<100	687	617	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	08/08/12	7.43	168.75	<100	805	485	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-4	176.18	01/10/13	5.92	170.26	<100	454	<94.3	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	04/03/13	6.23	169.95	<100	1,090	427	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	09/16/13	7.02	169.16	<100	439 / 528	341 / 488	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-4	176.18	12/18/13	6.22	169.96	<100	291 / 562	241 / 444	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-4	176.18	01/09/14	6.30	169.88	---	---	---	---	---	---	---	---	---	---	---	---
MW-4	176.18	03/04/14	5.18	171.00	<100	412 / 513	191 / 178	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	06/11/14	6.44	169.74	<100	613 / 549	271 / 161	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-4	176.18	08/28/14	7.81	168.37	<100	419	249	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-4	176.18	12/08/14	6.46	169.72	<100	149	<93.9	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-4	176.18	03/17/15	5.95	170.23	<100	614	128	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-4	176.18	06/08/15	6.95	169.23	<100	222	<94.3	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-4	176.18	08/27/15	8.36	167.82	<100	318	<93.0	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	<10.0
MW-4	176.18	12/22/15	4.88	171.30	<52.0	194 J	<380	<0.0320	<0.380	<0.0860	<0.0160	---	---	---	---	---
MW-4	176.18	03/22/16	5.31	170.87	28.2 J	289	63.4 J	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-4	176.18	06/01/16	6.96	169.22	18.1 J	120 J	<60.9	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-4	176.18	09/23/16	7.83	168.35	<17.8	121	<60.7	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	<0.170	<0.170	33.10
MW-4	176.18	12/16/16	5.66	170.52	<17.8	102 J	<60.3	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-4	176.18	03/07/17	5.21	170.97	<70.4	202 J	<124	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-4	176.18	06/09/17	6.31	169.87	<70.4	285	<132	<0.0930	<0.312	<0.198	0.471 J	---	---	---	---	---
MW-5	177.10	09/12/95	7.73	169.37	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-5	177.10	11/27/95	6.21	170.89	<50	<250	---	<0.5	<0.5	<0.5	<1.0	---	---	---	---	---
MW-5	177.10	02/20/97	4.56	172.54	ND	1,540	ND	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	05/20/97	5.65	171.45	ND	2,610	ND	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	07/31/97	6.47	170.63	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	08/20/97	6.93	170.17	ND	2,170	869	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	11/17/97	5.72	171.38	ND	2,270	854	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	02/19/98	5.33	171.77	ND	ND	ND	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	05/22/98	6.07	171.03	ND	2,420	ND	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	08/26/98	7.25	169.85	ND	1,360	ND	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	11/30/98	5.51	171.59	ND	2,460	771	ND	ND	ND	ND	---	---	---	---	---
MW-5	177.10	04/23/99	5.39	171.71	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	11/22/99	7.19	169.91	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	05/22/00	6.14	170.96	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	10/19/00	8.10	169.00	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	05/09/01	7.77	169.33	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	177.10	10/23/01	8.76	168.34	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-5	177.10	06/18/07	7.28	169.82	<50.0	790 c	<500	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-5	177.10	09/20/07	8.82	168.28	<50.0	2,740 a	1,710	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-5	177.10	12/03/07	6.74	170.36	<250	1,160 e,f	1,020	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-5	177.10	02/27/08	5.81	171.29	<50.0	3,800	2,310	3.86	2.41	<0.500	<0.500	---	---	---	---	---
MW-5	177.10	07/22/08	7.23	169.87	<100	560	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	10/02/08	8.00	169.10	<100	400	<100	<0.50	<1	<1	<1	---	---	<1	---	---
MW-5	177.10	01/21/09	4.74	172.36	<100	450	120	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	04/08/09	5.83	171.27	<100	220	220	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	7/22/2009*,**	6.95	170.15	---	680	120	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---
MW-5	177.10	10/19/09	8.14	168.96	<100	190	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	01/06/10	5.53	171.57	<100	410	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	04/23/10	5.26	171.84	<100	200	120	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	07/02/10	5.62	171.48	<100	190 h	<100	<0.50	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-5	177.10	10/06/10	7.37	169.73	<100	900 h	340 h	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-5	177.10	01/11/11	4.88	172.22	<100	245	124	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	177.10	05/05/11	5.74	171.36	<100	251	<95.2	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	177.10	08/01/11	6.92	170.18	<100	285	<238	<1.00	<1.00	<1.00	<3.00	---	---	<1.00	---	---
MW-5	177.10	11/04/11	7.41	169.69	<100	183	<245	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	175.65	01/10/12	6.04	169.61	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	175.65	08/08/12	7.25	168.40	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	175.65	01/10/13	5.22	170.43	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	175.65	04/03/13	6.53	169.12	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	175.65	09/16/13	6.90	168.75	<100	2,090 / 1,620	794 / 1,090	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-5	175.65	12/18/13	5.88	169.77	<100	1,370 / 1,580	652 / 936	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	175.65	01/09/14	5.80	169.85	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	175.65	03/04/14	5.34	170.31	<100	1,700 / 1,760	846 / 762	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	175.65	06/11/14	5.91	169.74	<100	1,300 / 1,350	562 / 384	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-5	175.65	08/28/14	6.99	168.66	<100	1,510	473	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-5	175.65	12/08/14	6.26	169.39	<100	1,130	334	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-5	175.65	03/17/15	5.30	170.35	<100	794	<93.5	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-5	175.65	06/08/15	6.65	169.00	<100	864	97.8	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-5	175.65	08/27/15	7.59	168.06	<100	1060	196	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	<10.0

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-5	175.65	12/22/15	4.85	170.80	<52.0	830	<285	0.0758 J	<0.0380	<0.0860	0.267 J	---	---	---	---	---
MW-5	175.65	03/22/16	4.45	171.20	<17.8	149	<60.3	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-5	175.65	06/01/16	6.16	169.49	18.8 J	568	116 J	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-5	175.65	09/23/16	7.49	168.16	<17.8	621	85.8 J	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	<0.170	<0.170	<3.90
MW-5	175.65	12/16/16	5.54	170.11	<17.8	680	131 J	<0.465	<1.56	<0.990	<2.21	---	---	---	---	---
MW-5	175.65	03/07/17	4.40	171.25	<70.4	209 J	<123	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-5	175.65	06/09/17	5.75	169.90	<70.4	657	158 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-6	177.84	11/27/95	5.24	172.60	1,100	750	---	570	8.9	41	260	---	---	---	---	---
MW-6	177.84	02/20/97	6.00	171.84	761	1,180	ND	333	6.17	15.5	56.9	---	---	---	---	---
MW-6	177.84	05/20/97	5.93	171.91	2,140	884	ND	547	19.8	58.7	309	---	---	---	---	---
MW-6	177.84	07/31/97	6.02	171.82	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	177.84	08/20/97	6.33	171.51	1,620	1,170	ND	430	18.4	42.3	263	---	---	---	---	---
MW-6	177.84	11/17/97	6.18	171.66	1,110	419	ND	291	13.9	23.2	195	---	---	---	---	---
MW-6	177.84	02/19/98	6.00	171.84	692	ND	ND	114	11.8	12.4	87.2	---	---	---	---	---
MW-6	177.84	05/22/98	6.27	171.57	1,290	1,040	ND	250	12	48.3	213	---	---	---	---	---
MW-6	177.84	08/26/98	6.68	171.16	1,230	613	ND	231	13.4	35.3	180	---	---	---	---	---
MW-6	177.84	11/30/98	5.10	172.74	575	879	ND	148	8.71	6.94	91.2	---	---	---	---	---
MW-6	177.84	04/23/99	5.23	172.61	409	---	---	37.9	5.84	1.32	37.6	---	---	---	---	---
MW-6	177.84	11/22/99	6.05	171.79	351	---	---	47.4	3.98	<0.5	18.2	---	---	---	---	---
MW-6	177.84	05/22/00	6.32	171.52	644	---	---	47.8	7.59	3.98	27.7	---	---	---	---	---
MW-6	177.84	10/19/00	8.02	169.82	1,410	---	---	86.7	5.7	3	42.7	---	---	---	---	---
MW-6	177.84	05/09/01	6.92	170.92	725	---	---	61.3	6.03	4.46	32.7	---	---	---	---	---
MW-6	177.84	10/23/01	8.94	168.90	387	---	---	6.23	5.10	<0.5	14	---	---	<0.5	---	---
MW-6	177.84	08/20/02	8.62	169.22	600	300	<500	<1	4	<1	10	---	---	---	---	---
MW-6	177.84	02/20/03	6.34	171.50	710	<250	<500	8.7	<1	<1	<1	---	---	16	---	---
MW-6	177.84	07/21/03	8.17	169.67	430	350	<500	5.4	4	<1	7	---	---	6.2	---	---
MW-6	177.84	02/17/04	6.37	171.47	410	360	<500	3.7	1.8	<1	1.8	---	---	2.6	---	---
MW-6	177.84	08/12/04	7.74	170.10	410	640	<500	<1	2.9	<1	4.3	---	---	4.2	---	---
MW-6	177.84	02/08/05	6.46	171.38	560	310	<500	2.4	3.2	<1	4.9	---	---	<1	---	---
MW-6	177.84	08/30/05	7.51	170.33	450	370	<500	<1	2.3	<1	4.9	---	---	---	---	---
MW-6	177.84	02/09/06	5.86	171.98	116	<236	<472	<0.5	0.548	<0.5	<1.0	---	---	---	---	---
MW-6	177.84	11/07/06	5.00	172.84	284	468	208	<0.500	0.950	<0.500	<3.00	---	---	<5.00	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-6	177.84	03/20/07	4.22	173.62	278	1,030 a	677	<0.500	0.850	<0.500	<3.00	---	---	---	---	---
MW-6	177.84	06/18/07	6.41	171.43	477	541 e	<485	<0.500	1.60	<0.500	<3.00	---	---	---	---	---
MW-6	177.84	09/20/07	7.81	170.03	135	915 a	829	<0.500	1.43	<0.500	<3.00	---	---	---	---	---
MW-6	177.84	12/03/07	5.96	171.88	<250	498 e,f	441	<1.00	<1.00	<1.00	<3.00	---	---	1.13	---	---
MW-6	177.84	02/27/08	6.31	171.53	<311	976	866	<0.500	0.820	0.590	<3.00	---	---	---	---	---
MW-6	177.84	07/22/08	6.60	171.24	400	430	<100	<0.50	<1.0	<1.0	0.89	---	---	---	---	---
MW-6	177.84	10/02/08	8.28	169.56	210	270	<100	<0.50	<1	<1	<1	---	---	1.9	---	---
MW-6	177.84	01/21/09	5.79	172.05	130	300	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-6	177.84	04/08/09	6.15	171.69	250	160	170	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-6	177.84	07/22/09	6.63	171.21	---	410	120	---	---	---	---	---	---	1.6	---	---
MW-6	177.84	10/19/09	6.71	171.13	230	120 h	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-6	177.84	01/06/10	6.29	171.55	290	450	150	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-6	177.84	04/23/10	6.23	171.61	150	180	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-6	177.84	07/02/10	6.33	171.51	200 h	<100	<100	<0.50	<1.0	<1.0	<1.0	---	---	<1.0	---	---
MW-6	177.84	10/06/10	6.50	171.34	230 h	450 h	340 h	<0.50	<1.0	<1.0	1.2	---	---	---	---	---
MW-6	177.84	01/11/11	6.25	171.59	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	177.84	05/05/11	6.03	171.81	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	177.84	08/01/11	6.69	171.15	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	177.84	11/04/11	9.69	168.15	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	176.43	01/10/12	6.40	170.03	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	176.43	08/08/12	9.34	167.09	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	176.43	01/10/13	6.05	170.38	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	176.43	04/03/13	6.94	169.49	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	176.43	09/16/13	6.60	169.83	165	526 / 555	251 / 230	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-6	176.43	12/18/13	6.32	170.11	208	414 / 298	178 / 340	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-6	176.43	01/09/14	6.50	169.93	194	538 / 381	254 / <105	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-6	176.43	03/04/14	6.25	170.18	<100	463 / 482	207 / 231	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-6	176.43	06/11/14	6.32	170.11	143	360 / 277	111 / 196	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-6	176.43	08/28/14	7.79	168.64	103	525	247	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-6	176.43	12/08/14	6.16	170.27	160	288	94.2	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-6	176.43	03/17/15	6.01	170.42	131	402	<93.5	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-6	176.43	06/08/15	6.42	170.01	117	215	<94.3	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-6	176.43	08/27/15	8.51	167.92	<100	538	114	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	1.10	<1.00	29.80
MW-6	176.43	12/22/15	5.57	170.86	57.2 J	371	298 J	<0.0320	<0.0380	<0.0860	0.247 J	---	---	---	---	---
MW-6	176.43	03/22/16	6.25	170.18	47.0 J	451	102 J	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-6	176.43	06/01/16	6.52	169.91	151	249	<60.5	2.09	1.07	<0.198	0.773 J	---	---	---	---	---
MW-6	176.43	09/23/16	6.77	169.66	139	246	<60.7	<0.200	0.605 J	<0.190	1.03 J	<0.170	0.235 J	0.839 J	<0.170	416
MW-6	176.43	12/16/16	5.76	170.67	27.0 J	248	60.6 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-6	176.43	03/07/17	6.31	170.12	78.1 J	464	<126	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-6	176.43	06/09/17	6.41	170.02	129 J	439	<133	20.0	8.77	<0.198	1.84 J	---	---	---	---	---
MW-7	179.95	11/27/95	7.78	172.17	210	<250	---	7.7	2.1	6	38	---	---	---	---	---
MW-7	179.95	02/20/97	8.00	171.95	2,920	1,090	ND	347	11.80	256	183	---	---	---	---	---
MW-7	179.95	05/20/97	8.40	171.55	2,680	ND	ND	272	6.80	207	93.6	---	---	---	---	---
MW-7	179.95	07/31/97	9.20	170.75	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	179.95	08/20/97	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	179.95	11/17/97	8.43	171.52	2,830	1,170	ND	138	5.82	178	158	---	---	---	---	---
MW-7	179.95	02/19/98	8.00	171.95	2,370	ND	ND	151	7.75	169	86.4	---	---	---	---	---
MW-7	179.95	05/22/98	8.87	171.08	1,670	818	ND	122	ND	135	55.4	---	---	---	---	---
MW-7	179.95	08/26/98	10.01	169.94	2,270	718	ND	77	6.50	121	133	---	---	---	---	---
MW-7	179.95	11/30/98	7.71	172.24	2,420	874	ND	111	6.41	199	155	---	---	---	---	---
MW-7	179.95	04/23/99	8.46	171.49	1,330	---	---	85.6	3.02	134	17	---	---	---	---	---
MW-7	179.95	11/22/99	9.64	170.31	214	---	---	1.11	<0.5	<0.5	<1.0	---	---	---	---	---
MW-7	179.95	05/22/00	9.17	170.78	332	---	---	2.01	1.93	8	1.07	---	---	---	---	---
MW-7	179.95	10/19/00	10.81	169.14	242	---	---	2.91	3.03	<0.5	8.71	---	---	---	---	---
MW-7	179.95	05/09/01	10.39	169.56	441	---	---	6.52	1.98	21	2.41	---	---	---	---	---
MW-7	179.95	10/23/01	11.48	168.47	811	---	---	33.3	2.26	44.9	8.61	---	---	---	---	---
MW-7	179.95	08/20/02	11.35	168.60	1,000	<250	<500	17	<1	37	27	---	---	---	---	---
MW-7	179.95	02/20/03	9.05	170.90	650	<250	<500	29	<1	<1	<1	---	---	3.8	---	---
MW-7	179.95	07/21/03	11.02	168.93	470	<250	<500	5	<1	11	9	---	---	18	---	---
MW-7	179.95	02/17/04	9.32	170.63	430	500	<500	1.8	<1	2	2.2	---	---	16	---	---
MW-7	179.95	08/12/04	11.24	168.71	350	600	<500	<1	<1	3.6	3.1	---	---	13	---	---
MW-7	179.95	02/08/05	9.14	170.81	360	<250	<500	3.8	<1	<1	2	---	---	6	---	---
MW-7	179.95	08/30/05	10.72	169.23	390	<250	<500	<1	<1	<1	4.4	---	---	---	---	---
MW-7	179.95	02/09/06	7.33	172.62	361	236	<472	4.69	0.785	2.8	11.9	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-7	179.95	11/07/06	10.36	169.59	447	428	290	1.27	<0.500	<0.500	4.10	---	---	8.49	---	---
MW-7	179.95	03/20/07	8.55	171.40	425	716 a	612	<0.500	<0.500	0.780	<3.00	---	---	---	---	---
MW-7	179.95	06/18/07	10.17	169.78	315	364 d	<500	<0.500	<0.500	<0.500	<3.00	---	---	---	---	---
MW-7	179.95	09/20/07	11.44	168.51	301	1,020 a	1,060	<0.500	<0.500	0.640	8.51	---	---	---	---	---
MW-7	179.95	12/03/07	9.11	170.84	295	514 e,f	481	<1.00	<1.00	<1.00	4.15	---	---	5.86	---	---
MW-7	179.95	02/27/08	9.09	170.86	266	760	758	0.600	<0.50	1.58	3	---	---	---	---	---
MW-7	179.95	07/22/08	10.04	169.91	330	260	<100	<0.50	0.29	4.5	1.4	---	---	---	---	---
MW-7	179.95	10/02/08	10.85	169.10	280	230	<100	<0.50	<1	<1	<1	---	---	5.9	---	---
MW-7	179.95	01/21/09	7.75	172.20	<100	230	140	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	04/08/09	8.50	171.45	<100	<100	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	07/22/09	10.10	169.85	---	---	---	---	---	---	---	---	---	6.3	---	---
MW-7	179.95	10/19/09	10.73	169.22	130	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	01/06/10	8.83	171.12	<100	300	140	0.75	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	04/23/10	8.55	171.40	<100	120	<100	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	07/02/10	8.90	171.05	<100	<100	<100	<0.50	<1.0	<1.0	<1.0	---	---	3.6	---	---
MW-7	179.95	10/06/10	9.94	170.01	<100	280 h	220 h	<0.50	<1.0	<1.0	<1.0	---	---	---	---	---
MW-7	179.95	01/11/11	8.69	171.26	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	179.95	05/05/11	8.60	171.35	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	179.95	08/01/11	9.73	170.22	<100	<98.0	<245	<1.00	<1.00	<1.00	<3.00	---	---	3.05	---	---
MW-7	179.95	11/04/11	9.83	170.12	<100	114	<240	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	01/10/12	8.64	169.86	<100	<96.2	266	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	08/08/12	9.67	168.83	<100	141	162	<1.00	<1.00	<1.00	<3.00	---	---	3.64	---	---
MW-7	178.50	01/10/13	8.00	170.50	<100	103	<100	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	04/03/13	8.36	170.14	<100	108	127	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	09/16/13	9.55	168.95	<100	409 / 408	427 / 424	<1.00	<1.00	<1.00	<2.00	---	---	2.00	---	---
MW-7	178.50	12/18/13	8.68	169.82	<100	222 / 338	459 / 288	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	01/09/14	8.60	169.90	<100	487 / 243	501 / 198	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	03/04/14	8.53	169.97	<100	320 / 307	211 / 167	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-7	178.50	06/11/14	8.71	169.79	<100	277 / 285	440 / 122	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-7	178.50	08/28/14	10.13	168.37	<100	337	99.8	<1.00	<1.00	<1.00	<2.00	---	---	2.01	---	---
MW-7	178.50	12/08/14	8.47	170.03	<100	275	226	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-7	178.50	03/17/15	8.34	170.16	---	---	---	---	---	---	---	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-7	178.50	06/08/15	8.51	169.99	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	08/27/15	10.62	167.88	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	12/22/15	7.18	171.32	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	03/22/16	7.75	170.75	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	06/01/16	9.32	169.18	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	09/23/16	9.49	169.01	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	12/16/16	8.22	170.28	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	03/07/17	7.79	170.71	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	178.50	06/09/17	8.55	169.95	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	07/31/97	6.92	173.36	77	554	---	2.51	2.4	1.2	4.18	---	---	---	---	---
MW-8	180.28	08/20/97	7.00	173.28	ND	513	ND	2.76	1.75	ND	2.24	---	---	---	---	---
MW-8	180.28	11/17/97	7.24	173.04	61	650	ND	4.37	1.68	0.53	3.56	---	---	---	---	---
MW-8	180.28	02/19/98	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	05/22/98	7.32	172.96	58.3	844	ND	ND	ND	ND	ND	---	---	---	---	---
MW-8	180.28	08/26/98	8.95	171.33	ND	311	ND	ND	ND	ND	1.35	---	---	---	---	---
MW-8	180.28	11/30/98	6.29	173.99	ND	402	ND	0.627	ND	ND	ND	---	---	---	---	---
MW-8	180.28	04/23/99	5.02	175.26	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	11/22/99	6.69	173.59	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	05/22/00	7.08	173.20	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	10/19/00	7.91	172.37	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	05/09/01	7.46	172.82	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	10/23/01	7.91	172.37	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	07/22/09	8.25	172.03	<100	320	120	<0.5	<1.0	<1.0	<1.0	---	---	2.8	---	---
MW-8	180.28	10/19/09	7.98	172.30	<100	<100	<100	<0.5	<1.0	<1.0	<1.0	---	---	---	---	---
MW-8	180.28	01/06/10	6.69	173.59	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	04/23/10	7.00	173.28	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	07/02/10	7.00	173.28	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	10/06/10	7.43	172.85	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	180.28	01/11/11	6.70	173.58	<100	832	655	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	180.28	05/05/11	6.84	173.44	<100	544	304	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	180.28	08/01/11	7.67	172.61	<100	654	<240	<1.00	<1.00	<1.00	<3.00	---	---	1.18	---	---
MW-8	180.28	11/04/11	7.46	172.82	<100	1,160	848	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-8	178.69	01/10/12	7.05	171.64	<100	837	734	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	08/08/12	8.06	170.63	<100	1,050	680	<1.00	<1.00	<1.00	<3.00	---	---	1.24	---	---
MW-8	178.69	01/10/13	6.40	172.29	<100	485	162	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	04/03/13	6.91	171.78	<100	976	517	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	09/16/13	7.10	171.59	<100	979 / 875	850 / 740	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-8	178.69	12/18/13	7.20	171.49	<100	698 / 844	504 / 807	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	01/09/14	6.51	172.18	---	---	---	---	---	---	---	---	---	---	---	---
MW-8	178.69	03/04/14	6.47	172.22	<100	588 / 614	310 / 376	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	06/11/14	7.42	171.27	<100	820 / 741	360 / 1420	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-8	178.69	08/28/14	8.41	170.28	<100	1,080	615	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-8	178.69	12/08/14	6.85	171.84	<100	664	428	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-8	178.69	03/17/15	6.70	171.99	<100	540	109	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-8	178.69	06/08/15	7.41	171.28	<100	519	151	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-8	178.69	08/27/15	8.46	170.23	<100	671	203	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	<10.0
MW-8	178.69	12/22/15	6.03	172.66	<52.0	265	<294	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-8	178.69	03/22/16	6.59	172.10	<17.8	288	108 J	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-8	178.69	06/01/16	7.70	170.99	24.9 J	373	131 J	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-8	178.69	09/23/16	7.79	170.90	<17.8	413	114 J	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	0.395 J	<0.170	31.6
MW-8	178.69	12/16/16	6.59	172.10	30.6 J	298	99.4 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-8	178.69	03/07/17	6.60	172.09	<70.4	363	146 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-8	178.69	06/09/17	7.14	171.55	<70.4	490	153 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-9	177.83	08/08/12	10.35	167.48	208	970	263	<1.00	<1.00	1.46	11.1	---	---	5.28	---	---
MW-9	177.83	01/10/13	5.83	172.00	151	1,010	121	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-9	177.83	04/03/13	5.91	171.92	<100	894	317	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-9	177.83	09/16/13	8.01	169.82	<100	1,040 / 1150	776 / 917	<1.00	<1.00	<1.00	<2.00	---	---	4.06	---	---
MW-9	177.83	12/18/13	6.05	171.78	<100	894 / 748	736 / 939	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-9	177.83	01/09/14	6.25	171.58	---	---	---	---	---	---	---	---	---	---	---	---
MW-9	177.83	03/04/14	6.01	171.82	<100	1,100 / 1080	643 / 399	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-9	177.83	06/11/14	6.17	171.66	<100	879 / 881	1,240 / 272	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-9	177.83	08/28/14	7.11	170.72	<100	1,100	438	<1.00	<1.00	<1.00	<2.00	---	---	4.83	---	---
MW-9	177.83	12/08/14	6.05	171.78	<100	688	206	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-9	177.83	03/17/15	6.55	171.28	<100	746	141	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-9	177.83	06/08/15	6.28	171.55	<100	900	217	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-9	177.83	08/27/15	6.91	170.92	<100	691	185	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	3.56	<1.00	12.50
MW-9	177.83	12/22/15	5.64	172.19	<52.0	667	<285	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-9	177.83	03/22/16	5.78	172.05	18.4 J	713	201 J	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-9	177.83	06/01/16	6.41	171.42	23.8 J	457	144 J	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-9	177.83	09/23/16	6.09	171.74	<17.8	481	125 J	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	3.73	<0.170	14.1
MW-9	177.83	12/16/16	5.01	172.82	<17.8	212	83.8 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-9	177.83	03/07/17	5.45	172.38	<70.4	242 J	<123	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-9	177.83	06/09/17	6.03	171.80	<70.4	343	<122	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-10	179.34	09/12/13	7.58	171.76	---	---	---	---	---	---	---	---	---	---	---	---
MW-10	179.34	09/16/13	8.50	170.84	<100	469 / 804	418 / 810	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-10	179.34	12/18/13	7.72	171.62	<100	1,100 / 1,220	1,600 / 1,600	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-10	179.34	01/09/14	8.04	171.30	---	---	---	---	---	---	---	---	---	---	---	---
MW-10	179.34	03/04/14	7.21	172.13	<100	862 / 997	999 / 1,200	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-10	179.34	06/11/14	7.64	171.70	<100	1,530 / 1,110	698 / 1,540	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-10	179.34	08/28/14	8.61	170.73	<100	909	714	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-10	179.34	12/08/14	7.41	171.93	<100	930	730	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-10	179.34	03/17/15	7.88	171.46	<100	---	---	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-10	179.34	06/08/15	7.82	171.52	<100	667	329	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-10	179.34	08/27/15	8.70	170.64	<100	166	103	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	<10.0
MW-10	179.34	12/22/15	6.82	172.52	<52.0	672	400 J	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-10	179.34	03/22/16	7.11	172.23	<17.8	297	345	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-10	179.34	06/01/16	7.99	171.35	24.0 J	310	247	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-10	179.34	09/23/16	8.21	171.13	<17.8	328	176 J	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	<0.170	<0.170	<3.90
MW-10	179.34	12/16/16	6.87	172.47	<17.8	426	364	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-10	179.34	03/07/17	7.32	172.02	<70.4	559	338 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-10	179.34	06/09/17	7.55	171.79	<70.4	624	378 J	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-11	177.70	09/12/13	5.33	172.37	---	---	---	---	---	---	---	---	---	---	---	---
MW-11	177.70	09/16/13	5.10	172.60	2,910	1,110 / 844	1,120 / 693	<1.00	<1.00	1.05	<2.00	---	---	<1.00	---	---
MW-11	177.70	12/18/13	5.76	171.94	<100	<94.3 / <94.3	512 / 543	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-11	177.70	01/09/14	5.81	171.89	<100	<100 / 165	<100 / 154	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-11	177.70	03/04/14	5.38	172.32	187	<93.5 / <93.5	<93.5 / <93.5	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---

Table 2
Summary of Groundwater Monitoring Data
Shell-branded Wholesale Facility
1349 Northwest State Avenue
Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE
MW-11	177.70	06/11/14	5.98	171.72	<100	<93.9 / <93.9	<93.9 / <93.9	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-11	177.70	08/28/14	6.61	171.09	104	156	338	<1.00	<1.00	<1.00	<2.00	---	---	<1.00	---	---
MW-11	177.70	12/08/14	5.52	172.18	<100	<93.9	222	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-11	177.70	03/17/15	4.92	172.78	<100	---	---	<1.00	<1.00	<1.00	<2.00	---	---	---	---	---
MW-11	177.70	06/08/15	6.01	171.69	<100	---	---	<1.00	<1.00	<1.00	<3.00	---	---	---	---	---
MW-11	177.70	08/27/15	6.42	170.28	<100	---	---	<1.00	<1.00	<1.00	<3.00	<2.00	<1.00	<1.00	<1.00	<10.0
MW-11	177.70	12/22/15	4.70	173.00	<52.0	---	---	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-11	177.70	03/22/16	5.03	172.67	<17.8	---	---	<0.0320	<0.0380	<0.0860	<0.0160	---	---	---	---	---
MW-11	177.70	06/01/16	6.24	171.46	<17.8	---	---	<0.0930	<0.312	<0.198	<0.162	---	---	---	---	---
MW-11	177.70	09/23/16	5.31	172.39	<17.8	---	---	<0.200	<0.170	<0.190	<0.580	<0.170	<0.210	<0.170	<0.170	<3.90
MW-11	177.70	12/16/16	5.05	172.65	<17.8	---	---	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-11	177.70	03/07/17	4.90	172.80	<70.4	---	---	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---
MW-11	177.70	06/09/17	5.81	171.89	<70.4	---	---	<0.0930	<0.312	<0.198	<0.442	---	---	---	---	---

Notes:

All results in micrograms per liter (µg/L) unless otherwise indicated.

< = Not detected at laboratory reporting limit. Starting on 12/22/15, < is reported at the method detection limit.

--- = Not analyzed

BOLD = Concentrations exceed the MTCA Method A Cleanup Levels

amsl = above mean sea level

btoc = below top of casing

DIPE = Diisopropyl ether

DTW = Depth to Water

ETBE = Ethyl tert-butyl ether

GWE = Groundwater Elevation

TPH-G = Total petroleum hydrocarbons as gasoline

TPH-D = Total petroleum hydrocarbons as diesel

TPH-O = Total petroleum hydrocarbons as oil

MTBE = Methyl tert-butyl ether

MTCA = Model Toxics Control Act

TAME = Tert-amyl methyl ether

TBA = Tert-butyl alcohol

J = The sample result is an estimated concentration.

¹ = Cleanup levels for TPH-g are 800 µ/L if benzene is present and is 1,000 µ/L benzene is non-detect

* indicates the samples were additionally analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) analyzed by EPA Method 8270C-SIM and for Polychlorinated biphenyls (PCBs) analyzed by EPA

** indicates the samples were additionally analyzed for Halogenated Volatile Organic Compounds (HVOCs) analyzed by EPA Method 8260B; of the HVOCs regulated by MTCA all analyte concentrations were below

a = Results in the diesel organics range are primarily due to overlap from a heavy oil range product.

b = Hydrocarbon pattern most closely resembles heavy gas/light diesel range components

Table 2
Summary of Groundwater Monitoring Data
 Shell-branded Wholesale Facility
 1349 Northwest State Avenue
 Chehalis, Washington

Sample ID	TOC (feet amsl)	Sample Date	DTW (feet btoc)	GWE (feet amsl)	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	DIPE	ETBE	MTBE	TAME	TBA
Model Toxics Control Act Method A Cleanup Levels					800/1000 ¹	500	500	5.00	1,000	700	1,000	NE	NE	20	NE	NE

c = Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
 d = Hydrocarbon pattern most closely resembles a blend of heavy gas/light diesel range components as well as heavily weathered diesel and/or biogenic interference.
 e = The primary contamination elutes between C8-C40, which is in the diesel fuel range.
 f = The contamination did not match any standards in our library.
 g = The primary contamination elutes between C16-C40, which is in the motor oil range.
 h = The sample chromatographic pattern for TPH does not match the specified standard. Quantitation of the unknown hydrocarbons was based on the specified standard.

Appendix A Historical Boring Logs

Date Logged: 11/02/94
 Logged By: Daniel Blaes (Blaes Environmental Management, Inc.)

Drilling Company: Cascade Drilling, Inc. Woodinville, WA
 Drilling Method: CME 75 Hollow-Stem Auger Drilling Rig

DEPTH (feet)	Well Box Cement Grout Bentonite	Blow Counts	OVA Reading (ppm)	USCS	GROUND SURFACE		LITHOLOGIC DESCRIPTION
0							Asphalt surface cover
0.5' - 5'				CL			Clay, silty, soft, brownish grey, moist, no odor
5' - 7'				SM			Sand, fine grained, silty, grey, slightly clayey, moist, no odor
7' - 18'		18/20/24	10	CL			Clay, silty, cohesive and slightly plastic, soft, moist, blue grey, slight gasoline odor
18' - 24'		8/12/24	2				
18' - 24'		10/14/21	ND	SM			Sand, fine grained, silty, with some clay, slightly cohesive, bluish grey, moist, no odor
24' - 40'		8/8/10	ND				Clay, sandy, cohesive and slightly plastic, grey, wet, slight odor at 25 feet
30' - 39'		8/9/9	ND	CL			

Field Indication of Groundwater Depth

Well Construction Details
 4-inch Diameter PVC Casing
 Screened Casing (0.020") 39' - 14'
 Blank Casing Interval: 14' - 0'
 Sand Pack: 39' - 11'
 Bentonite: 11' - 3'
 Cement Grout: 3' - .5'
 Well Box At Ground Surface

TOTAL DEPTH 40 FEET

LEGEND
 ■ SAMPLE DEPTH LOCATION

BLAES Texaco Refining and Marketing, Inc.
 Lynnwood, Washington

LITHOLOGIC LOG MW-1
 Texaco Facility #63-157-0020
 1349 N.W. State Street
 Chehalis, Washington

11/94 Project #: 02-94-0003

File Name: 2940003.5 Drawn By: D. Blaes

Date Logged: 11/02/94
 Logged By: Daniel Blaes (Blaes Environmental Management, Inc.)

Drilling Company: Cascade Drilling, Inc. Woodinville, WA
 Drilling Method: CME 75 Hollow-Stem Auger Drilling Rig

		GROUND SURFACE		LITHOLOGIC DESCRIPTION	
DEPTH (feet)		Blow Counts	OVA Reading (ppm)	USCS	
5	Well Box Cement Grout Bentonite	50/50	No Recovery	CL SM	Asphalt surface cover 0.5' - 6' Clay, silty, soft, brownish grey, moist, no odor 6' - 8' Sand, fine grained, silty, grey, slightly clayey, moist, slight odor
10		12/15/18	5	CL	8' - 17' Clay, silty, cohesive and slightly plastic, soft, moist, blueish grey, slight gasoline odor
15		15/18/21	ND		
20		10/16/12	ND	SM	17' - 24' Sand, fine grained, silty, with some clay, slightly cohesive, blueish grey, moist to wet, no odor
25	Field Indication of Groundwater Depth				
30	Sand Pack			CL	
35					
40					
45					
50					
55					
60					
65					
70					
75					

Well Construction Details
 4-inch Diameter PVC Casing
 Screened Casing (0.020") 34' - 9'
 Blank Casing Interval: 9' - 0'
 Sand Pack: 34' - 7'
 Bentonite: 7' - 3'
 Cement Grout: 3' - .5'
 Well Box At Ground Surface

TOTAL DEPTH 35 FEET

LEGEND
 █ SAMPLE DEPTH LOCATION

BLAES	Texaco Refining and Marketing, Inc. Lynnwood, Washington
LITHOLOGIC LOG MW-2	
Texaco Facility #63-157-0020 1349 N.W. State Street Chehalis, Washington	
11/94	Project #: 02-94-0003
File Name: 2940003.6	Drawn By: D. Blaes

Date Logged: 11/02/94
 Logged By: Daniel Blaes (Blaes Environmental Management, Inc.)

Drilling Company: Cascade Drilling, Inc. Woodinville, WA
 Drilling Method: CME 75 Hollow-Stem Auger Drilling Rig

GROUND SURFACE			LITHOLOGIC DESCRIPTION		
DEPTH (feet)	Well Box Cement Grout Bentonite	Blow Counts	OVA Reading (ppm)	USCS	
5		14/17/17	8	CL SM	Asphalt surface cover 0.5' - 4' Clay, silty, soft, brownish grey, moist, no odor
10		7/9/8	ND	CL	4' - 7' Sand, fine grained, silty, grey, slightly clayey, moist, slight odor
15	Sand Pack	12/12/16	ND	CL	7' - 18' Clay, silty, cohesive and slightly plastic, soft, moist, blueish grey, no odor
20	Field Indication of Groundwater Depth			SM	18' - 24' Sand, fine grained, silty, with some clay, slightly cohesive, blueish grey, moist to wet, no odor
25				CL	24' - 30' Clay, sandy, cohesive and slightly plastic, grey, wet, no odor
30					
35					
40					
45					
50					
55					
60					
65					
70					
75					

Well Construction Details
 4-inch Diameter PVC Casing
 Screened Casing (0.020") 30' - 5'
 Blank Casing Interval: 5' - 0'
 Sand Pack: 30' - 4'
 Bentonite: 4' - 2'
 Cement Grout: 2' - 5'
 Well Box At Ground Surface

TOTAL DEPTH 30 FEET

LEGEND
 ■ SAMPLE DEPTH LOCATION

BLAES	Texaco Refining and Marketing, Inc. Lynnwood, Washington
LITHOLOGIC LOG MW-3	
Texaco Facility #63-157-0020 1349 N.W. State Street Chehalis, Washington	
11/94	Project #: 02-94-0003
File Name: 2940003.7	Drawn By: D. Blaes

Project No.: 0038-02-01-01

Log of Monitoring Well MW-4

Drilling Contractor: Cascade Drilling Inc.

Location: 1349 NW State Street, Chehalis, WA

Drilling Method / Rig: Hollow-Stem Auger / CME-75

Surface Elevation: NA

Driller: Rodney / Mike (helper)

Date Started: 5 September 1995

Time: 11:53

Field Representative: Allan Wahl

Date Finished: 5 September 1995

Time: 15:53

Surface Conditions: Level asphalt parking area

Groundwater Depth: NA

DEPTH feet	SAMPLE ID.	BLOW COUNT	PID (ppm)	CORE RECOVERY	GRAPHIC LOG	USCS	SOIL/ROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
1							Surface: 5-in. of asphalt concrete, and 4-in. of -3/4 in. crushed rock base coarse.	<p>Surface Seal Ready Mix Concrete</p> <p>Well Seal Bentonite Chips</p> <p>Well Riser 4-inch I.D. Schedule 40 PVC</p> <p>Filter Pack 10-20 Colorado Silica Sand</p> <p>Well Screen 0.01-inch Machine Cut Slots</p>
2						SM	Tan- streaked grey, silty SAND with trace clay, moist to wet, loose, (Fill).	
3								
4								
5	S-1	50-6	0.0	10'				
6								
7	S-2	6	20.0	12'		SM	Dark brown, clayey, silty SAND with carbonized wood fragments, moist to wet, loose, (Fill).	
8								
9								
10	S-3	3	0.0	4'				
11								
12								
13								
14								
15						ML	Gray, clayey, fine sandy SILT, moist stiff, moderate plasticity, some root fibers (Native Soil)	
16	S-4	7	0.0	14'				
17								
18								
19								
20								
21	S-5	7	0.0	12'		SP	Gray, clean fine to medium SAND, wet, loose	
22								
23	Soil boring terminated at 20.0 feet below asphalt parking lot grade. Sampled to 21.5 feet.							
24								
25								
26								
27								
28								



Boateng & Associates, Inc.
8005 S.E. 28th Street
Mercer Island, Washington 98040
(206)236-6231



Texaco Refining and Marketing Inc.
3400 188th Street SW Ste. 630 A
Lynnwood, Washington 98037
(206) 774-8080

FACILITY NUMBER: 63-157-0020

TES PROJECT NUMBER: FTAG06

Project No.: 0038-02-01-01		Log of Monitoring Well MW-5	
Drilling Contractor: <i>Cascade Drilling Inc.</i>		Location: <i>1349 NW State Street, Chehalis, WA</i>	
Drilling Method / Rig: <i>Hollow-Stem Auger / CME-75</i>		Surface Elevation: <i>NA</i>	
Driller: <i>Rodney / Mike (helper)</i>		Date Started: <i>5 September 1995</i>	Time: <i>09:20</i>
Field Representative: <i>Allan Wahl</i>		Date Finished: <i>5 September 1995</i>	Time: <i>11:35</i>
Surface Conditions: <i>Level asphalt parking area</i>		Groundwater Depth: <i>NA</i>	

DEPTH feet	SAMPLE ID.	BLOW COUNT	PID (ppm)	CORE RECOVERY	GRAPHIC LOG	USCS	SOIL/ROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
1							Surface; 3.5-in. of asphalt concrete, and 3-in. of -3/4 in. crushed rock base coarse.	<p>Surface Seal Ready Mix Concrete</p> <p>Well Seal Bentonite Chips</p> <p>Well Riser 4-Inch I.D. Schedule 40 PVC</p> <p>Filter Pack 10-20 Colorado Silica Sand</p> <p>Well Screen 0.01-Inch Machine Cut Slots</p>
2						SM	Mottled tan-grey, silty fine SAND with clay, moist, loose, (Fill). Observation from hand auger soil cuttings.	
3								
4								
5	S-1	6						
6		12	0.0	12'		ML	Gray-dark brown, fine sandy SILT with clay and gravel, medium plasticity, moist, very stiff, (Fill).	
7		12						
8	S-2	10	0.0	4'		ML	AS ABOVE	
9		13						
10	S-3	3						
11		5	0.0	12'		ML	Brown-gray, clayey SILT with plant and root fibers, fine peaty matrix, moist, very plastic, stiff, (Native Soil).	
12		9						
13								
14								
15	S-4	4						
16		6	0.0	12'		ML	Blue-gray, fine sandy SILT with trace clay and root fibrils, blocky texture. moist to wet, moderate plasticity, stiff.	
17		7						
18								
19								
20	S-5	3						
21		6	0.0	12'		SM	Gray, silty, very fine SAND, dilatent, wet, medium dense.	
22		6						
23	Soil boring terminated at 20.0 feet below asphalt parking lot grade. Sampled to 21.5 feet.							
24								
25								
26								
27								
28								



Boateng & Associates, Inc.
8005 S.E. 28th Street
Mercer Island, Washington 98040
(206)236-6231



Texaco Refining and Marketing Inc.
3400 188th Street SW Ste. 630 A
Lynnwood, Washington 98037
(206) 774-6090

FACILITY NUMBER: 63-157-0020

TES PROJECT NUMBER: FTAG06

Project No.: 0038-02-02-01

Log of Monitoring Well MW-6

Drilling Contractor: Cascade Drilling Inc.

Location: 1349 NW State Street, Chehalis, WA

Drilling Method / Rig: Hollow-Stem Auger / CME-75

Surface Elevation: NA

Driller: Rodney / Mike (helper)

Date Started: 16 November 1995

Time: 11:00

Field Representative: Scott Gastring

Date Finished: 16 November 1995

Time: 12:05

Surface Conditions: Level asphalt parking area

Groundwater Depth: 10

DEPTH feet	SAMPLE ID.	BLOW COUNT	PID (ppm)	CORE RECOVERY	GRAPHIC LOG	USCS	SOIL/ROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
1							0 to 4" - asphalt.	<p>Surface Seal Ready Mix Concrete</p> <p>Well Seal Bentonite Chips</p> <p>Well Riser 4-inch I.D. Schedule 40 PVC</p> <p>Filter Pack 10-20 Colorado Silica Sand</p> <p>Well Screen 0.01-inch Machine Cut Slots</p>
2						Fill-gravel + sand		
3	S-1	7					Fill materials - 1 cobble + chunks of coal fine grained sandy silt.	
4		9	5.0	18"				
5		16						
6	NO RECOVERY		0.0	0'		SM	No sample- Encountered concrete layer at 5.0 to 6.5 ft.	
7								
8	S-2		50.0	18"			Fill materials from 7.5 to 8.0 feet. 8 to 8.5 ft. damp dark brown clay, contains organic fragments.	
9								
10	∇	5						
11	S-3	8	4.0	18"			Saturated, wet-gray clay with oxidized (Fe stained) material, gives clay a reddish orange appearance similar to material in MW-7. Water on split spoon barrel.	
12		9						
13	S-4	4	3.0	18"			As above: Water evident in fractures (zones) within clay.	
14		6						
15		7						
16	S-5	3	3.0	18"		CL	As above	
17		3						
18	S-6	3	3.0	18"			As above- clay grading to denser material at approx. 8.5 ft., brown clay with some silt and sand.	
19		3						
20		4						
21	S-7	5	4.0	18"			Saturated brown clay.	
22		6						
23	Soil boring terminated at 20.0 feet below asphalt parking lot grade. Sampled to 21.5 feet.							
24								
25								
26								
27								
28								



Boateng & Associates, Inc.
8005 S.E. 29th Street
Mercer Island, Washington 98040
(206) 236-8231



Texaco Refining and Marketing Inc.
3400 189th Street SW Ste. 630 A
Lynnwood, Washington 98037
(206) 774-1020

FACILITY NUMBER: 63-157-0020

TES PROJECT NUMBER: FTAG0623

Project No.: 0038-02-02-01		Log of Monitoring Well MW-7	
Drilling Contractor: Cascade Drilling Inc.		Location: 1349 NW State Street, Chehalis, WA	
Drilling Method / Rig: Hollow-Stem Auger / CME-75		Surface Elevation: NA	
Driller: Rodney / Mike (helper)		Date Started: 16 November 1995	Time: 09:00
Field Representative: Scott Gestring		Date Finished: 16 November 1995	Time: 10:05
Surface Conditions: Level asphalt parking area		Groundwater Depth: 12.5	

DEPTH feet	SAMPLE ID.	BLOW COUNT	PID (ppm)	CORE RECOVERY	GRAPHIC LOG	USCS	SOIL/ROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
1						SM	Fill- brown gravel- sand	<p>Surface Seal Ready Mx Concrete</p> <p>Well Seal Bentonite Chips</p> <p>Well Riser 4-Inch I.D. Schedule 40 PVC</p> <p>Filter Pack 10-20 Colorado Silica Sand</p> <p>Well Screen 0.01-Inch Machine Cut Slots</p>
2							Dry fill to 2.0 ft.	
3	S-1	10					Brown to gray, silty clay with iron staining, some basalt pebbles.	
4		2	0.0	12'				
5		16						
6	S-2	29	11.0	12'			Brown-gray, sandy silt, dry, concrete chunk at 6.0 to 6.5 ft. (any hydrocarbon odors, material adhering to concrete. (Fill to approx. 7.0 to 8.0 ft.)	
7		60						
8	S-3		387.0	18"			Dark brown, organic rich, dry clay, some pebbles and cobbles. Hydrocarbon odor.	
9								
10								
11	S-4		22.0	18"		CL	As above Very sticky, dense and compact, slight hydrocarbon odor.	
12	▼							
13	S-5	7	5.0	18"			Brown, silty clay, iron stained, grading to dark brown clay at 13.5 ft.	
14		9						
15		9						
16	S-6	4	4.0	18"			Gray, silty clay with iron staining, grading to dark brown silty clay.	
17		4						
18		11						
19	S-7	13	3.0	18"			Dark greenish-gray clay, damp, with organic fragments, no hydrocarbon odor.	
20		18						
21	S-8	4	3.0	18"		ML	Blue-gray clayey silt, saturated.	
22		6						
23		7						
24	Soil boring terminated at 20.0 feet below asphalt parking lot grade. Sampled to 21.5 feet.							
25								
26								
27								
28								



Boateng & Associates, Inc.
8005 S.E. 28th Street
Mercer Island, Washington 98040
(206) 236-6231



Texaco Refining and Marketing Inc.
3400 188th Street SW Ste. 630 A
Lynnwood, Washington 98037
(206) 774-6090

FACILITY NUMBER: 63-157-0020

TES PROJECT NUMBER: FTAG0623

Project No.: 0038-02-03-01

Log of Monitoring well mwv-0

Drilling Contractor: Cascade Drilling Inc.

Location: 1349 NW State Street, Chehalis, WA

Drilling Method / Rig: Hollow-Stem Auger / CME-55

Top of Casing Elevation: 180.28

Driller: Brent / Carl (helper)

Date Started: 22 July 1997

Time: 10:40

Field Representative: Ken Stark

Date Finished: 22 July 1997

Time: 12:30

Surface Conditions: Level asphalt parking area

Groundwater Depth: 10.5

DEPTH feet	SAMPLE ID.	BLOW COUNT	PID (ppm)	CORE RECOVERY	GRAPHIC LOG	USCS	SOIL/ROCK DESCRIPTION	WELL CONSTRUCTION DETAILS
1							3" asphalt, brown gravel with sand (fill)	<p>Surface Seal Ready Mix Concrete</p> <p>Well Seal Bentonite Chips</p> <p>Well Riser 4-inch I.D. Schedule 40 PVC</p> <p>Filter Pack #2/12 Colorado Silica Sand</p> <p>Well Screen 0.01-inch Machine Cut Slots</p>
2							Gray to brown, sandy, SILT, dry, medium dense (fill).	
3						SM	Mottled gray - tan, gravelly sandy SILT, moist (fill).	
4							Strong petroleum odor.	
5								
6								
7		7						
8	B8-8	7	NA	18"				
9		8						
10	B8-10	5						
11		5		18"			gray CLAY, with pebbles and cobbles, oxidized sections, soft, saturated, organic rich, petroleum odor.	
12		6						
13		4				CL	As above.	
14		3		18"				
15		2						
16		10		18"			Gray grading to dark brown silty CLAY, no odor.	
17		11						
18		17					Dark greenish-gray CLAY, damp, with organic fragments, no hydrocarbon odor.	
19								
20		15						
21		13		18"		ML	Blue-gray clayey SILT, moist, stiff, organic fragments.	
22		15						
23	Soil boring terminated at 20.0 feet below asphalt parking lot grade. Sampled to 21.5 feet.							
24								
25								
26								
27								
28								



Boaleng & Associates, Inc.
8005 S.E. 28th Street
Mercer Island, Washington 98040
(206)236-6231



Texaco Refining and Marketing Inc.
3400 188th Street SW Ste. 630 A
Lynnwood, Washington 98037
(206) 774-6090

FACILITY NUMBER: 63-157-0020

TES PROJECT NUMBER: FTAG0823



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: 1349 CHEH
 PROJECT NUMBER: 241795
 CLIENT: SHELL OIL PRODUCTS US
 LOCATION: 1349 NW STATE AVENUE, CHEHALIS, WA

HOLE DESIGNATION: SB-1
 DATE COMPLETED: July 23, 2012
 DRILLING METHOD: AIR KNIFE
 FIELD PERSONNEL: J. SONG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE					
				NUMBER	INTERVAL	REC (%)	BLOW COUNTS	PID (ppm)	
	CONCRETE	0.58	<p style="font-size: small;">← BACKFILLED WITH BENTONITE CHIPS ← 12" BOREHOLE</p>						
	PEA GRAVEL	1.00							
2	SM-SILTY SAND (FILL), with gravel, fine to medium grained, poorly graded, brown, damp, no odor				SB1-3	X			0.0
4									
6	SC-CLAYEY SAND, fine to medium grained, clay (30%-40), brown, moist, no odor	5.00			SB1-5.5	X			0.0
	END OF BOREHOLE @ 6.0ft BGS	6.00							
8									
10									
12									
14									
16									
18									
20									
22									
24									
26									
28									
30									
32									
34									

OVERBURDEN LOG 241795WIN.GPJ CRA_CORP.GDT 7/27/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

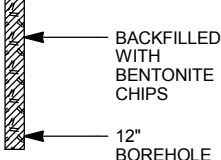
CHEMICAL ANALYSIS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: 1349 CHEH
 PROJECT NUMBER: 241795
 CLIENT: SHELL OIL PRODUCTS US
 LOCATION: 1349 NW STATE AVENUE, CHEHALIS, WA

HOLE DESIGNATION: SB-2
 DATE COMPLETED: July 23, 2012
 DRILLING METHOD: AIR KNIFE
 FIELD PERSONNEL: J. SONG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	BLOW COUNTS	PID (ppm)
	CONCRETE	0.58	 <p>BACKFILLED WITH BENTONITE CHIPS</p> <p>12" BOREHOLE</p>					
	PEA GRAVEL	1.00						
2	SM-SILTY SAND, with gravel (15%), silt (20-30%), fine to coarse grained, well graded, dark brown, damp, no odor			SB2-2.5	X			0.0
4	- REFUSAL - CONCRETE SLAB at 3.8ft BGS END OF BOREHOLE @ 3.8ft BGS	3.83		SB2-3.5	X			0.0
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

OVERBURDEN LOG 241795WIN.GPJ CRA_CORP.GDT 7/27/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: 1349 CHEH
 PROJECT NUMBER: 241795
 CLIENT: SHELL OIL PRODUCTS US
 LOCATION: 1349 NW STATE AVENUE, CHEHALIS, WA

HOLE DESIGNATION: SB-3
 DATE COMPLETED: July 24, 2012
 DRILLING METHOD: AIR KNIFE
 FIELD PERSONNEL: J. SONG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	BLOW COUNTS	PID (ppm)
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">ASPHALT</div> <div style="margin-bottom: 10px;">SM-SILTY SAND, with gravel, fine to medium grained, poorly graded, damp, brown, no odor</div> <div style="margin-bottom: 10px;">- REFUSAL - CONCRETE at 6.0ft BGS</div> <div>END OF BOREHOLE @ 6.0ft BGS</div> </div>	<div style="margin-bottom: 10px;">0.50</div> <div style="margin-bottom: 10px;">6.00</div>	<div style="margin-bottom: 10px;"> <p style="font-size: small;">← BACKFILLED WITH BENTONITE CHIPS</p> <p style="font-size: small;">← 12" BOREHOLE</p> </div>	<div style="margin-bottom: 10px;">SB3-5.5</div>	<div style="margin-bottom: 10px;">X</div>			<div style="margin-bottom: 10px;">0.0</div>	

OVERBURDEN LOG 241795WIN.GPJ CRA_CORP.GDT 7/27/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

Appendix B Standard Operating Procedures (SOPs)

AECOM STANDARD OPERATING PROCEDURE

SOIL SAMPLING

SOIL CLASSIFICATION AND LOGGING OF SUBSURFACE CONDITIONS

Soil characteristics will be visually examined and described in the field in general accordance with the Unified Soil Classification System.

Specific sample criteria to be noted includes:

- Soil Name
- USCS Group Symbol
- Color (Munsell Soil Color Charts, revised 1992)
- Grain size and distribution
- Soil particle lithology
- Gradation
- Plasticity
- Bedding or sedimentary structures
- Chemical precipitates
- Organic material
- Moisture content
- Background odor

Other observations, such as field screening data, visual evidence of contamination or lack thereof, the presence of debris or seepage horizons will also be noted. Observations will be recorded on a Soil Boring Log form for future reference. Other information to be noted on the Soil Boring Logs include:

- Project name and location
- Project number
- Field technician's name
- Drilling rig and sampling method
- Date of drilling start and completion
- Boring number
- Boring location
- Sample collection intervals and identification numbers
- Water level measurement (date and time)

Activities of the Observing Technician During Drilling:

1. Record the name of the drilling contractor.
2. Record the type and make of the drill rig used.
3. Note the weather or any special external conditions, which influence the drilling.
4. Examine soil samples and cuttings and make preliminary logs as the core is advanced.

5. Note date and time of all activities associated with the drilling.
6. Check that the methods used for drilling, well construction and decontamination conform to the project specifications.
7. Check that well construction materials conform to the project specifications.
8. The technician's daily record may include, but may not be limited to, the following items:
 - (a) Date and depth of hole at start and end of working day or shift.
 - (b) Type and condition of bit.
 - (c) Drilling rate.
 - (d) Gain or loss of water, mud or air flush; type of cuttings.
 - (e) Static water level at start and end of each working period.
 - (f) Description of soil or strata penetrated.
 - (g) Location of samples.
 - (h) Details of delays and breakdowns.
 - (i) Details of in-situ tests and instrumentation installed.
 - (j) Backfilling and grouting.

GENERAL NOTES

Included under general notes shall be all significant observations that do not readily fit elsewhere on the log sheet.

SOIL SAMPLE SCREENING

Soil samples will be screened for evidence of volatile organic compounds using a portable photoionization detector (PID) or flame ionization detector. Before use, the instrument will be calibrated to a known concentration of calibration gas, in accordance with the manufacturer's specifications.

The following sequential steps will be completed for each soil sample analyzed:

1. Place a representative portion of freshly exposed, uncompacted soil into a clean resealable plastic bag.
2. Seal the bag.
3. Allow the bag to sit at ambient temperature for three to five minutes.
4. Carefully insert the intake port of the analytical instrument through the plastic bag.
5. Record the sample concentration observed on the Soil Boring Log.

AECOM STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

Groundwater samples will be collected using new disposable polyethylene bailers using the following procedure.

- Remove the well cap and measure the depth from the top of casing (TOC) to the static water level. Depth to water measurements will be made using an electronic water level indicator capable of measuring to within 0.01 of a foot. Record the depth to water level measurement on the groundwater sampling form. Calculate the casing storage volume.
- Remove three saturated casing volumes of water using a disposable polyethylene bailer. Well purge water will be placed in a labeled Department of Transportation (DOT)-approved 55-gallon drum and stored on site pending disposal at an approved facility.
- If the well does not produce sufficient water for three saturated casing volumes, purge the well dry and sample as soon as the well recovers sufficiently.
- Before collecting samples, sampling personnel will don clean, nitrile or equivalent protective gloves. Transfer groundwater from the well into the appropriate laboratory provided sample bottles using the disposable polyethylene bailer. Volatile organic compound (VOC) samples will be collected first, as they are the most sensitive to volatilization. While filling VOC sample bottles, attempts will be made to pour down the inside of the container to minimize turbulence while sampling. While filling the sample vial for VOC analysis, a positive meniscus should be formed over the mouth of the vial to eliminate the formation of air bubbles and headspace prior to capping.
- Place all properly labeled and packaged sample containers in a cooler with ice. Each cooler should contain enough ice to maintain the samples at $4^{\circ}\text{C} \pm 2^{\circ}$ during continued sample collection and shipping. Add additional ice as needed, but do not freeze the samples.
- Record all sampling data on the groundwater sampling form.
- All non-disposable field equipment will be decontaminated prior to use at each well location.

AECOM STANDARD OPERATING PROCEDURE

DOCUMENTATION AND SAMPLE HANDLING

This section describes documentation and sample handling procedures. The procedures described are designed to provide a thorough record of events surrounding the collection of each sample, and to ensure, as far as can be accomplished in the field, that data collected are useable.

SAMPLE IDENTIFICATION AND LABELING

To provide a sample tracking mechanism, each sample collected will be given a sample identification number consisting of the well number. The site name and sampling date will not be included in the sample identification number because this information will be recorded in the field notes and on the sample label and chain-of-custody form.

Sample labels, whether blank or pre-printed, will contain an abbreviated summary of the logbook entry for the sample. The following information should be included on sample container labels:

- Sample identification number
- Date and time of sampling
- Type of sample preservatives added (if any)

SAMPLE CONTAINERS

Groundwater samples will be collected in glass or plastic containers, as specified in the analytical method, supplied by the contract analytical laboratory. The containers will have screw-type lids to assure adequate sealing of the bottles. Teflon inserts located inside the lids of the containers will prevent sample reaction with the lid and improve the quality of the seal.

The containers will be precleaned and certified under chain-of-custody. Commercially available precleaned jars are acceptable. The contract laboratory's bottle shipment documentation will record batch numbers for the bottles. With this documentation, bottles can be traced and bottle wash analyses can be reviewed.

SAMPLE PRESERVATION

Prior to shipping sample bottles to the field, the contract laboratory will add the required preservatives to the sample bottles that will be used for groundwater. The laboratory will affix waterproof labels to the bottles on which the type of preservative will be written.

Sample preservation procedures are used to maintain the original character of analytes during storage and shipment. Regardless of the nature of the sample, absolute stability for all constituents cannot be achieved. Preservation techniques, such as pH control and refrigeration, may retard physicochemical and biochemical changes. As a general rule, analyzing the sample as soon as possible is the best way to minimize physicochemical and biochemical changes.

All samples will be placed in the appropriate sample container and refrigerated with wet ice immediately upon sample collection. The samples will be transferred to the contract laboratory as soon as possible, preferably the same day as collection. The contract laboratory will meet all specified holding times and should make every effort to prepare and analyze the samples immediately after they are received.

STORAGE REQUIREMENTS

Samples will remain in the possession of the sampling personnel or be placed in secure, storage facility until they are shipped or delivered to the laboratory. Immediately after collection, and during shipment to the analytical laboratory, samples will be stored in coolers on ice at approximately $4^{\circ}\text{C} \pm 2^{\circ}$. Ice

packaged in plastic storage bags will be used to maintain the temperature in the shipping containers at approximately $4^{\circ}\text{C} \pm 2^{\circ}$. Ice will be replenished as necessary to ensure adequate cooling of samples during storage and shipping.

SAMPLE DOCUMENTATION

Entries into the logbook or other field sampling forms for sampling events may include, but not necessarily be limited to, the following:

- Project name, location, and number
- Date and time of sampling
- Sample numbers
- Cross-reference of numbers for split and blank samples
- Media sampled
- Geographical location of the sampling point in reference to site facilities
- Physical location of the sampling point, such as depth below ground surface (bgs)
- Method of sampling, including procedures, equipment, and any departure from the procedures specified in the Work Plan.
- Results of field measurements (e.g., PID readings).
- Sample preservation.
- Weather conditions at the time of sampling and previous events that may influence the representative nature of a sample. At a minimum, include temperature, approximate wind speed and direction, and sky cover.
- Photographic information. Briefly describe what was photographed and why, the date and time, the compass direction of the picture, number of the frame on the roll, and roll number.
- Sketches, when appropriate, with reference points tied to existing structures in the area (i.e., trees, roads).
- Analyses requested.
- Airbill number of sample shipment, when applicable.
- Other pertinent observations, such as the presence of other persons on the site (those associated with the job or members of the press, special interest groups, or passersby), and actions by others that may affect performance of site tasks.
- Name(s) of sampling personnel.

CHAIN-OF-CUSTODY PROCEDURES

Verifiable sample custody is an integral part of field and laboratory operations associated with this site investigation. The primary purpose of the chain-of-custody procedures is to document the possession of the samples from collection through storage and analysis to reporting. Chain-of-custody forms will become the permanent records of sample handling and shipment. The Field Investigation Manager or his/her designee will be responsible to the Project Manager for monitoring compliance with chain-of-custody procedures.

Field sampling personnel are responsible for the care and security of samples from the time the samples are collected until they have been turned over to the shipping agent or laboratory. A sample is

considered to be in one's custody if it is in plain view at all times, in the physical possession of the sampler, or stored in a locked place where tampering is prevented.

Samples collected during the day will be stored in shipping coolers beginning at the time of collection.

Chain-of-custody forms will be filled out starting when the first sample of each batch is collected. Each chain-of-custody form will contain the following information:

- Sample identification numbers.
- Date and time of sampling.
- Type of sample and number of sample containers associated with each sampling point.
- List of analyses requested.
- Name of sampling personnel.
- Spaces for transfer of custody acknowledgment.

When a complete batch has been collected and the chain-of-custody form is complete, field team members will crosscheck the form for possible errors. Any corrections will be made to the record with a single strike mark that is dated and initialed. The person who initials corrections will be the same person that relinquishes custody of the batch.

LABORATORY CUSTODY PROCEDURES

The laboratory will fill out a cooler receipt form. Upon receipt by the laboratory, custody seals will be inspected and the chain-of-custody form signed and dated by laboratory personnel. Laboratory personnel will verify the sample number and the condition of each cooler. Shipping manifests and chain-of-custody forms signed and dated by laboratory personnel will be considered sufficient documentation of sample custody transfer from the sampler, through the shipping agent, to the analyst in the contracted analytical laboratory.

A copy of each chain-of-custody form will be retained by the sampling team for the project file and the original will be sent with the samples. Bills of lading will also be retained as part of the documentation for the chain-of-custody records. In conjunction with data reporting, the analytical laboratory will return a copy of the original chain-of-custody forms to the project manager for inclusion into the central project file.

SHIPPING PROCEDURES

Samples will be transported to the project analytical laboratory in complete batches. The chain-of-custody form that accompanies each shipping container from the time of sample collection will be signed and dated, placed in a resealable plastic bag, and taped to the inside lid of one of the coolers.

Along with samples and ice, a temperature blank provided by the laboratory will be placed in each cooler. The temperature blank will consist of a labeled vial filled with laboratory-provided deionized water. Upon receipt of coolers at the laboratory, the temperature of the cooler will be measured by checking the temperature of the water in the temperature blank.

After the samples have been packaged and the chain-of-custody forms have been completed and sealed in the coolers, sampling personnel will affix dated custody seals to each cooler so that if it is opened the seals will be broken. Custody seals will contain the sample team member's signature (signature must match signature on chain-of-custody form) and date.

AECOM STANDARD OPERATING PROCEDURE

DECONTAMINATION

OVERVIEW

The purpose of this procedure is to ensure that all non-dedicated sampling, field screening, and water filtering equipment that contacts the sample material is clean and does not cause cross contamination between samples.

MOBILIZATION

Assemble the appropriate equipment.

- Alconox detergent (or equivalent)
- Potable water
- De-ionized water
- Three 5-gallon or larger buckets
- Two brushes
- 5-gallon garden sprayer
- Plastic sheeting
- Sealing plastic bags
- Drilling contractor provided equipment
- Steam cleaner
- Visqueen plastic
- Containment for steam cleaning water and removed soil

DECONTAMINATION

1) Drilling and well installation equipment:

- Set up a decontamination station at the location(s) designated by the Site representative.
- Verify that the drilling contractor has required equipment at the designated decontamination area and *thoroughly* cleans the equipment (inside and outside) with a high-pressure steam cleaning unit (water at 200° F and 1500 psi) prior to use at each boring/well location. All augers, drill steel, and drill casing should be decontaminated prior to use in each boring. Cleaned equipment should be placed on a visqueen covered surface following decontamination. Samplers can also be steamed clean in lieu of the decontamination procedure outlined below.
- Verify proper containment of water and soils generated by steam cleaning.
- Document decontamination procedures in the daily field report.

2) Sampling equipment during sampling:

- Rinse thoroughly with potable water.
- Scrub with Alconox/water wash to remove any visible dirt.
- Rinse with potable water.
- Double-rinse with deionized water.

- Replace wash and rinse water prior to sampling near each area of concern if identified on site, or more often if warranted.
- Store in a clean area on visqueen plastic sheeting during sampling.
- Wrap in plastic for storage unless equipment will be used immediately.
- Document decontamination procedures in the daily field report.

AECOM STANDARD OPERATING PROCEDURE

INVESTIGATION DERIVED WASTE (IDW) MANAGEMENT

It is anticipated that four types of waste will be generated, which includes disposable personal protective clothing and sampling equipment, soil cuttings, decontamination water, and purge water from groundwater sampling.

EXPECTED TYPES OF IDW

Personal Protective Equipment and Disposable Sampling Equipment

Disposable personal protective equipment (PPE) used during sample collection will include nitrile gloves.

Disposable sampling equipment may include polyethylene bailers, bailer twine, plastic bags, glass jars, and core liners.

Soil Cuttings

Soil cuttings will be brought to the surface during boring advancement and air knifing activities.

Decontamination Water

Sampling equipment such as an electronic water level indicator and non-disposable PPE will be decontaminated between each use and/or at the end of each day. The decontamination water will contain a minimum of phosphate-free detergent (Alconox or equivalent) and trace quantities of soil. Minimal amounts of decontamination water (<1 gallon) are expected to be generated during sampling procedures.

Purge Water

During groundwater sampling, water will be purged from each sampling point in an effort to remove suspended sediment from the sample.

HANDLING AND STORAGE OF IDW

In order to insure IDW is handled in a protective manner, URS personnel will adhere to the following procedures until disposal options are evaluated.

Personal Protective Equipment and Disposable Sampling Equipment

Disposable sampling equipment and PPE will be placed in trash bags after use or at the end of each workday. The disposable bags will be disposed of in a city garbage container.

Soil Cuttings

Soil cuttings generated during boring and air knifing activities will be containerized in Department of Transportation (DOT) approved 55-gallon steel drums. The drum(s) will be stored on site pending shipment to an approved facility.

Decontamination Water

Decontamination water generated during sampling activities will be containerized in DOT-approved 55-gallon steel drums. This water will be collected and stored on site pending shipment to an approved facility.

Purge Water

Purge water generated during groundwater sampling activities will be collected and disposed of in the same manner as the decontamination water.

DRUM LABELING

The waste drum will be clearly labeled with the following information.

- Generator's name
- Description of contents
- Date

Labeling information along with copies of field documentation related to the drum contents will be kept in the project file. The drum will be stored in a location approved by the site contact.

Waste Characterization

Soil cuttings, decontamination water and purge water will need to be characterized prior to shipment. Composite soil and composite groundwater samples (1 sample per 4-5 drums) will be collected and analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) by method NWTPH-Gx
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) by Environmental Protection Agency (EPA) method 8260B
- Resources Conservation and Recovery Act (RCRA)-8 metals.

Appendix C Field Forms



AECOM Shell SGW (US)
Daily Tailgate Meeting & Job Clearance Form

Issue: January 2, 2011
Revision 10: April 2016

Do NOT pre-populate any field.

Job Location:		Date:	
AECOM Site Supervisor:		AECOM PM:	

List activities to be performed today:	
Permitted Activities (specific permit to be completed):	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Confined Space Entry <input type="checkbox"/> Excavation/Trenching <input type="checkbox"/> Hot Work <input type="checkbox"/> Hoisting/Rigging (<u>any</u> lifting with equipment, excluding drill rigs) <input type="checkbox"/> Natural Gas System Maintenance

Muster Point:		Spill Kit Location:	
First Aid Kit Location:		Fire Extinguisher Location:	
Emergency cut-off switches:		Designated cell phone use area(s):	

Has the Site Manager/Owner been notified of the work activities and/or participated in a pre-work site walk?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Is a fuel delivery scheduled for today? If yes, plan to Stop Work during fuel delivery.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Has a site walk been performed to identify additional hazards?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Have all personnel reviewed and understand the site specific HASP?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Does each activity have a Job Safety Analysis (JSA)?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Does each subcontractor have JSAs for their activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have JSAs been reviewed by the work team and newly identified hazards been added to the JSA?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Has a Safe Lift Plan been completed and reviewed/approved by an AECOM Subject Matter Expert?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have all members of the work team confirmed understanding of the work, hazards, and controls/ mitigation?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Has each person on the work team discussed all hazards and mitigation measures associated with any task which will require their feet to leave the ground?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have work areas been properly cordoned-off to protect workers, site staff, and the public?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have equipment checks been completed, documented, and reviewed?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Have there been any equipment modifications made by subcontractor(s)? If yes, discuss modifications.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Do all members of the work team have API Safety Keys (AECOM excluded)?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
Do all members of the work team have a Shell "Life Saving Rules" Training card?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
Do all site workers understand injury/ intervention reporting requirements including immediately notifying the AECOM Site Supervisor of any injury near miss, unsafe condition or hazard observation?	<input type="checkbox"/> Yes <input type="checkbox"/> No*
If permits are required, have they been reviewed and permit conditions understood by the Team?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
If drilling, did driller physically point out all pinch points to entire team (AECOM and all subs)?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A
If drilling, has the driller & crew agreed the audible and visible signals for "all clear" prior to engaging controls?	<input type="checkbox"/> Yes <input type="checkbox"/> No* <input type="checkbox"/> N/A

* If No, then work cannot be performed until corrective action is completed and documented.

Title of AECOM JSAs reviewed today:		Title of Subcontractor's JSAs reviewed today:	
-------------------------------------	--	-----------------------------------------------	--

All personnel are wearing (regardless of activity):	<input type="checkbox"/> Hard Hat <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Safety Vest <input type="checkbox"/> Steel-Toed Boots <input type="checkbox"/> Gloves (appropriate for task) See JSA for additional task specific PPE requirements.
-----------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Other Items Discussed Today:	Stop Work Authority & Obligation
	<p>* All employees will stop the job any time anyone is concerned or uncertain about safety.</p> <p>* All employees will stop the job if anyone identifies a hazard or additional mitigation not recorded on the JSA.</p> <p>* All employees will be alerted to any changes in personnel or conditions at the worksite.</p> <p>* All employees will stop the job and reassess a task, hazards, and mitigations, and then amend the JSA as needed.</p>





AECOM Shell SGW (US)
Daily Tailgate Meeting & Job Clearance Form

Issue: January 2, 2011
Revision 10: April 2016

Do NOT pre-populate any field.

SITE WORKERS (including AECOM Contractors and Subcontractors): By signing here, you are stating the following:

- * You have been involved in reviewing the JSAs and understand the hazards and control measures associated with each task you are about to perform.
- * You understand the permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * You understand the Shell Life Saving Rules and are aware that tasks or work that is not risk-assessed shall not be performed.
- * You are aware of your authority and obligation to 'Stop Work'.

I arrived and departed fit for duty:

- * You are physically and mentally fit for duty,
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or fatigue issue you may have to the AECOM Site Supervisor.
- * You will sign-out uninjured unless you have otherwise informed the AECOM Site Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed)

PERSONAL SAFETY COMMITMENT (Attach additional Personal Safety Commitment sheets, if needed)

Print Name	"I will personally commit to do the following to positively improve site safety today":

SITE VISITORS (attach additional Site Visitor sign-in/out sheets if needed)

Print Name	Company Name	Arrival Time	Departure Time	Signature

SITE REPRESENTATIVE Sign In/Out (operating sites only, and signature must be requested. If the operator refuses to sign, note this on the Form)

Sign In: I have discussed this Job Clearance Form with the contractor		Sign Out: I have discussed this Job Clearance Form with the contractor	
Site Representative Name	Site Representative Signature	Site Representative Name	Site Representative Signature

TWILIGHT TOOL BOX TALK (Complete the following once field activities for the day have been concluded):

Were there any Incidents, Near Misses, Potential Incidents, or Positive Interventions today?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Were there any 'Stop Work' interventions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Were there any areas for improvement noted?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, provide details:
Is the Site Manager/Owner happy with the way you left the site (including the location of waste drums and/or equipment)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, provide details:
I certify that the above information is true and the job site is being left in a safe condition	<input type="checkbox"/> Yes <input type="checkbox"/> No	AECOM Site Supervisor Signature:

Project: _____
 Project Location: _____
 Project Number: _____

Log of Boring _____

Sheet 1 of _____

Date(s) Drilled	Logged By	Reviewed By
Drilling Method	Drilling Contractor	Total Depth of Borehole
Drill Rig Type	Drill Bit Size/Type	Approx. Ground Surface Elevation
Groundwater Level(s)	Sampling Method	Hammer Data
Borehole Backfill	Comments	

Depth, feet	SAMPLES				USCS Code	MATERIAL DESCRIPTION	FIELD NOTES
	Type and Number	Recovery, %	Headspace PID, ppm				
0							
5							
10							
15							
20							
25							
30							

Project: _____
 Project Location: _____
 Project Number: _____

Log of Boring _____

Sheet 2 of _____

Depth, feet	SAMPLES			USCS Code	MATERIAL DESCRIPTION	FIELD NOTES
	Type and Number	Recovery, %	Headspace PID, ppm			
30						
35						
40						
45						
50						
55						
60						
65						

Project: _____
 Project Location: _____
 Project Number: _____

Log of Boring _____

Sheet 3 of _____

Depth, feet	SAMPLES			USCS Code	MATERIAL DESCRIPTION	FIELD NOTES
	Type and Number	Recovery, %	Headspace PID, ppm			
65						
70						
75						
80						
85						
90						
95						
100						


Project: _____
 Project Location: _____
 Project Number: _____

Log of Boring _____

Sheet 4 of _____

Depth, feet	SAMPLES			USCS Code	MATERIAL DESCRIPTION	FIELD NOTES
	Type and Number	Recovery, %	Headspace PID, ppm			
105						
110						
115						
120						
125						
130						
135						

JOB SAFETY ANALYSIS

General Physical Hazards and Controls	
Potential Hazards	Controls
General Site Hazards	
All hazards	<div style="text-align: center;">  </div> <p style="text-align: center; color: orange;">What am I about to do?</p> <p style="text-align: center; color: blue;"><i>Have I stepped through the task in my mind?</i></p> <p style="text-align: center; color: blue;"><i>Do I really understand the task?</i></p> <p style="text-align: center; color: blue;"><i>Have I done this task before?</i></p> <p style="text-align: center; color: orange;">What could go wrong?</p> <p style="text-align: center; color: blue;"><i>What could move slip or fall?</i></p> <p style="text-align: center; color: blue;"><i>Does the equipment need to be checked?</i></p> <p style="text-align: center; color: blue;"><i>Could something spill, splash or leak?</i></p> <p style="text-align: center; color: orange;">What could be done to make it safer?</p> <p style="text-align: center; color: blue;"><i>Should I get help with the task?</i></p> <p style="text-align: center; color: blue;"><i>Do I have the right tools or equipment?</i></p> <p style="text-align: center; color: blue;"><i>Do I need to review the JSA/Procedures?</i></p> <p style="text-align: center; color: orange;">What have I done to communicate the hazards?</p> <p style="text-align: center; color: blue;"><i>Have I spoken to my team about the hazards?</i></p> <p style="text-align: center; color: blue;"><i>Have I informed others in the area?</i></p> <p style="text-align: center; color: blue;"><i>Does someone know where I am and what I am about to do?</i></p> <ul style="list-style-type: none"> • Manage projects so that adequate time is allowed to complete tasks • Manage projects so that proper equipment is available • Maintain and encourage a positive safety attitude/culture • Look out for yourself and others at the site; provide feedback to each other on safety performance • Report near misses and safety observations • Employees must review this Health and Safety Plan prior to work, and a copy must be available at the work site • Reevaluate the Job Safety Analysis daily; consider changes in weather conditions, work activities, and other site conditions • Conduct a daily safety briefing or tailgate meeting • Refer to SMS 072 Behavior Based Safety

General Physical Hazards and Controls	
Potential Hazards	Controls
Noise	<ul style="list-style-type: none"> • Use hearing protection when heavy equipment is operating • Refer to SMS 026 <u>Noise and Hearing Conservation</u>
Aggressive individuals or potentially dangerous locations (e.g. high crime areas or deserted buildings)	<ul style="list-style-type: none"> • Get approval from property owners prior to access and see if the owner will accompany you • Work in teams of two or more • If you are alone maintain contact with someone at the office • Leave and/or contact help if you are threatened • Refer to SMS 084 <u>Lone Worker</u>
Driving/vehicle safety	<p>Inspect vehicles before use Avoid driving when drowsy Obey traffic rules</p> <ul style="list-style-type: none"> • Use extra caution when entering roadways or backing • Completely exit roadways to park • Do not operate vehicles in unsafe conditions (e.g., on steep slopes, in deep mud) • Use a tow strap and proper procedures to remove a vehicle that is stuck in mud or snow • Do not use cell phones and avoid other distractions when operating vehicles <p>Secure all loads, including equipment within the cab</p> <ul style="list-style-type: none"> • Wear seat belts • Leave enough time to get to your destination without hurrying • Never follow too close • Avoid backing when possible • Be aware of heavy equipment and do not park or conduct work in the blind spot of the equipment operator; remember that "blind spots" of some equipment can be very large • Verify back-up alarms are functional for all heavy equipment; for pick-ups or SUVs with obstructed rear view, a back-up alarm or use a spotter when backing up <ul style="list-style-type: none"> • Refer to SMS 057 <u>Vehicle Safety Program</u>
Cold stress	<ul style="list-style-type: none"> • Stay inside when possible during extreme cold • Schedule outdoor work during mild weather • Stay dry • Dress in layers • Have a warm hat and socks available • Take breaks in heated areas • Refer to SMS 059 <u>Cold Stress</u>
Heat stress	<ul style="list-style-type: none"> • Stay inside when possible during extreme heat <p>Drink plenty of liquids and have plenty of water available in the field</p> <ul style="list-style-type: none"> • Take breaks in a cool area as necessary • Wear a hat and use sun screen • Wear loose fitting, light colored clothing • Moisten clothing to promote cooling • Avoid excessive alcohol or caffeine the night before work • Go someplace cool if you feel ill • Seek medical attention if symptoms of heat exhaustion or heat stroke appear (e.g., dizzy, pale dry skin, confusion) • Refer to SMS 018 <u>Heat Stress</u>

General Physical Hazards and Controls	
Potential Hazards	Controls
Severe weather	<p>Check the radio or internet for severe weather warnings</p> <p>Check road conditions with the state highway department</p> <p>During high winds watch for blowing doors, gates and other objects</p> <p>During lightning follow the 30/30 rule – if you hear thunder with 30 seconds of seeing lightning, do not restart work until 30 minutes has passed after the last sound of thunder or flash of light</p> <p>Know safe locations and/or evacuation routes in case of severe weather such as hurricanes and tornadoes</p>
Lifting	<ul style="list-style-type: none"> • Healthy employees should lift no more than 50 pounds – know your personal limit • Get help to lift heavy objects • Bend at the knees; do not use your back • Do not twist during lifts • Minimize the movement of heavy objects • Pack items to keep their weight below 50 pounds • Stretch before lifting • Store heavy objects off the ground • Refer to SMS 069 <u>Manual Material Handling</u>
Sharp objects	<ul style="list-style-type: none"> • Wear appropriate work safety-toe boots and work gloves • Use caution when working with any hand tool • Whenever possible use safety cutting tools instead of fixed open blade knives • Periodically inspect tools and equipment to insure that they remain in good operating condition • Watch out for barbed wire and electrical fences • Refer to SMS 064 <u>Hand Safety</u> and SMS 016 <u>Hand Tools and Portable Equipment</u>
Slips, trips, and falls	<ul style="list-style-type: none"> • Maintain good housekeeping • When possible, avoid steep and uneven terrain • Wear sturdy boots with good tread • Keep the work area free from water, ice or debris • Literally, watch where you step – mark slip, trip, fall hazards with flagging, etc. • Take the time to find a safe route to the desired location • Do not perform any activity with a fall exposure of 6 feet (1.8 meters) (construction industry) or 4 feet (1.2 meters) (general industry) or more without using fall protection • Use a backpack to avoid carrying too many items • Refer to SMS 021 <u>Housekeeping</u>
Vehicle traffic	<ul style="list-style-type: none"> • Implement traffic control in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) if lane closures are required • Contact the responsible authority for the road to determine if a right-of-way permit is required • For shoulder work and work near roadways, use a combination of orange cones and vehicle placement to ensure the work zone is protected from motorists • Wear ANSI Class 2 high-visibility vests (Class 3 for night work or work when there is low visibility) • Expect the unexpected • Refer to SMS 032 <u>Work Zone Traffic Control</u>
Fire/Explosion	<ul style="list-style-type: none"> • Refer to SMS 014 <u>Fire Protection and Prevention</u>

Chemical Hazards and Controls	
Potential Hazards	Controls
Potential chemical hazards	<ul style="list-style-type: none"> • Use nitrile gloves when handling potentially contaminated materials • Implement site control • Stay up wind from contamination • Minimize handling or contaminated materials • Contain or cover contaminated materials to minimize release of vapors • Using good personal hygiene practices; wash hands and face prior to eating or drinking) • The “buddy system” must be used in hazardous areas • Refer to provisions throughout this HASP • Refer to SMS 050 Toxic and Hazardous Substances
Hazardous materials	<ul style="list-style-type: none"> • Material Safety Data Sheets (MSDS) must be available for all chemicals brought on site (e.g., sample preservatives, decontamination solutions). Copies of the MSDS are provided in Attachment D. • Label all containers with chemical name and hazard warning • Use protective gear recommended on the MSDS • Refer to SMS 048 Hazardous Materials/Dangerous Goods Shipping • Refer to SMS 002, Hazard Communication

Biological Hazards and Controls	
Potential Hazards	Controls
Ticks	<ul style="list-style-type: none"> • Deer ticks can carry Lyme disease, other ticks can carry Rocky Mountain Spotted Fever and other disease • Use repellants containing DEET and/or permethrin • Wear light colored clothing so you can see ticks • Perform tick checks periodically and at the end of the day • Refer to SMS 047 Biological Hazards
Poisonous plants	<ul style="list-style-type: none"> • Know how to identify poison oak and poison ivy and avoid it • Burning or cutting poison plants can cause respiratory problems • Oils from these plants can transfer from clothing to equipment and cause reactions • Refer to SMS 047 Biological Hazards
Vectorborne disease	<ul style="list-style-type: none"> • Hantavirus may be present in mouse droppings or nesting materials • Histoplasmosis may be present in bird droppings • Plague may be transmitted by fleas • Do not generate dust from areas impacted by mouse or bird droppings • Eliminate locations for potential mouse and bird nests in equipment storage areas • Stay away from all animals especially if they appear to be ill or injured
Others	<ul style="list-style-type: none"> • Use caution when lifting objects that may provide shelter for spiders, snakes, hornets and rodents • Use repellent with DEET if mosquitoes are a problem at the site • Livestock, domestic animals, and wild animals are all biological hazards to consider • Refer to SMS 047 Biological Hazards

Job Safety Analysis

Contractor:		Date:		JSA No:		
Location of worksite:		JSA Team:		Initials	Initials	
Description of work: Monitoring Well Installation		Name		Initials	Name	
		Name		Initials	Name	
		Name		Initials	Name	
		Name		Initials	Name	
Personal Protective Equipment (PPE):						
<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shields <input checked="" type="checkbox"/> Safety Glasses <input type="checkbox"/> NOMEX/FRC <input type="checkbox"/> Tyvek Regular Poly_____		<input checked="" type="checkbox"/> Safety Toed Boots <input type="checkbox"/> Supplied Air Respirator <input type="checkbox"/> Air Purifying Respirator <input type="checkbox"/> Welding/Pipe Clothing <input type="checkbox"/> Welding Mask/Goggles <input checked="" type="checkbox"/> Safety Vest or High Visibility clothing		<input type="checkbox"/> Life Vest – Over water/Boat <input checked="" type="checkbox"/> Glove Type (s): Nitrile for protection from chemicals, Leather or equivalent for hand protection <input type="checkbox"/> Other: _____		
Activity	Hazard Category	How/Where/When	Control Mitigations Eliminate - Control - Protect		Who is responsible?	Stop Trigger
<i>- List the tasks required to perform the activity in the sequence they are carried out.</i>	<i>Motion, Chemical, Environmental or Energized Systems</i>	<i>- Could a hazard be present? - What am I about to do? - What could go wrong?</i>	<i>List the control measures required to eliminate, control, or protect against unwanted hazard.</i>			
Unloading / Loading Equipment and Supplies	Motion Environmental	<ul style="list-style-type: none"> - Lifting heavy equipment - Pinch points - Uneven surfaces - Slip, trip, and fall hazards - Traffic - Pedestrians 	<ul style="list-style-type: none"> - Lift heavy objects using leg strength and proper posture - Obtain assistance when lifting >50 lbs - Avoid placing hands / fingers beneath heavy objects - Wear leather gloves when handling equipment / supplies - Watch hand position when opening / closing hinged lids / gates (i.e., tailgates, utility boxes, doors, hood, etc.) - Establish a set route to unload equipment to the work zone 			<ul style="list-style-type: none"> - Control mitigations are not being used or followed - Changing conditions

Job Safety Analysis

Moving from well to well	Environmental Motion	<ul style="list-style-type: none">- Pedestrians- Traffic	<ul style="list-style-type: none">- No use of cell phones while operating vehicle- Wear seatbelt at all times while inside vehicle- Drive defensively- Wear proper PPE (i.e. high visibility clothing)- Remain alert to onsite traffic and traffic patterns- Use spotter when backing up	<ul style="list-style-type: none">- Control mitigations are not being used or followed- Changing conditions
--------------------------	----------------------	---------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------

Job Safety Analysis

<p>Drill Soil Boring</p>	<p>Motion Environmental Chemical</p>	<ul style="list-style-type: none"> - Heavy equipment - Lifting heavy objects - Drilling Operations - Chemical exposure - Drilling operations - Noise - Cross Contamination - Pinch Points 	<ul style="list-style-type: none"> - Maintain eye contact with operators at all times. Do not proceed if operator has not acknowledged your presence - Only authorized personnel are allowed in the exclusion zone - Verify overhead obstructions are not present prior to raising the drill rig mast - Stay at least 10 feet away from energized lines - Only properly trained personnel are allowed to operate heavy equipment - Be aware of auger movements – do not approach augers in motion. - Obtain assistance when lifting >50 lbs - Maintain equipment in an organized manner - Stop work when working on equipment - Wear leather gloves while conducting mechanical work - Wear nitrile gloves while handling soil cuttings - Monitor breathing zone - Ensure helper is taking breaks – switching labor intensive chores often during shift - Wear hearing protection while drill rig is operating - Decontaminate equipment before/between locations - Attempt to conduct soil sampling from least-impacted to most-impacted - Watch hand/finger positioning when working around drill rig - Use appropriate tools 	<ul style="list-style-type: none"> - Control mitigations are not being used or followed - Changing conditions
--------------------------	----------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------


Job Safety Analysis

Install Monitoring Well	Motion Environmental Chemical	<ul style="list-style-type: none"> - Pedestrians - Traffic - Chemical exposure - Pinch points - Heavy Lifting - Slip trip falls 	<ul style="list-style-type: none"> - Only properly trained personnel are allowed to operate heavy equipment - Be aware of auger movements – do not approach augers in motion. - Obtain assistance when lifting >50 lbs - Maintain equipment in an organized manner - Stop work when working on equipment - Wear leather gloves while conducting mechanical work - Wear nitrile gloves while handling soil cuttings - Monitor breathing zone - Ensure helper is taking breaks – switching labor intensive chores often during shift - Wear hearing protection while drill rig is operating 		<ul style="list-style-type: none"> - Control mitigations are not being used or followed - Changing conditions
Soil Sample Collection	Environmental Chemical	<ul style="list-style-type: none"> - Potential chemical exposure to contaminated soil 	<ul style="list-style-type: none"> - Wear nitrile gloves – replace often - Use appropriate tools and sample containers - Verify sample labels for accuracy prior to placing in cooler containing ice - Inspect glass for breaks/cracks – do not attempt to use broke/cracked glass – place immediately in trash - Close glass sample containers carefully to avoid breakage – use finger tip strength – wear Kevlar gloves 		<ul style="list-style-type: none"> - Control mitigations are not being used or followed - Changing conditions

Job Safety Analysis

<p>Disposal of Investigation Derived Waste (IDW)</p>	<p>Motion Chemical Environment</p>	<ul style="list-style-type: none"> - Pedestrians - Traffic - Lifting heavy equipment - Pinch points - Slip, trip, and fall hazards - Chemical exposure - Sprains and Strains 	<ul style="list-style-type: none"> - Wear nitrile gloves – replace often - Wear leather gloves when transporting containment drums - Watch hand / finger positioning when opening / closing / transporting drums - Use appropriate tools for opening / closing / transporting drums – ratchet/dolly - Lift heavy objects using leg strength and proper posture - Obtain assistance when lifting >50 lbs. – do not lift alone - If possible, use power lift truck, drum dolly, and / or other mechanical methods to transport drums to a staging area - Place drum label on waste containers identifying contents, contents origin, contact person, contact number, and generation date 		<ul style="list-style-type: none"> - Control mitigations are not being used or followed - Changing conditions

S3NA-209-FM TASK HAZARD ANALYSIS

		Project Name:			Project Number:			Client:		
		Supervisor:			Project Manager:			Location:		
		THA Developed By: C. Pearson						Date:		
TASK HAZARD ANALYSIS		Task Name: Drilling and Soil Sample Collection						Regularity of Task: One-time <input type="checkbox"/> Routine <input type="checkbox"/>		
Job Event Sequence <i>(List the major steps of the individual task)</i>	Hazards <i>(List primary hazards)</i>	Hazard Classification <i>(before controls)</i>				Controls <i>(List controls that AECOM will implement)</i>				
		Severity	Likelihood	Risk Level	Hazard Classification					
1 Unloading / Loading Equipment and Supplies	Pedestrian Traffic	2	4	8	Medium	Use traffic control measure and tape off work area(s) as needed. Use of proper PPE (high visibility clothing, proper gloves for the job). Use proper lifting techniques such as lifting with knees or using assistance when lifting extremely heavy items (>40 lbs). Maintain a clean work area.				
	Vehicular Traffic	4	5	20	High					
	Lifting heavy objects	3	4	12	Medium					
	Pinch points	2	4	8	Medium					
	Chemical Exposure	2	4	8	Medium					
	Slips, trips, and falls	2	3	6	Medium					
2 Moving from well to well (by foot or car)	Pedestrian Traffic	2	4	8	Medium	Do not use cell phones while operating vehicles. Wear seatbelt at all times while the vehicle is in motion. Use of proper PPE (high visibility clothing, proper gloves for the job). Maintain a clean work area. Remain alert to onsite traffic and traffic patterns.				
	Vehicular Traffic	4	5	20	High					
	Slips, trips, and falls	2	3	6	Medium					
3 Advance Soil Boring	Pedestrian Traffic	2	4	8	Medium	Use traffic control measure and tape off work area(s) as needed. Use of proper PPE (high visibility clothing, hearing protection, protective eyewear, proper gloves for the job). Use proper lifting techniques such as lifting with knees or using assistance when lifting extremely heavy items (>40 lbs). Maintain a clean work area. Use proper body positioning and techniques.				
	Vehicular Traffic	4	5	20	High					
	Pinch points	2	3	6	Medium					
	Chemical Exposure	2	3	6	Medium					
	Sprains and strains	2	3	6	Medium					
4 Soil Sample Collection	Pedestrian Traffic	1	4	4	Low	Use traffic control measure and tape off work area(s) as needed. Use of proper PPE (high visibility clothing, proper gloves for the job). Use proper lifting techniques such as lifting with knees or using assistance when lifting extremely heavy items (>40 lbs). Maintain a clean work area. Use proper body positioning and techniques.				
	Vehicular Traffic	4	5	20	High					
	Pinch points	2	2	4	Low					
	Chemical Exposure	2	4	8	Medium					
	Sprains and strains	2	2	4	Low					
5 Disposal of Investigation Derived Wastes (IDW)	Pedestrian Traffic	1	4	4	Low	Use traffic control measure and tape off work area(s) as needed. Use of proper PPE (high visibility clothing, proper gloves for the job). Use proper lifting techniques such as lifting with knees or using assistance when lifting extremely heavy items (>40 lbs).				
	Vehicular Traffic	4	5	20	High					
	Pinch points	3	4	12	Medium					
	Chemical Exposure	2	4	8	Medium					
	Sprains and strains	2	3	6	Medium					
	Lifting heavy objects	3	4	12	Medium					
	Slips, trips, and falls	2	3	6	Medium					

S3NA-209-FM TASK HAZARD ANALYSIS

Hazard Classification Guidelines

Severity	Likelihood of Occurrence	Hazard Classification Matrix																																																				
1 Remote potential for injury, property damage/\$ loss, or env damage 2 Potential for minor first aid injury, property damage/\$ loss, or environmental damage 3 Potential for moderate personnel injuries, including medical treatment, property damage/\$ loss, environmental damage, or negative public impact 4 Potential for a serious injury, major property damage/\$ loss, serious impact to the environment, and public health 5 Catastrophic damage to people, property/equipment, environment, or public health	1 Very unlikely 2 Unlikely 3 Likely 4 Very likely 5 Certain	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2"></th> <th colspan="5" style="text-align: center;">Severity</th> <th colspan="1"></th> </tr> <tr> <th colspan="2"></th> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">5</th> <th style="text-align: center;">Risk Level</th> </tr> </thead> <tbody> <tr> <th rowspan="5" style="writing-mode: vertical-rl; transform: rotate(180deg);">Likelihood</th> <th style="text-align: center;">2</th> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">6</td> <td style="text-align: center;">8</td> <td style="text-align: center;">10</td> <td style="text-align: center;">Low</td> </tr> <tr> <th style="text-align: center;">3</th> <td style="text-align: center;">3</td> <td style="text-align: center;">6</td> <td style="text-align: center;">9</td> <td style="text-align: center;">12</td> <td style="text-align: center;">15</td> <td style="text-align: center;">Medium</td> </tr> <tr> <th style="text-align: center;">4</th> <td style="text-align: center;">4</td> <td style="text-align: center;">8</td> <td style="text-align: center;">12</td> <td style="text-align: center;">16</td> <td style="text-align: center;">20</td> <td style="text-align: center;">High</td> </tr> <tr> <th style="text-align: center;">5</th> <td style="text-align: center;">5</td> <td style="text-align: center;">10</td> <td style="text-align: center;">15</td> <td style="text-align: center;">20</td> <td style="text-align: center;">25</td> <td style="text-align: center;">High</td> </tr> <tr> <th style="text-align: center;">1</th> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">Risk Level = Likelihood x Severity</p>			Severity								1	2	3	4	5	Risk Level	Likelihood	2	2	4	6	8	10	Low	3	3	6	9	12	15	Medium	4	4	8	12	16	20	High	5	5	10	15	20	25	High	1	1	2	3	4	5	
		Severity																																																				
		1	2	3	4	5	Risk Level																																															
Likelihood	2	2	4	6	8	10	Low																																															
	3	3	6	9	12	15	Medium																																															
	4	4	8	12	16	20	High																																															
	5	5	10	15	20	25	High																																															
	1	1	2	3	4	5																																																

