Groundwater Monitoring Report – 2nd Quarter 2018

JH Kelly
821 3rd Avenue, Longview, WA

Prepared for:
Mr. Mark Fleischauer
JH Kelly Holdings, LLC
Seattle, Washington

June 20, 2018

Prepared by:

HydroCon, LLC
314 W 15th Street, Suite 300 Vancouver, Washington 98660
Phone: (360) 703-6079 Fax: (360) 703-6086
www.hydroconllc.net

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1.0 INTRODUCTION

HydroCon, LLC (HydroCon) is pleased to present this summary of activities performed at the above referenced site shown on Figure 1. This report documents the quarterly groundwater monitoring event conducted at the site in May 2018.

1.1 Description of Property

The J.H. Kelly, Inc. (J.H. Kelly) site is located at 821 3rd Avenue in Longview, Washington. The site is located in a mixed use area and is surrounded by industrial, commercial, residential, and recreational properties (Figure 1). The Cowlitz River is located approximately 1,060 feet east of the site and Cowlitz County Diking District Drainage Ditch Number Five is located along the western property boundary of the site. The site is made up of several large buildings and is mostly paved with asphalt. The site is used for fabrication of pipe and storage of finished and stock materials.

A fueling system for J.H. Kelly vehicles was formerly located near the center of the site. The fueling system consisted of two underground storage tanks (USTs), one 10,000 gallon gasoline UST, and one 4,000 gallon diesel UST. The fuel dispensers were located on the western edge of the UST nest. The UST system was removed in 1989 and is discussed in more detail in the following sections. Figure 2 shows the current site layout and approximate location of the former UST system.

1.2 Site History

Pre-Tank Removal (July & September 1989)

On July 15, 1989, JH Kelly had a pressure test conducted on the USTs and both tanks passed the tightness test. A subsurface investigation was conducted by SRH Environmental Management on August 23, 1989. The test pit was located north of the fuel dispenser island and excavated to a depth of 18 feet below ground surface (bgs). Two soil samples were taken from the test pit and were composited by the lab into one sample for analysis. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons (TPH) were analyzed by EPA Method 418.1. BTEX constituents were not detected above the laboratory detection limits. A total TPH of 58 milligrams per kilogram (mg/kg) was reported. Only benzene had a detection limit greater than the current Washington State Department of Ecology (Ecology) cleanup level (CUL). The detection limit for benzene was 0.04 mg/kg, compared to the current CUL of 0.03 mg/kg. Reportedly, the excavation location was chosen based on a soil gas survey; however the soil gas survey was not provided to HydroCon for review.

UST Removal (November 1991)

The USTs were decommissioned in November of 1991 by Pacific Northern Environmental (PNE). Fuel dispensers, USTs, and ancillary equipment were removed. Field screening with a photoionization detector (PID) indicated petroleum contaminated soil (PCS) below the dispensers. PCS was also noted

around each of the USTs as they were removed. A water sample was taken from the excavation pit and had MTCA Method A CUL exceedances for TPH in the diesel range (DRPH), TPH in the gasoline range (GRPH), and BTEX with concentrations detected at 24,000 micrograms per liter (µg/L), 130,000 µg/L, 4,100 µg/L, 18,000 µg/L, 5,300 µg/L, and 32,000 µg/L, respectively.

Four soil samples (one sample from each end of each UST) were collected from the soil/groundwater interface and analyzed for TPH by EPA Method 3550/8015 Modified. One of the samples (JHK-SS3-12.5') detected TPH in the oil range (ORPH) at a concentration of 480 mg/kg which exceeded the CUL at the time of 200 mg/Kg. Two of the four samples were analyzed for BTEX. One of the samples (JHK-kSS5-12.5') had a detected concentration of benzene of 1.10 mg/Kg which exceeded the CUL. A remedial excavation was performed in the areas where ORPH (west end of the UST) and benzene (east end of the USTs) had exceeded their respective CULs. Following remedial excavation activities confirmation samples were collected from the area with the ORPH exceedance (JHK-SS5-12.5'). The confirmation sample had a DRPH concentration of 120 mg/kg and a ORPH concentration of 120 mg/kg. The confirmation sample taken from the area with the benzene exceedance was below the laboratory detection limit for all BTEX constituents. It should be noted that the laboratory detection limit for the benzene analysis was 0.1 mg/Kg, which is greater than the current CUL of 0.03 mg/Kg. Therefore, it is unknown whether the remedial excavation was successful at reducing benzene concentrations below the MTCA Method A CUL.

Groundwater Monitoring (December 1991 to 2006)

Prior to backfilling the remedial excavation, a monitoring well (JHK-MW) was installed in the UST excavation during the week of November 22, 1991. The monitoring well was constructed using a 30-inch diameter steel pipe to a depth of 10 feet bgs with a 24-inch slotted PVC casing inserted inside the steel casing from 9 to 12 feet bgs. The monitoring well location is shown on Figure 2. It should be noted that this well construction does not comply with current Ecology specifications.

The initial sampling results from December 1991 showed exceedances of GRPH (1,010 µg/L), ORPH (3,340 µg/L), and benzene (30 µg/L) above their respective CULs. Follow up sampling in May 1992 showed no detectible TPH in the well, but showed an exceedance for benzene (11.1 µg/L). The next sampling event was completed in June of 1993 and detected an exceedance of DRPH (270,000 µg/L) and a quantity of TPH designated as "Other" at 6,000 µg/L. The DRPH concentration was reported to be flagged as not matching the typical diesel fingerprint chromatogram. "Other" is not defined in the laboratory report. There was also no oil range results reported for TPH. It is not clear from the report if ORPH was not detected or not analyzed. None of the BTEX constituents exceeded the respective CULs.

The sampling event in April 1996 indicated that TPH was below laboratory their respective detection limits except for something designated as "Other". The "Other" result (279 µg/L) is flagged as eluting in the diesel range, but not matching the typical diesel fingerprint chromatogram. All BTEX constituents were below the laboratory detection limits.

The sampling event in April 2006 included samples collected from JHK-MW and the ditch behind the site. Analytical results indicated that both samples were below their respective laboratory detection limits.

The well was sampled twice in 2016 (April and July). Analytical results indicated that all samples were below their respective laboratory detection limits.

2017 Phase II ESA

A Phase II Environmental Site Assessment (ESA) was completed based on correspondence from Ecology dated October 31, 2016, in response to a request by the property owner for a determination of No Further Action (NFA) for the site. On September 26, 2017, the Ecology Project Manager for the site, Mr. Aaron Fiedler, was contacted to discuss a proposed scope of work for the site that could result in a no further action determination (NFA). The scope of work for the Phase II ESA was approved by Ecology and would be sufficient to justify a NFA determination if all conditions were achieved.

On October 11, 2017, HydroCon conducted a subsurface investigation which included a total of five direct push borings (HC01 through HC05) advanced to a maximum depth of 15 feet bgs to evaluate soil and groundwater conditions in the vicinity of the former UST excavation. Analytical results indicated that only a low concentration of ORPH was detected in the soil samples collected at 10 feet bgs at HC01 and HC02. The location of these samples were centrally located and along the eastern boundary of the former UST excavation. It is assumed that the likely source of the ORPH in the HC01-10 and HC02-10 samples was from the imported fill material used at the site and not from the release of the former UST system. Boring locations are shown on Figure 2.

DRPH was detected above the MTCA Method A cleanup level in the groundwater samples collected from HC01, HC02, and HC04. In addition, methyl tert butyl ether (MTBE) was detected above the MTCA Method A CUL in HC04. Groundwater results are summarized on Table 1.

It should be noted that water samples collected from temporary borings are screening level quality only and should not be solely relied upon for site characterization purposes. The drilling and sampling method used (direct push) produces disturbed (turbid) samples and may not represent groundwater conditions. Groundwater samples collected from properly constructed and developed monitoring wells produces relatively non turbid samples. It's possible that the concentrations of contaminants will be significantly lower in groundwater samples collected from properly constructed and developed monitoring wells than from temporary borings.

Based on historic data and data collected during the Phase II ESA, HydroCon concluded the remaining groundwater contamination has decreased significantly over time and would likely naturally attenuate to concentrations below the MTCA Method A CUL.

December 2017 Monitoring Well Installation

On December 12 and 13, 2017, HydroCon supervised the installation on monitoring wells MW01 through MW04. Soil samples were collected at the soil/groundwater interface and analyzed for TPH and related constituents. The results indicated that none of the samples had detections above the MTCA Method A CULs. The monitoring wells were constructed using 2-inch diameter PVC casing and a 15-foot length of 0.010-inch slotted well screen placed from approximately 5 to 20 feet bgs. Well construction details are documented on the boring logs[1].

The monitoring wells were sampled on December 18, 2017 with the following results:

- MW01 - DRPH (851 µg/L) was detected in the sample.
- MW02 - DRPH (375 µg/L), GRPH (117 µg/L) and MTBE (3.21 µg/L) were detected in the sample.
- MW03 - DRPH (416 µg/L) was detected in the sample.
- MW04 - ORPH (179 µg/L) was detected in the sample.

The results indicated that the sample collected from MW01 had a detection of DRPH above the MTCA Method A CUL (500 µg/L). Groundwater sampling result are presented in Table 1.

1.3 Regional Geology and Hydrogeology

The geology of southwestern Cowlitz County is characterized by sedimentary and volcanic deposits laid down or extruded during the Tertiary and Quaternary periods (Livingston, 1966). The oldest formations (Cowlitz Formation and Goble Volcanics) include Eocene basaltic andesite and volcanoclastic deposits which were deposited 45 to 32 million years ago (Phillips, 1987). Lava flows of the Columbia River Basalt Group overlie the older formations. The next youngest rocks exposed in the area are the Upper Miocene to Lower Pleistocene sand, silt, gravel, and conglomerate of the Troutdale Formation. The valley fill material represents deposits of the ancestral Columbia River. The dissected upland that bound the Columbia River valley is composed of these older Formations. The youngest material exposed in the region is the outburst deposits of glacial Lake Missoula, landslide deposits, and recent alluvium.

Regional hydrogeology in the vicinity of the site is characterized by recharge to bedrock in the upland areas and discharge into the Columbia River. Groundwater flows from the regional bedrock through the thick alluvial sequence in the river valley before discharging into the rivers (Meyers, 1970). Precipitation also infiltrates the surface of the alluvium, recharging local flow systems in the river's floodplain.

[1]HydroCon, *Monitoring Well Installation and Sampling Report* (February 14, 2018)

1.4 Local Geology and Hydrogeology

Locally the geology consists of fill material down to approximately 9 to 10 feet bgs. The fill consisted of chunks of wood, asphalt, concrete, rebar, and bricks in a matrix of silt, sand, and gravel[2]. Below the fill material is native sands and silts. A layer of grass and reeds was observed at the top of the native soils indicating the area had once been ground surface. Groundwater flow direction calculated during the October 2017 Phase II ESA was to the southwest towards Ditch Number Five. Flow direction was estimated using water levels collected on October 11, 2017 from temporary borings in relation to a ground surface elevation survey conducted upon completion of drilling activities. The well lid of the existing monitoring well (JHK-MW) was used as the site datum. The datum was assigned an elevation of 100 feet.

2.0 QUARTERLY GROUNDWATER MONITORING

On May 10, 2018 HydroCon collected groundwater samples from monitoring wells MW01 through MW04. The locations of the monitoring wells are shown on Figure 2. A discussion of the sampling methodology, groundwater conditions, and laboratory analytical results is provided below.

2.1 Groundwater Conditions

Prior to sampling, the well caps of the monitoring wells were removed and the water level was allowed to equilibrate prior to measuring the depth to water (DTW). The DTW in each well was measured using a clean electronic water level indicator. Water levels were measured at the scribed reference mark (north end of the top of the PVC casing) at each well. The static water levels in the monitoring wells varied between 5.32 feet and 7.20 feet below the top of the well casing (BTOC) during the May 10, 2018 sampling event. An apparent groundwater mound is present near MW04. The groundwater elevation calculated for MW04 was approximately 1.5 feet higher than monitoring wells MW01 through MW03. This is consistent with past sampling events.

A groundwater elevation contour map was generated from depth to water data collected on May 10, 2018. The groundwater flow direction south of the former UST excavation is towards the north and northwest. The groundwater gradient calculated in the southern portion of the site is approximately 0.037 feet/foot. The groundwater flow between MW01 and MW03, which ignores the mounding observed at MW04, is towards the south west at a calculated gradient of 0.0019 feet/foot. The groundwater elevations and groundwater contours are shown on Figure 3. Depth to groundwater measurements and groundwater elevations are summarized on Table 2.

[2] SRH Environmental Management, *Report on Soil Sampling and Analysis* (September 1, 1989)

2.2 Groundwater Sampling

Each monitoring well was purged, prior to sampling, with a low flow peristaltic pump equipped with new length of LDPE tubing attached to a new length of silicon tubing. Groundwater quality parameters (pH, temperature, specific conductivity, dissolved oxygen, & turbidity) were measured and recorded on a Groundwater Sample Collection field form along with the DTW measurements (Appendix A). Purging was completed when the field parameters had stabilized within the prescribed limits.

Upon stabilization of the groundwater quality parameters, the groundwater samples were collected and placed in laboratory-prepared sampling containers. The samples were placed in an iced cooler along with the chain-of-custody documentation and transported APEX Laboratory, in Tigard, Oregon for analysis.

Groundwater generated during this monitoring event was placed in a labeled 55-gallon drum. The drum is being temporarily stored at the northwest corner of the building south of the investigation area.

2.3 Laboratory Analysis

A total of four groundwater samples were collected for laboratory analysis. Each sample was analyzed for the following set of parameters:

- GPRH by Northwest Method NWTPH-Gx.
- DPRH and ORPH by Northwest Method NWTPH-Dx.
- BTEX and MTBE by EPA Method 8260C.

2.4 Analytical Results

The groundwater analytical results are reported in micrograms per liter (µg/L) (parts per billion) and are summarized below and on Table 2. Copies of the laboratory reports and chain-of-custody documents are included in Appendix B.

Groundwater analytical results indicate that there were low level detections of DRPH in monitoring wells MW01 through MW04 ranging from 75.9 µg/L in MW04 to 239 µg/L in MW01. However, each detected concentration is below the MTCA Method A CUL of 500µg/L. MTBE was detected in MW02 at a concentration of 3.34 µg/L, below the MTCA Method A CUL of 20 µg/L. All other analytes were below their respective laboratory Method Reporting Limits (MRLs).

3.0 RECOMMENDATIONS

Based on the results of the soil and groundwater sampling, HydroCon makes the following recommendations:

- Perform the final (fourth consecutive) quarterly groundwater monitoring event in the 3rd quarter of 2018.
- In the event that all contaminants of concern at all site monitoring wells remain below their respective MTCA Method A CULs, HydroCon recommends submitting a formal request to Ecology to review site reports and issue an NFA determination for the site.

4.0 QUALIFICATIONS

HydroCon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. HydroCon makes no warranties, either expressed or implied, regarding the findings, conclusions or recommendations. Please note that HydroCon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report.

Findings and conclusions resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this monitoring. Subsurface conditions may vary from those encountered at specific sampling locations or during other surveys, tests, assessments, investigations, or exploratory services; the data, interpretations and findings are based solely upon data obtained at the time and within the scope of these services.

This report is intended for the sole use of **JH Kelly**. This report may not be used or relied upon by any other party without the written consent of HydroCon. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

The conclusions presented in this report are, in part, based upon subsurface sampling performed at selected locations and depths. There may be conditions between borings or samples that differ significantly from those presented in this report and which cannot be predicted by this study.

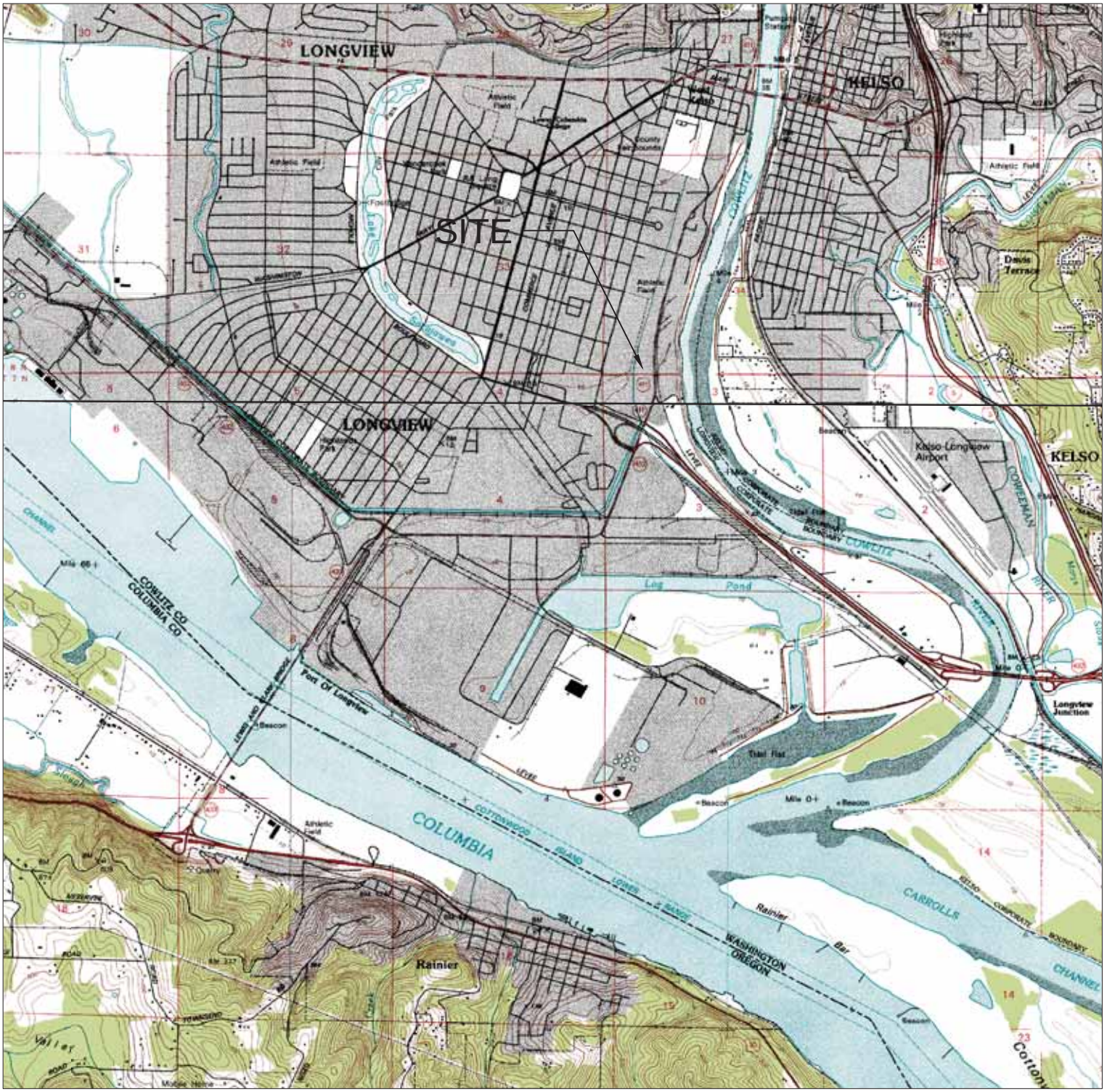
Signature:

Report Prepared By:

Brian Pletcher
Project Manager

Report Reviewed By:

Jonathan Horowitz, PE
Project Engineer



NOTE(S):

1. USGS, RAINIER, OREGON AND KELSO, WASHINGTON QUADRANGLES 7.5 MINUTE SERIES (TOPOGRAPHIC)

N
W E
S

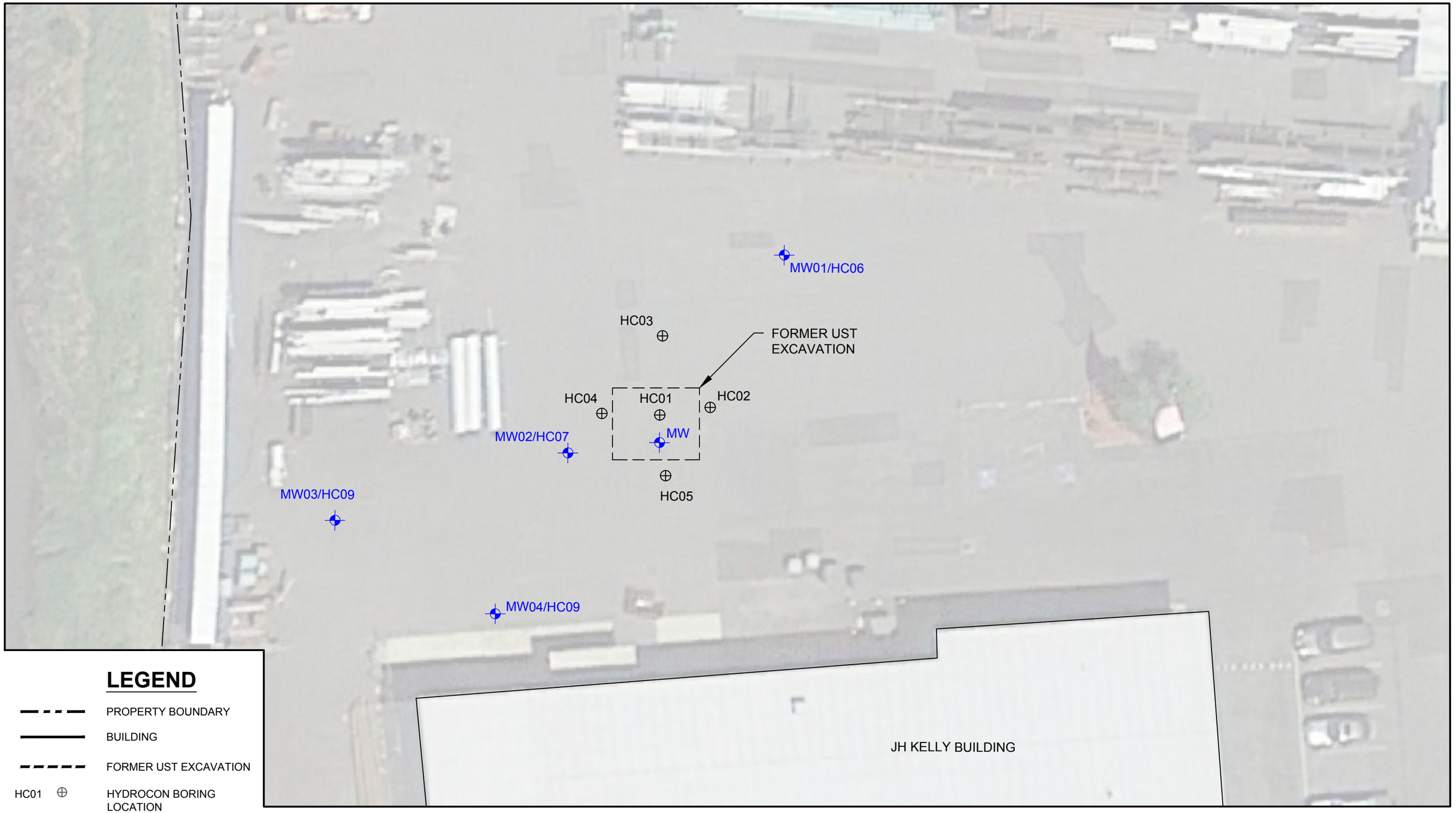
0 2000 4000
SCALE IN FEET
1" = 2000'

HydroCon
501 Allen St Suite B, Kelso WA Ph: (360) 706-6079

DATE: 06-06-18
DWN: JH
CHK: BP
APPROVED: BP
PRJ. MGR: DB
PROJECT NO: 2017-055

FIGURE 1
SITE LOCATION MAP

JH KELLY
821 THIRD AVENUE
LONGVIEW, WASHINGTON



LEGEND

- PROPERTY BOUNDARY
- BUILDING
- FORMER UST EXCAVATION
- HC01 — HYDROCON BORING LOCATION
- MW01 — MONITORING WELL

N / W / E / S

0 20 40

SCALE IN FEET
1" = 20'

HydroCon
510 Allen St. Suite B Kelso, WA 98626, Ph(360) 703-6079

DATE: 06-06-18
DWN: JH
CHK: BP
APPROVED: DB
PRJ. MGR: DB
PROJECT NO: 2017-055

FIGURE 2
SITE FEATURES

JH KELLY
821 THIRD AVENUE
LONGVIEW, WASHINGTON

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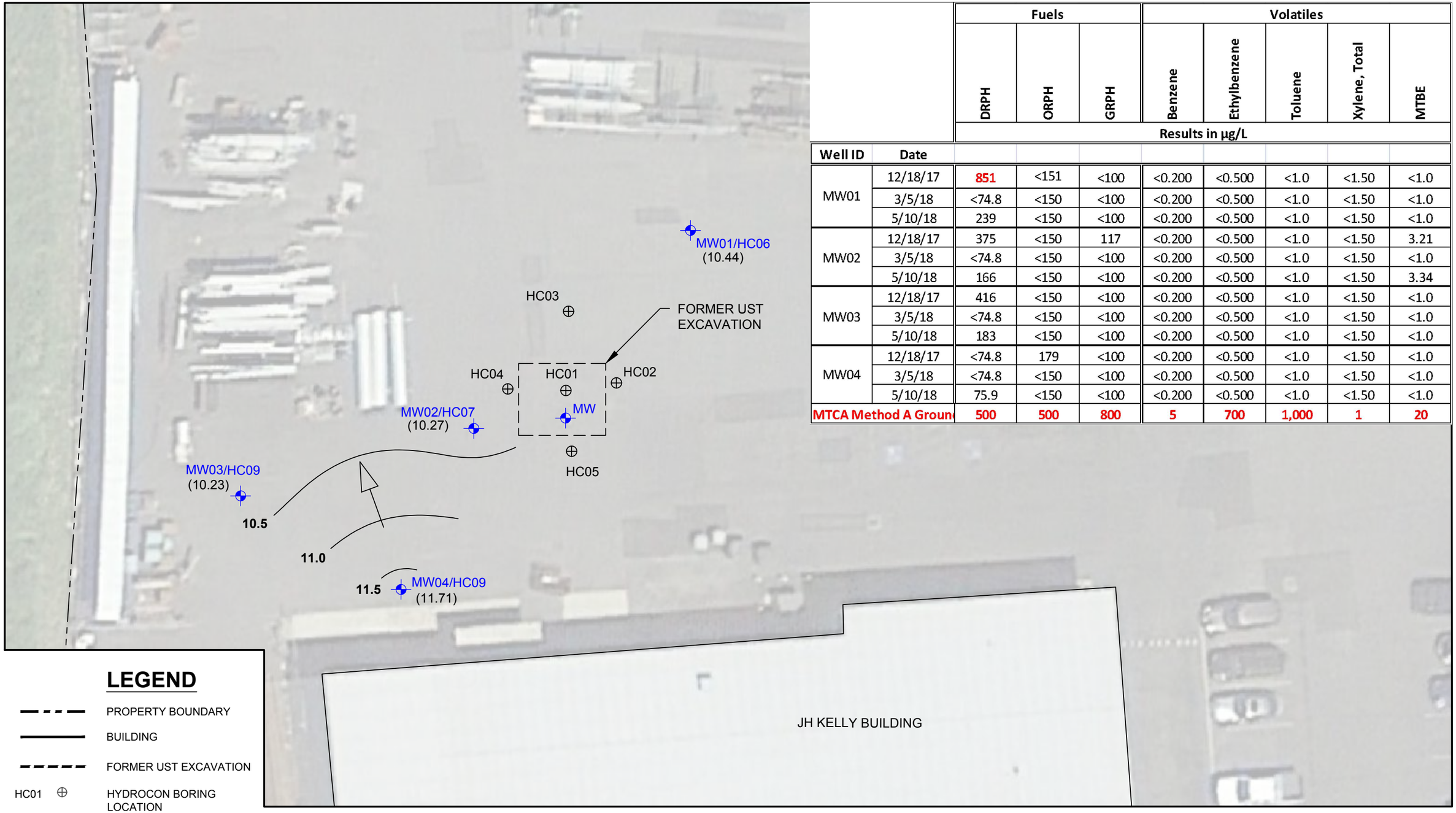

		Fuels			Volatiles				
		DRPH	ORPH	GRPH	Benzene	Ethylbenzene	Toluene	Xylene, Total	MTBE
		Results in µg/L							
Well ID	Date								
MW01	12/18/17	851	<151	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18	239	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MW02	12/18/17	375	<150	117	<0.200	<0.500	<1.0	<1.50	3.21
	3/5/18	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18	166	<150	<100	<0.200	<0.500	<1.0	<1.50	3.34
MW03	12/18/17	416	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18	183	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MW04	12/18/17	<74.8	179	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18	75.9	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MTCA Method A Groun		500	500	800	5	700	1,000	1	20

LEGEND

- PROPERTY BOUNDARY
- BUILDING
- FORMER UST EXCAVATION
- HC01 — HYDROCON BORING LOCATION
- MW01 (XX.XX) — MONITORING WELL (GROUNDWATER ELEVATION)
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW

N W E S

0 20 40

SCALE IN FEET
1" = 20'

HydroCon
510 Allen St. Suite B Kelso, WA 98626, Ph(360) 703-6079

DATE: 06-06-18
DWN: JH
CHK: BP
APPROVED: DB
PRJ. MGR: DB
PROJECT NO: 2017-055

FIGURE 3
GROUNDWATER CONTOUR MAP AND ANALYTICAL RESULTS
2ND QUARTER 2018
JH KELLY
821 THIRD AVENUE
LONGVIEW, WASHINGTON

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Table 1
JH Kelly Groundwater Analytical Results
821 3rd Aveneue, Longview, WA

		Measurements			Fuels			Volatiles				
		Top of Casing	Depth to Groundwater	Groundwater Elevation	DRPH	ORPH	GRPH	Benzene	Ethylbenzene	Toluene	Xylene, Total	MTBE
		Feet	Feet	Feet	Results in µg/L							
Well ID	**Date**											
MW01	12/18/17	17.64	7.54	10.10	**851**	<151	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18		7.41	10.23	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18		7.20	10.44	239	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MW02	12/18/17	17.02	7.04	9.98	375	<150	117	<0.200	<0.500	<1.0	<1.50	3.21
	3/5/18		6.81	10.21	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18		6.75	10.27	166	<150	<100	<0.200	<0.500	<1.0	<1.50	3.34
MW03	12/18/17	16.31	6.40	9.91	416	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18		6.18	10.13	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18		6.08	10.23	183	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MW04	12/18/17	17.03	6.53	10.50	<74.8	179	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	3/5/18		4.42	12.61	<74.8	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
	5/10/18		5.32	11.71	75.9	<150	<100	<0.200	<0.500	<1.0	<1.50	<1.0
MTCA Method A Groundwater Cleanup Levels					**500**	**500**	**800**	**5**	**700**	**1,000**	**1**	**20**

Notes

Red denotes concentration exceeds MTCA Method A cleanup level.

MTCA Method A Cleanup Levels, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, revised November 2007.

GRPH analyzed by Method NWTPH-Gx.

DRPH and ORPH analyzed by Method NWTPH-Dx.

Volatiles analyzed by EPA 8260B, 8260C or 8021B.

- = not measured/not analyzed

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

µg/L = micrograms per liter

DRPH = Diesel Range Petroleum Hydrocarbons

ORPH = Oil Range Petroleum Hydrocarbons

GRPH = Gasoline Range Petroleum Hydrocarbons

MTBE = methyl tertiary-butyl ether

APPENDIX A
FIELD FORMS

GROUNDWATER SAMPLE COLLECTION FORM

Well I.D. Number: MW01

Project Name:. JH Kelly
Hydrocon Project #: 2017-055
Date 5/10/18

Sample I.D. MW01-W Time: 1430
Field Duplicate I.D. - Time: -
Personnel: CD

WELL INFORMATION

Monument condition: ☒ Good ☐ Needs repair ☒ Water in Monument
Well cap condition: ☒ Good ☐ Replaced ☐ Needs replacement ☐ Surface Water in Well
Headspace reading: ☒ Not measured ____ ppm ☐ Odor
Well diameter: ☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
Comments

PURGING INFORMATION

Total well depth 19.71 ft Bottom: ☐ Hard ☐ Soft ☒ Not measured Screen Interval(s): 5-20'
Depth to product - ft
Depth to water 7.20 ft Intake Depth (BTOC) 12' Begin Purging Well: 1349
Casing volume 12.51 ft (H_2O) X 0.16 gal/ft = 2.00 gal. X 3 = 6.00 gal.
Volume Conversion Factors: 3/4"=0.02 gal/ft 1"=0.04 gal/ft 2"=0.16 gal/ft 4"=0.65 gal/ft 6"= 1.47 gal/ft

PURGING/DISPOSAL METHOD

Pump type ☒ Peristaltic ☐ Centrifugal ☐ Dedicated Bladder ☐ Non-Dedicated Bladder Other
Bailer type: Water Disposal:: ☒ Drummed ☐ Remediation System ☐ Other

FIELD PARAMETERS

Odor and/or Sheen:

Time	Water Level (BTOC)	Purge Rate (L/min)	Temp. (°C)	Sp. Cond. (mS/cm) (±3%)	Dissolved Oxygen (±10% or ≤1.00 ±0.2)	pH (SU) (±0.1)	ORP (mV)	Turbidity (NTU) (± 10% or ≤10)
1350	7.36		13.9	2.15	0.54	6.92	-72.8	1.77
1353	7.36		13.8	2.18	0.37	7.02	-90.7	1.28
1356	7.36		13.5	2.15	0.22	7.06	-96.7	1.38
1359	7.35	0.155	13.3	2.10	0.21	7.08	-99.9	1.16
1402	7.35		13.9	2.07	0.18	7.09	-100.8	1.25
1405	7.35		13.4	2.100	0.17	7.11	-101.8	1.23
1408	7.35		13.4	1.90	0.16	7.13	-101.8	1.39
1411	7.35		13.4	1.84	0.16	7.15	-102.3	1.36
1414	7.35		13.3	1.79	0.16	7.17	-101.7	1.07
1417	7.35		13.3	1.70	0.15	7.01	-101.3	1.04
1420	7.35		13.2	1.57	0.15	6.99	-98.6	1.01
1423	7.35		13.3	1.51	0.14	7.01	-98.0	0.94

Stabilization achieved if three successive measurements for pH, Conductivity and Turbidity or Dissolved Oxygen are recorded within their perspective stabilization criteria. A minimum of six measurements should be recorded.
Purging Comments: Sp Cond @ 1426: 1.47 Sampled @ 1430

SAMPLE INFORMATION

Container Type	Bottle Count	Preservative	Field Filtered?	Analysis
40 ml VOA	3	HCl	(No) 0.45 0.10	Gx, BTEX, MTBE
1L amber	1	HCl	(No) 0.45 0.10	DX
			No 0.45 0.10	
			No 0.45 0.10	
			No 0.45 0.10	

Sampling Comments:

GROUNDWATER SAMPLE COLLECTION FORM

Well I.D. Number: MW02

Project Name: JH Kelly
Hydrocon Project #: 2017-055
Date: 5/10/18

Sample I.D.: MW02-W Time: 1335
Field Duplicate I.D.: - Time: -
Personnel: CD

WELL INFORMATION

Monument condition: ☒ Good ☐ Needs repair _____ ☒ Water in Monument
Well cap condition: ☒ Good ☐ Replaced ☐ Needs replacement ☐ Surface Water in Well
Headspace reading: ☒ Not measured _____ ppm ☐ Odor _____
Well diameter: ☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
Comments _____

PURGING INFORMATION

Total well depth 19.63 ft Bottom: ☐ Hard ☐ Soft ☒ Not measured Screen Interval(s): 5-20'
Depth to product - ft
Depth to water 6.75 ft Intake Depth (BTOC) 12' Begin Purging Well: 1314
Casing volume 12.88 ft (H_2O) X 0.16 gal/ft = 2.06 gal. X 3 = 6.18 gal.
Volume Conversion Factors: 3/4"=0.02 gal/ft 1"=0.04 gal/ft 2"=0.16 gal/ft 4"=0.65 gal/ft 6"= 1.47 gal/ft

PURGING/DISPOSAL METHOD

Pump type ☒ Peristaltic ☐ Centrifugal ☐ Dedicated Bladder ☐ Non-Dedicated Bladder Other _____
Bailer type: _____ Water Disposal:: ☒ Drummed ☐ Remediation System ☐ Other _____

FIELD PARAMETERS

Odor and/or Sheen: None

Time	Water Level (BTOC)	Purge Rate (L/min)	Temp. (°C)	Sp. Cond. (mS/cm) (±3%)	Dissolved Oxygen (±10% or ≤1.00 ±0.2)	pH (SU) (±0.1)	ORP (mV)	Turbidity (NTU) (± 10% or ≤10)
1315	6.97		14.2	0.96	0.54	7.01	-52.6	6.38
1318	6.96		14.0	0.97	0.32	7.00	-68.9	3.30
1321	6.96	0.14	13.9	0.98	0.29	7.01	-76.4	2.53
1324	6.96		13.8	0.98	0.24	7.01	-80.3	1.81
1327	6.96		13.8	0.99	0.22	7.02	-84.4	1.41
1330			13.7	0.97	0.21	7.01	-86.3	2.12
			Sample @ 1335					

Stabilization achieved if three successive measurements for pH, Conductivity and Turbidity or Dissolved Oxygen are recorded within their perspective stabilization criteria. A minimum of six measurements should be recorded.
Purging Comments: _____

SAMPLE INFORMATION

Container Type	Bottle Count	Preservative	Field Filtered?	Analysis
40-ml VOA	3	HCl	No 0.45 0.10	GX, BTEX, MTBE
1 L amber	1	HCl	No 0.45 0.10	DX
			No 0.45 0.10	
			No 0.45 0.10	
			No 0.45 0.10	

Sampling Comments: _____

GROUNDWATER SAMPLE COLLECTION FORM

Well I.D. Number: MW03

Project Name: JH Kelly
Hydrocon Project #: 2017-055
Date: 5/10/18

Sample I.D.: MW03-W Time: 1205
Field Duplicate I.D.: - Time: -
Personnel: CD

WELL INFORMATION

Monument condition: ☒ Good ☐ Needs repair _____ ☒ Water in Monument
Well cap condition: ☒ Good ☐ Replaced ☐ Needs replacement ☐ Surface Water in Well
Headspace reading: ☒ Not measured _____ ppm ☐ Odor _____
Well diameter: ☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
Comments _____

PURGING INFORMATION

Total well depth 19.62 ft Bottom: ☐ Hard ☐ Soft ☒ Not measured Screen Interval(s): 5-20'
Depth to product - ft
Depth to water 6.03 ft Intake Depth (BTOC) 12' Begin Purging Well: 1146
Casing volume 13.54 ft (H_2O) X 0.16 gal/ft = 2.17 gal. X 3 = 6.51 gal.
Volume Conversion Factors: 3/4"=0.02 gal/ft 1"=0.04 gal/ft 2"=0.16 gal/ft 4"=0.65 gal/ft 6"= 1.47 gal/ft

PURGING/DISPOSAL METHOD

Pump type ☒ Peristaltic ☐ Centrifugal ☐ Dedicated Bladder ☐ Non-Dedicated Bladder Other _____
Bailer type: _____ Water Disposal:: ☒ Drummed ☐ Remediation System ☐ Other _____

FIELD PARAMETERS

Odor and/or Sheen: None

Time	Water Level (BTOC)	Purge Rate (L/min)	Temp. (°C)	Sp. Cond. (mS/cm) (±3%)	Dissolved Oxygen (±10% or ≤1.00 ±0.2)	pH (SU) (±0.1)	ORP (mV)	Turbidity (NTU) (± 10% or ≤10)
1147	6.09		13.9	1.13	0.80	7.07	-45.7	2.20
1150	6.09		13.4	1.11	0.37	7.34	-105.9	0.81
1153	6.09	0.155	13.4	1.10	0.49	7.39	-115.5	0.66
1156	6.09		13.3	1.09	0.38	7.41	-120.3	0.67
1159	6.09		13.2	1.08	0.24	7.43	-123.3	0.43
1202	6.04		13.2	1.08	0.26	7.45	-125.9	0.57
			Sample @ 1205					

Stabilization achieved if three successive measurements for pH, Conductivity and Turbidity or Dissolved Oxygen are recorded within their perspective stabilization criteria. A minimum of six measurements should be recorded.
Purging Comments: _____

SAMPLE INFORMATION

Container Type	Bottle Count	Preservative	Field Filtered?	Analysis
40ml VOA	3	HCl	(No) 0.45 0.10	6x, BTEX, MTBE
1 L amber	1	HCl	(No) 0.45 0.10	1DX
			No 0.45 0.10	
			No 0.45 0.10	
			No 0.45 0.10	

Sampling Comments: _____

GROUNDWATER SAMPLE COLLECTION FORM

Well I.D. Number: MW04

Project Name: 5th Kelly
Hydrocon Project #: 2017-055
Date: 5/10/18

Sample I.D.: MW04-W Time: 1255
Field Duplicate I.D.: - Time: -
Personnel: CD

WELL INFORMATION

Monument condition: ☒ Good ☐ Needs repair _____ ☐ Water in Monument
Well cap condition: ☒ Good ☐ Replaced ☐ Needs replacement ☐ Surface Water in Well
Headspace reading: ☒ Not measured _____ ppm ☐ Odor _____
Well diameter: ☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
Comments _____

PURGING INFORMATION

Total well depth 19.60 ft Bottom: ☐ Hard ☐ Soft ☒ Not measured Screen Interval(s): 5-20'
Depth to product - ft
Depth to water 5.32 ft Intake Depth (BTOC) 12' Begin Purging Well: 1237
Casing volume 14.28 ft (H_2O) X 0.16 gal/ft = 2.28 gal. X 3 = 6.84 gal.
Volume Conversion Factors: 3/4"=0.02 gal/ft 1"=0.04 gal/ft 2"=0.16 gal/ft 4"=0.65 gal/ft 6"= 1.47 gal/ft

PURGING/DISPOSAL METHOD

Pump type ☒ Peristaltic ☐ Centrifugal ☐ Dedicated Bladder ☐ Non-Dedicated Bladder Other _____
Bailer type: _____ Water Disposal:: ☒ Drummed ☐ Remediation System ☐ Other _____

FIELD PARAMETERS

Odor and/or Sheen: None

Time	Water Level (BTOC)	Purge Rate (L/min)	Temp. (°C)	Sp. Cond. (mS/cm) (±3%)	Dissolved Oxygen (±10% or ≤1.00 ±0.2)	pH (SU) (±0.1)	ORP (mV)	Turbidity (NTU) (± 10% or ≤10)
1239	5.43		14.6	0.567	1.12	7.45	-16.2	2.14
1242	5.57		14.1	0.543	0.37	7.24	-53.9	1.20
1245	5.67	0.135	13.8	0.541	0.25	7.19	-58.7	0.72
1248	5.77		13.7	0.544	0.24	7.18	-60.7	0.78
1251	5.92		13.6	0.546	0.24	7.17	-62.0	0.96
1254	6.01		13.5	0.549	0.26	7.16	-62.5	0.61
			Sample @ 1255					

Stabilization achieved if three successive measurements for pH, Conductivity and Turbidity or Dissolved Oxygen are recorded within their perspective stabilization criteria. A minimum of six measurements should be recorded.
Purging Comments: _____

SAMPLE INFORMATION

Container Type	Bottle Count	Preservative	Field Filtered?	Analysis
40ml VOA	3	HCl	(No) 0.45 0.10	GX, BTEX, MTBE
1 L amber	1	HCl	(No) 0.45 0.10	DX
			No 0.45 0.10	
			No 0.45 0.10	
			No 0.45 0.10	

Sampling Comments: _____

APPENDIX B
LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Tuesday, May 15, 2018

Brian Pletcher
HydroCon LLC
314 W 15th Street Suite 300
Vancouver, WA 98660

RE: A8E0357 - JH Kelly - 2017-055

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8E0357, which was received by the laboratory on 5/10/2018 at 6:30:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01-W	A8E0357-01	Water	05/10/18 14:30	05/10/18 18:30
MW02-W	A8E0357-02	Water	05/10/18 13:35	05/10/18 18:30
MW03-W	A8E0357-03	Water	05/10/18 12:05	05/10/18 18:30
MW04-W	A8E0357-04	Water	05/10/18 12:55	05/10/18 18:30

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Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW01-W (A8E0357-01)		**Matrix: Water**			**Batch: 8050699**			
Diesel	**239**	---	74.8	ug/L	1	05/12/18	NWTPH-Dx	**F-11**
Oil	ND	---	150	ug/L	1	05/12/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 72 %*	*Limits: 50-150 %*		*1*	*05/12/18*	*NWTPH-Dx*	
MW02-W (A8E0357-02)		**Matrix: Water**			**Batch: 8050699**			
Diesel	**166**	---	74.8	ug/L	1	05/12/18	NWTPH-Dx	**F-11**
Oil	ND	---	150	ug/L	1	05/12/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 74 %*	*Limits: 50-150 %*		*1*	*05/12/18*	*NWTPH-Dx*	
MW03-W (A8E0357-03)		**Matrix: Water**			**Batch: 8050699**			
Diesel	**183**	---	74.8	ug/L	1	05/12/18	NWTPH-Dx	**F-11**
Oil	ND	---	150	ug/L	1	05/12/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 64 %*	*Limits: 50-150 %*		*1*	*05/12/18*	*NWTPH-Dx*	
MW04-W (A8E0357-04)		**Matrix: Water**			**Batch: 8050699**			
Diesel	**75.9**	---	74.8	ug/L	1	05/12/18	NWTPH-Dx	**F-11**
Oil	ND	---	150	ug/L	1	05/12/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 83 %*	*Limits: 50-150 %*		*1*	*05/12/18*	*NWTPH-Dx*	

Apex Laboratories

Lisa Domenighini, Client Services Manager

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EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW01-W (A8E0357-01)		**Matrix: Water**			**Batch: 8050676**			
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 96 %*	*Limits: 50-150 %*		*1*	*05/11/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*88 %*	*50-150 %*	*1*	*05/11/18*	*NWTPH-Gx (MS)*	
MW02-W (A8E0357-02)		**Matrix: Water**			**Batch: 8050676**			
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 98 %*	*Limits: 50-150 %*		*1*	*05/11/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*91 %*	*50-150 %*	*1*	*05/11/18*	*NWTPH-Gx (MS)*	
MW03-W (A8E0357-03)		**Matrix: Water**			**Batch: 8050676**			
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 98 %*	*Limits: 50-150 %*		*1*	*05/11/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*90 %*	*50-150 %*	*1*	*05/11/18*	*NWTPH-Gx (MS)*	
MW04-W (A8E0357-04)		**Matrix: Water**			**Batch: 8050676**			
Gasoline Range Organics	ND	---	100	ug/L	1	05/11/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery: 99 %*	*Limits: 50-150 %*		*1*	*05/11/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*92 %*	*50-150 %*	*1*	*05/11/18*	*NWTPH-Gx (MS)*	

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC
12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

ANALYTICAL SAMPLE RESULTS

BTEX Compounds by EPA 8260C

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW01-W (A8E0357-01)		**Matrix: Water**			**Batch: 8050676**			
Benzene	ND	---	0.200	ug/L	1	05/11/18	EPA 8260C	
Toluene	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/18	EPA 8260C	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 95 %*		*Limits: 80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*99 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*105 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
MW02-W (A8E0357-02)		**Matrix: Water**			**Batch: 8050676**			
Benzene	ND	---	0.200	ug/L	1	05/11/18	EPA 8260C	
Toluene	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/18	EPA 8260C	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 97 %*		*Limits: 80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*101 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*104 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
MW03-W (A8E0357-03)		**Matrix: Water**			**Batch: 8050676**			
Benzene	ND	---	0.200	ug/L	1	05/11/18	EPA 8260C	
Toluene	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/18	EPA 8260C	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 96 %*		*Limits: 80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*99 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*104 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
MW04-W (A8E0357-04)		**Matrix: Water**			**Batch: 8050676**			
Benzene	ND	---	0.200	ug/L	1	05/11/18	EPA 8260C	
Toluene	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Ethylbenzene	ND	---	0.500	ug/L	1	05/11/18	EPA 8260C	
Xylenes, total	ND	---	1.50	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 99 %*		*Limits: 80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*100 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*102 %*		*80-120 %*	*1*	*05/11/18*	*EPA 8260C*	

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Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

ANALYTICAL SAMPLE RESULTS

Select Volatile Organic Compounds by EPA 8260C

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW01-W (A8E0357-01)		**Matrix: Water**			**Batch: 8050676**			
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 95 %*	*Limits: 80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*99 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*105 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
MW02-W (A8E0357-02)		**Matrix: Water**			**Batch: 8050676**			
Methyl tert-butyl ether (MTBE)	**3.34**	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 97 %*	*Limits: 80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*101 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*104 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
MW03-W (A8E0357-03)		**Matrix: Water**			**Batch: 8050676**			
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 96 %*	*Limits: 80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*99 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*104 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
MW04-W (A8E0357-04)		**Matrix: Water**			**Batch: 8050676**			
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	05/11/18	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 99 %*	*Limits: 80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
Toluene-d8 (Surr)		*100 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	
4-Bromofluorobenzene (Surr)		*102 %*	*80-120 %*		*1*	*05/11/18*	*EPA 8260C*	

Apex Laboratories

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Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8050699 - EPA 3510C (Fuels/Acid Ext.)												**Water**
Blank (8050699-BLK1)		Prepared: 05/11/18 13:37		Analyzed: 05/11/18 21:33								
NWTPH-Dx												
Diesel	ND	---	72.7	ug/L	1	---	---	---	---	---	---	
Oil	ND	---	145	ug/L	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 89 %*		*Limits: 50-150 %*			*Dilution: 1x*					
LCS (8050699-BS1)		Prepared: 05/11/18 13:37		Analyzed: 05/11/18 21:56								
NWTPH-Dx												
Diesel	381	---	80.0	ug/L	1	500	---	76	52-120%	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 91 %*		*Limits: 50-150 %*			*Dilution: 1x*					
LCS Dup (8050699-BSD1)		Prepared: 05/11/18 13:37		Analyzed: 05/11/18 22:19								**Q-19**
NWTPH-Dx												
Diesel	419	---	80.0	ug/L	1	500	---	84	52-120%	9	20%	
Surr: o-Terphenyl (Surr)		*Recovery: 93 %*		*Limits: 50-150 %*			*Dilution: 1x*					

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Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

HydroCon LLC	Project: **JH Kelly**	
314 W 15th Street Suite 300	Project Number: **2017-055**	**Report ID:**
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8050676 - EPA 5030B									Water			
Blank (8050676-BLK1)		Prepared: 05/11/18 08:22		Analyzed: 05/11/18 11:56								
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	100	ug/L	1	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 97 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)		*90 %*		*50-150 %*			*"*					
LCS (8050676-BS2)		Prepared: 05/11/18 08:22		Analyzed: 05/11/18 11:28								
NWTPH-Gx (MS)												
Gasoline Range Organics	451	---	100	ug/L	1	500	---	90	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 97 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)		*90 %*		*50-150 %*			*"*					
Duplicate (8050676-DUP1)		Prepared: 05/11/18 11:01		Analyzed: 05/11/18 14:46								
QC Source Sample: MW01-W (A8E0357-01)												
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	100	ug/L	1	---	ND	---	---	---	30%	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 99 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)		*91 %*		*50-150 %*			*"*					

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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8050676 - EPA 5030B												**Water**
Blank (8050676-BLK1)		Prepared: 05/11/18 08:22		Analyzed: 05/11/18 11:56								
EPA 8260C												
Benzene	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Toluene	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Ethylbenzene	ND	---	0.500	ug/L	1	---	---	---	---	---	---	
Xylenes, total	ND	---	1.50	ug/L	1	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 97 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*100 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*106 %*		*80-120 %*			*"*					
LCS (8050676-BS1)		Prepared: 05/11/18 08:22		Analyzed: 05/11/18 09:38								
EPA 8260C												
Benzene	18.0	---	0.200	ug/L	1	20.0	---	90	80-120%	---	---	
Toluene	18.6	---	1.00	ug/L	1	20.0	---	93	80-120%	---	---	
Ethylbenzene	19.9	---	0.500	ug/L	1	20.0	---	100	80-120%	---	---	
Xylenes, total	63.0	---	1.50	ug/L	1	60.0	---	105	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 95 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*98 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*100 %*		*80-120 %*			*"*					
Duplicate (8050676-DUP1)		Prepared: 05/11/18 11:01		Analyzed: 05/11/18 14:46								
QC Source Sample: MW01-W (A8E0357-01)												
EPA 8260C												
Benzene	ND	---	0.200	ug/L	1	---	ND	---	---	---	30%	
Toluene	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Ethylbenzene	ND	---	0.500	ug/L	1	---	ND	---	---	---	30%	
Xylenes, total	ND	---	1.50	ug/L	1	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 98 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*99 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*103 %*		*80-120 %*			*"*					
Matrix Spike (8050676-MS1)		Prepared: 05/11/18 11:01		Analyzed: 05/11/18 17:37								
QC Source Sample: Non-SDG (A8E0354-02)												
EPA 8260C												
Benzene	20.1	---	0.200	ug/L	1	20.0	ND	100	79-120%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

BTEX Compounds by EPA 8260C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8050676 - EPA 5030B							**Water**					
Matrix Spike (8050676-MS1)		Prepared: 05/11/18 11:01		Analyzed: 05/11/18 17:37								
QC Source Sample: Non-SDG (A8E0354-02)												
Toluene	20.0	---	1.00	ug/L	1	20.0	ND	100	80-121%	---	---	
Ethylbenzene	22.0	---	0.500	ug/L	1	20.0	ND	110	79-121%	---	---	
Xylenes, total	68.6	---	1.50	ug/L	1	60.0	ND	114	79-121%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 96 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*97 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*95 %*		*80-120 %*			*"*					

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QUALITY CONTROL (QC) SAMPLE RESULTS

Select Volatile Organic Compounds by EPA 8260C

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8050676 - EPA 5030B												**Water**
Blank (8050676-BLK1)		Prepared: 05/11/18 08:22 Analyzed: 05/11/18 11:56										
EPA 8260C												
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 97 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*100 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*106 %*		*80-120 %*				*"*			
LCS (8050676-BS1)		Prepared: 05/11/18 08:22 Analyzed: 05/11/18 09:38										
EPA 8260C												
Methyl tert-butyl ether (MTBE)	18.5	---	1.00	ug/L	1	20.0	---	92	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 95 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*98 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*100 %*		*80-120 %*				*"*			
Duplicate (8050676-DUP1)		Prepared: 05/11/18 11:01 Analyzed: 05/11/18 14:46										
QC Source Sample: MW01-W (A8E0357-01)												
EPA 8260C												
Methyl tert-butyl ether (MTBE)	ND	---	1.00	ug/L	1	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 98 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*99 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*103 %*		*80-120 %*				*"*			
Matrix Spike (8050676-MS1)		Prepared: 05/11/18 11:01 Analyzed: 05/11/18 17:37										
QC Source Sample: Non-SDG (A8E0354-02)												
EPA 8260C												
Methyl tert-butyl ether (MTBE)	20.1	---	1.00	ug/L	1	20.0	ND	100	71-124%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 96 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*97 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*95 %*		*80-120 %*				*"*			

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SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3510C (Fuels/Acid Ext.)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8050699							
A8E0357-01	Water	NWTPH-Dx	05/10/18 14:30	05/11/18 13:37	1070mL/2mL	1000mL/2mL	0.94
A8E0357-02	Water	NWTPH-Dx	05/10/18 13:35	05/11/18 13:37	1070mL/2mL	1000mL/2mL	0.94
A8E0357-03	Water	NWTPH-Dx	05/10/18 12:05	05/11/18 13:37	1070mL/2mL	1000mL/2mL	0.94
A8E0357-04	Water	NWTPH-Dx	05/10/18 12:55	05/11/18 13:37	1070mL/2mL	1000mL/2mL	0.94

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8050676							
A8E0357-01	Water	NWTPH-Gx (MS)	05/10/18 14:30	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-02	Water	NWTPH-Gx (MS)	05/10/18 13:35	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-03	Water	NWTPH-Gx (MS)	05/10/18 12:05	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-04	Water	NWTPH-Gx (MS)	05/10/18 12:55	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00

BTEX Compounds by EPA 8260C

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8050676							
A8E0357-01	Water	EPA 8260C	05/10/18 14:30	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-02	Water	EPA 8260C	05/10/18 13:35	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-03	Water	EPA 8260C	05/10/18 12:05	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-04	Water	EPA 8260C	05/10/18 12:55	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00

Select Volatile Organic Compounds by EPA 8260C

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8050676							
A8E0357-01	Water	EPA 8260C	05/10/18 14:30	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-02	Water	EPA 8260C	05/10/18 13:35	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00

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SAMPLE PREPARATION INFORMATION

Select Volatile Organic Compounds by EPA 8260C

Prep: EPA 5030B

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A8E0357-03	Water	EPA 8260C	05/10/18 12:05	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00
A8E0357-04	Water	EPA 8260C	05/10/18 12:55	05/11/18 11:01	5mL/5mL	5mL/5mL	1.00

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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

F-11 The hydrocarbon pattern indicates possible weathered diesel, or a contribution from a related component.

Q-19 Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source: In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met. Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

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LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) | EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Cert?

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Lisa A Domenighini

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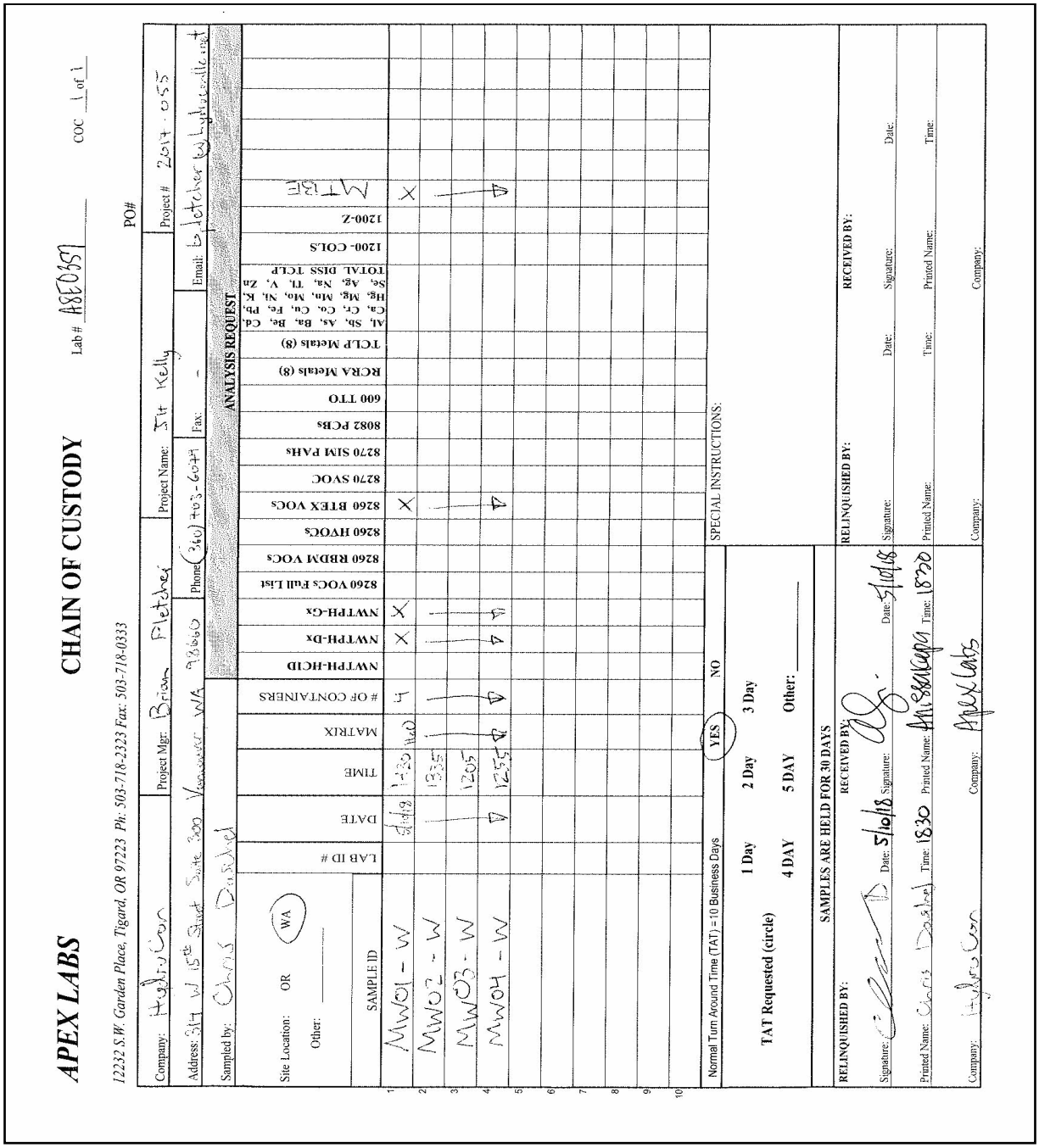
Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**



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Vancouver, WA 98660	Project Manager: **Brian Pletcher**	**A8E0357 - 05 15 18 1110**

APEX LABS COOLER RECEIPT FORM

Client: Hydrocon Element WO#: A8 E0357

Project/Project #: JH Kelly / 2017-055

Delivery info:

Date/Time Received: 5/10/18 @ 1830 By: AKK

Delivered by: Apex ___ Client X ESS ___ FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: AKK : 5/10/18 @ 1832

Chain of Custody Included? Yes X No ___ Custody Seals? Yes ___ No X

Signed/Dated by Client? Yes X No ___

Signed/Dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	5.9						
Received on Ice? (Y/N)	(Y)						
Temp. Blanks? (Y/N)	(Y)						
Ice Type: (Gel/Real/Other)	(Gel)						
Condition:	good						

Cooler out of temp? (Y/N) Possible reason why: (N)

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA (NA)

Samples Inspection: Inspected by: AKK : 5/11/18 @ 930 930 AKK

All Samples Intact? Yes ✓ No ___ Comments: ___

Bottle Labels/COCs agree? Yes ✓ No ___ Comments: ___

Containers/Volumes Received Appropriate for Analysis? Yes ✓ No ___ Comments:

Do VOA Vials have Visible Headspace? Yes ✓ No X NA ___

Comments HS in 1/3 voas MW03-W

Water Samples: pH Checked and Appropriate (except VOAs): Yes ✓ No ___ NA ___

Comments: ___

Additional Information: ___

Labeled by: (AK) Witness: W Cooler Inspected by: AKK 5/10/18 AKK See Project Contact Form: Y